

## PART IV - CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS

### IV.A. INTRODUCTION

This part describes the corrective action activities and the identified Solid Waste Management Units (SWMUs) at PCD. This part is organized as follows:

- IV.B. - General Information on Corrective Action - definitions, standard conditions, reporting requirements, notification requirements
- IV.C. - Corrective Action Schedule of Compliance - describes requirements for all steps in the Corrective Action process, including RCRA Facility Investigation (RFI), Corrective Measures Study (CMS), and Remedy Selection
- IV.D. - Description of Identified SWMUs
- IV.E. – Selected Remedies for SWMUs

### IV.B. GENERAL INFORMATION ON CORRECTIVE ACTION

#### IV.B.1. Definitions

For purposes of this part the following definitions shall apply:

“Baseline Ecological Risk Assessment” means the Tier 3 evaluation as defined by the Biological Technical Assistance Group for PCD.

“Calendar Quarter” means the three month periods of January 1 to March 31, April 1 to June 30, July 1 to September 30, and October 1 to December 31.

“Cumulative Risk” means the calculated ecological risk for the SWMU being evaluated plus the ecological risk for nearby areas, including other SWMUs that may contribute to the ecological risk for wide-ranging receptors.

“Facility” means all contiguous property under the control of the owner or operator seeking a permit under Colorado Hazardous Waste Regulations.

“Hazardous constituent” means any constituent identified in Appendix VIII of 6 CCR 1007-3, Part 261, or any constituent identified in Appendix IX of 6 CCR 1007-3, Part 264.

“Hazardous waste” means a solid waste, or combination of solid wastes, which because of its quantity, concentration, physical, or chemical characteristics may cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed. The term hazardous waste includes hazardous constituent as defined above.

“Release” means any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous

wastes (including hazardous constituents) into the environment (including abandonment or discard of drums, containers, and other closed receptacles containing hazardous wastes or hazardous constituents).

“Reuse Area” means the End State Uses identified on the Pueblo Chemical Depot Reuse Development Plan Land Use Map adopted June 29, 2000.

“Screening Ecological Risk Assessment” means the Tier 1 and Tier 2 evaluations as defined by the Biological Technical Assistance Group for PCDD.

“Solid Waste Management Unit” (SWMU) means any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released.

Unless defined above, all definitions from 6 CCR 1007-3, §260.10 shall apply for purposes of Part IV.

#### IV.B.2. Standard Conditions

IV.B.2.a. Section 3004(u) of RCRA, as amended by HSWA, and 6 CCR 1007-3, §264.101 require that permits issued after November 8, 1984 address corrective action for releases of hazardous wastes including hazardous constituents from any solid waste management unit (SWMU) at the facility, regardless of when the waste was placed in the unit.

IV.B.2.b. Failure to submit the information required in this part, or falsification of any submitted information, is grounds for termination of this Permit (6 CCR 1007-3, §100.64). The Permittee must ensure that all plans, reports, notifications, and other submissions to the Director required in this part are signed and certified in accordance with 6 CCR 1007-3, §100.42(k). Two copies of these plans, reports, notifications or other submissions must be submitted to the Director by mail, overnight delivery service, or hand delivery to:

Colorado Department of Public Health and Environment  
Hazardous Materials and Waste Management Division  
4300 Cherry Creek Drive South  
Denver, CO 80246-1530

IV.B.2.c. All plans and schedules required by the conditions of this part are, upon approval of the Director, incorporated into the Schedule of Compliance by reference and become an enforceable part of this Permit. Upon receipt of a written request for an extension from the

Permittee, the Director may grant an extension of the due date for a submittal required under Part IV.C or IV.E of this Permit.

IV.B.2.d. If the Director determines that further actions beyond those described in this Part, or changes to requirements stated herein, are warranted, the Director shall require the Permittee to take such additional actions. Any changes to plans and schedules become incorporated into the Schedule of Compliance by reference as described in Part IV.B.2.c of this Permit.

IV.B.2.e. 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 Part must be maintained in the operating record at the facility during the term of this Permit, including any reissued Permits, and must be submitted to the Director upon request.

#### IV.C. CORRECTIVE ACTION SCHEDULE OF COMPLIANCE

##### IV.C.1. Reporting Requirements

IV.C.1.a. The Permittee must submit to the Director signed quarterly progress reports of all activities (e.g., SWMU Assessments, RCRA Facility Investigations, Corrective Measures Studies, Corrective Measure Implementations) conducted pursuant to the provisions of this Part (this report is not a substitute for individual SWMU remedy progress reports). The reports are due 30 days after the end of each calendar quarter. These reports must contain:

- i. A description of the work completed;
- ii. Summaries of all findings, including significant findings from laboratory data;
- iii. Summaries of all problems or potential problems encountered during the reporting period and actions taken to rectify problems; and
- iv. Projected work for the next reporting period.

IV.C.1.b. Copies of other reports (e.g., inspection reports), drilling logs, and laboratory data must be made available to the Director upon request.

IV.C.1.c. As specified under Part IV.B.2.d of this Permit, the Director may require the Permittee to conduct new or more extensive assessments, investigations, or studies, as needed, based on information provided in these progress reports or other supporting information.

IV.C.2. Notification Requirements and Assessment of Newly-Identified Solid Waste Management Units

- IV.C.2.a. The Permittee must notify the Director in writing of any newly-identified SWMU (i.e., a unit not specifically described in Part IV.D of this Permit) discovered during the course of groundwater monitoring, field investigations, environmental audits, or other means, no later than 15 calendar days after discovery.
- IV.C.2.b. After such notification, the Director may request, in writing, that the Permittee prepare a SWMU Assessment Plan and a proposed schedule for implementing and completing the SWMU Assessment.
- IV.C.2.c. Within 90 calendar days after receipt of the Director's request for a SWMU Assessment Plan, the Permittee must prepare a SWMU Assessment Plan for determining past and present operations at the unit, as well as any sampling and analysis of ground water, land surface and subsurface strata, surface water or air, as necessary to determine whether a release of hazardous waste including hazardous constituents from such unit(s) has occurred, is likely to have occurred, or is likely to occur. The SWMU Assessment Plan must demonstrate that the sampling and analysis program, if applicable, is capable of yielding representative samples and must include parameters sufficient to identify migration of hazardous waste including hazardous constituents from the newly-discovered SWMU(s) to the environment. The SWMU Assessment Plan must also include a schedule for implementation of the assessment.
- IV.C.2.d. After the Permittee submits the SWMU Assessment Plan, the director must either approve or disapprove the plan in writing.
- i. If the Director approves the plan, the Permittee must implement the investigation described in the plan within 60 calendar days of receiving such written approval.
  - ii. If the Director disapproves the plan, the Director shall either: (1) Notify the Permittee in writing of the plan's deficiencies and specify a due date for submittal of a revised plan; or (2) Revise the plan and notify the Permittee of the revisions. This Director-revised plan becomes the approved SWMU Assessment Plan. The Permittee must implement the investigation described in the plan within 60 calendar days of receiving such written notification.
- IV.C.2.e. The Permittee must submit a SWMU Assessment Report to the Director no later than 90 calendar days from the completion date of the field investigation work as specified in the schedule included in

the approved SWMU Assessment Plan. The SWMU Assessment Report must describe all results obtained from the implementation of the approved SWMU Assessment Plan. At a minimum, the report must provide the following information for each newly-identified SWMU:

- i. The location of the newly-identified SWMU in relation to other SWMUs (the location description must include a map drawn to scale which clearly shows the location of the newly-identified SWMU)
- ii. The type and function of the SWMU
- iii. The general dimensions, capacities, and structural description of the SWMU
- iv. Any available drawings of the SWMU
- v. The period during which the SWMU was operated
- vi. The specifics on all wastes that have been or are being managed at the SWMU (to the extent available)
- vii. The results of any sampling and analysis conducted for the purpose of determining whether releases of hazardous wastes including hazardous constituents have occurred, are occurring, or are likely to occur from the SWMU
- viii. Any known information regarding the geology and hydrogeology of the area in which the newly-identified SWMU is located
- ix. Any other pertinent information useful in making future decisions regarding possible additional investigation and possible remediation of the newly-identified SWMU

IV.C.2.f. Based on the results of this report, the Director shall determine the need for further investigations at specific SWMUs covered in the SWMU Assessment. If the Director determines that such investigations are needed, the Director may require the Permittee to prepare an RFI Work Plan for such investigations.

#### IV.C.3. Notification Requirements for Newly-Discovered Releases at SWMUs

The Permittee must notify the Director, in writing, of any newly discovered release of hazardous waste including hazardous constituents discovered during the course of groundwater monitoring, field investigation, environmental auditing, or other activities undertaken after the commencement of the RFI, no later than 15 calendar days after discovery. Such newly-discovered release may be from newly-identified units; from units for which, based on the findings of the

site investigation documents, the Director had previously determined that no further investigation was necessary; or from units investigated as part of the RFI. The Director may require further investigation of the newly-discovered release. A plan for such investigation shall be reviewed for approval as described for an RFI Work Plan under Part IV.C.4.b of this Permit.

#### IV.C.4. RCRA Facility Investigation (RFI) Work Plan

IV.C.4.a. Within 90 calendar days after receipt of a request for an RFI Work Plan or Supplemental RFI Work Plan, the Permittee must submit a work plan to the Director to address releases of hazardous waste including hazardous constituents, and media of concern which, based on the results of the site investigation documents, require further investigation.

The work plan must describe the objectives of the investigation and the overall technical and analytical approach for completing all actions necessary to characterize the nature and extent, direction, rate, movement, and concentration of releases of hazardous waste including hazardous constituents from specific units or groups of units, and their actual or potential receptors. The work plan must detail all proposed activities and procedures to be conducted at the facility, the schedule for implementing and completing such investigations, and the overall management of the RFI. The RFI must provide sufficient data to support a decision on whether a Corrective Measures Study (CMS) is necessary.

IV.C.4.b. After the Permittee submits the work plan, the Director will either approve or disapprove the work plan in writing.

- i. If the Director approves the work plan, the Permittee must initiate the field investigation described in the work plan within 60 calendar days of receiving such written approval.
- ii. If the Director disapproves the plan, the Director shall either: (1) Notify the Permittee in writing of the plan's deficiencies and specify a due date for submittal of a revised plan; or (2) Revise the plan and notify the Permittee of the revisions. This Director-revised plan becomes the approved RFI Work Plan. The Permittee must initiate the investigation described in the work plan within 60 calendar days of receiving such written notification.

#### IV.C.5. RCRA Facility Investigation Report

IV.C.5.a. The Permittee must submit an RFI Report to the Director no later than 150 calendar days from the completion date of the field investigation

work as specified in the schedule included in the approved RFI Work Plan or Supplemental RFI Work Plan. The RFI Report must describe the procedures, methods, and results of all investigations of SWMUs and related releases, including information on the nature and extent of contamination at the site, contaminant sources and migration pathways, and actual or potential receptors. The RFI Report must present all information gathered under the approved RFI Work Plan. The report must contain adequate information to support further corrective action decisions at the facility. If the information gathered during the RFI is not adequate to determine the nature and extent of contamination at a SWMU, the Director may require the Permittee to conduct a Supplemental RFI to determine the nature and extent of contamination. A work plan for the Supplemental RFI must be submitted in accordance with Part IV.C.4.

- IV.C.5.b. After the Permittee submits the RFI Report, the Director shall either approve or disapprove the report in writing.
- i. If the Director approves the RFI Report, the Permittee must mail a short summary of the approved RFI Report to all individuals on the facility mailing list established pursuant to 6 CCR 1007-3, §100.506(c)(1), within 90 calendar days of receipt of approval. The summary may be sent as a separate mailing or be incorporated into other mailings such as routinely published newsletters.
  - ii. If the Director determines the RFI Report did not fully meet the objectives of the investigation stated under Part IV.C.4.a, the Director may disapprove the RFI Report. If the Director disapproves the report, the Director shall notify the Permittee in writing of the report's deficiencies and specify a due date for submittal of a revised report. The revised report is then subject to the requirements of Part IV.C.5.b.

#### IV.C.6. Corrective Measures Study Work Plan

- IV.C.6.a. If the Director has reason to believe that concentrations of hazardous waste including hazardous constituents in excess of an action level have been released from a SWMU, or if the Director determines that contaminants present at levels below an action level pose a threat to human health and the environment given site-specific exposure conditions, the Director may require a Corrective Measures Study (CMS) and shall notify the Permittee in writing. This notice shall identify the hazardous constituents that have exceeded action levels as well as those which have been determined to threaten human health and the environment given site-specific exposure conditions.

The notification may also specify remedial alternatives to be evaluated by the Permittee during the CMS.

For sites where a presumptive remedy may be the most appropriate and cost effective remedial option, the Director will impose a CMS with the provision that a presumptive remedy may be pursued. The Director will determine whether the documents described in Part IV.C.6 and Part IV.C.7 of this Permit are required for a presumptive remedy. Remedy selection for presumptive remedies will be conducted in accordance with Part IV.C.8.

IV.C.6.b. The Permittee must submit a CMS Work Plan to the Director within 90 calendar days of notification of the requirement to conduct a CMS. The CMS Work Plan must provide the following information:

- i. A definition of the overall objectives of the study, including corrective measure objectives
- ii. Identification of the corrective measure technologies that will be evaluated
- iii. A description of the approach to investigating and evaluating the corrective measure technologies
- iv. The specific plans for evaluating the technologies to form remedial alternatives capable of ensuring compliance with corrective measure objectives
- v. Plans for any bench-scale or pilot-scale studies
- vi. The schedule for conducting the study
- vii. The proposed format for the presentation of the information in the CMS Report

IV.C.6.c. After the Permittee submits the CMS Work Plan, the Director will either approve or disapprove the work plan in writing.

- i. If the Director approves the CMS Work Plan, the Permittee must implement the study described in the work plan within 45 calendar days of receiving such written approval
- ii. If the Director disapproves the CMS Work Plan, the Director shall either: (1) Notify the Permittee in writing of the work plan's deficiencies and specify a due date for submittal of a revised work plan; or (2) Revise the work plan and notify the Permittee of the revisions. The modified work plan becomes the approved CMS Work Plan. The Permittee must implement the study

described in the work plan within 45 calendar days of receiving such written notification.

IV.C.7. Corrective Measures Study Report

- IV.C.7.a. The Permittee must submit the CMS Report to the Director no later than 90 calendar days from the completion date of the CMS as specified in the schedule included in the approved CMS Work Plan. The CMS Report must include at a minimum:
- i. A description of the area, proposed media cleanup standards, and points of compliance
  - ii. Screening of each technology, including results of any bench-scale or pilot-scale studies conducted
  - iii. Technical evaluation of each corrective measure technology based on long-term effectiveness, toxicity/mobility/and volume reduction, short-term effectiveness, implementability, cost, community acceptance, and regulator acceptance;
  - iv. Development and evaluation of specific corrective measures alternatives that may include several corrective measure technologies. Land use controls may need to be included in corrective measure alternatives.
  - v. Cost estimates for each corrective measure alternative, including capital costs, and operation and maintenance costs
  - vi. The Permittee's recommended corrective measure alternative
- IV.C.7.b. The CMS Report must present all information gathered under the approved CMS Work Plan. The report must contain adequate information to support the Director in the remedy selection decision-making process described under Part IV.C.8 of this Permit.
- IV.C.7.c. If the Director approves the CMS Report, the Director shall then initiate a Permit modification for selection of a remedy as described under Part IV.C.9 of this Permit.
- IV.C.7.d. If the Director determines that the CMS Report does not satisfy the information requirements specified under Part IV.C.7.a of this Permit, the Director may disapprove the CMS Report. If the Director disapproves the CMS Report, the Director shall notify the Permittee in writing of deficiencies in the report and specify a due date for submittal of a revised report.

IV.C.7.e. As specified under Part IV.B.2.d, based on preliminary results and the final CMS Report, the Director may require the Permittee to evaluate additional remedial technologies or particular elements of one or more proposed corrective measure technologies.

IV.C.8. Remedy Selection

Based on the results of the CMS, a presumptive remedy work plan, and/or any further evaluations of additional corrective measure technologies, the Director shall select a corrective measure alternative that will: (1) Be protective of human health and the environment; (2) Meet the concentration levels of hazardous constituents in each medium that will be protective of human health and the environment; (3) Control the source(s) of release(s) so as to reduce or eliminate, to the maximum extent practicable, further releases that might pose a threat to human health and the environment; and (4) Specify Land Use Controls that are necessary to protect human health and the environment; and (5) Meet all applicable waste management requirements. The remedy selected may be No Further Action. The selected remedies for SWMUs are described in Part IV.E of this Permit.

IV.C.9. Permit Modification for Remedy

IV.C.9.a. Based on information the Permittee submits in the RFI Report, the CMS Report, the PRWP, or other relevant information, the Director will select a remedy for a SWMU identified in this Permit. The Director will initiate a permit modification for selection of the remedy, pursuant to 6 CCR 1007-3, §100.61.

IV.C.9.b. The modification shall specify the selected remedy and include, at a minimum, the following:

- i. Descriptions of all technical features of the remedy that are necessary for achieving the standards for remedies established under Part IV.C.8 of this Permit, including length of time for which compliance must be demonstrated at specified points of compliance
- ii. Concentration levels of hazardous constituents in each medium that the remedy must achieve to be protective of human health and the environment
- iii. Requirements for achieving compliance with these concentration levels
- iv. Requirements for complying with the standards for management of wastes

- v. Requirements for removal, decontamination, closure, or post-closure of units, equipment, devices or structures that will be used to implement the remedy
- vi. Requirements for preparing a schedule to initiate and complete all major technical features and milestones of the remedy
- vii. Requirements for submission of reports and other information
- viii. Any required land use controls

IV.C.10. Permit Modification for No Further Action as Remedy

The Director or the Permittee may initiate a permit modification to select No Further Action as the remedy for a SWMU in accordance with the following:

IV.C.10.a. The Director may select No Further Action or No Further Action with land use controls as the remedy for a SWMU if the Director determines that, based on information the Permittee submits in the RFI Report, the Basis for No Further Action document, or any other documents available to the Director, no releases of hazardous wastes including hazardous constituents from a SWMU at the facility pose a threat to human health or the environment, based on the designated Reuse Area. The Director may initiate a permit modification for selection of No Further Action as the remedy for a SWMU. [6 CCR 1007-3, §100.61]

IV.C.10.b. The Permittee may submit a Class 3 permit modification to the Director requesting that No Further Action or No Further Action with land use controls be selected as the remedy for an individual SWMU or several SWMUs within a Reuse Area [6 CCR 1007-3, §100.63(c)]. This permit modification request must include a risk assessment and/or risk screening document that is prepared using the process outlined in the most current, approved version of the *Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units* demonstrating there are no releases of hazardous wastes including hazardous constituents from the SWMU that, based on the designated Reuse Area, pose a threat to human health and the environment.

IV.C.10.c. The permit modification for No Further Action shall specify the following:

- i. Concentration levels of hazardous waste or hazardous constituents in each medium, demonstrating protection of human health and the environment, based on the designated Reuse Area.

- ii. The requirements, if any, for demonstrating continued compliance with the concentration levels.
- iii. The requirements, if any, for submission of reports and other information.
- iv. Requirements for maintaining Land Use Controls, if any.

IV.C.10.d. A determination of No Further Action shall not preclude the Director from requiring further investigations, studies, or remediation if new information or subsequent analyses indicate a release, or likelihood of a release, from a SWMU at the facility that is likely to pose a threat to human health or the environment, or if the future planned use of the Reuse Area changes. In such a case, the Director shall initiate a modification to this Permit in accordance with the procedures for a permit modification specified in 6 CCR 1007-3, §100.60, to rescind the selection of No Further Action as the remedy for a SWMU or SWMUs.

IV.C.11. Property Transfer

Any sale or transfer of any of the facility's real property must comply with 42 U.S.C. §9620(h) (CERCLA 120(h)). Where not all necessary remedial action has taken place before the sale or other transfer of real estate, or where such remedial action determinations have not yet been made, the Permittee must also comply with Colorado Executive Order D-013-98, dated June 18, 1998, and the incorporated Colorado Statewide Defense Initiatives/CDPHE Joint Policy, dated June 19, 1998.

A Class 3 permit modification will be required if property including all or part of a SWMU is being transferred prior to remedy selection or successful implementation and completion of that remedy. A Class 2 permit modification will be required if property including all or part of a SWMU for which the remedy is complete is being transferred and an environmental covenant or notice of environmental use restriction is required. If an environmental covenant or notice of environmental use restriction is necessary, it shall be recorded before the Director finalizes the permit modification for the transfer. A Class 3 permit modification will be required for any other property transfer, pursuant to 6 CCR 1007-3, §100.63, Appendix I.

IV.C.12. Modification of the Corrective Action Schedule of Compliance

The Director may initiate a modification to the Corrective Action Schedule of Compliance according to the procedures specified in 6 CCR 1007-3, §100.61 at any time the Director determines that modification of the Corrective Action Schedule of Compliance is necessary.

#### IV.C.13. Community Relations Requirements

IV.C.13.a. Except in case of an emergency, or in matters regarding enforcement of this Permit, any Party issuing a press release or initiating media contact for the purpose of providing information to the media with reference to any permitted activities, including corrective actions, shall advise the other Party of such press release or media contact and the contents thereof, at least two days prior to issuance. Other documents prepared by the Permittee for community involvement purposes related to this Permit, or documents prepared by the Director for community involvement purposes related to this Permit, shall be submitted to the other Party for review and comment at least two days in advance of issuance, unless otherwise agreed to.

IV.C.13.b. The Director will review, evaluate, and comment upon informational material (such as fact sheets, information updates, and newsletters) pertaining to any permitted activities, including corrective actions, prepared to support community involvement activities. The Permittee shall submit the informational material in electronic format or hard copy to the Director for review and comment at least seven days in advance of issuance, unless otherwise agreed to. Technical assistance in the preparation of such materials will be available from the Director as resources permit.

IV.C.13.c. When feasible, the Director shall receive notification seven days prior to any community meetings scheduled as part of the Permittee's community involvement efforts pertaining to any permitted activities, including corrective actions.

#### IV.D. DESCRIPTION OF IDENTIFIED SWMUs

The following SWMUs have been identified during the RCRA Facility Assessment (RFA) and/or subsequent activities at PCD. These SWMUs were identified because the RFA or subsequent investigation indicated the possible release to the environment of hazardous waste or hazardous constituents identified in 6 CCR 1007-3, Part 261, Appendix VIII or Part 264, Appendix IX.

The Director will determine which corrective action investigations and reports described in Part IV.C are required for each of the following SWMUs. When an investigation is required, all media of concern and hazardous constituents of concern identified by the Director through the corrective action process must be evaluated by the Permittee.

##### **SWMU No. 1 – North Demolition Area**

The North Demolition Area is located in the far northwestern corner of PCD within the Western Wildlife Management Reuse Area. Fourteen unlined demolition pits covering approximately 60 acres were used to demilitarize conventional munitions. Interim status of

this Open Burn/Open Detonation area was terminated on March 30, 2001, and closure will be managed under the Corrective Action Program. Future Open Burn/Open Detonation activities will only take place with prior permission from the Director under an emergency permit.

#### **SWMU No. 2 – Demolition Area**

The Demolition Area is located on the western side of PCD within the Western Wildlife Management Reuse Area. The Demolition Area covers approximately 25 acres, consisting of a metal burning cage, an earthen detonation pit, and about 14 linear ground scars from open burning and open detonation of munitions, including bombs, grenades, and artillery rounds.

#### **SWMU No. 3 – Unexploded Ordnance Area**

The Unexploded Ordnance Area is centrally located at PCD near the southeastern corner of Munitions Storage Area B within the Industrial Reuse Area. SWMU 3 was an open munitions storage area from approximately 1944 to 1948. Munitions (75-mm projectiles) were scattered in this area when lightning struck an outside storage pad in 1948.

#### **SWMU No. 4 – East Burn Area No. 1**

The East Burn Area No. 1 is located in the east-central portion of PCD within the Eastern Wildlife Management Reuse Area. SWMU 4 lies within a larger area known as the East Burn Area, comprising approximately 1,000 acres and encompassing SWMUs 4, 5, 32, and 33. The East Burn Area No. 1 was used for demilitarization activities from 1946 to 1953. A portion of this site, which is identified as SWMU 32, is currently being used as a small arms range.

#### **SWMU No. 5 – East Burn Area No. 2**

The East Burn Area No. 2 is located in the east-central portion of PCD within the Eastern Wildlife Management Reuse Area. SWMU 5 lies within a larger area known as the East Burn Area, comprising approximately 1,000 acres and encompassing SWMUs 4, 5, 32, and 33. East Burn Area No. 2 was used for demilitarization activities from 1946 to 1953.

#### **SWMU No. 6 – North Burn Area No. 1**

The North Burn Area No. 1 is located in the northwestern corner of PCD within the Western Wildlife Management Reuse Area. SWMU 6 covers approximately 30 acres and, like SWMU 1, was used to demilitarize munitions. Operations began in 1953, which included the open burning of energetics, old ammunition boxes and pallets, and demilitarized rocket casings, as well as the destruction of rocket engine waste derived from SWMUs 17, 18, and 19. In the late 1980s, this area was used for the static firing demilitarization of Pershing Missile rocket motors.

### **SWMU No. 7 – North Burn Area No. 2**

The North Burn Area No. 2 is located in the northwestern corner of PCD within the Western Wildlife Management Reuse Area, and occupies approximately 30 acres. The Pyrotechnic Burning Cage (SWMU 10) is located within SWMU 7. SWMU 7 began operations in 1953 with the burning of energetics, generally in burn trays. Interim status of this Open Burn/Open Detonation area was terminated on March 30, 2001, and closure will be managed under the Corrective Action Program.

### **SWMU No. 8 – Homemade Furnace**

The Homemade Furnace is located in the western portion of PCD within the Western Wildlife Management Reuse Area, and occupies approximately 12 acres. SWMU 8 includes the furnace area, two excavation areas, and an arroyo. The furnace was used for the destruction of fuses, bursters, primers, and small arms munitions, and operated from 1950 to 1967.

### **SWMU No. 9 – Inert Materials Burning Cage**

The Inert Materials Burning Cage is located along the southern boundary of PCD within the sanitary landfill (SWMU 14). SWMU 14 is located within the Industrial Reuse Area. The Inert Materials Burning Cage was composed of wire with a concrete floor protecting the underlying soil. The cage was used to burn inert (non-explosive), sanitary type, solid wastes and construction debris. No further action is currently required at the Inert Materials Burning Cage.

### **SWMU No. 10 – Pyrotechnic Burning Cage**

The Pyrotechnic Burning Cage is located within North Burn Area No. 2 (SWMU 7) in the northwestern corner of PCD within the Western Wildlife Management Reuse Area. The Pyrotechnic Burning Cage was used from the early 1960s to 1985 to burn small munitions, flash-burn igniters from rocket motors, and destroy illegal fireworks confiscated by the Pueblo Police and Sheriff Departments. Corrective action at SWMU 10 will occur under the corrective action process for SWMU 7.

### **SWMU No. 11 – Deactivation Incinerator**

The Deactivation Incinerator (also known as the Popping Furnace) is centrally located at PCD in the Industrial Reuse Area. The furnace was used from 1968 to 1989 to burn small arms ammunition. Closure of this unit was conducted under a closure plan approved by the Director. Site restoration took place in 1997. No further action is currently required at the Deactivation Incinerator.

### **SWMU No. 12 – West Chemical Disposal Ground**

The West Chemical Disposal Ground is located southeast of SWMU 8 between Gates 24 and 25 in the Western Wildlife Management Reuse Area. The fenced area measures approximately 500 feet square and occupies about 6 acres. The site was used for disposal of leaking 105mm and 155mm mustard rounds.

### **SWMU No. 13 – East Chemical Burial Ground**

The East Chemical Burial Ground is located one-half mile north of SWMU 4 in the Eastern Wildlife Management Reuse Area. The fenced area occupies approximately 1/4 acre. The site was used from 1942 to 1946 for the destruction of about 100 M-70 chemical bombs.

### **SWMU No. 14 – Landfill**

The landfill is located along the southern boundary of PCD, occupies 153 acres, and lies within the Industrial Reuse Area. The landfill was used between 1941 and 1992 for the disposal of installation waste. The final remedy for this site was selected and is described in Part IV.E of this Permit.

### **SWMU No. 15 – Radiation Tube Burial**

The Radiation Tube Burial site is located in the southwestern portion of PCD within the Western Wildlife Management Reuse Area. This site consists of a fenced burial area measuring approximately 100 feet by 100 feet. Electron tubes from the missile rebuild program were reportedly buried in this area in 1955. No further action is currently required at the Radiation Tube Burial Site.

### **SWMU No. 16 – Sodium-Filled Valve Burial Site**

The Sodium-Filled Valve Burial Site is located in the eastern portion of PCD within the Chemical Demilitarization Reuse Area. Six to eight sodium-filled, stainless steel valves were reportedly buried; however, the exact location of the valves is not recorded. No further action is currently required at the Sodium-Filled Valve Burial Site.

### **SWMU No. 17 – TNT Washout Facility and Discharge System**

The Trinitrotoluene (TNT) Washout Facility and Discharge System is located in the southwestern portion of PCD within the Western Wildlife Management Reuse Area. From the late 1940s to 1974, TNT from various munitions was reclaimed at the TNT Washout Facility. A pump and treat system for contaminated groundwater from SWMU 17, called the Southwest Terrace Groundwater Extraction, Treatment, and Injection (GETI) System, was installed and operational since June 2001. The final remedy for this site was selected and is described in Part IV.E of this Permit.

At the time of Permit renewal in 2013, the previously permitted containment buildings 591 and 592 were transferred to corrective action for remediation. The containment buildings are designated as subsets of SWMU 17.

**SWMU 17-1** – Building 591 – Former containment building used for storage of explosives contaminated soil

**SWMU 17-2** – Building 592 – Former containment building used for treatment of explosives contaminated soil

### **SWMU No. 18 – UDMH Washout Disposal Area**

The Unsymmetrical Dimethylhydrazine (UDMH) Washout Disposal Area is located in the southwestern portion of PCD, approximately 300 feet northwest of SWMU 19, within the Western Wildlife Management Reuse Area. SWMU 18 facilities included a bermed concrete evaporation pad measuring 88 feet by 50 feet, and a concrete sump lined with stainless steel and covered with steel grating. The final remedy for this site was selected and is described in Part IV.E of this Permit.

### **SWMU No. 19 – Red Fuming Nitric Acid (RFNA) Washout Disposal Area**

The Red Fuming Nitric Acid (RFNA) Washout Disposal Area is located in the southwestern portion of PCD, approximately 300 feet southeast of SWMU 18, within the Western Wildlife Management Reuse Area. During the early 1950s, fuel tanks that stored RFNA were steam-cleaned at the western end of the TNT Washout Building (SWMU 17). The final remedy for this site was selected and is described in Part IV.E of this Permit.

### **SWMU No. 20 – Concentrated RFNA Disposal Area**

The Concentrated Red Fuming Nitric Acid (RFNA) Disposal Area occupies approximately one-half acre in the east-central portion of PCD within the Eastern Wildlife Management Reuse Area. In 1955, concentrated RFNA was reportedly disposed in a limestone-lined pit during a one-time operation. The final remedy for this site was selected and is described in Part IV.E of this Permit.

### **SWMU No. 21 – East Lagoons**

The East Lagoons are two wastewater treatment lagoons located southeast of the primary warehouse area in the Industrial Reuse Area at PCD. Each lagoon occupies approximately 7.5 acres and is lined with a 30-mil polyvinyl chloride (PVC) liner. The northernmost lagoon was constructed in 1977, and the southernmost lagoon was constructed in 1984.

### **SWMU No. 22 – West Lagoon**

The West Lagoon covers a 1.4 acre area south of the TNT Washout Facility (SWMU 17) within the Western Wildlife Management Reuse Area. The lagoon measures 250 feet by

250 feet by 6 feet and was lined with a 30-mil chlorinated polyethylene liner when constructed in 1977. The final remedy for this site was selected and is described in Part IV.E of this Permit.

### **SWMU No. 23 – Mercury Storage Igloos (F101, F102, and F103)**

The Mercury Storage Igloos (F101, F102, and F103) are centrally located at PCD within the Industrial Reuse Area. In 1970, several tons of mercury were transferred to these adjacent, ventilated storage igloos, where it was stored in lead containers. The mercury was being stored as a product. All mercury containers have been removed from these igloos. No further action is currently required at the Mercury Storage Igloos.

### **SWMU No. 24 – Zinc Chlorate/Chromate Burial**

The Zinc Chlorate/Chromate Burial Area is located in the northwestern portion of PCD within the Western Wildlife Management Reuse Area. Approximately 5,000 180-ml cans containing zinc chlorate and zinc chromate were discovered in the North Burn Area in the 1960s and reportedly moved to a location east of SWMU 6. The exact location and size of the site has not been determined due to undeveloped terrain with no visual surface indication of the burial site. The final remedy for this site was selected and is described in Part IV.E of this Permit.

### **SWMU No. 25 – Sanitary Sewage Treatment Plant**

The Sanitary Sewage Treatment Plant (SSTP) is located in the southeastern portion of PCD within the Industrial Reuse Area. Operations at the SSTP were terminated in 1991 because of low flow rates. The final remedy for this site was selected and is described in Part IV.E of this Permit.

### **SWMU No. 26 – Munitions Storage Area A**

Munitions Storage Area A is located in the northern portion of PCD within the Chemical Demilitarization Reuse Area. Munitions are stored in aboveground, concrete, earth-covered igloos. The munitions were moved to Munitions Storage Area A in 1979. The chemical constituents (agents) are being stored as hazardous waste under interim status requirements specified in a compliance order issued by the Department. The storage igloos within Munitions Storage Area A where mustard agent filled munitions have been managed must be clean closed in accordance with a closure plan(s) to be submitted to the Department for approval.

### **SWMU No. 27 – Hazardous Waste Storage Building 540**

The Hazardous Waste Storage Building (Building 540) is located in the southeastern portion of PCD within the Industrial Reuse Area. Building 540 was permitted in 1992 to store hazardous wastes generated throughout the installation. Closure procedures are specified in

the Closure Plan of this Permit. This unit will be regulated under the provisions and conditions of Part III of this Permit.

### **SWMU No. 28 – Plating Waste Drainage Ditch and Former Building 539**

The Plating Waste Drainage Ditch and Former Building 539 are located in the south-central portion of PCD within the Industrial Reuse Area. The Former Building 539 (Plating Shop) was demolished in 1976, and only a concrete pad remains. The ditch flows west to east along the southern boundary of the warehouse area and dissipates toward the east. The final remedy for this site was selected and is described in Part IV.E of this Permit.

### **SWMU No. 29 – Fire Protection Training Area**

The Fire Protection Training Area is located near the intersection of Third Street and Burma Road, just north of the landfill (SWMU 14) and within the Industrial Reuse Area. This SWMU consists of a shallow depression approximately 24 feet by 25 feet in area and 1.5 feet deep. The final remedy for this site was selected and is described in Part IV.E of this Permit.

### **SWMU No. 30 – Munitions Storage Area B**

Munitions Storage Area B is located in the north-central portion of PCD within the Industrial and Chemical Demilitarization Reuse Areas. SWMU 30 consists of aboveground, concrete, earth-covered igloos. During the 1950s, excess munitions were stored on pads between these storage igloos. The munitions in Munitions Storage Area B were stored as a product. No further action is currently required at Munitions Storage Area B.

### **SWMU No. 31 – Propellant Storage Area**

The Propellant Storage Area is located in the southeastern portion of PCD within the Eastern Wildlife Management Reuse Area. SWMU 31 consists of two large warehouses and a small shed. These facilities historically stored liquid propellant used in missiles. The propellants stored in the Propellant Storage Area were stored as a product. No further action is currently required at the Propellant Storage Area.

### **SWMU No. 32 – Surveillance Test Range**

The Surveillance Test Range is located in the east-central portion of PCD within the Eastern Wildlife Management Reuse Area. SWMU 32 lies within a larger area known as the East Burn Area, comprising approximately 1,000 acres and encompassing SWMUs 4, 5, 32, and 33. The Surveillance Test Range covers approximately 25 acres and was used to test munitions and weapons. There are numerous impact areas located down range. Three large pits resulting from demolition activities are evident in the impact area. The site includes an active firing range area and a target range berm that is currently used by on-site and off-site personnel for weapons training. The active range area of SWMU 32 is located within SWMU 4.

### **SWMU No. 33 – Former Rifle/Pistol Range**

The Former Rifle/Pistol Range is located in the east-central portion of PCD within the Eastern Wildlife Management Reuse Area. SWMU 33 lies within a larger area known as the East Burn Area, comprising approximately 1,000 acres and encompassing SWMUs 4, 5, 32, and 33. SWMU 33 is adjacent to the Surveillance Test Range (SWMU 32).

### **SWMU No. 34 – Former Test Range Near the East Lagoons**

The Former Test Range is located in the southern portion of PCD in the area surrounding the East Lagoons (SWMU 21) within the Industrial and Eastern Wildlife Management Reuse Areas. The area includes two adjacent firing ranges used intermittently from the 1950s to the 1970s.

### **SWMU No. 35 – Vehicle Maintenance Building 595**

The Vehicle Maintenance Building 595 is located in the northwestern corner of the warehouse area within the Industrial Reuse Area. The SWMU includes Building 595, the drainage ditch to the east of the building, and the two storage areas north and northeast of the building. From 1949 to the early 1970s, all types of military vehicles were maintained and rebuilt at PCD, and Building 595 was used to steam clean and undercoat these military vehicles. The building was demolished in 2001, and only the foundation remains. The final remedy for this site was selected and is described in Part IV.E of this Permit.

### **SWMU No. 36 – Building 547**

Building 547 is the former Combat Vehicle Maintenance Building located in the southwestern portion of the primary warehouse area at PCD within the Industrial Reuse Area. The building is a large H-shaped structure with railroad spurs entering both west wings. The building was constructed in 1942 and was used for various tank and military vehicle maintenance operations, including painting and degreasing. The final remedy for this site was selected and is described in Part IV.E of this Permit.

### **SWMU No. 37 – Buildings 45 and 46**

Buildings 45 and 46 are located in the southern portion of PCD within the Industrial Reuse Area. These buildings are used for general vehicle maintenance. Building 45 was previously used as a battery shop, where batteries were melted, reformed, and charged. No further action is currently required at Buildings 45 and 46.

### **SWMU No. 38 – Building 406**

Building 406 is located southeast of the Munitions Storage Area B, just west of the East Burn Area within the Eastern Wildlife Management Reuse Area. The laboratory facility was used from approximately 1965 through 1973 to reclaim gold and silver from electronic

components and military uniform items, including buttons, rank, and insignia. The final remedy for this site was selected and is described in Part IV.E of this Permit.

### **SWMU No. 39 – Septic Tank Systems**

Nineteen septic tank systems and two dry well systems (SWMUs 39-5 and 39-10) are associated with various buildings throughout PCD within several reuse areas. Each system includes a septic tank, drainage piping, and a leach field. Seventeen of the nineteen systems are currently inactive and the wastewater is routed to the East Lagoons (SWMU 21). Following is a list of the system locations:

- SWMU 39-1 – Closed with LUCs – Northeast of former Building T88, southwest of warehouse area
- SWMU 39-2 – Active – Building 115, north side of Combat Vehicle Test Track
- SWMU 39-3 – Closed – West of the southwest corner of former Building 159 south of F-block
- SWMU 39-4 – Closed – West of Building 175, northwest corner F-block
- SWMU 39-5 – Closed dry well – West of former Building 180, south of B-block
- SWMU 39-6 – Closed – West of former Building 187, south of B-block
- SWMU 39-7 – Closed – West of former Building 186, south of B-block
- SWMU 39-8 – Closed - Tank removed – Northwest of Building 491, south G-block
- SWMU 39-9 – Closed – East of former Building 406, south of Building 409, east of F-block
- SWMU 39-10 – Closed with LUCs - dry well – East/northeast of former Building 406, east of F-block
- SWMU 39-11 – Closed – South of former Buildings 412 and 413, east of F-block
- SWMU 39-12 – Active – South of Building 417, east of F-block
- SWMU 39-13 – Active – East of Building 485, west of G-block
- SWMU 39-14 – Active – East of Building 487, west side G-block
- SWMU 39-15 – Closed – East of Building 492, south G-block
- SWMU 39-16 – Closed – East of Building 492, south G-block
- SWMU 39-17 – Determined not to exist – ammunition workshop area
- SWMU 39-18 – Determined not to exist – ammunition workshop area
- SWMU 39-19 – Closed – West of former Building 823, ammunition workshop area
- SWMU 39-20 – Closed - Tank removed – North of Building 935, guided missile workshop area
- SWMU 39-21 – Closed – Tank removed – West of Building 940, guided missile workshop area
- SWMU 39-22 – Active – Northeast of building 945, guided missile workshop area
- SWMU 39-23 – Closed – East of ammunition workshop area

The final remedy for this site was selected and is described in Part IV.E of this Permit.

### **SWMU No. 40 – Oil/Water Separators**

Nine oil/water separators (SWMUs 40-1 through 40-9), one underground sediment trap (SWMU 40-10), and one underground holding tank (SWMU 40-11) comprise SWMU 40.

All units except for one, SWMU 40-5, are located in the Industrial Reuse Area. SWMU 40-5 is located south of SWMU 17 in the Western Wildlife Management Reuse Area. Four oil separators (SWMUs 40-1, 40-7, 40-8 and 40-9) are currently active. The remaining SWMU 40 units are not active. Following is a list of the system locations:

SWMU 40-1 – Active – Southeast of Building 529, southeast corner of warehouse area  
SWMU 40-2 – Inactive – East of Building 547, warehouse area  
SWMU 40-3 – Inactive – South of Building 547, warehouse area  
SWMU 40-4 – Inactive – South of Building 537, warehouse area  
SWMU 40-5 – Inactive – South of TNT washout facility, ammunition workshop area  
SWMU 40-6 – Inactive – North of former Building 595, northeast of warehouse area  
SWMU 40-7 – Active – North of Building 560, warehouse area  
SWMU 40-8 – Active – Southeast of Building 67, warehouse area  
SWMU 40-9 – Active – South of Building 51, warehouse area  
SWMU 40-10 – Inactive sediment trap – Building 531, warehouse area  
SWMU 40-11 – Inactive holding tank – Building 594, warehouse area

The final remedy for this site was selected and is described in Part IV.E of this Permit.

#### **SWMU No. 41 – Missile Facility (Building 529)**

The Missile Facility (Building 529) is located northwest of the East Lagoons (SWMU 21) in the southern portion of PCD within the Industrial Reuse Area. Building operations consisted primarily of the repair, maintenance, testing, and eventual destruction of Pershing missile systems.

#### **SWMU No. 42 – Pits South of the Guided Missile Workshop**

SWMU 42 includes a number of pits located approximately 1/4 mile south of the Guided Missile Workshop (Building 940) in the southeastern portion of PCD within the Eastern Wildlife Management Reuse Area. The SWMU has pits reportedly used for munition demolition, including open detonation. The final remedy for this site was selected and is described in Part IV.E of this Permit.

#### **SWMU No. 43 – Historic Vehicle Staging and Storage Area Northeast of Building 594**

The Historic Vehicle Staging and Storage Area is located northeast of Building 594 in the Warehouse Area within the Industrial Reuse Area. From 1949 to the early 1970s, various types of military vehicles were maintained and rebuilt at PCD. SWMU 43 was used to stage and store damaged vehicles and parts in support of these maintenance and repair programs. The final remedy for this site was selected and is described in Part IV.E of this Permit.

#### **SWMU No. 44 – Industrial Waste Lagoons**

The Industrial Waste Lagoons are located just south of the TNT Washout Facility (SWMU 17), in the southwestern portion of PCD within the Western Wildlife Management Reuse

Area. This SWMU includes two lagoons that were constructed between 1970 and 1980 and reportedly never used. Each lagoon is approximately 90 feet by 50 feet in area and 6 feet deep. The final remedy for this site was selected and is described in Part IV.E of this Permit.

#### **SWMU No. 45 – Disposal Area North of the Disassembly Plant**

The Disposal Area North of the Disassembly Plant is located along the western boundary of PCD within the Western Wildlife Management Reuse Area. The area covers approximately 50 acres and includes numerous ground disturbances. This area was used for open burning/open detonation of munitions and disposal activities. The final remedy for this site was selected and is described in Part IV.E of this Permit.

#### **SWMU No. 46 – Former Ammunition Disassembly Area**

The Former Ammunition Disassembly Plant is located in the western part of PCD within the Western Wildlife Management Reuse Area. The SWMU consisted of three structures separated by earthen bunkers that housed ammunition disassembly equipment, a vacuum dust removal system, a wet-type explosive separator, and an office/break room. All buildings were demolished in 1997. The final remedy for this site was selected and is described in Part IV.E of this Permit.

#### **SWMU No. 47 – Storage Buildings 204, 205, 206, 207, 208, and 209**

The six Burma Road Storage Buildings (204 - 209) were located north of the intersection of Third Street and Burma Road, within the Industrial Reuse Area. Built in the mid-1940s, the facilities were used to store general supplies and combat materials including petroleum products, pesticides, herbicides, mercury, and gases. The final remedy for this site was selected and is described in Part IV.E of this Permit.

#### **SWMU No. 48 – Old Photo Lab/Firing Range**

The Old Photo Lab (Building 144) and the nearby firing range are located north of the Community Club in the southwestern corner of PCD, within the Western Wildlife Management Reuse Area. The building was removed and the associated concrete pads were demolished. The final remedy for this site was selected and is described in Part IV.E of this Permit.

#### **SWMU No. 49 – Sandblast Building 545**

The former Sandblast Building 545 was located within the Industrial Reuse Area. Paint removal operations in Building 545 involved abrasive blasting or sandblasting. The building was also used as a vehicle maintenance shop. The final remedy for this site was selected and is described in Part IV.E of this Permit.

### **SWMU No. 50 – Sandblast Building 546**

The former Sandblast Building 546 was located within the Industrial Reuse Area. Paint removal operations in Building 546 involved abrasive blasting or sandblasting. Building 546 was also used as a vehicle maintenance shop. The final remedy for this site was selected and is described in Part IV.E of this Permit.

### **SWMU No. 51 – Underground Hazardous Waste Storage Tank Associated with Building 487**

The Toxic Chemical Laboratory UST was located inside Munitions Storage Area A in the northeastern corner of PCD, within the Chemical Limited Area. The tank accumulated waste rinse liquids that were then neutralized and screened for mustard prior to discharge. The tank was removed in 1996. The tank closure was completed, and the site was backfilled and graded. No further action is currently required at the Underground Hazardous Waste Storage Tank Associated with Building 487.

### **SWMU No. 52 – The Area South of B Block**

SWMU 52 consists of five areas of interest south of B-Block at PCD. SWMU 52 is a large, open area formerly used for munitions surface storage and handling, and dunnage burning. SWMU 52 is located within the Western Wildlife Management Reuse Area.

### **SWMU No. 53 – Building 761**

SWMU 53 is a standard magazine building located within the Industrial Reuse Area. A visual site inspection of Building 761 conducted by the Director indicated a possible release to the environment of hazardous wastes or hazardous constituents. The final remedy for this site was selected and is described in Part IV.E of this Permit.

### **SWMU No. 54 – Building 746**

SWMU 54 is a standard magazine building located within the Industrial Reuse Area. A visual site inspection at Building 746 conducted by the Director indicated a possible release to the environment of hazardous wastes or hazardous constituents. The final remedy for this site was selected and is described in Part IV.E of this Permit.

### **SWMU No. 55 – Vacuum and Cyclone Buildings Associated with the 700 Series Buildings**

SWMU 55 consists of vacuum and cyclone buildings associated with 700-Series buildings in the Industrial Reuse Area. A visual site inspection of the vacuum and cyclone buildings conducted by the Director indicated the possible release to the environment of hazardous wastes or hazardous constituents. The final remedy for this site was selected and is described in Part IV.E of this Permit.

### **SWMU No. 56 – Building 543**

Building 543 is located in the southern Industrial Reuse Area within PCD. The building was constructed in 1942, providing approximately 90,000 square feet for use as a general storage warehouse. An internal firewall partition separates the eastern and western storage areas within the building. A 60-foot by 80-foot fenced enclosure in the eastern portion of the building was used for the storage of several hundred metric tons of mercury (national stockpile) until 1970. The final remedy for this site was selected and is described in Part IV.E of this Permit.

### **SWMU No. 57 – Area around Buildings 701, 706, and 731**

Constructed in 1942, Buildings 701, 706, and 731 are standard magazine buildings located within the Industrial Reuse Area. Buildings 701 and 706 were used for repacking small arms ammunition. Building 731 housed the laundry facilities used to clean the work uniforms of employees working in the 700 Series Buildings. The final remedy for this site was selected and is described in Part IV.E of this Permit.

### **SWMU No. 58 – CM1 Area Hot Spot**

The CM1 Area Hot Spot is located in the Industrial Reuse Area, approximately 60 feet south of the sheet pile barrier associated with the Interim Corrective Action Groundwater Remediation System, approximately 30 feet from PCD's southern boundary. The hot spot area is bisected by Unnamed Creek. The site currently measures approximately 20 feet by 30 feet. The final remedy for this site was selected and is described in Part IV.E of this Permit.

### **SWMU No. 59 – Petroleum-Contaminated Soil Disposal Area**

SWMU 59 is located west of the East Lagoons (SWMU 21) in the Industrial Reuse Area. The size of this area is approximately 100 feet by 75 feet. The Petroleum-Contaminated Soil Disposal Area is a soil pile approximately 12 to 15 feet high. The final remedy for this site was selected and is described in Part IV.E of this Permit.

### **SWMU No. 60 – Pershing Missile Disposal Site and Asbestos Landfill Area**

SWMU 60 is located northeast of the Landfill (SWMU 14) in the southern Industrial Reuse Area. The asbestos landfill consists of two asbestos disposal trenches; however, only one trench was used for asbestos disposal and the other remains empty. The trenches where Pershing missile components were disposed of are located directly west of the asbestos landfill. Pershing missile rocket motors, casings, trainer modules, and other missile components were disposed of in these trenches. Some of these missile components also contain asbestos. The SWMU 60 area was used for disposal of asbestos and Pershing missile components from approximately 1988 to 1993. The area is approximately 14 acres. The final remedy for this site was selected and is described in Part IV.E of this Permit.

## IV.E. SELECTED REMEDIES FOR SWMUS

### SOUTH CENTRAL TERRACE REMEDIES

#### IV.E.1. South Central Terrace SWMU No. 14 – Landfill (Landfill Cap)

##### IV.E.1.a. Selected Remedy

The remedy selected for the SWMU 14 landfill is an evapotranspiration (ET) cover. Installation of the cover will require importing soil to create a cover capable of supporting vegetation. The approved cover vegetation must be established and maintained to facilitate transpiration and minimize erosion; thereby ensuring the evapotranspiration properties of the cover. This system shall be designed to control potential contact with the waste and minimize percolation of precipitation into the waste. The ET cover will cover approximately 67 acres.

The remedy selection was finalized on September 12, 2006 and updated at the time of Permit renewal. If this remedy is not implemented within five years of the effective date of Permit renewal, the Permittee must notify the Director and provide an estimated remedy implementation date. The Director may reevaluate this remedy after this notification. Within six months of the notification, and additionally up to six months prior to the estimated implementation date, the Director may modify the requirements of this remedy to meet current standards of practice.

##### IV.E.1.b. Technical Requirements

- i. The evapotranspiration cover shall be constructed in accordance with the approved Final 100% Design Package (100% Design). Requirements for submitting the 100% Design for review are included in Part IV.E.1.d.iii. of this Permit.
- ii. Regrade and import soil to construct the evapotranspiration cover over the SWMU 14 disposal area.
- iii. The cover thickness will be determined during the design phase.
- iv. All debris must be managed in accordance with the approved 100% Design.
- v. The aboveground components of the Soil Vapor Extraction/Air Sparge (SVE/AS) system that are currently located at the landfill must be decontaminated and removed prior to construction of the ET cover. The SVE/AS wells must be abandoned in accordance with Colorado Office of the State Engineer rules and procedures.

- vi. Asbestos-containing materials and soil must be managed in accordance with the approved asbestos management plan in the approved 100% Design.
- vii. Survey monuments to monitor settlement must be installed during placement of the soil cover in accordance with the approved 100% Design.
- viii. Erosion control measures must be employed in accordance with the approved 100% Design.
- ix. The soil cover must be revegetated to provide for transpiration and erosion control.
- x. The seed types used during revegetation must be consistent with the seeding specifications in the approved 100% Design.
- xi. The vegetation must be established, maintained, and monitored in accordance with the Final Post-Closure Monitoring and Maintenance Plan required under Part IV.E.1.d.viii.
- xii. The SWMU 14 cover shall remain in place and be monitored and maintained in accordance with the Monitoring Requirements described in Part IV.E.1.c.

#### IV.E.1.c. Monitoring Requirements

- i. Implementation of initial post-closure monitoring and maintenance must begin upon the construction completion date specified in response to Part IV.E.1.d.v. Initial post-closure monitoring and maintenance must be conducted in accordance with the *Draft Post-Closure Monitoring and Maintenance Plan* included in the approved 100% Design.
- ii. Quality control samples must be taken at the frequencies specified in the most current, approved version of the *Chemical Data Acquisition Plan*.
- iii. Implementation of the final post-closure monitoring and maintenance procedures must begin upon approval of the *Final Post-Closure Monitoring and Maintenance Plan* required under Part IV.E.1.d.viii.
- iv. At a minimum, the SWMU 14 cover must be monitored for:
  - a. Erosion
  - b. Settlement
  - c. Maintenance of vegetation
  - d. Maintenance of proper drainage

- v. The period of compliance evaluation is 30 years, consistent with post-closure requirements for landfills, as identified in 6 CCR 1007-3, Part 264, Subpart N. The Director may extend the period of compliance evaluation if the Director finds that an extended period is necessary to protect human health and the environment. The beginning of the period of compliance is the construction completion date specified in response to Part IV.E.1.d.v.

#### IV.E.1.d. Reporting Requirements

- i. A *60 Percent Design Package* (60% Design) must be submitted for Director review and comment within three years of the effective date of Permit renewal. The 60% Design shall consist of the plans and specifications, and appendices as well as the Post-Closure Monitoring and Maintenance Plan, a Materials Management Plan, an Asbestos Management Plan, the third party Construction Quality Assurance Plan and any other necessary supporting plans and calculations.
- ii. A *90 Percent Design Package* (90% Design) must be submitted for Director review and comment when directed by the Director. The 90% Design shall consist of updated versions of the plans and specifications, and appendices from the 60% Design as well as the Post-Closure Monitoring and Maintenance Plan, a Materials Management Plan, an Asbestos Management Plan, the third party Construction Quality Assurance Plan, and any other necessary supporting plans and calculations.
- iii. A *Final 100 Percent Design Package* (100% Design), signed and stamped by a Colorado-registered Professional Engineer, must be submitted for Director review and approval, when directed by the Director. The 100% Design shall include final versions of all plans, specifications, drawings and appendices included in the 90% Design. The drawings shall be stamped by a Colorado-registered Professional Engineer.
- iv. The Permittee must provide written notification to the Director 14 days prior to implementation of the technical requirements of the remedy. This notification may be made by electronic mail.
- v. The Permittee must provide written notification to the Director within 14 days of construction completion stating that construction is complete. Completion of construction for purposes of this Permit is defined as completion of construction of the cover as designed in the 100% Design, and

implementation of the Additional Controls specified in Part IV.E.1.e.ii.

- vi. Within 14 days of contractor submittal of the draft construction completion report to the U.S. Army, the Permittee must provide written notification to the Director confirming the submittal.
- vii. A remedy construction completion report must be prepared in accordance with the approved 100% Design, and must be submitted for Director review and approval within six months of the construction completion date specified in response to Part IV.E.1.d.v. The remedy construction completion report must be accompanied by a Construction Certification Report signed and stamped by the independent third-party Professional Engineer.
- viii. A Final Post-Closure Monitoring and Maintenance Plan must be submitted for Director review and approval within six months of the construction completion date specified in response to Part IV.E.1.d.v.
- ix. Post-closure monitoring and maintenance reports must be submitted to the Director annually beginning one year following completion of construction. The due date will be based on the construction completion date specified in response to Part IV.E.1.d.v.
- x. The Director must be notified of any changes to the Certificate of Designation that are made by Pueblo County or the Permittee.

IV.E.1.e. Land Use and Additional Controls

- i. Land use controls required for SWMU 14 are:
  - a. No access except for operations and maintenance of SWMU 14.
  - b. No vehicle access, no driving over any part of the cover, except as necessary for monitoring and maintenance activities.
  - c. No future use of any type (including residential or recreational) other than as a landfill cover as designed.
  - d. No excavation or building within the SWMU boundary.
  - e. No drilling, trenching, or other intrusive activities that may disrupt the landfill cover.
  - f. No water from the alluvial aquifer may be withdrawn or used for any purpose, except as authorized in a remedial decision document or environmental sampling plan approved by the Director.

- ii. Installation of these additional controls is required following completion of cover construction at SWMU 14:
  - a. A three-strand barbed wire fence with locked gates must be placed around the entire SWMU.
  - b. Signs stating “This Area Is Off Limits By Order of the Commander” must be placed at every entrance, on every side of the SWMU, and additionally around the perimeter of the SWMU at a minimum spacing of every 300 feet.
  - c. Signs indicating the area is a landfill must be placed at every entrance, on every side of the SWMU, and additionally around the perimeter of the SWMU at a minimum spacing of every 300 feet.
- iii. SWMU 14 must be inspected once per calendar year to ensure the land use controls and additional controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.
- iv. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMU 14 within 30 days of the effective date of Permit renewal.
- v. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of Permit renewal.
- vi. A map of SWMU 14 that includes GPS coordinates at multiple locations around the perimeter of the SWMU, and a table of the GPS locations must be included in the Land Use Control Plan.
- vii. Upon remedy construction completion of the SWMU 14 landfill cover, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 14 landfill cover. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

#### IV.E.2. South Central Terrace SWMU No. 14 – Landfill (Groundwater Treatment)

##### IV.E.2.a. Selected Remedy

The remedy selected for SWMU 14 groundwater is enhanced reductive dechlorination of groundwater contamination in the VOC source area. Enhanced reductive dechlorination is the process of providing nutrients to the subsurface microbial population to stimulate anaerobic reductive dechlorination.

The remedy selection was finalized on September 12, 2006 and additional requirements were added during Permit renewal.

If the selected remedy does not achieve the groundwater cleanup standards throughout the groundwater plume within 48 months of the effective date of Permit renewal, the Director will evaluate the treatment system at that time and annually thereafter and may modify this remedy.

#### IV.E.2.b. Technical Requirements

- i. Treatment shall consist of injection of a substrate that will provide nutrients for enhanced growth of existing microorganisms. The Permittee may select the substrate from any of the substrates that have proven to be effective. The substrate must be specified in the work plan required by IV.E.2.d. The area to be treated is depicted in Figure 6-10 of the *Final Corrective Measures Study, South Central Terrace* dated January 2006.
- ii. Details of the remedy implementation must be contained in remedy-specific work plans.
- iii. The groundwater cleanup levels for the contaminants of concern are the Colorado Ground Water Standards (CGWS). The concentrations of any associated hazardous constituents also must not exceed the CGWS. The concentration of COCs in groundwater must not exceed the following levels:
  - a. Trichloroethylene - 5 micrograms per liter ( $\mu\text{g/L}$ )
  - b. cis-1,2 dichloroethylene - 70  $\mu\text{g/L}$
  - c. Vinyl chloride - 2  $\mu\text{g/L}$
- iv. Remediation of the SWMU 14 VOC source area will be considered complete when all aspects of the remedy have been implemented, when active treatment has ceased (recirculation system has been shut down, there are no injections into injection wells or infiltration galleries, sufficient time has lapsed for substrate to dissipate, ORP is  $> 0\text{mV}$  and DO  $> 3\text{mg/L}$  throughout the plume), and when concentrations of COCs and associated hazardous constituents at the compliance wells meet or are maintained below the CGWS for three consecutive years following cessation of treatment. The South Central Terrace is comprised of multiple areas. Remedy completion will be considered for individual areas; however, the South Central Terrace remedy will be considered complete when all areas within the South Central Terrace have met their respective remediation goals.

#### IV.E.2.c. Monitoring Requirements

- i. The point of compliance wells are LFPIEZ046, LFMW19, and LFMW20.
- ii. The point of compliance wells must be sampled each calendar quarter beginning upon implementation of the remedy. An alternate monitoring schedule may be approved in writing by the Director for portions of the monitoring.
- iii. The samples must be analyzed for VOCs using U.S. EPA Method SW-846 8260.
- iv. If the Director determines the existing compliance wells do not adequately monitor the entire plume or possible hot spots within the plume, the Director may add, delete, or change compliance wells during the course of remediation to ensure that the plume is adequately monitored. Additional compliance wells may also be added following cessation of treatment to ensure the entire plume has been remediated and groundwater concentrations throughout the plume are maintained below the cleanup standards.
- v. No wells within the SWMU or wells that are or have been used for any purpose during remediation of the SWMU may be abandoned without prior approval of the Director.
- vi. Quality control samples must be taken at the frequencies specified in the most current, approved version of the *Chemical Data Acquisition Plan*.

#### IV.E.2.d. Reporting Requirements

- i. A Corrective Measure Implementation Work Plan for the enhanced reductive dechlorination at SWMU 14 must be submitted to the Division within 60 days of the effective date of this remedy selection. The work plan may be combined with the work plans required for the other remedies to be implemented in the South Central Terrace area. The work plan must:
  - a. Describe the sequence for submitting subsequent work plans and/or designs for each aspect of the remedy.
  - b. Provide a timeframe for implementing each aspect of the remedy. This timeframe can be in the form of a flow chart from scheduling software.
- ii. Quarterly reports describing the progress towards implementing and completing the remedy at SWMU 14 groundwater must be submitted for Director review. The quarterly reports are due 90

days after the end of each calendar quarter. The reports must include at a minimum a summary of activities during the quarter, analytical data reports, data verification/validation reports, field logs, investigation derived waste letters, and time/series plots when adequate data have been obtained to prepare the plots.

- iii. Annual reports detailing the progress on achieving the CGWS at SWMU 14 must be submitted for Director review. The annual reports should focus on progress made on remediation throughout the plume and provide more detailed figures than the quarterly reports. The reports are due annually on October 31.
- iv. The Permittee must provide written notification to the Director when treatment has ceased (recirculation system has been shut down, there are no injections into injection wells or infiltration galleries, sufficient time has lapsed for substrate to dissipate, ORP is  $> 0\text{mV}$  and DO  $> 3\text{ mg/L}$  throughout the plume) and they are entering the three year period of monitoring after cessation of treatment.
- v. The Permittee must provide written notification to the Director within 14 days of receipt of validated data completing the three years of quarterly monitoring with concentrations below the CGWS following cessation of treatment.
- vi. A remedy completion report must be submitted for Director review and approval when all aspects of the remedy have completed. The report must contain details on remedy construction, all the groundwater monitoring data and groundwater contaminant concentration trends, and a risk evaluation following the methodology in the most current, approved *Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units*.
- vii. The remedy completion report is due within 120 days of the date of the letter required by Part IV.E.2.d.v.

#### IV.E.2.e. Land Use Controls

- i. Land use controls required for the SWMU 14 VOC source area are:
  - a. No water from the alluvial aquifer may be withdrawn or used for any purpose, except as authorized in a remedial decision document or environmental sampling plan approved by the Director.

- b. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
  - c. Surface water may not be used for any purpose, except as authorized in a remedial decision document or environmental sampling plan approved by the Director.
- ii. SWMU 14 must be inspected once per calendar year to ensure the land use controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.
  - iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include this restriction for SWMU 14 within 30 days of the effective date of this Permit renewal.
  - iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
  - v. A map of SWMU 14 that includes GPS coordinates at multiple locations around the perimeter of the SWMU, and a table of the GPS locations must be included in the Land Use Control Plan.
  - vi. Upon remedy construction completion of the SWMU 14 groundwater remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 14 groundwater remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

IV.E.3. South Central Terrace SWMU No. 28 - Plating Waste Drainage Ditch and Former Building 539 (Soil Remediation)

IV.E.3.a. Selected Remedy

Excavation is selected as the remedy for contaminated soil at SWMU 28. Soil excavation is an effective remedy because the contamination is removed from the site and disposed of at an off-site disposal facility designed for that purpose.

The remedy selection was finalized on September 12, 2006 and additional requirements were added during Permit renewal.

#### IV.E.3.b. Technical Requirements

- i. An area approximately 1000 feet long, 10 feet wide, and 2 feet deep must be excavated where the contaminant concentrations exceed industrial reuse scenario human health risk-based levels. The specific area to be excavated is depicted in Figure 2-6 and Figure 6-3 of the *Final Corrective Measures Study, South Central Terrace* dated January 2006.
- ii. The concentration of lead remaining in the soil must not exceed 504 milligrams per kilogram (mg/kg) and the concentration of total chromium must not exceed 637 mg/kg.
- iii. Additional excavation is required in any area where contaminant concentrations in soil exceed the groundwater protection levels (GPLs), or the calculated GPL based on SWMU-specific synthetic precipitation leaching procedure (SPLP) results for any contaminant of concern at SWMU 28. Figure 2-5 and Figure 6-4 of the *Final Corrective Measures Study, South Central Terrace* dated January 2006 show the area to be sampled and possibly excavated. The procedure for deriving site-specific GPLs is specified in the most current, approved, *Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units*. This procedure must be followed for determining whether the contaminant concentrations left in place are protective of groundwater.
- iv. The excavated area must be backfilled with clean fill and reseeded with native vegetation.
- v. The excavated soil must be characterized to determine if it is hazardous waste.
- vi. All the soil excavated must be disposed of at an appropriate disposal facility.
- vii. Remediation of the SWMU 28 soil contamination area will be considered complete when analytical data confirm that concentrations of contaminants of concern in the remaining soil are below the industrial reuse scenario human health risk-based levels, and the GPLs or SWMU-specific values based on SPLP analysis.

#### IV.E.3.c. Monitoring Requirements

- i. A confirmation sample must be taken every 50 feet along the length of the excavated area, or 1 sample per 100 square feet with a minimum of 1 sample per sidewall and base of excavation for

smaller excavations. These samples must be analyzed for total lead and total chromium.

- ii. Samples for SPLP extraction must be taken at the seven areas depicted in Figure 6-2 of the *Final Corrective Measures Study, South Central Terrace* dated January 2006, and must be analyzed for arsenic, barium, cadmium, total chromium, lead, mercury, selenium, and silver.
- iii. Quality control samples must be taken at the frequencies specified in the most current, approved version of the *Chemical Data Acquisition Plan*.

#### IV.E.3.d. Reporting Requirements

- i. A Corrective Measure Implementation Work Plan for the excavation at SWMU 28 must be submitted to the Division within 60 days of the effective date of this remedy selection. The work plan may be combined with the work plans required for the other remedies to be implemented in the South Central Terrace area. The work plan must:
  - a. Describe the sequence for submitting subsequent work plans and/or designs for each aspect of the remedy.
  - b. Provide a timeframe for implementing each aspect of the remedy. This timeframe can be in the form of a flow chart from scheduling software.
- ii. A remedy completion report, including figures showing the extent of excavation, post-excavation sampling locations, contaminant concentrations at those locations, and a risk evaluation following the methodology in the *Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units* must be submitted for Director review and approval.
- iii. The remedy completion report is due to the Director 120 days following completion of the remedy.

#### IV.E.3.e. Land Use Controls

- i. Land use controls required for the soil excavation area are:
  - a. No residential or recreational use
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the SWMU 28 boundary, except as authorized in a remedial decision document or environmental sampling plan approved by the Director

- c. Irrigation of the area is prohibited, except as approved by the Director in a remedial decision document to establish and maintain vegetation
  - d. Construction or maintenance of any standing body of water, including any pond or stormwater retention basin, is prohibited
- ii. SWMU 28 must be inspected once per calendar year to ensure the land use controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.
  - iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMU 28 within 30 days of the effective date of this remedy selection.
  - iv. A map of the impacted area must be included in the Land Use Control Plan.
  - v. Upon remedy construction completion of the SWMU 28 soil remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 28 soil remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

#### IV.E.3.f. Compliance Schedule

- i. A supplemental Corrective Measure Implementation Work Plan for SWMU 28 Soil must be submitted to the Director within two years of the effective date of Permit renewal.

#### IV.E.4. South Central Terrace SWMU No. 28 - Plating Waste Drainage Ditch and Former Building 539 and SWMU No. 36 - Building 547 (Groundwater Treatment)

##### IV.E.4.a. Selected Remedy

The remedy selected for SWMUs 28 and 36 groundwater is enhanced reductive dechlorination of groundwater contamination in the VOC source area. Enhanced reductive dechlorination is the process of providing nutrients to the subsurface microbial population to stimulate anaerobic reductive dechlorination.

The remedy selection was finalized on September 12, 2006 and additional requirements were added during Permit renewal.

If the selected remedy does not achieve the groundwater cleanup standards throughout the groundwater plume within 48 months of the effective date of Permit renewal, the Director will evaluate the treatment system at that time and annually thereafter and may modify this remedy.

#### IV.E.4.b. Technical Requirements

- i. Treatment shall consist of injection of a substrate that will provide nutrients for enhanced growth of existing microorganisms. The Permittee may select the substrate from any of the substrates that have proven to be effective. The substrate must be specified in the work plan required by IV.E.4.d. The area to be treated is depicted in Figure 6-6 of the *Final Corrective Measures Study, South Central Terrace* dated January 2006.
- ii. Details of the remedy implementation must be contained in remedy-specific work plans.
- iii. The groundwater cleanup levels for the contaminants of concern were based on modeling presented in the *Final Corrective Measures Study; South Central Terrace* dated January 2006. These groundwater cleanup levels may be revised if treatment to these levels does not result in meeting the CGWS at the property boundary point of compliance wells. The concentrations of any associated hazardous constituents also must not exceed the CGWS at the property boundary point of compliance wells. The remedy must achieve the following cleanup levels at the source area point of compliance wells:
  - a. Trichloroethylene – 25 µg/L
  - b. cis 1,2-dichloroethylene – 320 µg/L
  - c. Vinyl chloride – 7 µg/L
- iv. Remediation of the SWMU 28 and 36 VOC source area will be considered complete when all aspects of the remedy have been implemented, when active treatment has ceased (recirculation system has been shut down, there are no injections into injection wells or infiltration galleries, sufficient time has lapsed for substrate to dissipate, ORP is > 0mV and DO > 3 mg/L throughout the plume), and when concentrations of COCs and associated hazardous constituents at the compliance wells meet or are maintained below the CGWS for three consecutive years following cessation of treatment. The South Central Terrace is comprised of multiple areas. Remedy completion will be considered for individual areas; however, the South Central Terrace remedy will be considered complete when all areas

within the South Central Terrace have met their respective remediation goals.

#### IV.E.4.c. Monitoring Requirements

- i. The source area point of compliance wells are DDMW30, DDMW31, and DDMW32.
- ii. The point of compliance wells must be sampled each calendar quarter beginning upon implementation of the remedy. An alternate monitoring schedule may be approved by the Director in writing for portions of the monitoring.
- iii. Samples must be analyzed for VOCs using U.S. EPA Method SW-846 8260.
- iv. If the Director determines the existing compliance wells do not adequately monitor the entire plume or possible hot spots within the plume, the Director may add, delete, or change compliance wells during the course of remediation to ensure that the plume is adequately monitored. Additional compliance wells may also be added following cessation of treatment to ensure the entire plume has been remediated and groundwater concentrations throughout the plume are maintained below the cleanup standards.
- v. No wells within the SWMU or wells that are or have been used for any purpose during remediation of the SWMU may be abandoned without prior approval of the Director.
- vi. Quality control samples must be taken at the frequencies specified in the most current, approved version of the *Chemical Data Acquisition Plan*.

#### IV.E.4.d. Reporting Requirements

- i. A Corrective Measure Implementation Work Plan for the enhanced reductive dechlorination at SWMUs 28 and 36 must be submitted to the Division within 60 days of the effective date of this remedy selection. The work plan may be combined with the work plans required for the other remedies to be implemented in the South Central Terrace area. The work plan must:
  - a. Describe the sequence for submitting subsequent work plans and/or designs for each aspect of the remedy.
  - b. Provide a timeframe for implementing each aspect of the remedy. This timeframe can be in the form of a flow chart from scheduling software.

- ii. Quarterly reports describing the progress towards implementing and completing the remedy at SWMU 28 and 36 groundwater must be submitted for Director review. The quarterly reports are due 90 days after the end of each calendar quarter. The reports must include at a minimum a summary of activities during the quarter, analytical data reports, data verification/validation reports, field logs, investigation derived waste letters, and time/series plots when adequate data have been obtained to prepare the plots.
- iii. Annual reports detailing the progress on achieving the CGWS at SWMU 28 and 36 must be submitted for Director review. The annual reports should focus on progress made on remediation throughout the plume and provide more detailed figures than the quarterly reports. The reports are due annually on October 31.
- iv. The Permittee must provide written notification to the Director when treatment has ceased (recirculation system has been shut down, there are no injections into injection wells or infiltration galleries, sufficient time has lapsed for substrate to dissipate, ORP is  $> 0\text{mV}$  and DO  $> 3\text{ mg/L}$  throughout the plume) and they are entering the three year period of monitoring after cessation of treatment.
- v. The Permittee must provide written notification to the Director within 14 days of receipt of validated data completing the three years of quarterly monitoring with concentrations below the CGWS following cessation of treatment.
- vi. A remedy completion report must be submitted for Director review and approval when all aspects of the remedy have been completed. The report must contain details on remedy construction, all the groundwater monitoring data and groundwater contaminant concentration trends, and a risk evaluation following the methodology in the most current, approved *Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units*.
- vii. The remedy completion report is due within 120 days of the date of the letter required by Part IV.E.4.d.v.

#### IV.E.4.e. Land Use Controls

- i. Land use controls required for the VOC source area are:
  - a. No residential or recreational use
  - b. Structures located above the onsite groundwater plume must not be used for residential uses

- c. Existing structures must have adequate ventilation.
  - d. If the current use changes at an existing structure, installation of a properly designed and constructed vapor intrusion mitigation system is required unless indoor air quality monitoring reviewed and approved by the Director shows that a system is not required. The Director must review the design and construction of the mitigation system before installation may commence. Once constructed, all such mitigation systems must be operated and maintained as needed to prevent intrusion of volatile organic compounds above risk levels set forth in the design document approved by the Director.
  - e. New permanent structures must have a properly designed and constructed vapor intrusion mitigation system. The Director must review the design and construction of any such system before building construction may commence. Once constructed, all such mitigation systems must be operated and maintained as needed to prevent intrusion of volatile organic compounds above risk levels set forth in the design document approved by the Director.
  - f. No water from the alluvial aquifer may be withdrawn or used for any purpose, except as authorized in a remedial decision document or environmental sampling plan approved by the Director.
  - g. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
  - h. Removal or disturbance of the Building 547 foundation slab is prohibited
- ii. SWMU 28 and 36 must be inspected once per calendar year to ensure the land use controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.
  - iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMUs 28 and 36 within 30 days of the effective date of this Permit renewal.
  - iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
  - v. A map of SWMU 28/36 that includes GPS coordinates at multiple locations around the perimeter of the SWMU, and a

table of the GPS locations must be included in the Land Use Control Plan.

- vi. Upon remedy construction completion of the SWMU 28/36 groundwater remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 28/36 groundwater remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

#### IV.E.5. South Central Terrace SWMU No. 58 – CM1 Area Hot Spot

##### IV.E.5.a. Selected Remedy

The remedy selected for SWMU 58 is enhanced reductive dechlorination of groundwater contamination in the VOC source area and the downgradient plume area. Enhanced reductive dechlorination is the process of providing nutrients to the subsurface microbial population to stimulate anaerobic reductive dechlorination. In addition, air sparge is selected as an adjunct treatment method if the enhanced reductive dechlorination process does not result in adequate reduction of vinyl chloride concentrations in groundwater.

The remedy selection was finalized on September 12, 2006, and modified on June 23, 2009 and March 27, 2012. Additional requirements were added during Permit renewal.

If the selected remedy does not achieve the groundwater cleanup standards throughout the groundwater plume within 48 months of the effective date of Permit renewal, the Director will evaluate the treatment system at that time and annually thereafter and may modify this remedy.

##### IV.E.5.b. Technical Requirements

- i. Treatment shall consist of injection of a substrate that will provide nutrients for enhanced growth of existing microorganisms. The Permittee may select the substrate from any of the substrates that have proven to be effective. The substrate must be specified in the work plan required by IV.E.5.d. The area to be treated is depicted in Figure 6-12 of the *Final Corrective Measures Study; South Central Terrace* dated January 2006.
- ii. The SWMU 58 source area and the downgradient plume area extending to the off-site central treatment system area must be treated.

- iii. Details of the remedy implementation must be contained in remedy-specific work plans. If air sparging is necessary, a separate remedy-specific work plan for the air sparge must be submitted.
- iv. The groundwater cleanup levels for the contaminants of concern are the Colorado Ground Water Standards (CGWS). The concentrations of any associated hazardous constituents also must not exceed the CGWS. The concentrations of COCs in groundwater must not exceed the following levels:
  - a. Trichloroethylene - 5 µg/L
  - b. cis-1,2 dichloroethylene - 70 µg/L
  - c. Vinyl chloride - 2 µg/L
- v. Remediation of the SWMU 58 VOC source area and downgradient plume will be considered complete when all aspects of the remedy have been implemented, when active treatment has ceased (recirculation system has been shut down, there are no injections into injection wells or infiltration galleries, sufficient time has lapsed for substrate to dissipate, ORP is > 0mV and DO > 3 mg/L throughout the plume), and when concentrations of COCs and associated hazardous constituents at the compliance wells meet or are maintained below the CGWS for three consecutive years following cessation of treatment. The South Central Terrace is comprised of multiple areas. Remedy completion will be considered for individual areas; however, the South Central Terrace remedy will be considered complete when all areas within the South Central Terrace have met their respective remediation goals.

#### IV.E.5.c. Monitoring Requirements

- i. The point of compliance wells are CM1, OLFPIEZ044, OLFCP11, OLFMW05, and CP1MW1.
- ii. The point of compliance wells must be sampled each calendar quarter beginning upon implementation of the remedy. An alternate monitoring schedule may be approved by the Director in writing for portions of the monitoring.
- iii. Samples must be analyzed for VOCs using U.S. EPA Method SW-846 8260.
- iv. If the Director determines the existing compliance wells do not adequately monitor the entire plume or possible hot spots within the plume, the Director may add, delete, or change compliance wells during the course of remediation to ensure that the plume is

adequately monitored. Additional compliance wells may also be added following cessation of treatment to ensure the entire plume has been remediated and groundwater concentrations throughout the plume are maintained below the cleanup standards.

- v. No wells within the SWMU or wells that are or have been used for any purpose during remediation of the SWMU may be abandoned without prior approval of the Director.
- vi. Quality control samples must be taken at the frequencies specified in the most current, approved version of the *Chemical Data Acquisition Plan*.

#### IV.E.5.d. Reporting Requirements

- i. A Corrective Measure Implementation Work Plan for the enhanced reductive dechlorination at SWMU 58 must be submitted to the Division within 60 days of the effective date of this remedy selection. The work plan may be combined with the work plans required for the other remedies to be implemented in the South Central Terrace area. The work plan must:
  - a. Describe the sequence for submitting subsequent work plans and/or designs for each aspect of the remedy.
  - b. Provide a timeframe for implementing each aspect of the remedy. This timeframe can be in the form of a flow chart from scheduling software.
- ii. Quarterly reports describing the progress towards implementing and completing the remedy at SWMU 58 groundwater must be submitted for Director review. The quarterly reports are due 90 days after the end of each calendar quarter. The reports must include at a minimum a summary of activities during the quarter, analytical data reports, data verification/validation reports, field logs, investigation derived waste letters, and time/series plots when adequate data have been obtained to prepare the plots.
- iii. Annual reports detailing the progress on achieving the CGWS at SWMU 58 must be submitted for Director review. The annual reports should focus on progress made on remediation throughout the plume and provide more detailed figures than the quarterly reports. The reports are due annually on October 31.
- iv. The Permittee must provide written notification to the Director when treatment has ceased (recirculation system has been shut down, there are no injections into injection wells or infiltration galleries, sufficient time has lapsed for substrate to dissipate, ORP is  $> 0\text{mV}$  and DO  $> 3\text{ mg/L}$  throughout the plume) and they

are entering the three year period of monitoring after cessation of treatment.

- v. The Permittee must provide written notification to the Director within 14 days of receipt of validated data completing the three years of quarterly monitoring with concentrations below the CGWS following cessation of treatment.
- vi. A remedy completion report must be submitted for Director review and approval when all aspects of the remedy have been completed. The report must contain details on remedy construction, all the groundwater monitoring data and groundwater contaminant concentration trends, and a risk evaluation following the methodology in the most current, approved *Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units*.
- vii. The remedy completion report is due within 120 days of the date of the letter required by Part IV.E.5.d.v.

#### IV.E.5.e. Land Use Controls

- i. Land use controls required for SWMU 58 are:
  - a. No residential or recreational use within the onsite plume area
  - b. No water from the alluvial aquifer may be withdrawn or used for any purpose, except as authorized in a remedial decision document or environmental sampling plan approved by the Director.
  - c. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
  - d. Surface water may not be used for any purpose, except as authorized in a remedial decision document or environmental sampling plan approved by the Director.
  - e. Existing structures must have adequate ventilation.
  - f. If the current use changes at an existing structure, installation of a properly designed and constructed vapor intrusion mitigation system is required unless indoor air quality monitoring reviewed and approved by the Director shows that a system is not required. The Director must review the design and construction of the mitigation system before installation may commence. Once constructed, all such mitigation systems must be operated and maintained as needed to prevent intrusion of volatile organic compounds above risk levels set forth in the design document approved by the Director.

- g. New permanent structures must have a properly designed and constructed vapor intrusion mitigation system. The Director must review the design and construction of any such system before building construction may commence. Once constructed, all such mitigation systems must be operated and maintained as needed to prevent intrusion of volatile organic compounds above risk levels set forth in the design document approved by the Director.
- ii. SWMU 58 must be inspected once per calendar year to ensure the land use controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.
- iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMU 58 within 30 days of the effective date of this Permit renewal.
- iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
- v. A map of SWMU 58 that includes GPS coordinates at multiple locations around the perimeter of the SWMU, and a table of the GPS locations must be included in the Land Use Control Plan.
- vi. Upon remedy construction completion of the SWMU 58 groundwater remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 58 groundwater remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

#### IV.E.6. South Central Terrace – Eastern Mid-plume Area

##### IV.E.6.a. Selected Remedy

The selected remedy for the eastern mid-plume area is enhanced reductive dechlorination of groundwater contamination. Enhanced reductive dechlorination is the process of providing nutrients to the subsurface microbial population to stimulate anaerobic reductive dechlorination.

The remedy selection was finalized on September 12, 2006, modified on March 8, 2010, and additional requirements were added during Permit renewal.

If the selected remedy does not achieve the groundwater cleanup standards throughout the groundwater plume within 48 months of the effective date of Permit renewal, the Director will evaluate the treatment system at that time and annually thereafter and may modify this remedy.

#### IV.E.6.b. Technical Requirements

- i. Treatment shall consist of injection of a substrate that will provide nutrients for enhanced growth of existing microorganisms. An infiltration gallery shall be installed south of the SWMU 28 Plating Waste Drainage Ditch and biobarriers shall be installed in the middle portion of the eastern mid-plume as shown on Figure 1 of the *Final Remedy-Specific Work Plan, Solid Waste Management Units 28 and 36, Eastern Mid-Plume Area*, dated October 13, 2009. The Permittee may select the substrate from any of the substrates that have proven to be effective.
- ii. Details of the remedy implementation must be contained in remedy-specific work plans.
- iii. The groundwater cleanup levels for the contaminants of concern are the Colorado Ground Water Standards (CGWS). The concentrations of any associated hazardous constituents also must not exceed the CGWS. The concentration of COCs in groundwater must not exceed the following levels:
  - a. Trichloroethylene - 5 µg/L
  - b. cis-1,2 dichloroethylene - 70 µg/L
  - c. Vinyl chloride - 2 µg/L
- iv. Details of the remedy implementation are contained in the *Final Remedy-Specific Work Plan, Solid Waste Management Units 28 and 36, Eastern Mid-Plume Area*, dated October 13, 2009.
- v. Remediation of the eastern mid-plume area will be considered complete when all aspects of the remedy have been implemented, when active treatment has ceased (recirculation system has been shut down, there are no injections into injection wells or infiltration galleries, sufficient time has lapsed for substrate to dissipate, ORP is > 0mV and DO > 3 mg/L throughout the plume), and when concentrations of COCs and associated hazardous constituents at the compliance wells meet or are maintained below the CGWS for three consecutive years following cessation of treatment. The South Central Terrace is comprised of multiple areas. Remedy completion will be considered for individual areas; however, the South Central Terrace remedy will be considered complete when all areas

within the South Central Terrace have met their respective remediation goals.

#### IV.E.6.c. Monitoring Requirements

- i. The point of compliance wells are DDMW15, LFMW40, EM1, LFMW41, EM2, LFEP18, and EM3.
- ii. The point of compliance wells must be sampled each calendar quarter beginning upon implementation of the remedy. An alternate monitoring schedule may be approved in writing by the Director for portions of the monitoring.
- iii. Samples must be analyzed for VOCs using U.S. EPA Method SW-846 8260.
- iv. If the Director determines the existing compliance wells do not adequately monitor the entire plume or possible hot spots within the plume, the Director may add, delete, or change compliance wells during the course of remediation to ensure that the plume is adequately monitored. Additional compliance wells may also be added following cessation of treatment to ensure the entire plume has been remediated and groundwater concentrations throughout the plume are maintained below the cleanup standards.
- v. No wells within the SWMU or wells that are or have been used for any purpose during remediation of the SWMU may be abandoned without prior approval of the Director.
- vi. Quality control samples must be taken at the frequencies specified in the most current, approved version of the *Chemical Data Acquisition Plan*.

#### IV.E.6.d. Reporting Requirements

- i. A Corrective Measure Implementation Work Plan must be submitted to the Division within 60 days of the effective date of this remedy selection. The work plan may be combined with the work plans required for the other remedies to be implemented in the South Central Terrace area. The work plan must:
  - a. Describe the sequence for submitting subsequent work plans and/or designs for each aspect of the remedy.
  - b. Provide a timeframe for implementing each aspect of the remedy. This timeframe can be in the form of a flow chart from scheduling software.

- ii. Quarterly reports describing the progress towards implementing and completing the remedy at the eastern mid-plume area must be submitted for Director review. The quarterly reports are due 90 days after the end of each calendar quarter. The reports must include at a minimum a summary of activities during the quarter, analytical data reports, data verification/validation reports, field logs, investigation derived waste letters, and time/series plots when adequate data have been obtained to prepare the plots.
- iii. Annual reports detailing the progress on achieving the CGWS at the eastern mid-plume area must be submitted for Director review. The annual reports should focus on progress made on remediation throughout the plume and provide more detailed figures than the quarterly reports. The reports are due annually on October 31.
- iv. The Permittee must provide written notification to the Director when treatment has ceased (recirculation system has been shut down, there are no injections into injection wells or infiltration galleries, sufficient time has lapsed for substrate to dissipate, ORP is  $> 0\text{mV}$  and DO  $> 3\text{ mg/L}$  throughout the plume) and they are entering the three year period of monitoring after cessation of treatment.
- v. The Permittee must provide written notification to the Director within 14 days of receipt of validated data completing the three years of quarterly monitoring with concentrations below the CGWS following cessation of treatment.
- vi. A remedy completion report must be submitted for Director review and approval when all aspects of the remedy have been completed. The report must contain details on remedy construction, all the groundwater monitoring data and groundwater contaminant concentration trends, and a risk evaluation following the methodology in the most current, approved *Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units*.
- vii. The remedy completion report is due within 120 days of the date of the letter required by Part IV.E.6.d.v.

#### IV.E.6.e. Land Use Controls

- i. Land use controls required for the eastern mid-plume area are:
  - a. No residential or recreational use
  - b. Structures located above the onsite groundwater plume must not be used for residential uses

- c. Existing structures must have adequate ventilation.
  - d. If the current use changes at an existing structure, installation of a properly designed and constructed vapor intrusion mitigation system reviewed and approved by the Director is required unless indoor air quality monitoring shows that a system is not required. The Director must review the design and construction of the mitigation system before installation may commence. Once constructed, all such mitigation systems must be operated and maintained as needed to prevent intrusion of volatile organic compounds above risk levels set forth in the design document approved by the Director.
  - e. New permanent structures must have a properly designed and constructed vapor intrusion mitigation system. The Director must review the design and construction of any such system before building construction may commence. Once constructed, all such mitigation systems must be operated and maintained as needed to prevent intrusion of volatile organic compounds above risk levels set forth in the design document approved by the Director.
  - f. No water from the alluvial aquifer may be withdrawn or used for any purpose, except as authorized in a remedial decision document or environmental sampling plan approved by the Director.
  - g. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
- ii. The eastern mid-plume area must be inspected once per calendar year to ensure the land use controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.
  - iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for the eastern mid-plume area within 30 days of the effective date of this Permit renewal.
  - iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
  - v. A map of the SWMU 28/36 eastern mid-plume area that includes GPS coordinates at multiple locations around the perimeter of the area, and a table of the GPS locations must be included in the Land Use Control Plan.

- vi. Upon remedy construction completion of the SWMU 28/36 eastern mid-plume groundwater remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 28/36 eastern mid-plume groundwater remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

#### IV.E.7. South Central Terrace – Western Mid-plume Area

##### IV.E.7.a. Selected Remedy

The remedy selected for the western mid-plume area is enhanced reductive dechlorination. Enhanced reductive dechlorination is the process of providing nutrients to the subsurface microbial population to stimulate anaerobic reductive dechlorination.

The remedy selection was finalized on September 12, 2006, modified on June 23, 2009, and additional requirements were added during Permit renewal.

If the selected remedy does not achieve the groundwater cleanup standards throughout the groundwater plume within 48 months of the effective date of Permit renewal, the Director will evaluate the treatment system at that time and annually thereafter and may modify this remedy.

##### IV.E.7.b. Technical Requirements

- i. Treatment shall consist of injection of a substrate that will provide nutrients for enhanced growth of existing microorganisms. The Permittee may select the substrate from any of the substrates that have proven to be effective. The substrate must be specified in the work plan required by IV.E.7.d. The area to be treated is depicted in the *Final Remedy-Specific Work Plan, Solid Waste Management Units 28 and 36, Western Mid-Plume* dated December 29, 2008 and modified April 9, 2009.
- ii. Details of the remedy implementation must be contained in remedy-specific work plans.
- iii. The groundwater cleanup levels for the contaminants of concern are the Colorado Ground Water Standards (CGWS). The concentrations of any associated hazardous constituents also must not exceed the CGWS. The concentration of COCs in groundwater must not exceed the following levels:
  - a. Trichloroethylene - 5 µg/L
  - b. cis-1,2 dichloroethylene - 70 µg/L
  - c. Vinyl chloride - 2 µg/L

- iv. Remediation of the western mid-plume area will be considered complete when all aspects of the remedy have been implemented, when active treatment has ceased (recirculation system has been shut down, there are no injections into injection wells or infiltration galleries, sufficient time has lapsed for substrate to dissipate, ORP is  $> 0\text{mV}$  and  $\text{DO} > 3 \text{ mg/L}$  throughout the plume), and when concentrations of COCs and associated hazardous constituents at the compliance wells meet or are maintained below the CGWS for three consecutive years following cessation of treatment. The South Central Terrace is comprised of multiple areas. Remedy completion will be considered for individual areas; however, the South Central Terrace remedy will be considered complete when all areas within the South Central Terrace have met their respective remediation goals.

#### IV.E.7.c. Monitoring Requirements

- i. The point of compliance wells are LFMW06, DDMW21, and WMPMW20.
- ii. The point of compliance wells must be sampled each calendar quarter beginning upon implementation of the remedy. An alternate monitoring schedule may be approved in writing by the Director for portions of the monitoring.
- iii. Samples must be analyzed for VOCs using U.S. EPA Method SW-846 8260.
- iv. If the Director determines the existing compliance wells do not adequately monitor the entire plume or possible hot spots within the plume, the Director may add, delete, or change compliance wells during the course of remediation to ensure that the plume is adequately monitored. Additional compliance wells may also be added following cessation of treatment to ensure the entire plume has been remediated and groundwater concentrations throughout the plume are maintained below the cleanup standards.
- v. No wells within the SWMU or wells that are or have been used for any purpose during remediation of the SWMU may be abandoned without prior approval of the Director.
- vi. Quality control samples must be taken at the frequencies specified in the most current, approved version of the *Chemical Data Acquisition Plan*.

#### IV.E.7.d. Reporting Requirements

- i. A Corrective Measure Implementation Work Plan for the enhanced reductive dechlorination system in the western mid-plume area must be submitted to the Division within 60 days of the effective date of this remedy selection. The work plan may be combined with the work plans required for the other remedies to be implemented in the south central terrace area. The work plan must:
  - a. Describe the sequence for submitting subsequent work plans and/or designs for each aspect of the remedy.
  - b. Provide a timeframe for implementing each aspect of the remedy. This timeframe can be in the form of a flow chart from scheduling software.
- ii. Quarterly reports describing the progress towards implementing and completing the remedy at the western mid-plume area must be submitted for Director review. The quarterly reports are due 90 days after the end of each calendar quarter. The reports must include at a minimum a summary of activities during the quarter, analytical data reports, data verification/validation reports, field logs, investigation derived waste letters, and time/series plots when adequate data have been obtained to prepare the plots.
- iii. Annual reports detailing the progress on achieving the CGWS at the western mid-plume area must be submitted for Director review. The annual reports should focus on progress made on remediation throughout the plume and provide more detailed figures than the quarterly reports. The reports are due annually on October 31.
- iv. The Permittee must provide written notification to the Director when treatment has ceased (recirculation system has been shut down, there are no injections into injection wells or infiltration galleries, sufficient time has lapsed for substrate to dissipate, ORP is  $> 0\text{mV}$  and DO  $> 3\text{ mg/L}$  throughout the plume) and they are entering the three year period of monitoring after cessation of treatment.
- v. The Permittee must provide written notification to the Director within 14 days of receipt of validated data completing the three years of quarterly monitoring with concentrations below the CGWS following cessation of treatment.
- vi. A remedy completion report must be submitted for Director review and approval when all aspects of the remedy have been completed. The report must contain details on remedy

construction, all the groundwater monitoring data and groundwater contaminant concentration trends, and a risk evaluation following the methodology in the most current, approved *Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units*.

- vii. The remedy completion report is due within 120 days of the date of the letter required by Part IV.E.7.d.v.

#### IV.E.7.e. Land Use Controls

- i. Land use controls required for the western mid-plume area are:
  - a. No residential or recreational use
  - b. Structures located above the onsite groundwater plume must not be used for residential uses
  - c. Existing structures must have adequate ventilation.
  - d. If the current use changes at an existing structure, installation of a properly designed and constructed vapor intrusion mitigation system is required unless indoor air quality monitoring reviewed and approved by the Director shows that a system is not required. The Director must review the design and construction of the mitigation system before installation may commence. Once constructed, all such mitigation systems must be operated and maintained as needed to prevent intrusion of volatile organic compounds above risk levels set forth in the design document approved by the Director.
  - e. New permanent structures must have a properly designed and constructed vapor intrusion mitigation system. The Director must review the design and construction of any such system before building construction may commence. Once constructed, all such mitigation systems must be operated and maintained as needed to prevent intrusion of volatile organic compounds above risk levels set forth in the design document approved by the Director.
  - f. No water from the alluvial aquifer may be withdrawn or used for any purpose, except as authorized in a remedial decision document or environmental sampling plan approved by the Director.
  - g. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
- ii. The western mid-plume area must be inspected once per calendar year to ensure the land use controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the

inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.

- iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for the western mid-plume area within 30 days of the effective date of this Permit renewal.
- iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
- v. A map of the SWMU 28/36 western mid-plume area that includes GPS coordinates at multiple locations around the perimeter of the area, and a table of the GPS locations must be included in the Land Use Control Plan.
- vi. Upon remedy construction completion of the SWMU 28/36 western mid-plume groundwater remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 28/36 western mid-plume groundwater remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

#### IV.E.8. South Central Terrace – Eastern Terrace Area

##### IV.E.8.a. Selected Remedy

The remedy selected for the eastern terrace area is groundwater flushing through the use of infiltration galleries, plus enhanced reductive dechlorination through addition of a substrate to the infiltration galleries. The infiltration galleries will increase clean groundwater flow through the area which will aid in flushing the contamination from the area. The addition of a substrate to provide nutrients to the subsurface microbial population will stimulate anaerobic reductive dechlorination.

In addition to the infiltration galleries, biobarriers are an additional acceptable means for treatment.

The remedy selection was finalized on September 12, 2006. The remedy was modified on June 23, 2009 and December 9, 2011, and additional requirements were added during Permit renewal

If the selected remedy does not achieve the groundwater cleanup standards throughout the groundwater plume within 48 months of the effective date of Permit renewal, the Director will evaluate the treatment system at that time and annually thereafter and may modify this remedy.

#### IV.E.8.b. Technical Requirements

- i. Two infiltration galleries shall be positioned east to west and approximately 100 feet apart. A substrate will be added to the water to provide nutrients for enhanced growth of existing microorganisms. The Permittee may select the substrate from any of the substrates that have proven to be effective. The area to be treated is depicted in Figure 6-14 of the *Final Corrective Measures Study, South Central Terrace* dated January 2006.
- ii. Biobarriers may be installed in accordance with approved work plans in areas requiring additional treatment. Treatment shall consist of injection of a substrate that will provide nutrients for enhanced growth of existing microorganisms. The Permittee may select the substrate from any of the substrates that have proven to be effective.
- iii. The groundwater cleanup levels for the contaminants of concern are the Colorado Ground Water Standards (CGWS). The concentrations of any associated hazardous constituents also must not exceed the CGWS. The concentration of COCs in groundwater must not exceed the following levels:
  - a. Trichloroethylene - 5 µg/L
  - b. cis-1,2 dichloroethylene - 70 µg/L
  - c. Vinyl chloride - 2 µg/L
- iv. Remediation of the eastern terrace area will be considered complete when all aspects of the remedy have been implemented, when active treatment has ceased (recirculation system has been shut down, there are no injections into injection wells or infiltration galleries, sufficient time has lapsed for substrate to dissipate, ORP is > 0mV and DO > 3 mg/L throughout the plume), and when concentrations of COCs and associated hazardous constituents at the compliance wells meet or are maintained below the CGWS for three consecutive years following cessation of treatment. The South Central Terrace is comprised of multiple areas. Remedy completion will be considered for individual areas; however, the South Central Terrace remedy will be considered complete when all areas within the South Central Terrace have met their respective remediation goals.

#### IV.E.8.c. Monitoring Requirements

- i. The point of compliance wells are OLFMW21 and OLFMW15.

- ii. The point of compliance wells must be sampled each calendar quarter beginning upon implementation of the remedy. An alternate monitoring schedule may be approved in writing by the Director for portions of the monitoring.
- iii. Samples must be analyzed for VOCs using U.S. EPA Method SW-846 8260.
- iv. If the Director determines the existing compliance wells do not adequately monitor the entire plume or possible hot spots within the plume, the Director may add, delete, or change compliance wells during the course of remediation to ensure that the plume is adequately monitored. Additional compliance wells may also be added following cessation of treatment to ensure the entire plume has been remediated and groundwater concentrations throughout the plume are maintained below the cleanup standards.
- v. No wells within the SWMU or wells that are or have been used for any purpose during remediation of the SWMU may be abandoned without prior approval of the Director.
- vi. Quality control samples must be taken at the frequencies specified in the most current, approved version of the *Chemical Data Acquisition Plan*.

#### IV.E.8.d. Reporting Requirements

- i. A Corrective Measure Implementation Work Plan for constructing infiltration galleries in the eastern terrace area must be submitted to the Division within 60 days of the effective date of this remedy selection. The work plan may be combined with the work plans required for the other remedies to be implemented in the South Central Terrace area. The work plan must:
  - a. Describe the sequence for submitting subsequent work plans and/or designs for each aspect of the remedy.
  - b. Provide a timeframe for implementing each aspect of the remedy. This timeframe can be in the form of a flow chart from scheduling software.
- ii. Quarterly reports describing the progress towards implementing and completing the remedy at the eastern terrace area must be submitted for Director review. The quarterly reports are due 90 days after the end of each calendar quarter. The reports must include at a minimum a summary of activities during the quarter, analytical data reports, data verification/validation reports, field logs, investigation derived waste letters, and time/series plots when adequate data have been obtained to prepare the plots.

- iii. Annual reports detailing the progress on achieving the CGWS at the eastern terrace area must be submitted for Director review. The annual reports should focus on progress made on remediation throughout the plume and provide more detailed figures than the quarterly reports. The reports are due annually on October 31.
- iv. The Permittee must provide written notification to the Director when treatment has ceased (recirculation system has been shut down, there are no injections into injection wells or infiltration galleries, sufficient time has lapsed for substrate to dissipate, ORP is  $> 0\text{mV}$  and DO  $> 3\text{ mg/L}$  throughout the plume) and they are entering the three year period of monitoring after cessation of treatment.
- v. The Permittee must provide written notification to the Director within 14 days of receipt of validated data completing the three years of quarterly monitoring with concentrations below the CGWS following cessation of treatment.
- vi. A remedy completion report must be submitted for Director review and approval when all aspects of the remedy have been completed. The report must contain details on remedy construction, all the groundwater monitoring data and groundwater contaminant concentration trends, and a risk evaluation following the methodology in the most current, approved *Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units*.
- vii. The remedy completion report is due within 120 days of the date of the letter required by Part IV.E.8.d.v.

#### IV.E.8.e. Land Use Controls

- i. A map of the impacted area must be included in the Land Use Control Plan.

#### IV.E.9. South Central Terrace – Boundary Area

##### IV.E.9.a. Selected Remedy

The remedy selected for the Boundary Area of the South Central Terrace is continued operation of the Interim Corrective Action Groundwater Remediation System until CGWS are met in the groundwater upgradient from the ICAGRS. The ICAGRS consists of a pump and treat system with a centralized air stripping treatment unit to remove chlorinated VOCs from groundwater. The extent of the South Central Terrace plume is shown on Figure 2-1 of the *Final Corrective Measures Study; South Central Terrace* dated January 2006.

The remedy selection was finalized on September 12, 2006 and additional requirements were added during Permit renewal.

#### IV.E.9.b. Technical Requirements

- i. Continue operation of the ICAGRS in accordance with the most current, approved PCMP.
- ii. The groundwater cleanup levels for the contaminants of concern are the Colorado Ground Water Standards (CGWS). The concentrations of any associated hazardous constituents also must not exceed the CGWS. The concentration of COCs in groundwater must not exceed the following levels:
  - a. Trichloroethylene - 5 µg/L
  - b. cis-1,2 dichloroethylene - 70 µg/L
  - c. Vinyl chloride - 2 µg/L
- iii. Remediation of the South Central Terrace plume will be considered complete when:
  - a. All aspects of the remedy have been implemented upgradient and the remediation goals are achieved
  - b. Active treatment has ceased at the ICAGRS (the pump and treat system and infiltration galleries have been shut down)
  - c. Concentrations of COCs and associated hazardous constituents at the compliance wells and determination monitoring wells associated with the boundary area meet or are maintained below the CGWS for three consecutive years following cessation of treatment
- iv. The South Central Terrace is comprised of multiple areas. Remedy completion will be considered for individual areas; however, the South Central Terrace remedy will be considered complete when all areas within the South Central Terrace have met their respective remediation goals.
- v. The Director may allow shutdown of sections of the ICAGRS if review of available data indicates that shutdown of a section will not impact completion of groundwater remediation.

#### IV.E.9.c. Monitoring Requirements

- i. The property boundary point of compliance wells are, WM1, OLFMW09, WM2, WP2, EM4, EM5, EM6, EM10, EM7, EM11, EM8, EM12, and EM9.

- ii. The determination wells are OLFMW23, LFMW10, LFWP10, LFMW19, LFMW20, LFMW29, LFMW08B, LFMW40, EM1, LFMW41, EM2, LFEP18, and EM3.
- iii. The point of compliance and determination monitoring wells must be sampled each calendar quarter beginning with the effective date of this remedy selection.
- iv. Samples must be analyzed for VOCs using U.S. EPA Method SW-846 8260.
- v. Quality control samples must be taken at the frequencies specified in the most current, approved version of the *Chemical Data Acquisition Plan*.

#### IV.E.9.d. Reporting Requirements

- i. Performance Assessment Reports (PAR) must be submitted 60 days after the end of each current reporting quarter.
- ii. System Operations Assessment Reports (SOAR) must be submitted 120 days after the end of the current reporting year.
- iii. A remedy completion report must be submitted for Director review and approval when all aspects of the South Central Terrace remedy have been implemented and groundwater cleanup levels have been met and maintained at the point of compliance wells and determination wells for three consecutive years following cessation of treatment. The report must contain details on remedy construction, all the groundwater monitoring data and groundwater contaminant concentration trends, and a risk evaluation following the methodology in the most current, approved *Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units*.
- iv. The remedy completion report is due to the Director 120 days following completion of the remedy.

#### IV.E.9.e. Land Use Controls

- i. Land use controls required for the boundary area are:
  - a. No water from the alluvial aquifer may be withdrawn or used for any purpose, except as authorized in a remedial decision document or environmental sampling plan approved by the Director.

- b. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
  - c. Surface water may not be used for any purpose, except as authorized in a remedial decision document or environmental sampling plan approved by the Director.
  - d. Existing structures must have adequate ventilation.
  - e. If the current use changes at an existing structure, installation of a properly designed and constructed vapor intrusion mitigation system is required unless indoor air quality monitoring reviewed and approved by the Director shows that a system is not required. The Director must review the design and construction of the mitigation system before installation may commence. Once constructed, all such mitigation systems must be operated and maintained as needed to prevent intrusion of volatile organic compounds above risk levels set forth in the design document approved by the Director.
  - f. New permanent structures must have a properly designed and constructed vapor intrusion mitigation system. The Director must review the design and construction of any such system before building construction may commence. Once constructed, all such mitigation systems must be operated and maintained as needed to prevent intrusion of volatile organic compounds above risk levels set forth in the design document approved by the Director.
- ii. The ICAGRS boundary area must be inspected once per calendar year to ensure the land use controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.
  - iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for the boundary area within 30 days of the effective date of this Permit renewal.
  - iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
  - v. A map of the ICAGRS boundary area that includes GPS coordinates at multiple locations around the perimeter of the area, and a table of the GPS locations must be included in the Land Use Control Plan.

- vi. A map of the impacted area must be included in the Land Use Control Plan.
- vii. Upon remedy construction completion of the South Central Terrace Boundary Area groundwater remedy, the Director will prepare a Notice of Environmental Use Restriction for the South Central Terrace Boundary Area groundwater remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

## SWMU 17 - SOUTHWEST TERRACE REMEDIES

### IV.E.10. SWMU No. 17 – TNT Washout Area and Discharge System – Area of Interest 1 – Soil and Groundwater

#### IV.E.10.a. Selected Remedy

The remedy selected for soil at depth and the groundwater at AOI 1 is Enhanced In Situ Bioremediation (EISB) with land use controls to restrict access to the area and potential exposure to contamination at depth in the soil. The remediation goal for soil from 0 to 6 feet below ground surface (bgs) at the Southwest Terrace are the Wildlife Management Worker risk-based screening levels in the *Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units (Revision 8)*. The surficial soil at AOI 1 meets these criteria. The soil at depth continues to be a source of contaminants impacting groundwater in the Southwest Terrace.

The remedy selection was finalized on April 22, 2008 and additional requirements were added during Permit renewal.

If the selected remedy does not achieve the groundwater cleanup standards throughout AOI 1 within 48 months of the effective date of Permit renewal, the Director will evaluate the treatment system at that time and annually thereafter and may modify this remedy.

#### IV.E.10.b. Technical Requirements

- i. Treatment shall consist of injection or infiltration of a substrate that will provide nutrients for enhanced growth of existing microorganisms. The Permittee may select the substrate from any of the substrates that have proven to be effective in previous work at SWMU 17. The substrate must be specified in the work plan required by Part IV.E.10.d.iii. The area to be treated is depicted in Figure 4-1 of the *Final (Revision 1) SWMU 17 Corrective Measures Study*, dated September 2007.

- ii. The effectiveness of the deep soil and groundwater remedy will be determined by monitoring groundwater downgradient of AOI 1. The groundwater remediation levels for the contaminants of concern at the source area are 1.5 times the groundwater cleanup level specified in Amended Compliance Order 99-10-06-01, except for PETN which is 1.5 times the RBSL established in the *Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units, Revision 13*. The concentration of COCs in groundwater must not exceed the following levels:
  - a. Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) – 903 µg/L
  - b. Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) – 0.825 µg/L
  - c. 1,3,5-trinitrobenzene – 541.5 µg/L
  - d. 1,3-dinitrobenzene – 1.8 µg/L
  - e. Tetryl – 180 µg/L
  - f. Nitrobenzene – 5.25 µg/L
  - g. Dinitrotoluene mixture – 0.1328 µg/L
  - h. 2,4,6-Trinitrotoluene – 3.02 µg/L
  - i. 4-Amino-2,6-dinitrotoluene – 180 µg/L
  - j. 2-Amino-4,6-dinitrotoluene – 252 µg/L
  - k. 2,4-Dinitrotoluene – 0.1328 µg/L
  - l. 2,6-Dinitrotoluene – 0.1328 µg/L
  - m. 2-Nitrotoluene – 252 µg/L
  - n. 3-Nitrotoluene – 252 µg/L
  - o. 4-Nitrotoluene – 252 µg/L
  - p. Pentaerythritol Tetranitrate (PETN) – 22.65 µg/L
  - q. Nitrate – 15 mg/L
- iii. If concentrations of the contaminants of concern in groundwater are not reduced to the cleanup levels listed above, additional remedial action may be required.
- iv. If treated soil previously removed from SWMU 17 will be used as backfill, the work plan required in Part IV.E.10.d.iii. must specify the locations and depths where the composted soil will be used.
- v. AOI 1 must be seeded to ensure erosion of the surficial soil does not occur. Details of the revegetation plan must be included in the work plan required in Part IV.E.10.d.iii.
- vi. Remediation of the AOI 1 source area will be considered complete when all aspects of the remedy have been implemented, and when active treatment has ceased (recirculation system has been shut down, there are no injections into injection wells or

infiltration galleries, sufficient time has lapsed for substrate to dissipate, ORP is > 0mV and DO > 3 mg/L throughout the plume), and concentrations of contaminants of concern meet or are maintained below the groundwater remediation levels at the point of compliance wells for three consecutive years. The Southwest Terrace is comprised of multiple areas. Remedy completion will be considered for individual areas; however, the Southwest Terrace remedy will be considered complete when all areas within the Southwest Terrace have met their respective remediation goals.

#### IV.E.10.c. Monitoring Requirements

- i. To determine whether the remediation has been effective, groundwater samples must be taken at point of compliance wells. The point of compliance wells must be identified in the work plan required in Part IV.E.10.d.iii. The location of the point of compliance wells must be approved by the Director.
- ii. The point of compliance wells must be monitored monthly following substrate injection. An alternate monitoring schedule may be approved by the Director for portions of the monitoring; however, monthly monitoring is required to complete the three years of monitoring following cessation of treatment.
- iii. The point of compliance wells must be monitored until concentrations of contaminants of concern are at or below the groundwater remediation levels specified in Part IV.E.10.b.ii. for three continuous years following cessation of treatment.
- iv. Samples from the point of compliance wells must be analyzed for explosives using U.S. EPA Method 8330B or 8321M, and nitrate using Method 300 or 353.2.
- v. If the Director determines the existing compliance wells do not adequately monitor the entire plume or possible hot spots within the plume, the Director may add, delete, or change compliance wells during the course of remediation to ensure that the plume is adequately monitored. Additional compliance wells may also be added following cessation of treatment to ensure the entire plume has been remediated and groundwater concentrations throughout the plume are maintained below the cleanup standards.
- vi. No wells within the SWMU or wells that are or have been used for any purpose during remediation of the SWMU may be abandoned without prior approval of the Director.

- vii. Quality control samples must be taken at the frequencies specified in the most current, approved version of the *Chemical Data Acquisition Plan*.

#### IV.E.10.d. Reporting Requirements

- i. A Corrective Measure Implementation Work Plan for the Southwest Terrace remedy must be submitted to the Division within 90 days of the effective date of this remedy selection for review and approval. The work plan must:
  - a. Describe the sequence for submitting subsequent work plans and/or designs for each aspect of the Southwest Terrace remedy.
  - b. Provide a timeframe for implementing each aspect of the Southwest Terrace remedy. This timeframe can be in the form of a flow chart from scheduling software.
- ii. The Director-approved work plan and the schedule will become an enforceable document under this Permit.
- iii. A work plan describing the specific design and implementation aspects of the remedy at AOI 1 must be submitted as scheduled in the work plan required by Part IV.E.10.d.i. The Director-approved work plan will become an enforceable document under this Permit.
- iv. A groundwater monitoring plan must also be submitted when the work plan required by Part IV.E.10.d.iii. is submitted. The groundwater monitoring plan may be prepared to cover the entire monitoring program for the Southwest Terrace or be specific to AOI 1. The Director-approved monitoring plan will become an enforceable document under this Permit.
- v. Quarterly reports describing the progress towards implementing and completing the remedy at AOI 1 must be submitted for Director review. The quarterly reports are due 60 days after the end of each calendar quarter. The reports must include at a minimum a summary of activities during the quarter, analytical data reports, data verification/validation reports, field logs, investigation derived waste letters, and time/series plots when adequate data have been obtained to prepare the plots.
- vi. Annual reports detailing the progress on achieving the CGWS at AOI 1 must be submitted for Director review. The annual reports should focus on progress made on remediation throughout the plume and provide more detailed figures than the quarterly reports. The reports are due annually on May 31.

- vii. The Permittee must provide written notification to the Director when treatment has ceased (recirculation system has been shut down, there are no injections into injection wells or infiltration galleries, sufficient time has lapsed for substrate to dissipate, ORP is > 0mV and DO > 3 mg/L throughout the plume) and they are entering the three year period of monitoring after cessation of treatment.
- viii. The Permittee must provide written notification to the Director within 14 days of receipt of validated data completing the three years of monthly monitoring with concentrations below the CGWS following cessation of treatment.
- ix. A remedy completion report must be submitted for Director review and approval when all aspects of the remedy have been completed. The report must contain details on remedy construction, all the groundwater monitoring data and groundwater contaminant concentration trends, and a risk evaluation following the methodology in the most current, approved *Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units*.
- x. The remedy completion report is due within 120 days of the date of the letter required by Part IV.E.10.d.viii.

#### IV.E.10.e. Land Use Controls

- i. Land use controls required for AOI 1 are:
  - a. Property use is restricted to wildlife and natural resource management
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the AOI 1 boundary, except as authorized in a remedial decision document or environmental sampling plan approved by the Director
  - c. There shall be no placement of material at AOI 1 other than to backfill excavated areas or add topsoil for revegetation. Any fill activities must be described in the work plan required in Part IV.E.10.d.iii.
  - d. There shall be no installation of groundwater supply wells in AOI 1
  - e. Use of groundwater from the alluvial aquifer for drinking water, bathing, gardening, or any domestic use is prohibited. "Domestic use" means household or family use, including, but not limited to: drinking, bathing, gardening, public water systems and non-public individual or private water sources.

- f. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
  - g. Irrigation of the area is prohibited, except as approved by the Director in a remedial decision document to establish and maintain vegetation
  - h. Construction or maintenance of any standing body of water, including any pond or stormwater retention basin, is prohibited
  - i. There shall be no placement of structures within AOI 1 except for temporary structures related to implementation of the remedy, such as treatment sheds which shall be removed following completion of the remedy
  - j. There shall be no training activities, including military training activities, within AOI 1
  - k. There shall be no real estate actions, such as lease or transfer, taken on the property at AOI 1
- ii. SWMU 17 must be inspected once per calendar year to ensure the land use controls and additional controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.
  - iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMU 17 within 30 days of the effective date of this Permit renewal.
  - iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
  - v. A map of AOI 1 that includes GPS coordinates at multiple locations around the perimeter of the AOI and a table of the GPS locations must be included in the Land Use Control Plan.
  - vi. Upon remedy construction completion of the SWMU 17 AOI 1 remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 17 AOI 1 remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

IV.E.11. SWMU No. 17 – TNT Washout Area and Discharge System – Area of Interest 2A – Soil and Groundwater

IV.E.11.a. Selected Remedy

The remedy selected for soil at depth and the groundwater at AOI 2A is Enhanced In Situ Bioremediation (EISB) and land use controls to restrict access to the area and potential exposure to contamination at depth in the soil. The remediation goal for soil from 0 to 6 feet below ground surface (bgs) at the Southwest Terrace are the Wildlife Management Worker risk-based screening levels in the *Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units (Revision 8)*. The surficial soil at AOI 2A meets these criteria. The soil at depth continues to be a source of contaminants impacting groundwater in the Southwest Terrace.

The remedy selection was finalized on April 22, 2008 and additional requirements were added during Permit renewal.

If the selected remedy does not achieve the groundwater cleanup standards throughout AOI 2A within 48 months of the effective date of Permit renewal, the Director will evaluate the treatment system at that time and annually thereafter and may modify this remedy.

IV.E.11.b. Technical Requirements

- i. Treatment shall consist of injection or infiltration of a substrate that will provide nutrients for enhanced growth of existing microorganisms. The Permittee may select the substrate from any of the substrates that have proven to be effective in previous work at SWMU 17. The substrate must be specified in the work plan required by Part IV.E.11.d.iii. The area to be treated is depicted in Figure 4-1 of the *Final (Revision 1) SWMU 17 Corrective Measures Study*, dated September 2007.
- ii. The effectiveness of the deep soil and groundwater remedy will be determined by monitoring groundwater downgradient of AOI 2A. The groundwater remediation levels for the contaminants of concern at the source area are 1.5 times the groundwater cleanup level specified in Amended Compliance Order 99-10-06-01, except for PETN which is 1.5 times the RBSL established in the *Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units, Revision 13*. The concentration of COCs in groundwater must not exceed the following levels:

- a. Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) – 903 µg/L
  - b. Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) – 0.825 µg/L
  - c. 1,3,5-trinitrobenzene – 541.5 µg/L
  - d. 1,3-dinitrobenzene – 1.8 µg/L
  - e. Tetryl – 180 µg/L
  - f. Nitrobenzene – 5.25 µg/L
  - g. Dinitrotoluene mixture – 0.1328 µg/L
  - h. 2,4,6-Trinitrotoluene – 3.02 µg/L
  - i. 4-Amino-2,6-dinitrotoluene – 180 µg/L
  - j. 2-Amino-4,6-dinitrotoluene – 252 µg/L
  - k. 2,4-Dinitrotoluene – 0.1328 µg/L
  - l. 2,6-Dinitrotoluene – 0.1328 µg/L
  - m. 2-Nitrotoluene – 252 µg/L
  - n. 3-Nitrotoluene – 252 µg/L
  - o. 4-Nitrotoluene – 252 µg/L
  - p. Pentaerythritol Tetranitrate (PETN) – 22.65 µg/L
  - q. Nitrate – 15 mg/L
- iii. If concentrations of the contaminants of concern in groundwater are not reduced to the cleanup levels listed above, additional remedial action may be required.
  - iv. If treated soil previously removed from SWMU 17 will be used as backfill, the work plan required in Part IV.E.11.d.iii. must specify the locations and depths where the composted soil will be used.
  - v. AOI 2A must be seeded to ensure erosion of the surficial soil does not occur. Details of the revegetation plan must be included in the work plan required in Part IV.E.11.d.iii.
  - vi. Remediation of the AOI 2A source area will be considered complete when all aspects of the remedy have been implemented, and when active treatment has ceased (recirculation system has been shut down, there are no injections into injection wells or infiltration galleries, sufficient time has lapsed for substrate to dissipate, ORP is > 0mV and DO > 3 mg/L throughout the plume), and concentrations of contaminants of concern meet or are maintained below the groundwater remediation levels at the point of compliance wells for three consecutive years. The Southwest Terrace is comprised of multiple areas. Remedy completion will be considered for individual areas; however, the Southwest Terrace remedy will be considered complete when all areas within the Southwest Terrace have met their respective remediation goals.

#### IV.E.11.c. Monitoring Requirements

- i. To determine whether the remediation has been effective, groundwater samples must be taken at point of compliance wells. The point of compliance wells must be identified in the work plan required in Part IV.E.11.d.iii. The location of the point of compliance wells must be approved by the Director.
- ii. The point of compliance wells must be monitored monthly following substrate injection. An alternate monitoring schedule may be approved by the Director for portions of the monitoring; however, monthly monitoring is required to complete the three years of monitoring following cessation of treatment.
- iii. The point of compliance wells must be monitored until concentrations of contaminants of concern are at or below the groundwater remediation levels specified in Part IV.E.11.b.ii. for three consecutive years following cessation of treatment.
- iv. Samples from the point of compliance wells must be analyzed for explosives using U.S. EPA Method 8330B or 8321M, and nitrate using Method 300 or 353.2.
- v. If the Director determines the existing compliance wells do not adequately monitor the entire plume or possible hot spots within the plume, the Director may add, delete, or change compliance wells during the course of remediation to ensure that the plume is adequately monitored. Additional compliance wells may also be added following cessation of treatment to ensure the entire plume has been remediated and groundwater concentrations throughout the plume are maintained below the cleanup standards.
- vi. No wells within the SWMU or wells that are or have been used for any purpose during remediation of the SWMU may be abandoned without prior approval of the Director.
- vii. Quality control samples must be taken at the frequencies specified in the most current, approved version of the *Chemical Data Acquisition Plan*.

#### IV.E.11.d. Reporting Requirements

- i. A Corrective Measure Implementation Work Plan for the Southwest Terrace remedy must be submitted to the Division within 90 days of the effective date of this remedy selection for review and approval. The work plan must:

- a. Describe the sequence for submitting subsequent work plans and/or designs for each aspect of the Southwest Terrace remedy.
  - b. Provide a timeframe for implementing each aspect of the Southwest Terrace remedy. This timeframe can be in the form of a flow chart from scheduling software.
- ii. The Director-approved work plan and the schedule will become an enforceable document under this Permit.
  - iii. A work plan describing the specific design and implementation aspects of the remedy at AOI 2A must be submitted as scheduled in the work plan required by Part IV.E.11.d.i. The Director-approved work plan will become an enforceable document under this Permit.
  - iv. A groundwater monitoring plan must also be submitted when the work plan required by Part IV.E.11.d.iii. is submitted. The groundwater monitoring plan may be prepared to cover the entire monitoring program for the Southwest Terrace or be specific to AOI 2A. The Director-approved monitoring plan will become an enforceable document under this Permit.
  - v. Quarterly reports describing the progress towards implementing and completing the remedy at AOI 2A must be submitted for Director review. The quarterly reports are due 60 days after the end of each calendar quarter. The reports must include at a minimum a summary of activities during the quarter, analytical data reports, data verification/validation reports, field logs, investigation derived waste letters, and time/series plots when adequate data have been obtained to prepare the plots.
  - vi. Annual reports detailing the progress on achieving the CGWS at AOI 2A must be submitted for Director review. The annual reports should focus on progress made on remediation throughout the plume and provide more detailed figures than the quarterly reports. The reports are due annually on May 31.
  - vii. The Permittee must provide written notification to the Director when treatment has ceased (recirculation system has been shut down, there are no injections into injection wells or infiltration galleries, sufficient time has lapsed for substrate to dissipate, ORP is  $> 0\text{mV}$  and DO  $> 3\text{ mg/L}$  throughout the plume) and they are entering the three year period of monitoring after cessation of treatment.

- viii. The Permittee must provide written notification to the Director within 14 days of receipt of validated data completing the three years of monthly monitoring with concentrations below the CGWS following cessation of treatment.
- ix. A remedy completion report must be submitted for Director review and approval when all aspects of the remedy have been completed. The report must contain details on remedy construction, all the groundwater monitoring data and groundwater contaminant concentration trends, and a risk evaluation following the methodology in the most current, approved *Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units*.
- x. The remedy completion report is due within 120 days of the date of the letter required by Part IV.E.11.d.viii.

#### IV.E.11.e. Land Use Controls

- i. Land use controls required for AOI 2A are:
  - a. Property use is restricted to wildlife and natural resource management
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the AOI 2A boundary, except as authorized in a remedial decision document or environmental sampling plan approved by the Director
  - c. There shall be no placement of material at AOI 2A other than to backfill excavated areas or add topsoil for revegetation. Any fill activities must be described in the work plan required in Part IV.E.11.d.iii.
  - d. There shall be no installation of groundwater supply wells in AOI 2A
  - e. Use of groundwater from the alluvial aquifer for drinking water, bathing, gardening, or any domestic use is prohibited. "Domestic use" means household or family use, including, but not limited to: drinking, bathing, gardening, public water systems and non-public individual or private water sources.
  - f. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
  - g. Irrigation of the area is prohibited, except as approved by the Director in a remedial decision document to establish and maintain vegetation

- h. Construction or maintenance of any standing body of water, including any pond or stormwater retention basin, is prohibited
  - i. There shall be no placement of structures within AOI 2A except for temporary structures related to implementation of the remedy, such as treatment sheds which shall be removed following completion of the remedy
  - j. There shall be no training activities, including military training activities, within AOI 2A
  - k. There shall be no real estate actions, such as lease or transfer, taken on the property at AOI 2A
- ii. SWMU 17 must be inspected once per calendar year to ensure the land use controls and additional controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.
  - iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMU 17 within 30 days of the effective date of this Permit renewal.
  - iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
  - v. A map of AOI 2A that includes GPS coordinates at multiple locations around the perimeter of the AOI and a table of the GPS locations must be included in the Land Use Control Plan.
  - vi. Upon remedy construction completion of the SWMU 17 AOI 2A remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 17 AOI 2A remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

IV.E.12. SWMU No. 17 – TNT Washout Area and Discharge System – Area of Interest 2B – Soil

IV.E.12.a. Selected Remedy

The remedy selected for soil at AOI 2B is land use controls to restrict access to the area and potential exposure to contaminants at depth in the soil. The remediation goal for soil from 0 to 6 feet below ground surface (bgs) at the Southwest Terrace are the Wildlife Management Worker risk-based screening

levels in the *Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units (Revision 8)*. Due to previous excavation of contaminated soil at AOI 2B, the surficial soil meets these criteria. AOI 2B is not thought to be a source of contaminants to the groundwater plume in the Southwest Terrace area; therefore, a groundwater remedy is not being selected.

The remedy selection was finalized on April 22, 2008, and additional requirements were added during Permit renewal.

#### IV.E.12.b. Technical Requirements

- i. Although AOI 2B requires no further remedial action, AOI 2B does not meet the unrestricted use criteria and future use is limited to wildlife and natural resource management.
- ii. If treated soil previously removed from SWMU 17 will be used as backfill, the work plan required in Part IV.E.12.d.iii. must specify the locations and depths where the composted soil will be used.
- iii. AOI 2B must be seeded to ensure erosion of the surficial soil does not occur. Details of the revegetation plan must be included in the work plan required in Part IV.E.12.d.iii.

#### IV.E.12.c. Monitoring Requirements

- i. There are no monitoring requirements other than maintaining the land use controls.

#### IV.E.12.d. Reporting Requirements

- i. A Corrective Measure Implementation Work Plan for the Southwest Terrace remedy must be submitted to the Division within 90 days of the effective date of this remedy selection for review and approval. The work plan must:
  - a. Describe the sequence for submitting subsequent work plans and/or designs for each aspect of the Southwest Terrace remedy.
  - b. Provide a timeframe for implementing each aspect of the Southwest Terrace remedy. This timeframe can be in the form of a flow chart from scheduling software.
- ii. The Director-approved work plan and the schedule will become an enforceable document under this Permit.

- iii. A work plan describing the specific design and implementation aspects of the remedy at AOI 2B must be submitted as scheduled in the work plan required by Part IV.E.12.d.i. The Director-approved work plan will become an enforceable document under this Permit.
- iv. Annual reports describing the progress on implementing the land use controls at AOI 2B must be submitted for Director review. The reports are due annually on May 31.
- v. A remedy completion report following the methodology in the *Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units* must be submitted for Director review and approval.
- vi. The remedy completion report is due to the Director 120 days following completion of the remedy.

#### IV.E.12.e. Land Use Controls

- i. Land use controls required for AOI 2B are:
  - a. Property use is restricted to wildlife and natural resource management
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the AOI 2B boundary, except as authorized in a remedial decision document or environmental sampling plan approved by the Director
  - c. There shall be no placement of material at AOI 2B other than to backfill excavated areas or add topsoil for revegetation. Any fill activities must be described in the work plan required in Part IV.E.12.d.iii.
  - d. There shall be no installation of groundwater supply wells in AOI 2B
  - e. Use of groundwater from the alluvial aquifer for drinking water, bathing, gardening, or any domestic use is prohibited. "Domestic use" means household or family use, including, but not limited to: drinking, bathing, gardening, public water systems and non-public individual or private water sources.
  - f. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
  - g. Irrigation of the area is prohibited, except as approved by the Director in a remedial decision document to establish and maintain vegetation

- h. Construction or maintenance of any standing body of water, including any pond or stormwater retention basin, is prohibited
  - i. There shall be no placement of structures within AOI 2B except for temporary structures related to implementation of the remedy, such as treatment sheds which shall be removed following completion of the remedy
  - j. There shall be no training activities, including military training activities, within AOI 2B
  - k. There shall be no real estate actions, such as lease or transfer, taken on the property at AOI 2B
- ii. SWMU 17 must be inspected once per calendar year to ensure the land use controls and additional controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.
  - iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMU 17 within 30 days of the effective date of this Permit renewal.
  - iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
  - v. A map of AOI 2B that includes GPS coordinates at multiple locations around the perimeter of the AOI and a table of the GPS locations must be included in the Land Use Control Plan.
  - vi. Upon remedy construction completion of the SWMU 17 AOI 2B remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 17 AOI 2B remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

IV.E.13. SWMU No. 17 – TNT Washout Area and Discharge System – Area of Interest 3A – Soil

IV.E.13.a. Selected Remedy

The remedy selected for soil at AOI 3A is excavation of contaminated soil to a depth of 6 feet bgs with land use controls to restrict access to the area and potential exposure to contaminants at depth in the soil. The remediation goal for soil from 0 to 6 feet below ground surface (bgs) at the Southwest Terrace are the

Wildlife Management Worker risk-based screening levels in the *Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units (Revision 8)*.

The remedy selection was finalized on April 22, 2008.

#### IV.E.13.b. Technical Requirements

- i. AOI 3A is approximately 11,000 square feet in area. The soil from 0 to 6 feet bgs must be excavated where contaminant concentrations exceed the Wildlife Management Worker risk-based screening levels. AOI 3A is depicted on Figure 4-1 of the *Final (Revision 1) SWMU 17 Corrective Measures Study*, dated September 2007.
- ii. The soil remediation levels for the contaminants of concern are the Wildlife Management Worker risk-based screening levels in the *Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units (Revision 8)*. The remedy must result in meeting the following soil remediation levels at the surface and from 0 to 6 feet bgs in the excavation:
  - a. Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) – 19,400 mg/kg
  - b. Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) – 13 mg/kg
  - c. 1,3,5-trinitrobenzene – 11,600 mg/kg
  - d. 1,3-dinitrobenzene – 38.8 mg/kg
  - e. Tetryl – If tetryl is confirmed to be present in soil, a site-specific risk-based screening level must be developed
  - f. Nitrobenzene – 138 mg/kg
  - g. Dinitrotoluene mixture – 2.1 mg/kg
  - h. 2,4,6-Trinitrotoluene – 47.7 mg/kg
  - i. 4-Amino-2,6-dinitrotoluene – 3880 mg/kg
  - j. 2-Amino-4,6-dinitrotoluene – 5430 mg/kg
  - k. 2,4-Dinitrotoluene – 776 mg/kg
  - l. 2,6-Dinitrotoluene – 388 mg/kg
  - m. 2-Nitrotoluene – 22.6 mg/kg
  - n. 3-Nitrotoluene – 28,200 mg/kg
  - o. 4-Nitrotoluene – 305 mg/kg
  - p. Pentaerythritol Tetranitrate (PETN) – If PETN is confirmed to be present in soil, a site-specific risk-based screening level must be developed
- iii. The excavated soil must be characterized to determine if it is hazardous waste.
- iv. The excavated soil must be disposed of at an appropriate disposal facility.

- v. The excavation must be backfilled. If treated soil previously removed from SWMU 17 will be used as backfill, the work plan required in Part IV.E.13.d.iii. must specify the locations and depths where the composted soil will be used.
- vi. AOI 3A must be seeded to ensure erosion of the surficial soil does not occur. Details of the revegetation plan must be included in the work plan required in Part IV.E.13.d.iii.
- vii. Remediation of the AOI 3A source area will be considered complete when all aspects of the remedy have been implemented and concentrations of contaminants of concern are below the soil remediation levels at the designated soil sampling locations. The Southwest Terrace is comprised of multiple areas. Remedy completion will be considered for individual areas; however, the Southwest Terrace remedy will be considered complete when all areas within the Southwest Terrace have met their respective remediation goals.

#### IV.E.13.c. Monitoring Requirements

- i. Confirmation samples must be taken on the surface (0-3 inches) from the perimeter of the excavation at a rate of one sample per 50 linear feet and from the sidewalls of the excavation at a rate of one sample per 300 square feet.
- ii. The samples must be analyzed for the parameters listed in Part IV.E.13.b.ii.
- iii. The confirmation samples must be analyzed for explosives using U.S. EPA Method 8330B or 8321M.
- iv. Quality control samples must be taken at the frequencies specified in the most current, approved version of the *Chemical Data Acquisition Plan*.

#### IV.E.13.d. Reporting Requirements

- i. A Corrective Measure Implementation Work Plan for the Southwest Terrace remedy must be submitted to the Division within 90 days of the effective date of this remedy selection for review and approval. The work plan must:
  - a. Describe the sequence for submitting subsequent work plans and/or designs for each aspect of the Southwest Terrace remedy.

- b. Provide a timeframe for implementing each aspect of the Southwest Terrace remedy. This timeframe can be in the form of a flow chart from scheduling software.
- ii. The Director-approved work plan and the schedule will become an enforceable document under this Permit.
- iii. A work plan describing the specific design and implementation aspects of the remedy at AOI 3A must be submitted as scheduled in the work plan required by Part IV.E.13.d.i. The Director-approved work plan will become an enforceable document under this Permit.
- iv. Annual reports describing the progress on achieving the soil cleanup levels at AOI 3A must be submitted for Director review. The reports are due annually on May 31.
- v. A remedy completion report for AOI 3A must be submitted for Director review and approval when all aspects of the remedy have been implemented and soil cleanup levels have been met. The report must contain details on remedy construction, analytical data, and a risk evaluation following the methodology in the most current, approved *Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units*.
- vi. The remedy completion report is due to the Director 120 days following completion of the remedy.

#### IV.E.13.e. Land Use Controls

- i. Land use controls required for AOI 3A are:
  - a. Property use is restricted to wildlife and natural resource management
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the AOI 3A boundary, except as authorized in a remedial decision document or environmental sampling plan approved by the Director
  - c. There shall be no placement of material at AOI 3A other than to backfill excavated areas or add topsoil for revegetation. Any fill activities must be described in the work plan required in Part IV.E.13.d.iii.
  - d. There shall be no installation of groundwater supply wells in AOI 3A
  - e. Use of groundwater from the alluvial aquifer for drinking water, bathing, gardening, or any domestic use is

prohibited. "Domestic use" means household or family use, including, but not limited to: drinking, bathing, gardening, public water systems and non-public individual or private water sources.

- f. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
  - g. Irrigation of the area is prohibited, except as approved by the Director in a remedial decision document to establish and maintain vegetation
  - h. Construction or maintenance of any standing body of water, including any pond or stormwater retention basin, is prohibited
  - i. There shall be no placement of structures within AOI 3A except for temporary structures related to implementation of the remedy, such as treatment sheds which shall be removed following completion of the remedy
  - j. There shall be no training activities, including military training activities, within AOI 3A
  - k. There shall be no real estate actions, such as lease or transfer, taken on the property at AOI 3A
- ii. SWMU 17 must be inspected once per calendar year to ensure the land use controls and additional controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.
  - iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for AOI 3A within 30 days of the effective date of this Permit renewal.
  - iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
  - v. A map of AOI 3A that includes GPS coordinates at multiple locations around the perimeter of the AOI and a table of the GPS locations must be included in the Land Use Control Plan.
  - vi. Upon remedy construction completion of the SWMU 17 AOI 3A remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 17 AOI 3A remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30

days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

IV.E.14. SWMU No. 17 – TNT Washout Area and Discharge System – Area of Interest 3A – Groundwater

IV.E.14.a. Selected Remedy

The remedy selected for soil at depth and the groundwater at AOI 3A is Enhanced In Situ Bioremediation (EISB) with land use controls to restrict access to the area and potential exposure to contaminants at depth in the soil. Although the surficial soil at AOI 3A will be excavated, the soil at depth continues to be a source of contaminants impacting groundwater in the Southwest Terrace.

The remedy selection was finalized on April 22, 2008 and additional requirements were added during Permit renewal.

If the selected remedy does not achieve the groundwater cleanup standards throughout AOI 3A within 48 months of the effective date of Permit renewal, the Director will evaluate the treatment system at that time and annually thereafter and may modify this remedy.

IV.E.14.b. Technical Requirements

- i. Treatment shall consist of injection or infiltration of a substrate that will provide nutrients for enhanced growth of existing microorganisms. The Permittee may select the substrate from any of the substrates that have proven to be effective in previous work at SWMU 17. The substrate must be specified in the work plan required by Part IV.E.14.d.iii. The area to be treated is depicted in Figure 4-1 of the *Final (Revision 1) SWMU 17 Corrective Measures Study*, dated September 2007.
- ii. The effectiveness of the deep soil and groundwater remedy will be determined by monitoring groundwater downgradient of AOI 3A. The groundwater remediation levels for the contaminants of concern at the source area are 1.5 times the groundwater cleanup level specified in Amended Compliance Order 99-10-06-01, except for PETN which is 1.5 times the RBSL established in the *Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units, Revision 13*. The concentration of COCs in groundwater must not exceed the following levels:
  - a. Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) – 903 µg/L
  - b. Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) – 0.825 µg/L
  - c. 1,3,5-trinitrobenzene – 541.5 µg/L

- d. 1,3-dinitrobenzene – 1.8 µg/L
  - e. Tetryl – 180 µg/L
  - f. Nitrobenzene – 5.25 µg/L
  - g. Dinitrotoluene mixture – 0.1328 µg/L
  - h. 2,4,6-Trinitrotoluene – 3.02 µg/L
  - i. 4-Amino-2,6-dinitrotoluene – 180 µg/L
  - j. 2-Amino-4,6-dinitrotoluene – 252 µg/L
  - k. 2,4-Dinitrotoluene – 0.1328 µg/L
  - l. 2,6-Dinitrotoluene – 0.1328 µg/L
  - m. 2-Nitrotoluene – 252 µg/L
  - n. 3-Nitrotoluene – 252 µg/L
  - o. 4-Nitrotoluene – 252 µg/L
  - p. Pentaerythritol Tetranitrate (PETN) - 22.65 µg/L
  - q. Nitrate – 15 mg/L
- iii. If concentrations of the contaminants of concern in groundwater are not reduced to the cleanup levels listed above, additional remedial action may be required.
  - iv. Remediation of the AOI 3A source area will be considered complete when all aspects of the remedy have been implemented, and when active treatment has ceased (recirculation system has been shut down, there are no injections into injection wells or infiltration galleries, sufficient time has lapsed for substrate to dissipate, ORP is > 0mV and DO > 3 mg/L throughout the plume), and concentrations of contaminants of concern meet or are maintained below the groundwater remediation levels at the point of compliance wells for three consecutive years. The Southwest Terrace is comprised of multiple areas. Remedy completion will be considered for individual areas; however, the Southwest Terrace remedy will be considered complete when all areas within the Southwest Terrace have met their respective remediation goals.

#### IV.E.14.c. Monitoring Requirements

- i. To determine whether the remediation has been effective, groundwater samples must be taken at point of compliance wells. The point of compliance wells must be identified in the work plan required in Part IV.E.14.d.iii. The location of the point of compliance wells must be approved by the Director.
- ii. The point of compliance wells must be monitored monthly following substrate injection. An alternate monitoring schedule may be approved by the Director for portions of the monitoring; however, monthly monitoring is required to complete the three years of monitoring following cessation of treatment.

- iii. The point of compliance wells must be monitored until concentrations of contaminants of concern are at or below the groundwater remediation goals specified in Part IV.E.14.b.ii. for three consecutive years following cessation of treatment.
- iv. Samples from the point of compliance wells must be analyzed for explosives using U.S. EPA Method 8330B or 8321M, and nitrate using Method 300 or 353.2.
- v. If the Director determines the existing compliance wells do not adequately monitor the entire plume or possible hot spots within the plume, the Director may add, delete, or change compliance wells during the course of remediation to ensure that the plume is adequately monitored. Additional compliance wells may also be added following cessation of treatment to ensure the entire plume has been remediated and groundwater concentrations throughout the plume are maintained below the cleanup standards.
- vi. No wells within the SWMU or wells that are or have been used for any purpose during remediation of the SWMU may be abandoned without prior approval of the Director.
- vii. Quality control samples must be taken at the frequencies specified in the most current, approved version of the *Chemical Data Acquisition Plan*.

#### IV.E.14.d. Reporting Requirements

- i. A Corrective Measure Implementation Work Plan for the Southwest Terrace remedy must be submitted to the Division within 90 days of the effective date of this remedy selection for review and approval. The work plan must:
  - a. Describe the sequence for submitting subsequent work plans and/or designs for each aspect of the Southwest Terrace remedy.
  - b. Provide a timeframe for implementing each aspect of the Southwest Terrace remedy. This timeframe can be in the form of a flow chart from scheduling software.
- ii. The Director-approved work plan and the schedule will become an enforceable document under this Permit.
- iii. A work plan describing the specific design and implementation aspects of the remedy at AOI 3A must be submitted as scheduled in the work plan required by Part IV.E.14.d.i. The Director-approved work plan will become an enforceable document under this Permit.

- iv. A groundwater monitoring plan must also be submitted when the work plan required by Part IV.E.14.d.iii. is submitted. The groundwater monitoring plan may be prepared to cover the entire monitoring program for the Southwest Terrace or be specific to AOI 3A. The Director-approved monitoring plan will become an enforceable document under this Permit.
- v. Quarterly reports describing the progress towards implementing and completing the remedy at AOI 3A must be submitted for Director review. The quarterly reports are due 60 days after the end of each calendar quarter. The reports must include at a minimum a summary of activities during the quarter, analytical data reports, data verification/validation reports, field logs, investigation derived waste letters, and time/series plots when adequate data have been obtained to prepare the plots.
- vi. Annual reports detailing the progress on achieving the CGWS at AOI 3A must be submitted for Director review. The annual reports should focus on progress made on remediation throughout the plume and provide more detailed figures than the quarterly reports. The reports are due annually on May 31.
- vii. The Permittee must provide written notification to the Director when treatment has ceased (recirculation system has been shut down, there are no injections into injection wells or infiltration galleries, sufficient time has lapsed for substrate to dissipate, ORP is  $> 0\text{mV}$  and DO  $> 3\text{ mg/L}$  throughout the plume) and they are entering the three year period of monitoring after cessation of treatment.
- viii. The Permittee must provide written notification to the Director within 14 days of receipt of validated data completing the three years of monthly monitoring with concentrations below the CGWS following cessation of treatment.
- ix. A remedy completion report must be submitted for Director review and approval when all aspects of the remedy have been implemented and groundwater cleanup levels have been met and maintained at the point of compliance wells for three consecutive years. The report must contain details on remedy construction, all the groundwater monitoring data and groundwater contaminant concentration trends, and a risk evaluation following the methodology in the most current, approved *Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units*.

- x. The remedy completion report is due within 120 days of the date of the letter required by Part IV.E.14.d.viii.

IV.E.14.e. Land Use Controls

- i. Land use controls required for AOI 3A are:
  - a. Property use is restricted to wildlife and natural resource management
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the AOI 3A boundary, except as authorized in a remedial decision document or environmental sampling plan approved by the Director
  - c. There shall be no placement of material at AOI 3A other than to backfill excavated areas or add topsoil for revegetation. Any fill activities must be described in the work plan required in Part IV.E.14.d.iii.
  - d. There shall be no installation of groundwater supply wells in AOI 3A
  - e. Use of groundwater from the alluvial aquifer for drinking water, bathing, gardening, or any domestic use is prohibited. "Domestic use" means household or family use, including, but not limited to: drinking, bathing, gardening, public water systems and non-public individual or private water sources.
  - f. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
  - g. Irrigation of the area is prohibited, except as approved by the Director in a remedial decision document to establish and maintain vegetation
  - h. Construction or maintenance of any standing body of water, including any pond or stormwater retention basin, is prohibited
  - i. There shall be no placement of structures within AOI 3A except for temporary structures related to implementation of the remedy, such as treatment sheds which shall be removed following completion of the remedy
  - j. There shall be no training activities, including military training activities, within AOI 3A
  - k. There shall be no real estate actions, such as lease or transfer, taken on the property at AOI 3A
- ii. SWMU 17 must be inspected once per calendar year to ensure the land use controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection

from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.

- iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMU 17 within 30 days of the effective date of this Permit renewal.
- iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
- v. A map of AOI 3A that includes GPS coordinates at multiple locations around the perimeter of the AOI and a table of the GPS locations must be included in the Land Use Control Plan.
- vi. Upon remedy construction completion of the SWMU 17 AOI 3A remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 17 AOI 3A remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

IV.E.15. SWMU No. 17 – TNT Washout Area and Discharge System – Area of Interest 3B – Soil

IV.E.15.a. Selected Remedy

The remedy selected for contaminated soil at AOI 3B is excavation of contaminated soil from 0 to 6 feet below ground surface (bgs) to the Wildlife Management Worker risk-based screening levels in the *Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units (Revision 8)*, and Enhanced In-Situ Bioremediation for soil in the bottom of the TNT washout lagoon and potential overflow area, and soil at depth. The remedy also includes disposal of contaminated soil at an off-site disposal facility, with land use controls to restrict access to the area and potential exposure to contaminants at depth in the soil.

The remedy selection was finalized on April 22, 2008, modified on April 21, 2009, and additional requirements were added during Permit renewal.

IV.E.15.b. Technical Requirements

- i. The AOI 3B area encompasses approximately 1.3 acres. The soil from 0 to 6 feet bgs must be excavated where contaminant concentrations exceed the Wildlife Management Worker risk-based screening levels. AOI 3B is depicted on Figure 4-1 of the *Final (Revision 1) SWMU 17 Corrective Measures Study*, dated September 2007.

- ii. The soil remediation levels for the contaminants of concern in the 0 to 6 feet bgs zone are the Wildlife Management Worker risk-based screening levels in the *Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units (Revision 8)*. The remedy must result in meeting the following soil remediation levels:
  - a. Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) – 19,400 mg/kg
  - b. Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) – 13 mg/kg
  - c. 1,3,5-trinitrobenzene – 11,600 mg/kg
  - d. 1,3-dinitrobenzene – 38.8 mg/kg
  - e. Tetryl – If tetryl is confirmed to be present in soil, a site-specific risk-based screening level must be developed
  - f. Nitrobenzene – 138 mg/kg
  - g. Dinitrotoluene mixture – 2.1 mg/kg
  - h. 2,4,6-Trinitrotoluene – 47.7 mg/kg
  - i. 4-Amino-2,6-dinitrotoluene – 3880 mg/kg
  - j. 2-Amino-4,6-dinitrotoluene – 5430 mg/kg
  - k. 2,4-Dinitrotoluene – 776 mg/kg
  - l. 2,6-Dinitrotoluene – 388 mg/kg
  - m. 2-Nitrotoluene – 22.6 mg/kg
  - n. 3-Nitrotoluene – 28,200 mg/kg
  - o. 4-Nitrotoluene – 305 mg/kg
  - p. Pentaerythritol Tetranitrate (PETN) – If PETN is confirmed to be present in soil, a site-specific risk-based screening level must be developed
  
- iii. The soil at depth in AOI 3B continues to be a source of contaminants impacting groundwater in the Southwest Terrace. The soil in the base of the TNT washout lagoon and potential overflow area at AOI 3B will be treated with a substrate to promote Enhanced In-Situ Bioremediation (EISB). The Permittee may select the substrate from any of the substrates that have proven to be effective in previous work at SWMU 17. The substrate must be specified in the work plan required by Part IV.E.15.d.iii. An infiltration gallery will be placed in the bottom of both the TNT washout lagoon and the potential overflow area. In addition, extraction wells will be placed downgradient of the infiltration gallery, and injection wells will be placed within and between the TNT washout lagoon and the potential overflow area.
  
- iv. If the EISB does not result in reduction of contaminant concentrations in soil to a level that prevents continued leaching of contaminants to groundwater, the soil in the base of the TNT washout lagoon and the potential overflow area must be

excavated to bedrock to remove as much of the contaminant source as possible. Following completion of the excavation, a substrate that will provide nutrients for enhanced growth of existing microorganisms must be placed in the base of the excavation to provide additional treatment. The Permittee may select the substrate from any of the substrates that have proven to be effective in previous work at SWMU 17. If Part IV.E.15.b.iv. is implemented, a work plan describing the excavation work and the substrate to be used must be submitted to the Division for review and approval prior to starting the excavation.

- v. The excavated soil must be characterized to determine if it is hazardous waste.
- vi. The excavated soil must be disposed of at an appropriate disposal facility.
- vii. The excavations, TNT washout lagoon, and potential overflow area must be backfilled to the previous natural grade. If treated soil previously removed from SWMU 17 will be used as backfill, the work plan required in Part IV.E.15.d.iii. must specify the locations and depths where the composted soil will be used
- viii. AOI 3B must be seeded to ensure erosion of the surficial soil does not occur. Details of the revegetation plan must be included in the work plan required in Part IV.E.15.d.iii.
- ix. Remediation of the AOI 3B source area will be considered complete when all aspects of the remedy have been implemented and concentrations of contaminants of concern are below the soil remediation levels at the designated soil sampling locations. The Southwest Terrace is comprised of multiple areas. Remedy completion will be considered for individual areas; however, the Southwest Terrace remedy will be considered complete when all areas within the Southwest Terrace have met their respective remediation goals.

#### IV.E.15.c. Monitoring Requirements

- i. Confirmation samples must be taken on the surface from the perimeter of the excavation at a rate of one sample per 50 linear feet and from the sidewalls of the excavation at a rate of one sample per 300 square feet.
- ii. The samples must be analyzed for the parameters listed in Part IV.E.15.b.ii.

- iii. The confirmation samples must be analyzed for explosives using U.S. EPA Method 8330B or 8321M.
- iv. Quality control samples must be taken at the frequencies specified in the most current, approved version of the *Chemical Data Acquisition Plan*.

#### IV.E.15.d. Reporting Requirements

- i. A Corrective Measure Implementation Work Plan for the Southwest Terrace remedy must be submitted to the Division within 90 days of the effective date of this remedy selection for review and approval. The work plan must:
  - a. Describe the sequence for submitting subsequent work plans and/or designs for each aspect of the Southwest Terrace remedy.
  - b. Provide a timeframe for implementing each aspect of the Southwest Terrace remedy. This timeframe can be in the form of a flow chart from scheduling software.
- ii. The Director-approved work plan and the schedule will become an enforceable document under this Permit.
- iii. A work plan describing the specific design and implementation aspects of the remedy at AOI 3B must be submitted as scheduled in the work plan required by Part IV.E.15.d.i. The Director-approved work plan will become an enforceable document under this Permit.
- iv. Annual reports describing the progress on achieving the soil cleanup levels at AOI 3B must be submitted for Director review. The reports are due annually on May 31.
- v. A remedy completion report, including figures showing the extent of excavation, post-excavation sampling locations, contaminant concentrations at those locations, and a risk evaluation following the methodology in the *Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units* must be submitted for Director review and approval.
- vi. The remedy completion report is due to the Director 120 days following completion of the remedy.

#### IV.E.15.e. Land Use Controls

- i. Land use controls required for AOI 3B are:
  - a. Property use is restricted to wildlife and natural resource management
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the AOI 3B boundary, except as authorized in a remedial decision document or environmental sampling plan approved by the Director
  - c. There shall be no placement of material at AOI 3B other than to backfill excavated areas or add topsoil for revegetation. Any fill activities must be described in the work plan required in Part IV.E.15.d.iii.
  - d. There shall be no installation of groundwater supply wells in AOI 3B
  - e. Use of groundwater from the alluvial aquifer for drinking water, bathing, gardening, or any domestic use is prohibited. "Domestic use" means household or family use, including, but not limited to: drinking, bathing, gardening, public water systems and non-public individual or private water sources.
  - f. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
  - g. Irrigation of the area is prohibited, except as approved by the Director in a remedial decision document to establish and maintain vegetation
  - h. Construction or maintenance of any standing body of water, including any pond or stormwater retention basin, is prohibited
  - i. There shall be no placement of structures within AOI 3B except for temporary structures related to implementation of the remedy, such as treatment sheds which shall be removed following completion of the remedy
  - j. There shall be no training activities, including military training activities, within AOI 3B
  - k. There shall be no real estate actions, such as lease or transfer, taken on the property at AOI 3B
- ii. SWMU 17 must be inspected once per calendar year to ensure the land use controls and additional controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any

adverse findings from the inspection and how identified problems were resolved.

- iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for AOI 3B within 30 days of the effective date of this Permit renewal.
- iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
- v. A map of AOI 3B that includes GPS coordinates at multiple locations around the perimeter of the AOI and a table of the GPS locations must be included in the Land Use Control Plan.
- vi. Upon remedy construction completion of the SWMU 17 AOI 3B remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 17 AOI 3B remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

IV.E.16. SWMU No. 17 – TNT Washout Area and Discharge System – Area of Interest 3B – Groundwater

IV.E.16.a. Selected Remedy

The remedy selected for groundwater at AOI 3B is Enhanced In Situ Bioremediation (EISB) and land use controls to restrict access to the area and potential exposure to contaminants at depth.

The remedy selection was finalized on April 22, 2008, modified on April 21, 2009, and additional requirements were added during Permit renewal.

If the selected remedy does not achieve the groundwater cleanup standards throughout AOI 3B within 48 months of the effective date of Permit renewal, the Director will evaluate the treatment system at that time and annually thereafter and may modify this remedy.

IV.E.16.b. Technical Requirements

- i. Treatment shall consist of injection or infiltration of a substrate that will provide nutrients for enhanced growth of existing microorganisms. The Permittee may select the substrate from any of the substrates that have proven to be effective in previous work at SWMU 17. The substrate must be specified in the work plan required by Part IV.E.16.d.iii. The area to be treated is

depicted in Figure 4-1 of the *Final (Revision 1) SWMU 17 Corrective Measures Study*, dated September 2007.

- ii. The effectiveness of the groundwater remedy will be determined by monitoring groundwater downgradient of AOI 3B. The groundwater remediation levels for the contaminants of concern at the source area are 1.5 times the groundwater cleanup level specified in Amended Compliance Order 99-10-06-01, except for PETN which is 1.5 times the RBSL established in the *Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units, Revision 13*. The concentration of COCs in groundwater must not exceed the following levels:
  - a. Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) – 903 µg/L
  - b. Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) – 0.825 µg/L
  - c. 1,3,5-trinitrobenzene – 541.5 µg/L
  - d. 1,3-dinitrobenzene – 1.8 µg/L
  - e. Tetryl – 180 µg/L
  - f. Nitrobenzene – 5.25 µg/L
  - g. Dinitrotoluene mixture – 0.1328 µg/L
  - h. 2,4,6-Trinitrotoluene – 3.02 µg/L
  - i. 4-Amino-2,6-dinitrotoluene – 180 µg/L
  - j. 2-Amino-4,6-dinitrotoluene – 252 µg/L
  - k. 2,4-Dinitrotoluene – 0.1328 µg/L
  - l. 2,6-Dinitrotoluene – 0.1328 µg/L
  - m. 2-Nitrotoluene – 252 µg/L
  - n. 3-Nitrotoluene – 252 µg/L
  - o. 4-Nitrotoluene – 252 µg/L
  - p. Pentaerythritol Tetranitrate (PETN) – 22.65 µg/L
  - q. Nitrate – 15 mg/L
- iii. If concentrations of the contaminants of concern in groundwater are not reduced to the cleanup levels listed above, additional remedial action may be required.
- iv. Remediation of the AOI 3B source area will be considered complete when all aspects of the remedy have been implemented, and when active treatment has ceased (recirculation system has been shut down, there are no injections into injection wells or infiltration galleries, sufficient time has lapsed for substrate to dissipate, ORP is > 0mV and DO > 3 mg/L throughout the plume), and concentrations of contaminants of concern meet or are maintained below the groundwater remediation levels at the point of compliance wells for three consecutive years. The Southwest Terrace is comprised of multiple areas. Remedy completion will be considered for individual areas; however, the

Southwest Terrace remedy will be considered complete when all areas within the Southwest Terrace have met their respective remediation goals.

#### IV.E.16.c. Monitoring Requirements

- i. To determine whether the remediation has been effective, groundwater samples must be taken at point of compliance wells. The point of compliance wells must be identified in the work plan required in Part IV.E.16.d.iii. The location of the point of compliance wells must be approved by the Director.
- ii. The point of compliance wells must be monitored monthly following substrate injection. An alternate monitoring schedule may be approved by the Director for portions of the monitoring; however, monthly monitoring is required to complete the three years of monitoring following cessation of treatment.
- iii. The point of compliance wells must be monitored until concentrations of contaminants of concern are at or below the groundwater remediation goals specified in Part IV.E.16.b.iii. for three consecutive years following cessation of treatment.
- iv. Samples from the point of compliance wells must be analyzed for explosives using U.S. EPA Method 8330B or 8321M, and nitrate using Method 300 or 353.2.
- v. If the Director determines the existing compliance wells do not adequately monitor the entire plume or possible hot spots within the plume, the Director may add, delete, or change compliance wells during the course of remediation to ensure that the plume is adequately monitored. Additional compliance wells may also be added following cessation of treatment to ensure the entire plume has been remediated and groundwater concentrations throughout the plume are maintained below the cleanup standards.
- vi. No wells within the SWMU or wells that are or have been used for any purpose during remediation of the SWMU may be abandoned without prior approval of the Director.
- vii. Quality control samples must be taken at the frequencies specified in the most current, approved version of the *Chemical Data Acquisition Plan*.

#### IV.E.16.d. Reporting Requirements

- i. A Corrective Measure Implementation Work Plan for the Southwest Terrace remedy must be submitted to the Division

within 90 days of the effective date of this remedy selection for review and approval. The work plan must:

- a. Describe the sequence for submitting subsequent work plans and/or designs for each aspect of the Southwest Terrace remedy.
  - b. Provide a timeframe for implementing each aspect of the Southwest Terrace remedy. This timeframe can be in the form of a flow chart from scheduling software.
- ii. The Director-approved work plan and the schedule will become an enforceable document under this Permit.
  - iii. A work plan describing the specific design and implementation aspects of the remedy at AOI 3B must be submitted as scheduled in the work plan required by Part IV.E.16.d.i. The Director-approved work plan will become an enforceable document under this Permit.
  - iv. A groundwater monitoring plan must also be submitted when the work plan required by Part IV.E.16.d.iii. is submitted. The groundwater monitoring plan may be prepared to cover the entire monitoring program for the Southwest Terrace or be specific to AOI 3B. The Director-approved monitoring plan will become an enforceable document under this Permit.
  - v. Quarterly reports describing the progress towards implementing and completing the remedy at AOI 3B must be submitted for Director review. The quarterly reports are due 60 days after the end of each calendar quarter. The reports must include at a minimum a summary of activities during the quarter, analytical data reports, data verification/validation reports, field logs, investigation derived waste letters, and time/series plots when adequate data have been obtained to prepare the plots.
  - vi. Annual reports detailing the progress on achieving the CGWS at AOI 3B must be submitted for Director review. The annual reports should focus on progress made on remediation throughout the plume and provide more detailed figures than the quarterly reports. The reports are due annually on May 31.
  - vii. The Permittee must provide written notification to the Director when treatment has ceased (recirculation system has been shut down, there are no injections into injection wells or infiltration galleries, sufficient time has lapsed for substrate to dissipate, ORP is  $> 0\text{mV}$  and DO  $> 3\text{ mg/L}$  throughout the plume) and they are entering the three year period of monitoring after cessation of treatment.

- viii. The Permittee must provide written notification to the Director within 14 days of receipt of validated data completing the three years of monthly monitoring with concentrations below the CGWS following cessation of treatment.
- ix. A remedy completion report must be submitted for Director review and approval when all aspects of the remedy have been completed. The report must contain details on remedy construction, all the groundwater monitoring data and groundwater contaminant concentration trends, and a risk evaluation following the methodology in the most current, approved *Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units*.
- x. The remedy completion report is due within 120 days of the date of the letter required by Part IV.E.16.d.viii.

#### IV.E.16.e. Land Use Controls

- i. Land use controls required for AOI 3B are:
  - a. Property use is restricted to wildlife and natural resource management
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the AOI 3B boundary, except as authorized in a remedial decision document or environmental sampling plan approved by the Director
  - c. There shall be no placement of material at AOI 3B other than to backfill excavated areas or add topsoil for revegetation. Any fill activities must be described in the work plan required in Part IV.E.16.d.iii.
  - d. There shall be no installation of groundwater supply wells in AOI 3B
  - e. Use of groundwater from the alluvial aquifer for drinking water, bathing, gardening, or any domestic use is prohibited. "Domestic use" means household or family use, including, but not limited to: drinking, bathing, gardening, public water systems and non-public individual or private water sources.
  - f. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
  - g. Irrigation of the area is prohibited, except as approved by the Director in a remedial decision document to establish and maintain vegetation

- h. Construction or maintenance of any standing body of water, including any pond or stormwater retention basin, is prohibited
  - i. There shall be no placement of structures within AOI 3B except for temporary structures related to implementation of the remedy, such as treatment sheds which shall be removed following completion of the remedy
  - j. There shall be no training activities, including military training activities, within AOI 3B
  - k. There shall be no real estate actions, such as lease or transfer, taken on the property at AOI 3B
- ii. SWMU 17 must be inspected once per calendar year to ensure the land use controls and additional controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.
  - iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMU 17 within 30 days of the effective date of this Permit renewal.
  - iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
  - v. A map of AOI 3B that includes GPS coordinates at multiple locations around the perimeter of the AOI and a table of the GPS locations must be included in the Land Use Control Plan.
  - vi. Upon remedy construction completion of the SWMU 17 AOI 3B remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 17 AOI 3B remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

IV.E.17. SWMU No. 17 – TNT Washout Area and Discharge System – Intermediate Area – Groundwater

IV.E.17.a. Selected Remedy

The remedy selected for groundwater in the intermediate area between the source area and the facility boundary is Enhanced In Situ Bioremediation (EISB) at multiple transects, and land use controls to restrict access to the area and potential exposure to contaminants at depth.

The remedy selection was finalized on April 22, 2008, and additional requirements were added during Permit renewal.

If the selected remedy does not achieve the groundwater cleanup standards throughout the intermediate area within 72 months of the effective date of Permit renewal, the Director will evaluate the treatment system at that time and annually thereafter and may modify this remedy.

#### IV.E.17.b. Technical Requirements

- i. Treatment shall consist of injection of a substrate that will provide nutrients for enhanced growth of existing microorganisms. The Permittee may select the substrate from any of the substrates that have proven to be effective in previous work at SWMU 17. The substrate must be specified in the work plan required by Part IV.E.17.d.iii. The area to be treated is depicted in Figure 3-1 of the *Final (Revision 1) SWMU 17 Corrective Measures Study*, dated September 2007.
- ii. Several transect locations have already been identified and field pilot studies have been conducted at some of the transects. These transects may be used during the final remedy. Replacement transects or additional transects may also be utilized during the final remedy. Locations of the transects must be identified in the work plan required by Part IV.E.17.d.iii.
- iii. The effectiveness of the groundwater remedy will be determined by monitoring groundwater at point of compliance wells downgradient of the injection transects. The groundwater remediation levels for the contaminants of concern in the plume upgradient of existing transects T-15 and T-26 are 1.5 times the groundwater cleanup level specified in Amended Compliance Order 99-10-06-01, except for PETN which is 1.5 times the RBSL established in the *Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units, Revision 13*. The concentration of COCs in groundwater must not exceed the following levels:
  - a. Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) – 903 µg/L
  - b. Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) – 0.825 µg/L
  - c. 1,3,5-trinitrobenzene – 541.5 µg/L
  - d. 1,3-dinitrobenzene – 1.8 µg/L
  - e. Tetryl – 180 µg/L
  - f. Nitrobenzene – 5.25 µg/L
  - g. Dinitrotoluene mixture – 0.1328 µg/L

- h. 2,4,6-Trinitrotoluene – 3.02 µg/L
  - i. 4-Amino-2,6-dinitrotoluene – 180 µg/L
  - j. 2-Amino-4,6-dinitrotoluene – 252 µg/L
  - k. 2,4-Dinitrotoluene – 0.1328 µg/L
  - l. 2,6-Dinitrotoluene – 0.1328 µg/L
  - m. 2-Nitrotoluene – 252 µg/L
  - n. 3-Nitrotoluene – 252 µg/L
  - o. 4-Nitrotoluene – 252 µg/L
  - p. Pentaerythritol Tetranitrate (PETN) – 22.65 µg/L
  - q. Nitrate – 15 mg/L
- iv. The groundwater remediation levels for the contaminants of concern in the plume downgradient of existing transects T-15 and T-26 are the groundwater cleanup levels specified in Amended Compliance Order 99-10-06-01, except for PETN which is the RBSL established in the *Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units, Revision 13*. The concentration of COCs in groundwater must not exceed the following levels:
- a. Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) – 602 µg/L
  - b. Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) – 0.55 µg/L
  - c. 1,3,5-trinitrobenzene – 361 µg/L
  - d. 1,3-dinitrobenzene – 1.20 µg/L
  - e. Tetryl – 120 µg/L
  - f. Nitrobenzene – 3.5 µg/L
  - g. Dinitrotoluene mixture – 0.0885 µg/L
  - h. 2,4,6-Trinitrotoluene – 2.01 µg/L
  - i. 4-Amino-2,6-dinitrotoluene – 120 µg/L
  - j. 2-Amino-4,6-dinitrotoluene – 168 µg/L
  - k. 2,4-Dinitrotoluene – 0.0885 µg/L
  - l. 2,6-Dinitrotoluene – 0.0885 µg/L
  - m. 2-Nitrotoluene – 118 µg/L
  - n. 3-Nitrotoluene – 118 µg/L
  - o. 4-Nitrotoluene – 118 µg/L
  - p. Pentaerythritol Tetranitrate (PETN) – 15.1 ug/L
  - q. Nitrate – 10 mg/L
- v. If concentrations of the contaminants of concern in groundwater are not reduced to the cleanup levels listed above, additional remedial action may be required.
- vi. Remediation of the intermediate area will be considered complete when all aspects of the remedy have been implemented, and when active treatment has ceased (recirculation system has been shut down, there are no injections into injection wells or infiltration galleries, sufficient time has lapsed for substrate to

dissipate, ORP is  $> 0\text{mV}$  and DO  $> 3\text{ mg/L}$  throughout the plume), and concentrations of contaminants of concern meet or are maintained below the groundwater remediation levels at the point of compliance wells for three consecutive years. The Southwest Terrace is comprised of multiple areas. Remedy completion will be considered for individual areas; however, the Southwest Terrace remedy will be considered complete when all areas within the Southwest Terrace have met their respective remediation goals.

#### IV.E.17.c. Monitoring Requirements

- i. To determine whether the remediation has been effective, groundwater samples must be taken at point of compliance wells located within the intermediate area. The number of point of compliance wells will be determined based on location and length of the treatment transects. The point of compliance wells must be identified in the work plan required in Part IV.E.17.d.iii. The location of the point of compliance wells must be approved by the Director.
- ii. The point of compliance wells must be monitored monthly following substrate injection. An alternate monitoring schedule may be approved by the Director for portions of the monitoring; however, monthly monitoring is required to complete the three years of monitoring following cessation of treatment.
- iii. The point of compliance wells must be monitored until concentrations of contaminants of concern are at or below the groundwater remediation goals specified in Part IV.E.17.b.iii. or iv., as specified, for three consecutive years following cessation of treatment.
- iv. Samples from the point of compliance wells must be analyzed for explosives using U.S. EPA Method 8330B or 8321M, and nitrate using Method 300 or 353.2.
- v. If the Director determines the existing compliance wells do not adequately monitor the entire plume or possible hot spots within the plume, the Director may add, delete, or change compliance wells during the course of remediation to ensure that the plume is adequately monitored. Additional compliance wells may also be added following cessation of treatment to ensure the entire plume has been remediated and groundwater concentrations throughout the plume are maintained below the cleanup standards.

- vi. Quality control samples must be taken at the frequencies specified in the most current, approved version of the *Chemical Data Acquisition Plan*.

#### IV.E.17.d. Reporting Requirements

- i. A Corrective Measure Implementation Work Plan for the Southwest Terrace remedy must be submitted to the Division within 90 days of the effective date of this remedy selection for review and approval. The work plan must:
  - a. Describe the sequence for submitting subsequent work plans and/or designs for each aspect of the Southwest Terrace remedy.
  - b. Provide a timeframe for implementing each aspect of the Southwest Terrace remedy. This timeframe can be in the form of a flow chart from scheduling software.
- ii. The Director-approved work plan and the schedule will become an enforceable document under this Permit.
- iii. A work plan describing the specific design and implementation aspects of the remedy at the intermediate area must be submitted as scheduled in the work plan required by Part IV.E.17.d.i. The Director-approved work plan will become an enforceable document under this Permit.
- iv. A groundwater monitoring plan must also be submitted when the work plan required by Part IV.E.17.d.iii. is submitted. The groundwater monitoring plan may be prepared to cover the entire monitoring program for the Southwest Terrace or be specific to the intermediate area. The Director-approved monitoring plan will become an enforceable document under this Permit.
- v. Quarterly reports describing the progress towards implementing and completing the remedy at the intermediate area must be submitted for Director review. The quarterly reports are due 60 days after the end of each calendar quarter. The reports must include at a minimum a summary of activities during the quarter, analytical data reports, data verification/validation reports, field logs, investigation derived waste letters, and time/series plots when adequate data have been obtained to prepare the plots.
- vi. Annual reports detailing the progress on achieving the CGWS at the intermediate area must be submitted for Director review. The annual reports should focus on progress made on remediation throughout the plume and provide more detailed figures than the quarterly reports. The reports are due annually on May 31.

- vii. The Permittee must provide written notification to the Director when treatment has ceased (recirculation system has been shut down, there are no injections into injection wells or infiltration galleries, sufficient time has lapsed for substrate to dissipate, ORP is  $> 0\text{mV}$  and DO  $> 3\text{ mg/L}$  throughout the plume and they are entering the three year period of monitoring after cessation of treatment.
- viii. The Permittee must provide written notification to the Director within 14 days of receipt of validated data completing the three years of monthly monitoring with concentrations below the CGWS following cessation of treatment.
- ix. A remedy completion report must be submitted for Director review and approval when all aspects of the remedy have been completed. The report must contain details on remedy construction, all the groundwater monitoring data and groundwater contaminant concentration trends, and a risk evaluation following the methodology in the most current, approved *Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units*.
- x. The remedy completion report is due within 120 days of the date of the letter required by Part IV.E.17.d.viii.

#### IV.E.17.e. Land Use Controls

- i. Land use controls required for the intermediate area are:
  - a. Property use is restricted to wildlife and natural resource management
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the intermediate area, except as authorized in a remedial decision document or environmental sampling plan approved by the Director
  - c. There shall be no placement of material within the intermediate area other than to backfill excavated areas or add topsoil for revegetation. Any fill activities must be described in the work plan required in Part IV.E.17.d.iii.
  - d. There shall be no installation of groundwater supply wells within the intermediate area
  - e. Use of groundwater from the alluvial aquifer for drinking water, bathing, gardening, or any domestic use is prohibited. "Domestic use" means household or family use, including, but not limited to: drinking, bathing, gardening, public water systems and non-public individual or private water sources.

- f. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
  - g. Irrigation of the area is prohibited, except as approved by the Director in a remedial decision document to establish and maintain vegetation
  - h. Construction or maintenance of any standing body of water, including any pond or stormwater retention basin, is prohibited
  - i. There shall be no placement of structures within the intermediate area, except for temporary structures related to implementation of the remedy, such as treatment sheds which shall be removed following completion of the remedy
  - j. There shall be no training activities, including military training activities, within the intermediate area
  - k. There shall be no real estate actions, such as lease or transfer, taken on the property within the intermediate area
- ii. The intermediate area must be inspected once per calendar year to ensure the land use controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.
  - iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMU 17 within 30 days of the effective date of this Permit renewal.
  - iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
  - v. A map of the intermediate area that includes GPS coordinates at multiple locations around the perimeter of the intermediate area and a table of the GPS locations must be included in the Land Use Control Plan.
  - vi. Upon remedy construction completion of the SWMU 17 intermediate area remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 17 intermediate area remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

IV.E.18. SWMU No. 17 – TNT Washout Area and Discharge System – Facility Boundary – Groundwater

IV.E.18.a. Selected Remedy

The remedy selected for the Southwest Terrace boundary is continued operation of the Groundwater Treatment, Extraction, and Injection (GETI) System and land use controls to restrict access to the area and potential exposure to contaminants at depth. The boundary GETI system includes the Southwest Boundary system, the South Point system, and the Ciruli Spring system.

The remedy selection was finalized on April 22, 2008, and additional requirements were added during Permit renewal.

If the selected remedy does not achieve the groundwater cleanup standards at the facility boundary within 84 months of the effective date of Permit renewal, the Director will evaluate the treatment system at that time and annually thereafter and may modify this remedy.

IV.E.18.b. Technical Requirements

- i. Treatment shall consist of continued operation of the groundwater pump and treat system, with treatment by granular activated carbon at all treatment sheds and treatment by ion exchange where nitrate concentrations exceed the GWCL.
- ii. The groundwater remediation levels for the contaminants of concern in the boundary point of compliance wells and determination wells are the groundwater cleanup levels specified in Amended Compliance Order 99-10-06-01, except for PETN which is the RBSL established in the *Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units, Revision 13*. The concentration of COCs in groundwater must not exceed the following levels:
  - a. Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) – 602 µg/L
  - b. Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) – 0.55 µg/L
  - c. 1,3,5-trinitrobenzene – 361 µg/L
  - d. 1,3-dinitrobenzene – 1.20 µg/L
  - e. Tetryl – 120 µg/L
  - f. Nitrobenzene – 3.5 µg/L
  - g. Dinitrotoluene mixture – 0.0885 µg/L
  - h. 2,4,6-Trinitrotoluene – 2.01 µg/L
  - i. 4-Amino-2,6-dinitrotoluene – 120 µg/L
  - j. 2-Amino-4,6-dinitrotoluene – 168 µg/L
  - k. 2,4-Dinitrotoluene – 0.0885 µg/L
  - l. 2,6-Dinitrotoluene – 0.0885 µg/L

- m. 2-Nitrotoluene – 118 µg/L
  - n. 3-Nitrotoluene – 118 µg/L
  - o. 4-Nitrotoluene – 118 µg/L
  - p. Pentaerythritol Tetranitrate (PETN) – 15.1 ug/L
  - q. Nitrate – 10 mg/L
- iii. If concentrations of the contaminants of concern in groundwater are not reduced to the cleanup levels listed above, additional remedial action may be required.
  - iv. Remediation of the Southwest Terrace plume will be considered complete when:
    - a. All aspects of the SWMU 17 - Southwest Terrace Area remedies upgradient have been implemented and remediation goals are achieved
    - b. Treatment has ceased at the GETI system (the boundary pump and treat systems have been shut down, reinjection has ceased)
    - c. Concentrations of contaminants of concern at the extraction wells and compliance wells associated with the boundary area meet or are maintained below the groundwater remediation levels for three consecutive years following cessation of treatment.
  - v. The Southwest Terrace is comprised of multiple areas. Remedy completion will be considered for individual areas; however, the Southwest Terrace remedy will be considered complete when all areas within the Southwest Terrace have met their respective remediation goals.
  - vi. The Director may allow shutdown of sections of the GETI system if review of available data indicates that shutdown of a section will not impact completion of groundwater remediation.

#### IV.E.18.c. Monitoring Requirements

- i. To determine whether the remediation has been effective, groundwater samples must be taken at point of compliance wells located at the facility boundary and extraction wells upgradient of the GETI system.
- ii. The boundary and extraction wells are identified in the most current, approved version of the Corrective Measures Monitoring Plan (CMMP), Table 1. The monitoring frequency for the wells is also identified in the CMMP.

- iii. The point of compliance wells and extraction wells must be monitored until concentrations of contaminants of concern are at or below the groundwater remediation goals specified in Part IV.E.18.b.ii. for three consecutive years following cessation of treatment.
- iv. Samples from the point of compliance wells and extraction wells must be analyzed for explosives using U.S. EPA Method 8330B or 8321M, and nitrate using Method 300 or 353.2.
- v. If the Director determines the existing compliance wells do not adequately monitor the entire plume or possible hot spots within the plume, the Director may add, delete, or change compliance wells during the course of remediation to ensure that the plume is adequately monitored. Additional compliance wells may also be added following cessation of treatment to ensure the entire plume has been remediated and groundwater concentrations throughout the plume are maintained below the cleanup standards.
- vi. No wells within the SWMU or wells that are or have been used for any purpose during remediation of the SWMU may be abandoned without prior approval of the Director.
- vii. Quality control samples must be taken at the frequencies specified in the most current, approved version of the *Chemical Data Acquisition Plan*.

#### IV.E.18.d. Reporting Requirements

- i. Monthly reports containing data tables and time/series plots from monitoring required by the CMMP and Paragraph 49.c.of Amended Compliance Order 99-10-06-01 must be submitted on the last day of each month for data obtained from the previous calendar month. This data submittal may be in an electronic format such as a spreadsheet submitted electronically via electronic mail or by posting on a portal.
- ii. Quarterly reports containing the data from monitoring required by the CMMP and Paragraph 49.c.of Amended Compliance Order 99-10-06-01 are due 60 days after the end of each calendar quarter for data obtained from the previous calendar quarter.
- iii. Annual reports describing the progress on achieving the groundwater cleanup levels at the boundary area must be submitted for Director review. The reports are due annually on May 31.

- iv. The Permittee must provide written notification to the Director when treatment has ceased (shut down of the pump and treat systems) and they are entering the three year period of monitoring after cessation of treatment.
- v. The Permittee must provide written notification to the Director within 14 days of receipt of validated data completing the three years of monitoring with concentrations below the CGWS following cessation of treatment.
- vi. A remedy completion report must be submitted for Director review and approval when all aspects of the SWMU 17 – Southwest Terrace Remedies have been implemented and groundwater cleanup levels have been met and maintained at the point of compliance and extraction wells for three consecutive years following cessation of treatment. The report must contain details on remedy construction, all the groundwater monitoring data and groundwater contaminant concentration trends, and a risk evaluation following the methodology in the most current, approved *Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units*.
- vii. The remedy completion report is due within 120 days of the date of the letter required by Part IV.E.18.d.viii.

#### IV.E.18.e. Land Use Controls

- i. Land use controls required for the boundary area are:
  - a. Property use is restricted to wildlife and natural resource management
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the SWMU 17 - facility boundary area, except as authorized in a remedial decision document or environmental sampling plan approved by the Director
  - c. There shall be no placement of material within the SWMU 17 – facility boundary area other than to backfill excavated areas or add topsoil for revegetation. Any fill activities must be described in a work plan and submitted to the Director for review and approval.
  - d. There shall be no installation of groundwater supply wells within the facility boundary area
  - e. Use of groundwater from the alluvial aquifer for drinking water, bathing, gardening, or any domestic use is prohibited. “Domestic use” means household or family use, including, but not limited to: drinking, bathing,

- gardening, public water systems and non-public individual or private water sources.
- f. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
  - g. Irrigation of the area is prohibited, except as approved by the Director in a remedial decision document to establish and maintain vegetation
  - h. Construction or maintenance of any standing body of water, including any pond or stormwater retention basin, is prohibited
  - i. There shall be no placement of structures within the facility boundary area, except for temporary structures related to implementation of the remedy, such as treatment sheds which shall be removed following completion of the remedy
  - j. There shall be no training activities, including military training activities, within the intermediate area
  - k. There shall be no real estate actions, such as lease or transfer, taken on the property within the facility boundary area
- ii. The facility boundary area must be inspected once per calendar year to ensure the land use controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.
  - iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMU 17 within 30 days of the effective date of this Permit renewal.
  - iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
  - v. A map of the boundary area that includes GPS coordinates at multiple locations at the boundary including points connecting the boundary to the intermediate area, and a table of the GPS locations must be included in the Land Use Control Plan.
  - vi. Upon remedy construction completion of the SWMU 17 facility boundary remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 17 facility boundary remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the

final version of the Notice of Environmental Use Restriction from the Director.

IV.E.19. SWMU No. 17-1 and 17-2 – Building 591 and Building 592

IV.E.19.a. Compliance Schedule

- i. Within two years of the effective date of Permit renewal the Permittee must submit a Corrective Measures Study Work Plan for SWMUs 17-1 and 17-2.

IV.E.20. SWMU No. 18 – UDMH Washout Disposal Area

The remedy selected for SWMU 18 is No Further Action. The information used to justify the selection of No Further Action as the remedy is described in the *Final Justification Documentation for No Further Action at SWMU 18 Unsymmetrical Dimethyl Hydrazine Washout Facility, September 2006* as modified by replacement pages dated December 12, 2006.

The remedy selection was finalized on March 22, 2007.

IV.E.21. SWMU No. 19 – Red Fuming Nitric Acid (RFNA) Washout Disposal Area

The remedy selected for SWMU 19 is No Further Action with use restricted to wildlife and natural resource management. The information used to justify the selection of No Further Action as the remedy is described in the *Final Justification Documentation for No Further Action at SWMU 19, RFNA Washout Disposal Area*, dated August 2011.

The remedy selection was finalized on March 27, 2012.

IV.E.21.a. Technical Requirements

- i. Risk screening of the contaminant concentrations at SWMU 19 identified that the arsenic and cobalt concentrations in soil exceed their respective residential risk criteria. The arsenic concentration at one sampling location exceeds the wildlife worker risk-based screening level; however, it is within the range of background arsenic concentrations. Although SWMU 19 requires no further remedial action, the SWMU does not meet the unrestricted use criteria and future use is limited to wildlife and natural resource management.

IV.E.21.b. Monitoring Requirements

- i. There are no monitoring requirements for SWMU 19.

IV.E.21.c. Reporting Requirements

- i. There are no reporting requirements for SWMU 19.

#### IV.E.21.d. Land Use Controls

- i. Land use controls required for SWMU 19 are:
  - a. Property use is restricted to wildlife and natural resource management
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the SWMU 19 boundary, except as authorized in a remedial decision document, environmental sampling plan, or Materials Management Plan approved by the Director
  - c. Construction or maintenance of any standing body of water, including any pond or stormwater retention basin, is prohibited
  - d. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
- ii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMU 19 within 30 days of the effective date of this Permit renewal.
- iii. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
- iv. A map of the impacted area and a table showing the GPS coordinates must be included in the Land Use Control Plan.
- v. The Director will prepare a Notice of Environmental Use Restriction for the SWMU 19 remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

#### IV.E.22. SWMU No. 20 – Concentrated RFNA Disposal Area

The remedy selected for SWMU 20 is No Further Action. The contaminated soil at this SWMU was removed. The information used to justify the selection of No Further Action as the remedy is described in the *Draft Final SWMU 20 RCRA Facility Investigation Report and Justification Document for No Further Action, February 2002*; and the *Addendum to the Draft Final SWMU 20 RCRA Facility Investigation Report and Justification Document for No Further Action, December 3, 2002*.

The remedy selection was finalized on April 22, 2003.

IV.E.23. SWMU No. 22 – West Lagoon

The remedy selected for SWMU 22 is No Further Action. The information used to justify the selection of No Further Action as the remedy is described in the *Draft Final Justification Documentation for No Further Action at SWMU 22 West Lagoon, April 2004*.

The remedy selection was finalized on August 26, 2004

IV.E.24. SWMU No. 24 – Zinc Chlorate/Chromate Burial

The remedy selected for SWMU 24 is No Further Action. The information used to justify the selection of No Further Action as the remedy is described in the *RCRA Facility Investigation Report* (May 6, 1994), *Appendix G* (June 5, 1996), and *Quality Control Summary Report* (February 1, 1996); and the *Summary of Activities and Geophysical Survey at SWMU 24, May 26, 2004*.

The remedy selection was finalized on August 26, 2004.

IV.E.25. SWMU No. 25 – Sanitary Sewage Treatment Plant

IV.E.25.a. Selected Remedy

The remedy selected for SWMU 25 is excavation of contaminated soil containing organochlorine pesticides, primarily dichlorodiphenyltrichloroethane (DDT), and polycyclic aromatic hydrocarbons (PAHs) in excess of the site-specific unrestricted use residential risk-based screening levels. Soil excavation is an effective remedy because the contaminated soil is removed from the site and disposed of at an off-site disposal facility designed for that purpose. The remedy does not include demolition of the wastewater treatment plant structures at the SWMU, other than that specified in Part IV.E.25.b.i. If the plant structures are demolished in the future, disposal of the demolition debris and any water remaining in the structures must be conducted in accordance with requirements of the Solid Waste Disposal Act, 6 CCR 1007-2.

The remedy selection was finalized on May 6, 2011 and modified on October 17, 2014.

SWMU 25 is located in the industrial reuse area. The selected remedy was implemented. However, the risk screening conducted following remediation activities showed that SWMU 25 does not meet unrestricted use criteria for risk for all constituents across the SWMU. This necessitates adding land use controls for the area to ensure protection of human health when conducting activities within SWMU 25. The land use control requirements were added on October 17, 2014.

Pueblo Chemical Depot has completed the technical, monitoring and reporting requirements of the remedy that are described below. The information used to verify completion of the remedy is described in the *Draft Final, Revision 1*,

*Remedy Completion Report, Former Sewage Treatment Plant, Solid Waste Management Unit*, dated September 2013, and the change pages for the document dated January 28, 2014. Soil at SWMU 25 has been remediated to levels that are safe for the designated industrial reuse area.

#### IV.E.25.b. Technical Requirements

- i. Prior to soil excavation, the laboratory building must be demolished in accordance with any applicable Air Pollution Control Division regulations.
- ii. The approximate 8400 square feet area to be remediated is depicted on Figure 5-1 in the *Final Presumptive Remedy Work Plan for Solid Waste Management Unit 25, Former Sewage Treatment Plant*, dated November 2010.
- iii. The soil must be excavated where the organochlorine pesticide and/or PAH constituent concentrations as identified in the *Final Supplemental RCRA Facility Investigation Report for Solid Waste Management Unit 25, Former Sewage Treatment Plant*, dated December 2008 exceed the unrestricted use residential risk-based screening levels as specified in the *Draft Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units (Revision 11)* dated September 2010 (NFA Methodology).
- iv. The excavated soil must be disposed of at a facility whose Waste Acceptance Plan allows disposal of PAH and organochlorine pesticide contaminated soil.
- v. The excavation must be backfilled and the area reseeded in accordance with the *Final Presumptive Remedy Work Plan for Solid Waste Management Unit 25, Former Sewage Treatment Plant*, dated November 2010.
- vi. Remediation of the SWMU 25 soil contamination area will be considered complete when analytical data from the confirmation samples indicates that concentrations of the following organochlorine pesticides and PAHs in the remaining soil do not exceed the specified concentrations. Any other related organochlorine pesticides and related PAHs must also be below their respective risk-based screening levels as identified in the NFA Methodology.
  - a. Dichlorodiphenyltrichloroethane (DDT) – 1.67 mg/kg
  - b. Dichlorodiphenyldichloroethane (DDD) – 2.36 mg/kg
  - c. Dichlorodiphenyldichloroethene (DDE) – 1.67 mg/kg
  - d. Acenaphthene – 0.722 mg/kg

- e. Benzo(a)anthracene – 0.131 mg/kg
- f. Benzo(a)pyrene – 0.0131 mg/kg
- g. Benzo(b)fluoranthene – 0.131 mg/kg
- h. Dibenz(a,h)anthracene – 0.0131 mg/kg
- i. Indeno (1,2,3-cd)pyrene – 0.131 mg/kg

#### IV.E.25.c. Monitoring Requirements

- i. Field screening for DDT using U.S. EPA Method 4042 test kits may be conducted to determine the boundaries of contamination prior to excavation in accordance with the *Presumptive Remedy Work Plan for Solid Waste Management Unit 25, Former Sewage Treatment Plant*, dated November 2010.
- ii. Composite confirmation samples must be obtained from the bottom surface and sidewalls of each excavation grid cell in the organochlorine pesticide contaminated area. The composite samples must consist of four aliquots collected from 0.0 to 0.5 feet into the soil surface. The soil must be analyzed using U.S. EPA Method 4042 test kits.
- iii. Discrete confirmation samples must be obtained from the bottom surface and sidewalls of each excavation grid cell. The discrete samples must be collected from 0.0 to 0.5 feet into the soil surface.
- iv. The discrete confirmation samples from the PAH contaminated areas must be analyzed using U.S. EPA Method 8270C SIM.
- v. The discrete confirmation samples from the organochlorine pesticide contaminated areas must be analyzed using U.S. EPA Method 8081A.
- vi. Sampling must be conducted in accordance with the *Presumptive Remedy Work Plan for Solid Waste Management Unit 25, Former Sewage Treatment Plant*, dated November 2010, and the most current, approved version of the *Chemical Data Acquisition Plan*.
- vii. Quality control samples must be taken at the frequencies specified in the *Final Presumptive Remedy Work Plan for Solid Waste Management Unit 25, Former Sewage Treatment Plant*, dated November 2010, or the most current, approved version of the *Chemical Data Acquisition Plan* if not specified.

#### IV.E.25.d. Reporting Requirements

- i. A remedy completion report, including figures showing the post-excavation sampling locations and the contaminant concentrations at those locations, must be submitted for Director review and approval. The report must also include an evaluation of the risk of contaminants remaining in place.
- ii. The remedy completion report is due to the Director 120 days following completion of the excavation.

#### IV.E.25.e. Land Use Controls

- i. Land use controls required for SWMU 25 are:
  - a. Property use is restricted to industrial use
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the SWMU 25 boundary, except as authorized in a remedial decision document, environmental sampling plan, or Materials Management Plan approved by the Director
  - c. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
- ii. SWMU 25 must be inspected once per calendar year to ensure the land use controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.
- iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMU 25 within 30 days of the effective date of this Permit modification.
- iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit modification.
- v. A map of SWMU 25 that includes GPS coordinates at multiple locations around the perimeter of the SWMU and a table of the GPS locations must be included in the Land Use Control Plan.
- vi. Upon remedy construction completion of the SWMU 25 remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 25 remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of

receipt of the final version of the Notice of Environmental Use Restriction from the Director.

IV.E.26. SWMU No. 29 – Fire Protection Training Area

The remedy selected for SWMU 29 is No Further Action. The information used to justify the selection of No Further Action as the remedy is described in the *Draft Final Justification Documentation for No Further Action at SWMU 29, Fire Protection Training Area*, dated May 2007.

The remedy selection was finalized on August 21, 2007.

IV.E.27. SWMU No. 35 – Vehicle Maintenance Building 595

The remedy selected for SWMU 35 is No Further Action with use restricted to industrial uses. The information used to justify the selection of No Further Action as the remedy is described in the *Draft Final, Revision 1, Justification Documentation for No Further Action at SWMU 35, Vehicle Maintenance Building 595*, dated March 2011.

The remedy selection was finalized on March 27, 2012.

IV.E.27.a. Technical Requirements

- i. Risk screening of the contaminant concentrations at SWMU 35 identified that the n-nitrosodi-n-propylamine, polychlorinated biphenyl 1260, cobalt, and manganese concentrations in soil exceed the residential risk criteria, but are below their respective groundskeeper risk-based screening levels. Although SWMU 35 requires no further remedial action, the SWMU does not meet the unrestricted use criteria and future use is limited to industrial uses.

IV.E.27.b. Monitoring Requirements

- i. There are no monitoring requirements for SWMU 35.

IV.E.27.c. Reporting Requirements

- i. There are no reporting requirements for SWMU 35.

IV.E.27.d. Land Use Controls

- i. Land use controls required for SWMU 35 are:
  - a. Property use is restricted to industrial use
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the SWMU 35 boundary, except as authorized in a remedial decision

- document, environmental sampling plan, or Materials Management Plan approved by the Director
- c. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
  - ii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMU 35 within 30 days of the effective date of this Permit renewal.
  - iii. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
  - iv. A map of the impacted area and a table showing the GPS coordinates must be included in the Land Use Control Plan.
  - v. The Director will prepare a Notice of Environmental Use Restriction for the SWMU 35 remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

#### IV.E.28. SWMU No. 38 – Laboratory Building 406

##### IV.E.28.a. Selected Remedy

The remedy selected for SWMU 38 is excavation of contaminated soil containing polycyclic aromatic hydrocarbons (PAHs) in excess of the site-specific wildlife management worker reuse risk-based screening levels. Soil excavation is an effective remedy because the contamination is removed from the site and disposed of at an off-site disposal facility designed for that purpose. Following remediation, the use of SWMU 38 will be restricted to wildlife and natural resource management uses.

The remedy selection was finalized on October 17, 2014.

##### IV.E.28.b. Technical Requirements

- i. Soil at SWMU 38 must be excavated where the PAH concentrations exceed the wildlife management reuse risk-based screening levels as specified in the *Draft Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units (Revision 14)* dated October 2013. The areas to be excavated are depicted in Figure 5-1 of the *Final, Solid Waste Management Unit 38, Laboratory Building 406, Presumptive Remedy Work Plan, Revision 4* dated September 27, 2012.

- ii. The excavated soil must be disposed of at a facility whose Waste Acceptance Plan allows disposal of PAH contaminated soil.
- iii. The excavation must be backfilled and the area reseeded in accordance with the *Final, Solid Waste Management Unit 38, Laboratory Building 406, Presumptive Remedy Work Plan, Revision 4* dated September 27, 2012.
- iv. Remediation of the SWMU 38 soil contamination area will be considered complete when the technical requirements of this remedy have been implemented and analytical data from post-excavation confirmation samples do not exceed the specified concentrations.
- v. Any other related contaminant concentrations that are not specified herein must also be below their respective risk-based screening levels as identified in the *Draft Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units (Revision 14)* dated September 2013.
  - a. Acenaphthene – 118 milligrams/kilogram (mg/kg)
  - b. Anthracene – 4.26 mg/kg
  - c. Benzo(a)anthracene – 1.58 mg/kg
  - d. Benzo(a)pyrene – 0.158 mg/kg
  - e. Benzo(b)fluoranthene – 1.58 mg/kg
  - f. Indeno(1,2,3-cd)pyrene – 1.58 mg/kg
  - g. Pyrene – 44 mg/kg

#### IV.E.28.c. Monitoring Requirements

- i. Discrete confirmation samples must be obtained from the bottom surface and the perimeter of each excavation grid cell. Sidewall samples must also be obtained from grids E07 and E08.
  - a. The discrete samples must be collected from 0.0 to 0.5 feet into the soil surface.
  - b. Two samples must be obtained from the base of each 20 foot by 20 foot grid (or 400 square feet of base area if the original excavation is not maintained in the grid areas)
  - c. One sample must be obtained per 20 linear feet of perimeter sidewall
  - d. Interior sidewall samples must be obtained from grids E07 and E08 at the transition from the 2 foot to 10 foot excavation depth
  - e. If results from these samples indicate that further excavation is required, additional confirmation samples must be collected after the additional excavation at the rate of 1 sample per 100 square feet of newly excavated base area and 1 sample per 10 linear feet of perimeter sidewall

with a minimum of 1 sample per sidewall and 1 sample per base of excavation in the newly excavated area.

- ii. The discrete confirmation samples from the PAH contaminated areas must be analyzed using U.S. EPA Method 8270C SIM.
- iii. Sampling must be conducted in accordance with the *Final, Solid Waste Management Unit 38, Laboratory Building 406, Presumptive Remedy Work Plan, Revision 4* dated September 27, 2012, and the most current, approved version of the *Chemical Data Acquisition Plan*.
- iv. Quality control samples must be taken at the frequencies specified in the *Final, Solid Waste Management Unit 38, Laboratory Building 406, Presumptive Remedy Work Plan, Revision 4* dated September 27, 2012, or the most current, approved version of the *Chemical Data Acquisition Plan* if not specified.

#### IV.E.28.d. Reporting Requirements

- i. A remedy completion report, including analytical data from confirmation samples, figures showing the extent of excavation, post-excavation sampling locations, contaminant concentrations at those locations, and a risk evaluation following the *Draft Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units (Revision 14)* must be submitted for Director review and approval.
- ii. The remedy completion report is due to the Director 120 days following completion of the excavation.

#### IV.E.28.e. Land Use Controls

- i. Land use controls required for SWMU 38 are:
  - a. Property use is restricted to wildlife and natural resource management use
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the SWMU 38 boundary, except as authorized in a remedial decision document, environmental sampling plan, or Materials Management Plan approved by the Director
  - c. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.

- ii. SWMU 38 must be inspected once per calendar year to ensure the land use controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.
- iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMU 38 within 30 days of the effective date of this Permit renewal.
- iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
- v. A map of SWMU 38 that includes GPS coordinates at multiple locations around the perimeter of the SWMU and a table of the GPS locations must be included in the Land Use Control Plan.
- vi. Upon remedy construction completion of the SWMU 38 remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 38 remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

#### IV.E.29. SWMU No. 39 – Septic Tank Systems

##### IV.E.29.a. Selected Remedy

There are 23 sites included in SWMU 39. The remedy selected for SWMU 39 includes No Further Action without restrictions at 5 septic tanks; No Further Action with use restricted to industrial use at 1 septic tank; cleanout of the septic tanks and/or dry well pits and filling the tanks or pits and no land use controls at 14 sites; cleanout of the septic tanks at 2 active septic tank sites; and excavation of contaminated soil at 1 dry well site with use restricted to wildlife reuse.

The remedy selection was finalized on March 22, 2013. If this remedy is not implemented within five years of this date, the Permittee must notify the Director and provide an estimated remedy implementation date. The Director may reevaluate this remedy after five years. Within six months of the end of the five year period, and additionally up to six months prior to the estimated implementation date, the Director may modify the requirements of this remedy to meet current standards of practice.

The remedy for tanks 39-2, 39-12 and 39-22 was modified on October 17, 2014.

IV.E.29.b. Septic Tank Systems 39-5, 39-17, 39-18, 39-20, and 39-23

The remedy selected for these septic tank systems is No Further Action. The information used to justify the selection of No Further Action as the remedy is described in the *Draft Final, Justification Documentation for No Further Action at 6 SWMU 39 Septic Tank Systems*, dated January 2012.

IV.E.29.c. Septic Tank System 39-1

The remedy selected for this septic tank system is No Further Action with land use controls restricting use to industrial uses. The information used to justify the selection of No Further Action as the remedy is described in the *Draft Final, Justification Documentation for No Further Action at 6 SWMU 39 Septic Tank Systems*, dated January 2012.

i. Technical Requirements

Risk screening of the contaminant concentrations at SWMU 39-1 identified that the benzo(a)pyrene concentration in soil exceeds the residential risk criteria but is below the groundskeeper risk-based screening level. Although no further remedial action is required at SWMU 39-1, the SWMU does not meet the unrestricted use criteria and future use is limited to industrial uses.

ii. Monitoring Requirements

There are no monitoring requirements for 39-1.

IV.E.29.d. Septic Tank Systems, 39-3, 39-4, 39-6, 39-7, 39-8, 39-9, 39-11, 39-15, 39-16, 39-19, 39-21

The remedy selected for these septic tank systems is rendering the tanks useless and abandoning in place.

i. Technical Requirements

The process for rendering the tanks useless includes emptying the contents, breaking the bottom of the tank, collapsing the lid, grouting and capping inflow and outflow piping, and backfilling the tank void space with inert material to surface grade in accordance with the *Final Presumptive Remedy Work Plan (PRWP), Solid Waste Management Unit 39, Septic Tank Systems*, dated December 2012 and the January 18, 2013 addendum to the PRWP.

The ground surface at each site will be either reseeded or patched with roadbase and asphalt to match the surrounding surface.

ii. Monitoring Requirements

There are no monitoring requirements for these tank systems.

#### IV.E.29.e. Septic Tank System 39-10

The remedy selected for this septic tank system, which consists of a dry well, is excavation and disposal of contaminated soil.

##### i. Technical Requirements

- a. The soil at Area 1 at SWMU 39-10 must be excavated where the benzo(a)pyrene concentration exceeds the respective wildlife reuse risk-based screening level (RBSL) as specified in the *Draft Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units (Revision 12)* dated October 2011, and where beryllium, chromium III, mercury, and nickel concentrations exceed the groundwater protection levels (GPL) or the calculated GPL based on SWMU-specific synthetic precipitation leaching procedure (SPLP) results. The areas to be excavated are depicted in Figures 3-1 and 7-1 of the *Final, Presumptive Remedy Work Plan, Solid Waste Management Unit 39, Septic Tank Systems*, dated December 2012 and the January 18, 2013 addendum to the PRWP.
- b. The soil at Area 2 at SWMU 39-10 must be excavated where the copper, cadmium, and nickel concentrations exceed the GPL or the calculated GPL based on SWMU-specific SPLP results. The areas to be excavated are depicted in Figures 3-1 and 7-2 of the *Final, Presumptive Remedy Work Plan, Solid Waste Management Unit 39, Septic Tank Systems*, dated December 2012 and the January 18, 2013 addendum to the PRWP.
- c. The excavated soil must be disposed of at a facility whose Waste Acceptance Plan allows disposal of PAH and metals contaminated soil.
- d. The excavations must be backfilled and the areas reseeded in accordance with the *Final, Presumptive Remedy Work Plan, Solid Waste Management Unit 39, Septic Tank Systems*, dated December 2012 and the January 18, 2013 addendum to the PRWP.
- e. The soil cleanup levels for the contaminants of concern at SWMU 39-10 are the RBSLs and GPLs as identified in the *Draft Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units (Revision 12)* dated October 2011. Any other related COCs must also be below their respective RBSLs and GPLs. The concentrations of COCs in soil must not exceed the following levels:
  1. Benzo(a)pyrene – 0.158 milligrams/kilogram (mg/kg) wildlife management reuse

2. Beryllium – 2630 mg/kg wildlife management reuse
  3. Beryllium – 1.76 mg/kg GPL
  4. Cadmium – 1820 mg/kg wildlife management reuse
  5. Cadmium – 2.2 mg/kg GPL
  6. Chromium III – 1,000,000 mg/kg wildlife management reuse
  7. Chromium III – 44 mg/kg GPL
  8. Copper – 56,400 mg/kg wildlife management reuse
  9. Copper – 88 mg/kg GPL
  10. Mercury – 423 mg/kg wildlife management reuse
  11. Mercury – 0.88 mg/kg GPL
  12. Nickel – 24,300 mg/kg wildlife management reuse
  13. Nickel – 44 mg/kg GPL
- f. Remediation of the SWMU 39-10 soil contamination areas will be considered complete when the concentrations of COCs are below the associated soil RBSLs and GPLs in the compliance monitoring samples.

ii. Monitoring Requirements

- a. Discrete confirmation samples must be obtained from each sidewall of each excavation at two depths. Each sidewall must be sampled at the 0-2 foot depth below ground surface and at the bottom one foot of the excavation. The base of each excavation must also be sampled. The samples must be collected from 0.0 to 0.5 feet into the soil surface.
- b. If any sidewall exceeds 15 feet laterally, one sample must be collected per 15 feet of lateral excavation or fraction thereof at each depth (0-2 feet and the bottom one foot).
- c. If the base of any excavation exceeds 100 square feet, one sample must be collected per 100 square feet or fraction thereof.
- d. The PAH samples must be analyzed using U.S. EPA Method 8270-SIM.
- e. The metals samples must be analyzed using U.S. EPA Method 6010B for total metals and Method 7471A for mercury. Metals samples should also be extracted using SPLP for GPL determination.
- f. The sampling must be conducted in accordance with the *Final, Presumptive Remedy Work Plan, Solid Waste Management Unit 39, Septic Tank Systems*, dated December 2012 and the January 18, 2013 addendum to the PRWP, except where modified by this Permit.
- g. Field duplicates, matrix spike/matrix spike duplicates, and other QA/QC samples must be taken in accordance with the *Final, Presumptive Remedy Work Plan, Solid Waste Management Unit 39, Septic Tank Systems*, dated

December 2012 and the January 18, 2013 addendum to the PRWP.

IV.E.29.f. Septic Tank Systems 39-2, 39-12, 39-13, 39-14 and 39-22

The remedy selected for these septic tank systems is decontamination. These five systems are active systems and following decontamination they will be placed back into active service.

i. Technical Requirements

- a. The tank contents must be removed and the interior of the tank vaults pressure washed in accordance with the procedure described in the *Final Presumptive Remedy Work Plan, Solid Waste Management Unit 39, Septic Tank Systems*, dated December 2012 and the January 18, 2013 addendum to the PRWP.
- b. Following cleaning of the tank, a seepage loss test must be conducted in accordance with the *Final Presumptive Remedy Work Plan, Solid Waste Management Unit 39, Septic Tank Systems*, dated December 2012 and the January 18, 2013 addendum to the PRWP. If the tank is determined to be leaking, it must be repaired and retested until it passes the test, or the tank must be replaced.

ii. Monitoring Requirements

The washwater from the decontamination process must be analyzed for the following prior to disposal.

- a. Toxicity characteristic leaching procedure (TCLP) Volatile Organic Compounds
- b. TCLP Semi-Volatile Organic Compounds
- c. TCLP Metals
- d. The sampling must be conducted in accordance with the *Final, Presumptive Remedy Work Plan, Solid Waste Management Unit 39, Septic Tank Systems*, dated December 2012 and the January 18, 2013 addendum to the PRWP, except where modified by this Permit.
- e. Field duplicates, matrix spike/matrix spike duplicates, and other QA/QC samples must be taken in accordance with the *Final, Presumptive Remedy Work Plan, Solid Waste Management Unit 39, Septic Tank Systems*, dated December 2012 and the January 18, 2013 addendum to the PRWP.

#### IV.E.29.g. Reporting Requirements

- i. The Permittee must provide written notification to the Director 14 days prior to implementation of the technical requirements of the remedy. This notification may be made by electronic mail.
- ii. A remedy completion report and a risk evaluation following the methodology in the *Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units (Revision 12)* for septic tank systems 39-2, 39-3, 39-4, 39-6, 39-7, 39-8, 39-9, 39-10, 39-11, 39-12, 39-13, 39-14, 39-15, 39-16, 39-19, 39-21, and 39-22 must be submitted for Director review and approval.
- iii. The report is due 120 days following completion of the technical requirements of the remedy.

#### IV.E.29.h. Land Use Controls

- i. Land use controls required for septic tank system 39-1 are:
  - a. Property use is restricted to industrial use
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the SWMU 39-1 boundary, except as authorized in a remedial decision document, environmental sampling plan, or Materials Management Plan approved by the Director
  - c. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
- ii. Land use controls required for septic tank system 39-10 are:
  - a. Property use is restricted to wildlife and natural resource management
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the SWMU 39-10 boundary, except as authorized in a remedial decision document, environmental sampling plan, or Materials Management Plan approved by the Director
  - c. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
- iii. SWMUs 39-1 and 39-10 must be inspected once per calendar year to ensure the land use controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the

inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.

- iv. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for septic tank systems 39-1 and 39-10 within 30 days of the effective date of this Permit renewal.
- v. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
- vi. A map of the impacted areas and a table showing the GPS coordinates must be included in the Land Use Control Plan.
- vii. Upon remedy construction completion of the SWMU 39 remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 39 remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

#### IV.E.30. SWMU No. 40 – Oil/Water Separators

##### IV.E.30.a. Selected Remedy

There are nine oil/water separators (SWMUs 40-1 through 40-9), one underground sediment trap (SWMU 40-10), and one underground holding tank (SWMU 40-11) in SWMU 40. The remedy selected for SWMU 40 includes No Further Action without restrictions at 5 areas, No Further Action with use restricted to industrial use at 2 areas, abandonment in place at 2 areas, and remediation of contaminated soil and cleanout of the tank at 2 areas.

The remedy selection was finalized on March 27, 2012. The remedy for separator 40-1 was modified on March 22, 2013.

##### IV.E.30.b. SWMUs 40-2, 40-3, 40-4, 40-5, 40-6

The remedy selected for these areas is No Further Action. The information used to justify the selection of No Further Action as the remedy is described in the *Final, Justification Documentation for No Further Action at 7 SWMU 40 Oil Water Separators*, dated November 2011.

##### IV.E.30.c. SWMUs 40-10, 40-11

The remedy selected for these areas is No Further Action with land use controls restricting use to industrial uses. The information used to justify the selection of No Further Action as the remedy is described in the *Final, Justification Documentation for No Further Action at 7 SWMU 40 Oil Water Separators*, dated November 2011.

i. Technical Requirements

Risk screening of the contaminant concentrations at SWMU 40-10 identified that the 1,2-dinitrobenzene concentration in soil exceeds the residential risk criteria but is below the groundskeeper risk-based screening level. Risk screening of the contaminant concentrations at SWMU 40-11 identified that the benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, and diesel range organics concentrations in soil exceed the residential risk criteria but are below the groundskeeper risk-based screening levels. Although no further remedial action is required at SWMU 40-10 and 40-11, the SWMU does not meet the unrestricted use criteria and future use is limited to industrial uses.

ii. Monitoring Requirements

There are no monitoring requirements for 40-10 and 40-11.

IV.E.30.d. SWMU 40-7

The remedy selected for this area is abandonment in place.

i. Technical Requirements

The separator must be rendered useless by filling the tank with an inert solid, and by grouting or capping pipes, drains, and access ports.

ii. Monitoring Requirements

There are no monitoring requirements for 40-7

IV.E.30.e. SWMU 40-8

The remedy selected for this area is abandonment in place and land use controls restricting use to industrial uses.

i. Technical Requirements

The separator must be rendered useless by filling the tank with an inert solid, and by grouting or capping pipes, drains, and access ports. Risk screening of the contaminant concentrations at SWMU 40-8 identified that the benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene concentrations in soil exceed the residential risk criteria but are below the groundskeeper risk-based screening levels. Although no further remedial action is required at SWMU 40-8, the SWMU does not meet the unrestricted use criteria and future use is limited to industrial uses.

ii. Monitoring Requirements

There are no monitoring requirements for 40-8

#### IV.E.30.f. SWMUs 40-1 and 40-9

The remedy selected for these separators is removal of the tanks contents and cleaning of the tanks with a pressure washer. The remedy also includes land use controls restricting use to industrial uses.

##### i. Technical Requirements

Remove the tanks contents and clean the tanks with a pressure washer. Conduct a seepage loss test on the tanks in accordance with the procedure described in the *Final Revision 1, Presumptive Remedy Work Plan for Solid Waste Management Unit 40 Oil Water Separators*, dated September 2012. Following confirmation that the tanks are not leaking, the oil water separators may be placed back in service.

Risk screening of the contaminant concentrations at SWMU 40-9 identified that the benzo[a]pyrene and benzo[b]fluoranthene concentrations in soil exceed the residential risk-based screening levels but are below the groundskeeper risk-based screening levels. Although no further remedial action is required at SWMU 40-9, the SWMU does not meet the unrestricted use criteria and future use is limited to industrial uses.

#### IV.E.30.g. Reporting Requirements

- i. The Permittee must provide written notification to the Director 14 days prior to implementation of the technical requirements of the remedy. This notification may be made by electronic mail.
- ii. A remedy completion report and a risk evaluation following the methodology in the *Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units (Revision 11)* for SWMUs 40-1, 40-7, 40-8, and 40-9 must be submitted for Director review and approval. The report is due 120 days following completion of the remedy.

#### IV.E.30.h. Land Use Controls

- i. Land use controls required for SWMUs 40-1, 40-8, 40-9, 40-10 and 40-11 are:
  - a. Property use is restricted to industrial use
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the SWMU 40-1, 40-8, 40-9, 40-10, or 40-11 boundary, except as authorized in a remedial decision document, environmental sampling plan, or Materials Management Plan approved by the Director

- c. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
- ii. SWMUs 40-1, 40-8, 40-9, 40-10 and 40-11 must be inspected once per calendar year to ensure the land use controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.
- iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMUs 40-1, 40-8, 40-9, 40-10 and 40-11 within 30 days of the effective date of this Permit renewal.
- iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
- v. A map of the impacted areas and a table showing the GPS coordinates must be included in the Land Use Control Plan.
- vi. Upon remedy construction completion of the SWMU 40 remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 40 remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

IV.E.31. SWMU No. 42 – Pits South of the Guided Missile Workshop

The remedy selected for SWMU 42 is No Further Action. The information used to justify the selection of No Further Action as the remedy is described in the *Draft Final Justification Documentation for No Further Action at Solid Waste Management Unit 42, Pits South of the Guided Missile Workshop, November 2005*.

The remedy selection was finalized on April 20, 2006.

IV.E.32. SWMU No. 43 – Historic Vehicle Staging and Storage Area Northeast of Building 594

IV.E.32.a. Selected Remedy

The remedy selected for SWMU 43 is excavation of contaminated soil and sediment containing polycyclic aromatic hydrocarbons (PAHs), diesel range organics (DRO), and metals in excess of the site-specific industrial reuse risk-

based screening levels. Soil and sediment excavation is an effective remedy because the contamination is removed from the site and disposed of at an off-site disposal facility designed for that purpose. Monitoring of groundwater is also required as part of the remedy. Active remediation of groundwater is not being required at this time. However, if groundwater contaminant concentrations exceed the screening criterion during monitoring, an active groundwater remedy will be selected. Following remediation, the use of SWMU 43 will be restricted to industrial uses.

The remedy selection was finalized on December 9, 2011.

IV.E.32.b. Pueblo Chemical Depot has completed the technical, monitoring and reporting requirements of the remedy that are described below. The information used to verify completion of the remedy is described in the *Final Remedy Completion Report, Former Historical Vehicle Staging and Storage Area, Solid Waste Management Unit 43*, dated December 2013. Soil at SWMU 43 has been remediated to levels that are safe for the designated industrial reuse area. Technical Requirements

- i. Soil and sediment at SWMU 43 must be excavated where the PAH, DRO, cadmium, and lead concentrations exceed their respective industrial reuse risk-based screening levels as specified in the *Draft Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units (Revision 11)* dated September 2010, and where cadmium and lead concentrations exceed the groundwater protection levels (GPL) or the calculated GPL based on SWMU-specific synthetic precipitation leaching procedure (SPLP) results. The areas to be excavated are depicted in Figure 5-1 of the *Final, Revision 1, Presumptive Remedy Work Plan, Solid Waste Management Unit 43, Historic Vehicle Staging and Storage Area* dated May 2011.
- ii. Pre-excavation sampling may be conducted to determine whether GPLs, leachate reference concentrations, and industrial reuse risk-based screening levels are exceeded for cadmium and lead, and whether benzo(a)pyrene and DRO concentrations exceed the industrial reuse risk-based screening levels as described in the *Final, Revision 1, Presumptive Remedy Work Plan, Solid Waste Management Unit 43, Historic Vehicle Staging and Storage Area* dated May 2011. Final excavation limits may be guided using these data.
- iii. The excavated soil must be disposed of at a facility whose Waste Acceptance Plan allows disposal of PAH, DRO, and metals contaminated soil.

- iv. The excavation must be backfilled and the area reseeded in accordance with the *Final, Revision 1, Presumptive Remedy Work Plan, Solid Waste Management Unit 43, Historic Vehicle Staging and Storage Area* dated May 2011.
- v. Remediation of the SWMU 43 soil contamination area will be considered complete when analytical data from post-excavation confirmation samples do not exceed the specified concentrations. Post-excavation samples for cadmium and lead will not be required if these two constituents are eliminated as contaminants of concern during pre-excavation sampling. Any other related contaminant concentrations that are not specified herein must also be below their respective risk-based screening levels as identified in the *Draft Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units (Revision 11)* dated September 2010.
  - a. Benzo(a)pyrene – 0.432 milligrams/kilogram (mg/kg)
  - b. Diesel Range Organics – 10,100 mg/kg
  - c. Cadmium – 1840 mg/kg industrial use
  - d. Cadmium – 2.2 mg/kg GPL
  - e. Lead – 1550 mg/kg industrial use
  - f. Lead – 22 mg/kg GPL
- vi. Install a temporary monitoring well near sampling location HVSSB02.
- vii. The concentration of 1,1,2,2-Tetrachloroethane must not exceed 0.18 µg/L. If this concentration is exceeded, this remedy will be revised as appropriate to include a groundwater remedy.

IV.E.32.c. Monitoring Requirements

- i. Discrete confirmation samples must be obtained from the bottom surface and sidewalls of each excavation. The samples must be collected from 0.0 to 0.5 feet into the soil surface.
- ii. In Area 1, one sample must be collected from the bottom of the excavation every 25 feet of lateral excavation and one sample from each sidewall every 25 feet of lateral excavation.
- iii. In Areas 2 and 3, one sample must be collected from the bottom of the excavation every 10 feet of lateral excavation and one sample from each sidewall every 10 feet of lateral excavation.
- iv. The PAH samples must be analyzed using U.S. EPA Method 8270-SIM. The DRO samples must be analyzed using U.S. EPA

Method 8015B. The metals samples must be analyzed using U.S. EPA Method 6010B.

- v. Two groundwater samples must be obtained from the temporary groundwater sampling point. The samples must be obtained between 3 and 6 months apart.
- vi. The groundwater samples must be analyzed using U.S. EPA Method 8260B.
- vii. The sampling must be conducted in accordance with the *Final, Revision 1, Presumptive Remedy Work Plan, Solid Waste Management Unit 43, Historic Vehicle Staging and Storage Area* dated May 2011 and the most current, approved version of the *Chemical Data Acquisition Plan*.
- viii. Field duplicates, matrix spike/matrix spike duplicates, and other QA/QC samples must be taken in accordance with the *Final, Revision 1, Presumptive Remedy Work Plan, Solid Waste Management Unit 43, Historic Vehicle Staging and Storage Area* dated May 2011 and the most current, approved version of the *Chemical Data Acquisition Plan*.

#### IV.E.32.d. Reporting Requirements

- i. A letter report containing the groundwater monitoring data from each monitoring event must be submitted to the Director 60 days following completion of the monitoring event.
- ii. A remedy completion report, including figures showing the extent of excavation, post-excavation sampling locations, groundwater monitoring location, contaminant concentrations at those locations, and a risk evaluation following the methodology in the *Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units (Revision 11)* must be submitted for Director review and approval.
- iii. The remedy completion report is due to the Director 120 days following completion of the remedy.

#### IV.E.32.e. Land Use Controls

- i. Land use controls required for SWMU 43 are:
  - a. Property use is restricted to industrial use
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the SWMU 43 boundary, except as authorized in a remedial decision

- document, environmental sampling plan, or Materials Management Plan approved by the Director
- c. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
  - ii. SWMU 43 must be inspected once per calendar year to ensure the land use controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.
  - iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMU 43 within 30 days of the effective date of this Permit renewal.
  - iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
  - v. A map of SWMU 43 that includes GPS coordinates at multiple locations around the perimeter of the SWMU and a table of the GPS locations must be included in the Land Use Control Plan.
  - vi. Upon remedy construction completion of the SWMU 43 remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 43 remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

IV.E.33. SWMU No. 44 – Industrial Waste Lagoons

The remedy selected for SWMU 44 is No Further Action. The information used to justify the selection of No Further Action as the remedy is described in the *Draft Final RCRA Facility Investigation Report, SWMUs 2, 3, 34, 39, 40, 41, 42, 43, 44, and 45, July 1998*; and the *Draft (Revision 1) Justification Documentation for No Further Action, Solid Waste Management Unit 44, September 2003*.

The remedy selection was finalized on April 7, 2004.

IV.E.34. SWMU No. 45 – Disposal Area North of the Disassembly Plant

The remedy selected for SWMU 45 is manual collection of Munitions Debris (MD) plus land use controls (LUCs) in the Central Disposal Area; excavation with mechanical separation of MD plus LUCs in the Linear Ground Scar Area; and surveying, re-surveying, and conducting QA/QC checks in the Surrounding

Area. Descriptions of the Central Disposal Area, the Linear Ground Scar Area, and the Surrounding Area are in the *Final SWMU 45 Corrective Measures Study*, dated September 2009.

The remedy selection was finalized on March 8, 2010. If this remedy is not implemented within five years of this date, the Permittee must notify the Director and provide an estimated remedy implementation date. The Director may reevaluate this remedy after five years. Within six months of the end of the five year period, and additionally up to six months prior to the estimated implementation date, the Director may modify the requirements of this remedy to meet current standards of practice.

#### IV.E.34.a. Technical Requirements

- i. In the Central Disposal Area, manual methods shall be used to collect MD from the surface. Manual collection will be performed using standard equipment such as gloves and rakes. Separated, non-energetic, materials shall be characterized and either recycled or disposed of at an off-site disposal facility designed for that purpose.
- ii. In the Linear Ground Scar Area, the two linear ground scars shall be excavated to a depth of 2 feet. The debris and soil shall be mechanically separated. Separated, non-energetic, materials shall be either recycled or disposed of at an off-site disposal facility designed for that purpose. The excavation must be backfilled and revegetated. Excavated soil may be used for backfill.
- iii. In the Surrounding Area, complete the QA procedures on 10 percent of each grid not previously QA checked; perform QC procedures on anomalies detected in each grid previously not QC checked; and re-survey two grids that were previously cleared and QA/QC checked to confirm the sufficiency of the previous clearance and QA/QC.
- iv. Survey (including appropriate QA/QC checks) a new Row O located north of Row N, and grids L-3 through O-3 on the northwest boundary to determine if any munitions and explosives of concern (MEC) are present. This area is identified in Figure 3-1 of the *Final SWMU 45 Corrective Measures Study*, dated September 2009.
- v. Energetic materials found during implementation of this remedy must be treated on-site after obtaining an emergency permit from the Director. Treatment must occur at SWMU 1 unless the

Explosive Ordnance Detachment determines the item is too dangerous to transport to SWMU 1.

- vi. If soil contamination is identified during monitoring conducted in accordance with Part IV.E.34.b.i, the Director must be notified and the Permittee must develop a plan for excavation and disposal of the soil.

#### IV.E.34.b. Monitoring Requirements

- i. A soil sample shall be collected immediately beneath the location of any energetic MEC that is found. The sample must be analyzed for explosives using U.S. EPA Method 8330B or 8321M.
- ii. Quality control samples must be taken at the frequencies specified in the most current, approved version of the *Chemical Data Acquisition Plan*.
- iii. In the Linear Ground Scar Area, after excavation and before backfilling the trenches, a confirmation check using magnetometers must be performed to confirm MEC and MD have been successfully removed. The procedure for conducting the confirmation checks must be described in the Corrective Measures Implementation Work Plan required in Part IV.E.34.c.i.

#### IV.E.34.c. Reporting Requirements

- i. Six months prior to planned implementation of this remedy, the Permittee must submit a Corrective Measures Implementation Work Plan to the Director for review and approval. Remedy implementation shall not begin prior to approval of the work plan. The work plan must contain the following information:
  - a. Detailed information on the geophysical prove-out or the geophysical system verification that will be used
  - b. Lane widths and layout that will be used for clearance work and QA/QC activities
  - c. Procedure that will be followed if MEC is identified, including additional monitoring that will be conducted beneath identified MEC
  - d. A complete description of the collection and separation procedures that will be utilized in the Central Disposal Area and the Linear Ground Scar Area
  - e. Disposal, reuse, and recycling plans for the various waste streams that will be generated during implementation of this remedy

- f. Post-remediation backfill and revegetation plans
  - g. A timeframe for implementing each aspect of the SWMU 45 remedy. This timeframe can be in the form of a flow chart from scheduling software.
- ii. If the remedy takes more than six months to complete, a project status report must be submitted to the Director seven months after the date of remedy implementation and every six months thereafter.
  - iii. The Permittee must provide written notification to the Director 14 days prior to implementation of the technical requirements of the remedy. This notification may be made by electronic mail.
  - iv. A remedy completion report, including figures showing the extent of excavation, QA/QC results, post-excavation sampling locations, contaminant concentrations at those locations, and a risk evaluation following the methodology in the *Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units (Revision 10)* must be submitted for Director review and approval.
  - v. The remedy completion report is due 120 days after completion of the technical and monitoring requirements of the remedy.

#### IV.E.34.d. Land Use Controls

- i. Land use controls required for SWMU 45 are:
  - a. Property use is restricted to wildlife and natural resource management
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the SWMU 45 boundary, except as authorized in a remedial decision document or environmental sampling plan approved by the Director
  - c. There shall be no placement of material at SWMU 45 other than to backfill excavated areas or add topsoil for revegetation.
  - d. There shall be no installation of groundwater supply wells in SWMU 45
  - e. There shall be no placement of structures within SMWU 45 except for temporary structures related to implementation of the remedy
  - f. There shall be no training activities, including military training activities, within SWMU 45
  - g. There shall be no real estate actions, such as lease or transfer, taken on the property at SWMU 45

- ii. Additional Controls
  - a. Permanent markers must be placed at SWMU 45 identifying SWMU 45 as a potential MEC hazard
- iii. SWMU 45 must be inspected once per calendar year to ensure the land use controls and additional controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.
- iv. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMU 45 within 30 days of the effective date of this Permit renewal.
- v. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
- vi. A map of SWMU 45 that includes GPS coordinates at multiple locations around the perimeter of the SWMU and a table of the GPS locations must be included in the Land Use Control Plan.
- vii. Upon remedy construction completion of the SWMU 45 remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 45 remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

IV.E.35. SWMU No. 46 – Former Ammunition Disassembly Plant

The remedy selected for SWMU 46 is No Further Action. The information used to justify the selection of No Further Action as the remedy is described in the *Final RCRA Facility Investigation Report, SWMUs 46, 47, and 48, August 2001*; and the *Final Justification Documentation for No Further Action, SWMU 46, July 2005*.

The remedy selection was finalized on September 22, 2005.

IV.E.36. SWMU No. 47 – Storage Buildings 204, 205, 206, 207, 208, and 209

The remedy selected for SWMU 47 is No Further Action. The information used to justify the selection of No Further Action as the remedy is described in the *Final RCRA Facility Investigation Report, SWMUs 46, 47, and 48, August 2001*; and the *Final Justification Documentation for No Further Action, SWMU 47, Burma Road Storage Buildings, October 2006*.

The remedy selection was finalized on January 9, 2007.

IV.E.37. SWMU No. 48 – Old Photo Lab/Firing Range

The remedy selected for SWMU 48 is No Further Action with use restricted to wildlife and natural resource management. The information used to justify the selection of No Further Action as the remedy is described in the *Final RCRA Facility Investigation Report, SWMUs 46, 47, and 48, August 2001*; and the *Final Justification Documentation for No Further Action at SWMU 48, Old Photo Laboratory and Former Firing Range, May 2006*.

The remedy selection was finalized on September 5, 2006.

IV.E.37.a. Technical Requirements

- i. Risk screening of the contaminant concentrations at SWMU 48 identified that the benzo(a)pyrene concentration (0.122 mg/kg) exceeds the residential risk-based screening level of 0.056 mg/kg, but is below the wildlife management worker risk-based screening level of 0.158 mg/kg. Although SWMU 48 requires no further remedial action, the SWMU does not meet the unrestricted use criteria and future use is limited to wildlife and natural resource management.

IV.E.37.b. Monitoring Requirements

- i. There are no monitoring requirements for SWMU 48.

IV.E.37.c. Reporting Requirements

- i. There are no reporting requirements for SWMU 48.

IV.E.37.d. Land Use Controls

- i. Land use controls required for SWMU 48 are:
  - a. Property use is restricted to wildlife and natural resource management
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the SWMU 48 boundary, except as authorized in a remedial decision document, environmental sampling plan, or Materials Management Plan approved by the Director
  - c. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
- ii. SWMU 48 must be inspected once per calendar year to ensure the land use controls are operated and maintained in compliance

with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.

- iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMU 48 within 30 days of the effective date of this Permit renewal.
- iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
- v. A map of SWMU 48 that includes GPS coordinates at multiple locations around the perimeter of the SWMU and a table of the GPS locations must be included in the Land Use Control Plan.
- vi. The Director will prepare a Notice of Environmental Use Restriction for the SWMU 48 remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

#### IV.E.38. SWMU No. 49 – Sandblast Building 545

##### IV.E.38.a. Selected Remedy

The remedy selected for SWMU 49 is excavation of contaminated soil containing hexavalent chromium concentrations in excess of the site-specific unrestricted use human health risk-based levels. Soil excavation is an effective remedy because the contaminated soil is removed from the site and disposed of at an off-site disposal facility designed for that purpose.

The remedy selection was finalized on September 10, 2008.

The Permittee has completed the major portions of the technical requirements and all the monitoring and reporting requirements of the remedy that are described below. The information used to verify completion of the remedy is described in the *Final Remedy Completion Report, SWMU 49 Sandblast Building 545*, dated March 18, 2010. The one exception to meeting the technical requirements is the soil at SWMU 49 was not remediated to unrestricted use criteria. However, the soil remaining at the site does meet the industrial screening criteria which are appropriate for the planned reuse of the area. Due to the change in cleanup criteria, the remedy has been modified to include land use controls with use restricted to industrial uses.

This remedy was modified on August 20, 2010.

#### IV.E.38.b. Technical Requirements

- i. An area approximately 76 feet long, 16 feet wide, and 1.5 feet deep must be excavated where the hexavalent chromium concentration exceeds the unrestricted use human health risk-based levels as specified in the most current approved *Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units*. The specific area to be excavated is depicted in Figure 2 of the *Presumptive Remedy Work Plan for Removal of Hexavalent Chromium-Contaminated Soil at Solid Waste Management Units 49 and 50*, dated June 26, 2008.
- ii. The excavated soil must be characterized to determine if it is hazardous waste.
- iii. The excavated soil must be disposed of at an appropriate disposal facility.
- iv. Remediation of the SWMU 49 soil contamination area will be considered complete when analytical data from grab samples confirm that concentrations of hexavalent chromium in the remaining soil are below 25.2 mg/kg.

#### IV.E.38.c. Monitoring Requirements

- i. A total of ten confirmation samples must be taken from the perimeter of the excavation and the base of the excavation in accordance with the *Presumptive Remedy Work Plan for Removal of Hexavalent Chromium-Contaminated Soil at Solid Waste Management Units 49 and 50*, dated June 26, 2008.
- ii. The samples must be analyzed for hexavalent chromium in accordance with the most recent approved version of the *Chemical Data Acquisition Plan*.
- iii. Quality control samples must be taken at the frequencies specified in the most current, approved version of the *Chemical Data Acquisition Plan*.

#### IV.E.38.d. Reporting Requirements

- i. A remedy completion report, including figures showing the post-excavation sampling locations and the contaminant concentrations at those locations, must be submitted for Director review and approval.

- ii. The remedy completion report is due to the Director 120 days following completion of the excavation.

IV.E.38.e. Land Use Controls

- i. Land use controls required for SWMU 49 are:
  - a. Property use is restricted to industrial uses
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the SWMU 49 boundary, except as authorized in a remedial decision document, environmental sampling plan, or Materials Management Plan approved by the Director
  - c. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
- ii. SWMU 49 must be inspected once per calendar year to ensure the land use controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.
- iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMU 49 within 30 days of the effective date of this Permit renewal.
- iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
- v. A map of SWMU 49 that includes GPS coordinates at multiple locations around the perimeter of the SWMU and a table of the GPS locations must be included in the Land Use Control Plan.
- vi. Upon remedy construction completion of the SWMU 49 remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 49 remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

IV.E.39. SWMU No. 50 – Sandblast Building 546

- IV.E.39.a. The remedy selected for SWMU 50 is No Further Action with use restricted to industrial uses. The information used to justify the selection of No Further Action as the remedy is described in the

*Justification Documentation for No Further Action at SWMU 50, Sandblast Building 546, September 2009 as modified by replacement pages dated 18 November 2009 and 2 December 2009.*

The remedy selection was finalized on March 8, 2010.

#### IV.E.39.b. Technical Requirements

- i. Risk screening of the contaminant concentrations at SWMU 50 identified that the lead concentration in soil (820 mg/kg) exceeds the residential risk-based screening level of 400 mg/kg, but is below the groundskeeper risk-based screening level of 1549 mg/kg. Although SWMU 50 requires no further remedial action, the SWMU does not meet the unrestricted use criteria and future use is limited to industrial uses.

#### IV.E.39.c. Monitoring Requirements

- i. There are no monitoring requirements for SWMU 50.

#### IV.E.39.d. Reporting Requirements

- i. There are no reporting requirements for SWMU 50.

#### IV.E.39.e. Land Use Controls

- i. Land use controls required for SWMU 50 are:
  - a. Property use is restricted to industrial uses
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the SWMU 50 boundary, except as authorized in a remedial decision document, environmental sampling plan, or Materials Management Plan approved by the Director
  - c. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
- ii. SWMU 50 must be inspected once per calendar year to ensure the land use controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.
- iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMU 50 within 30 days of the effective date of this Permit renewal.

- iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
- v. A map of SWMU 50 that includes GPS coordinates at multiple locations around the perimeter of the SWMU and a table of the GPS locations must be included in the Land Use Control Plan.
- vi. Upon remedy construction completion of the SWMU 50 remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 50 remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

IV.E.40. SWMU No. 53 – Building 761

The remedy selected for SWMU 53 is No Further Action with use restricted to industrial uses. The information used to justify the selection of No Further Action as the remedy is described in the *Final Justification Documentation for No Further Action at SWMU 53, Building 761, September 2006*.

The remedy selection was finalized on January 9, 2007.

IV.E.40.a. Technical Requirements

- i. Risk screening of the contaminant concentrations at SWMU 53 identified that the lead concentration in soil (698 mg/kg) exceeds the residential risk-based screening level of 400 mg/kg, but is below the groundskeeper risk-based screening level of 1549 mg/kg. Although SWMU 53 requires no further remedial action, the SWMU does not meet the unrestricted use criteria and future use is limited to industrial uses.

IV.E.40.b. Monitoring Requirements

- i. There are no monitoring requirements for SWMU 53.

IV.E.40.c. Reporting Requirements

- i. There are no reporting requirements for SWMU 53.

IV.E.40.d. Land Use Controls

- i. Land use controls required for SWMU 53 are:
  - a. Property use is restricted to industrial use
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the SWMU

- 53 boundary, except as authorized in a remedial decision document, environmental sampling plan, or Materials Management Plan approved by the Director
- c. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
  - ii. SWMU 53 must be inspected once per calendar year to ensure the land use controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.
  - iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMU 53 within 30 days of the effective date of this Permit renewal.
  - iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
  - v. A map of SWMU 53 that includes GPS coordinates at multiple locations around the perimeter of the SWMU and a table of the GPS locations must be included in the Land Use Control Plan.
  - vi. The Director will prepare a Notice of Environmental Use Restriction for the SWMU 53 remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

IV.E.41. SWMU No. 54 – Building 746

The remedy selected for SWMU 54 is No Further Action. The information used to justify the selection of No Further Action as the remedy is described in the *Draft Final SWMUs 53, 54, and 55 and other 700 Series Ammunition Standard Buildings Assessment Report, December 1998*; the *Final RCRA Facility Investigation Work Plan, SWMUs 53, 54, 55 and 57, 700 Series Building, September 2001*; the letter regarding *Satisfaction of RFI Requirements for SWMU 54*, dated October 2, 2001; the letter regarding *Supplemental Sampling to Evaluate Ground Water Protection Levels (GPLs), SWMU 54*, dated January 23, 2003; the letter regarding *Evaluation of TCLP Results for SWMU 54*, dated June 11, 2003; the letter regarding *Letter Report for Sampling to Investigate the Presence of Polychlorinated Biphenyls at SWMU 54*, dated September 24, 2003; and the *Final Justification Documentation for No Further Action at Solid Waste Management Unit 54, Building 746, July 2004*.

The remedy selection was finalized on December 7, 2004.

IV.E.42. SWMU No. 55 – Vacuum and Cyclone Buildings Associated with the 700 Series Buildings

The remedy selected for SWMU 55 is No Further Action with use restricted to industrial uses. The information used to justify the selection of No Further Action as the remedy is described in the *Draft Final (Revision 1) Justification Documentation for No Further Action at SWMU 55, Vacuum and Cyclone Buildings Associated with the 700 Series Buildings, October 2006.*

The remedy selection was finalized on January 9, 2007.

IV.E.42.a. Technical Requirements

- i. Risk screening of the contaminant concentrations at SWMU 55 identified that the 2,4-dinitrotoluene concentration in soil at three locations (1 mg/kg, 1 mg/kg and 0.76 mg/kg) exceeds the residential risk-based screening level of 0.66 mg/kg, but is below the groundskeeper risk-based screening level of 5.17 mg/kg. Although SWMU 55 requires no further remedial action, the SWMU does not meet the unrestricted use criteria and future use is limited to industrial uses.

IV.E.42.b. Monitoring Requirements

- i. There are no monitoring requirements for SWMU 55.

IV.E.42.c. Reporting Requirements

- i. There are no reporting requirements for SWMU 55.

IV.E.42.d. Land Use Controls

- i. Land use controls required for SWMU 55 are:
  - a. Property use is restricted to industrial use
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the SWMU 55 boundary, except as authorized in a remedial decision document, environmental sampling plan, or Materials Management Plan approved by the Director
  - c. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
- ii. SWMU 55 must be inspected once per calendar year to ensure the land use controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the

Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.

- iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMU 55 within 30 days of the effective date of this Permit renewal.
- iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
- v. A map of SWMU 55 that includes GPS coordinates at multiple locations around the perimeter of the SWMU and a table of the GPS locations must be included in the Land Use Control Plan.
- vi. The Director will prepare a Notice of Environmental Use Restriction for the SWMU 55 remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

#### IV.E.43. SWMU No. 56 – Building 543

The remedy selected for SWMU 56 consists of debris removal; surface cleaning and mercury vacuuming of contaminated concrete; building demolition and off-site disposal of building debris; slab removal, mercury vacuuming, and off-site disposal of concrete; and mercury vacuuming, excavation, and off-site disposal of soil. Following remediation, the use of SWMU 56 will be limited to industrial uses.

The remedy selection was finalized on March 8, 2010. If this remedy is not implemented within five years of this date, the Permittee must notify the Director and provide an estimated remedy implementation date. The Director may reevaluate this remedy after five years. Within six months of the end of the five year period, and additionally up to six months prior to the estimated implementation date, the Director may modify the requirements of this remedy to meet current standards of practice.

##### IV.E.43.a. Technical Requirements

- i. The mercury waste at Building 543 is a U151 hazardous waste. All waste characterization, treatment, and disposal must be based on the U151 designation unless the Director determines that media or debris no longer contains the listed waste.
- ii. The remedy for SWMU 56 shall consist of the following activities as described in the *Draft SWMU 56 Corrective*

*Measures Study, June 2009.* The details of the remediation activities shall be described in the Corrective Measures Implementation Work Plan required by Part IV.E.43.c.i.

- a. Initial cleaning of the entire building to remove debris, gravel, animal carcasses, and feces
  - b. The surface of the concrete floor in Area 1 of the building shall be cleaned with HgX® Mercury Decontaminant Powder or a similarly effective material approved by the Director
  - c. Demolition of Building 543 and either recycling, reuse, or off-site disposal of the debris based on characterization of the building debris
  - d. Following surface cleaning, the concrete slab shall be removed. A mercury vacuum shall be used to clean the pieces of concrete and underlying soil. The contaminated concrete debris must be sent off-site for thermal treatment. The waste characterization and specific waste management practices for the concrete must be described in the Corrective Measures Implementation Work Plan required by Part IV.E.43.c.i.
  - e. Excavation of approximately the top 2 feet of soil below Area 1 of the building
  - f. Excavated soil shall be characterized and either sent off-site for thermal treatment or for disposal without treatment
  - g. Wastewater from decontamination shall be characterized and transported off-site for treatment or disposal
- iii. The concentration of mercury remaining in the soil shall not exceed the construction worker risk-based screening level of 34.3 milligrams per kilogram (mg/kg).

#### IV.E.43.b. Monitoring Requirements

- i. Air monitoring shall be performed using a real-time mercury monitoring device during slab removal, soil vacuuming, and excavation activities.
- ii. A field monitoring device such as an X-ray fluorescence (XRF) analyzer shall be used to locate mercury hot spots in concrete and soil and to separate contaminated media from non-mercury contaminated concrete and soil. Additional sampling using laboratory methods will also be needed to properly characterize the materials for disposal.
- iii. Pre-excavation delineation sampling or post-excavation confirmation sampling must be conducted to confirm that the construction worker RBSL of 34.3 mg/kg is met in the soil left in

place. The sampling frequencies and locations must be described in the Corrective Measures Implementation Work Plan required by Part IV.E.43.c.i.

- iv. The soil samples must be analyzed for total mercury by U.S. EPA Method 7471.

#### IV.E.43.c. Reporting Requirements

- i. Six months prior to planned implementation of this remedy, the Permittee must submit a Corrective Measures Implementation Work Plan to the Director for review and approval. Remedy implementation shall not begin prior to approval of the work plan. The work plan must contain the following information.
  - a. Detailed waste management information on how high concentration U151 mercury waste, low concentration U151 mercury waste, and mercury contaminated debris, feces, and animal carcasses will be managed. Waste management must be based on the waste carrying the U151 hazardous waste code not D009.
  - b. Sampling required to determine if Area 2 has been contaminated with mercury
  - c. Action levels for air monitoring and soil/concrete monitoring conducted using the real-time mercury monitoring devices.
  - d. The expected residual concentration of mercury in concrete and in soil after the mercury vacuum has been used. Include sampling requirements to document concentrations.
  - e. The pre-excavation delineation sampling or post-excavation confirmation sampling plan for determining which soil must be excavated.
  - f. A complete description of the selective demolition procedures.
  - g. A complete description of the mercury vacuuming procedure.
  - h. A complete description of the HgX® Mercury Decontaminant Powder use and how the powder and any rinse water will be collected for disposal.
  - i. A timeframe for implementing each aspect of the SWMU 56 remedy. This timeframe can be in the form of a flow chart from scheduling software.
- ii. The Permittee must provide written notification to the Director 14 days prior to implementation of the technical requirements of the remedy. This notification may be made by electronic mail.

- iii. A remedy completion report, including figures showing the excavation and remediation area, post-excavation and remediation sampling locations, contaminant concentrations at those locations, and a risk evaluation following the methodology in the *Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units* must be submitted for Director review and approval.
- iv. The remedy completion report is due 90 days after completion of the technical and monitoring requirements of the remedy.

IV.E.43.d. Land Use Controls

- i. Land use controls required for SWMU 56 are:
  - a. Prior to remediation, access to SWMU 56 is prohibited, except for authorized remedial activities
  - b. Property use is restricted to industrial use following remediation
  - c. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the SWMU 56 boundary, except as authorized in a remedial decision document, environmental sampling plan, or Materials Management Plan approved by the Director
  - d. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
- ii. SWMU 56 must be inspected once per calendar year to ensure the land use controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.
- iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMU 56 within 30 days of the effective date of this Permit renewal.
- iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
- v. A map of SWMU 56 that includes GPS coordinates at multiple locations around the perimeter of the SWMU and a table of the GPS locations must be included in the Land Use Control Plan.

- vi. Upon remedy construction completion of the SWMU 56 remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 56 remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

IV.E.44. SWMU No. 57 – Area around Buildings 701, 706, and 731

IV.E.44.a. Selected Remedy

The remedy selected for SWMU 57 is excavation of contaminated soil containing PCBs in excess of the EPA high occupancy standard of 1.0 mg/kg and removal of junction boxes, control boxes, piping and debris contaminated with PCBs. Contaminated soil containing benzo(a)pyrene, pyrene, diesel range organics (DRO), antimony and lead in excess of the site-specific industrial reuse risk-based screening levels must also be excavated. Soil excavation is an effective remedy because the contamination is removed from the site and disposed of at an off-site disposal facility designed for that purpose. Following remediation, the use of SWMU 57 will be restricted to industrial uses. The remedy selection was finalized on December 9, 2011.

IV.E.44.b. Technical Requirements

- i. Soil at SWMU 57 must be excavated where the PCB concentration exceeds 1.0 mg/kg and/or where the benzo(a)pyrene, pyrene, DRO, antimony or lead concentrations exceed their respective industrial reuse risk-based screening levels as specified in the *Draft Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units (Revision 11)* dated September 2010. The areas to be excavated are depicted in Figure 5-1 of the *Draft Final Presumptive Remedy Work Plan, Solid Waste Management Unit 57, Former Ammunition Renovation Area*, dated September 2011.
- ii. Junction boxes, control boxes, piping and other debris contaminated with PCBs must be removed from the areas identified in Figure 5-1 of the *Draft Final Presumptive Remedy Work Plan, Solid Waste Management Unit 57, Former Ammunition Renovation Area*, dated September 2011.
- iii. The excavated soil, debris, and associated remediation derived waste must be disposed of at appropriate disposal facilities.
- iv. The excavated areas must be backfilled and restored in accordance with the *Draft Final Presumptive Remedy Work Plan*,

*Solid Waste Management Unit 57, Former Ammunition Renovation Area*, dated September 2011.

- v. Remediation of the SWMU 57 soil contamination area will be considered complete when analytical data from post-excavation confirmation samples do not exceed the specified concentrations. Any other related contaminant concentrations that are not specified herein must also be below their respective risk-based screening levels as identified in the *Draft Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units (Revision 11)* dated September 2010.
  - a. Total polychlorinated biphenyls – 1.0 mg/kg
  - b. Benzo(a)pyrene – 0.432 mg/kg
  - c. Pyrene – 8.25 mg/kg
  - d. Diesel Range Organics – 10,100 mg/kg
  - e. Antimony – 769 mg/kg
  - f. Lead – 1550 mg/kg

IV.E.44.c. Monitoring Requirements

- i. Confirmation samples must be collected from the sidewalls and bottom of each excavation.
- ii. One discrete sample must be collected from each sidewall and the bottom on the smaller excavations at Areas 1, 2, and 3 where RCRA contaminants are present. In areas that are trenched, the two sidewalls of the trench should be sampled and the end of the trench if it is near the area of concern.
- iii. Composite samples consisting of no more than nine aliquots must be collected in the areas where soil contaminated with PCBs is excavated.
- iv. If results from the confirmation samples indicate that further excavation is required, additional confirmation samples must be collected after the excavation is extended.
- v. In Area 1 the samples must be analyzed for pyrene using U.S. EPA Method 8270 -SIM and DRO using U.S. EPA Method 8015B. In Area 2 the samples must be analyzed for antimony using U.S. EPA Method 6010B. In Area 3 the samples must be analyzed for lead using U.S. EPA Method 6010B and PCBs using Method 8082A. In Areas 4 and 5 the samples must be analyzed for PCBs using U.S. EPA Method 8082A. The area around the junction/control boxes and process piping must be analyzed for PCBs using U.S. EPA Method 8082A and, where indicated, benzo(a)pyrene by U.S. EPA Method 8270-SIM.

- vi. Sampling must be conducted in accordance with the *Draft Final Presumptive Remedy Work Plan, Solid Waste Management Unit 57, Former Ammunition Renovation Area*, dated September 2011, and the most current, approved version of the *Chemical Data Acquisition Plan*.
- vii. Field duplicates, matrix spike/matrix spike duplicates, and other QA/QC samples must be taken in accordance with the *Draft Final Presumptive Remedy Work Plan, Solid Waste Management Unit 57, Former Ammunition Renovation Area*, dated September 2011 and the most current, approved version of the *Chemical Data Acquisition Plan*.

#### IV.E.44.d. Reporting Requirements

- i. A remedy completion report, including figures showing the extent of excavation, post-excavation sampling locations, contaminant concentrations at those locations, and a risk evaluation following the methodology in the *Final Decision Criteria and Methodology for Identification of No Further Action Solid Waste Management Units* must be submitted for Director review and approval.
- ii. The remedy completion report is due to the Director 120 days following completion of the remedy.

#### IV.E.44.e. Land Use Controls

- i. Land use controls required for SWMU 57 are:
  - a. Property use is restricted to industrial use
  - b. No excavation, drilling, grading, digging, tilling, or any other soil-disturbing activity is allowed within the SWMU 57 boundary, except as authorized in a remedial decision document, environmental sampling plan, or Materials Management Plan approved by the Director
  - c. Nothing in the preceding shall prohibit the installation or use of wells as authorized in a remedial decision document or environmental sampling plan approved by the Director.
- ii. SWMU 57 must be inspected once per calendar year to ensure the land use controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.

- iii. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMU 57 within 30 days of the effective date of this Permit renewal.
- iv. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
- v. A map of SWMU 57 that includes GPS coordinates at multiple locations around the perimeter of the SWMU and a table of the GPS locations must be included in the Land Use Control Plan.
- vi. Upon remedy construction completion of the SWMU 57 remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 57 remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

IV.E.45. SWMU No. 59 – Petroleum-Contaminated Soil Disposal Area

The remedy selected for SWMU 59 is No Further Action. The contaminated soil at this SWMU was removed. The information used to justify the selection of No Further Action as the remedy is described in the *Draft Final Justification Documentation for No Further Action at Solid Waste Management Unit 59, Former Petroleum-Contaminated Soil Disposal Area, December 2005*.

The remedy selection was finalized on April 20, 2006.

IV.E.46. SWMU No. 60 – Pershing Missile Disposal Site and Asbestos Landfill Area

IV.E.46.a. Selected Remedy

The remedy selected for SWMU 60 is an evapotranspiration cover. Installation of the cover will require importing soil to create a cover capable of supporting vegetation. The approved cover vegetation must be established and maintained to facilitate transpiration and minimize erosion; thereby ensuring the evapotranspiration properties of the cover. This system is designed to control potential contact with the waste and minimize percolation of precipitation into the waste. The evapotranspiration cover will cover approximately 10 acres.

Remediation of groundwater is not required at this time at SWMU 60.

The remedy selection was finalized on March 22, 2013. If this remedy is not implemented within five years of this date, the Permittee must notify the Director and provide an estimated remedy implementation date. The Director may reevaluate this remedy after five years. Within six months of the end of the five year period, and additionally up to six months prior to the estimated

implementation date, the Director may modify the requirements of this remedy to meet current standards of practice.

#### IV.E.46.b. Technical Requirements

- i. The evapotranspiration cover shall be constructed in accordance with the approved Final 100% Design Package (100% Design). Requirements for submitting the 100% Design for review are included in Part IV.E.46.d.iii. of this Permit.
- ii. Regrade and import soil to construct the evapotranspiration cover over the SWMU 60 disposal area.
- iii. The cover thickness will be determined during the design phase.
- iv. All debris must be managed in accordance with the approved 100% Design.
- v. Asbestos-containing materials and soil must be managed in accordance with the approved asbestos management plan in the approved 100% Design.
- vi. Survey monuments to monitor settlement must be installed during placement of the soil cover in accordance with the approved 100% Design.
- vii. Erosion control measures must be employed in accordance with the approved 100% Design.
- viii. The soil cover must be revegetated to provide for transpiration and erosion control.
- ix. The seed types used during revegetation must be consistent with the seeding specifications in the approved 100% Design.
- x. The vegetation must be established, maintained, and monitored in accordance with the Final Post-Closure Monitoring and Maintenance Plan required under Part IV.E.46.d.viii.
- xi. The SWMU 60 cover shall remain in place and be monitored and maintained in accordance with the Monitoring Requirements described in Part IV.E.46.c.

#### IV.E.46.c. Monitoring Requirements

- i. Implementation of initial post-closure monitoring and maintenance must begin upon the construction completion date specified in response to Part IV.E.46.d.v. Initial post-closure

monitoring and maintenance must be conducted in accordance with the *Draft Post-Closure Monitoring and Maintenance Plan* included in the approved 100% Design.

- ii. Quality control samples must be taken at the frequencies specified in the most current, approved version of the *Chemical Data Acquisition Plan*.
- iii. Implementation of the final post-closure monitoring and maintenance procedures must begin upon approval of the *Final Post-Closure Monitoring and Maintenance Plan* required under Part IV.E.46.d.viii.
- iv. At a minimum, the SWMU 60 cover must be monitored for:
  - a. Erosion
  - b. Settlement
  - c. Maintenance of vegetation
  - d. Maintenance of proper drainage
- v. The period of compliance evaluation is 30 years, consistent with post-closure requirements for landfills, as identified in 6 CCR 1007-2, Part 1, Section 3.6. The Director may extend the period of compliance evaluation if the Director finds that an extended period is necessary to protect human health and the environment. The beginning of the period of compliance is the construction completion date specified in response to Part IV.E.46.d.v.

#### IV.E.46.d. Reporting Requirements

- i. A *60 Percent Design Package* (60% Design) must be submitted for Director review and comment within 18 months of the effective date of Permit renewal. The 60% Design shall consist of the plans and specifications, and appendices as well as the Draft Post-Closure Monitoring and Maintenance Plan, a Materials Management Plan, an Asbestos Management Plan, the third party Construction Quality Assurance Plan and any other necessary supporting plans and calculations.
- ii. A *90 Percent Design Package* (90% Design) must be submitted for Director review and comment when directed by the Director. The 90% Design shall consist of updated versions of the plans and specifications, and appendices from the 60% Design as well as the Draft Post-Closure Monitoring and Maintenance Plan, a Materials Management Plan, an Asbestos Management Plan, the third party Construction Quality Assurance Plan, and any other necessary supporting plans and calculations.

- iii. A *Final 100 Percent Design Package* (100% Design), signed and stamped by a Colorado-registered Professional Engineer, must be submitted for Director review and approval, when directed by the Director. The 100% Design shall include final versions of all plans, specifications, drawings and appendices included in the 90% Design. The drawings shall be stamped by a Colorado-registered Professional Engineer.
- iv. The Permittee must provide written notification to the Director 14 days prior to implementation of the technical requirements of the remedy. This notification may be made by electronic mail.
- v. The Permittee must provide written notification to the Director within 14 days of construction completion stating that construction is complete. Completion of construction for purposes of this Permit is defined as completion of construction of the cover as designed in the 100% Design, and implementation of the Additional Controls specified in Part IV.E.46.e.ii.
- vi. Within 14 days of contractor submittal of the draft construction completion report to the U.S. Army, the Permittee must provide written notification to the Director confirming the submittal.
- vii. A remedy construction completion report must be prepared in accordance with the approved 100% Design, and must be submitted for Director review and approval within six months of the construction completion date specified in response to Part IV.E.46.d.v. The remedy construction completion report must be accompanied by a Construction Certification Report signed and stamped by the independent third-party Professional Engineer.
- viii. A *Final Post-Closure Monitoring and Maintenance Plan* must be submitted for Director review and approval within six months of the construction completion date specified in response to Part IV.E.46.d.v.
- ix. Post-closure monitoring and maintenance reports must be submitted to the Director annually beginning one year following completion of construction. The due date will be based on the construction completion date specified in response to Part IV.E.46.d.v.

#### IV.E.46.e. Land Use and Additional Controls

- i. Land use controls required for SWMU 60 are:

- a. No access except for operations and maintenance of SWMU 60.
  - b. No vehicle access, no driving over any part of the cover, except as necessary for monitoring and maintenance activities.
  - c. No future use of any type (including residential or recreational) other than as a landfill cover as designed.
  - d. No excavation or building within the SWMU boundary.
  - e. No drilling, trenching, or other intrusive activities that may disrupt the landfill cover.
  - f. No removal of groundwater or injection into the aquifer is allowed within the SWMU boundary (with the exception of monitoring and remedial activities).
- ii. Installation of these additional controls is required following completion of cover construction at SWMU 60:
    - a. A three-strand barbed wire fence with locked gates must be placed around the entire SWMU.
    - b. Signs stating “This Area Is Off Limits By Order of the Commander” must be placed at every entrance, on every side of the SWMU, and additionally around the perimeter of the SWMU at a minimum spacing of every 300 feet.
    - c. Signs indicating the area is an asbestos landfill must be placed at every entrance, on every side of the SWMU, and additionally around the perimeter of the SWMU at a minimum spacing of every 300 feet.
  - iii. SWMU 60 must be inspected once per calendar year to ensure the land use controls and additional controls are operated and maintained in compliance with this Permit. The Permittee must submit a report to the Director by March 31 of each year summarizing the inspection from the previous year, noting any adverse findings from the inspection and how identified problems were resolved.
  - iv. The Pueblo Chemical Depot Land Use Control Plan must be modified to include these restrictions for SWMU 60 within 30 days of the effective date of this Permit renewal.
  - v. An updated copy of the Land Use Control Plan must be submitted to the Director within 60 days of the effective date of this Permit renewal.
  - vi. A map of SWMU 60 that includes GPS coordinates at multiple locations around the perimeter of the SWMU and a table of the GPS locations must be included in the Land Use Control Plan.

- vii. Upon remedy construction completion of the SWMU 60 remedy, the Director will prepare a Notice of Environmental Use Restriction for the SWMU 60 remedy. The Permittee must sign the Notice of Environmental Use Restriction within 30 days of receipt of the final version of the Notice of Environmental Use Restriction from the Director.

TABLE IV-1  
GENERAL CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS  
FACILITY REQUIREMENT SUMMARY

Below is a summary of the planned requirements pursuant to Part IV's Schedule of Compliance:

<u>Facility Requirements</u>	<u>Due Date</u>
Notification of newly identified SWMUs	15 calendar days after discovery
Notification of newly discovered releases	15 calendar days after discovery
Progress reports on all activities	Quarterly
SWMU Assessment plan for newly identified SWMUs	90 calendar days after receipt of request
Revised SWMU Assessment Plan	as determined
Implement SWMU Assessment Plan	60 calendar days after Director approval
SWMU Assessment Report	90 calendar days after completion of the field investigations of the SWMU Assessment Plan
RFI Work Plan for SWMUs identified at Time of Permit issuance	90 calendar days after receipt of request
Revised RFI Work Plan	as determined
Implement RFI Work Plan	60 calendar days after Director approval
RFI Report	150 calendar days after completion of the field investigations of the RFI
Revised RFI Report	as determined
Mail RFI Summary to Mailing list	90 calendar days after Director approval of RFI
CMS Plan	90 calendar days after notification of requirement to perform CMS
Revised CMS Plan	as determined
Implement CMS Plan	45 calendar days after Director approval
CMS Report	90 calendar days after completion of CMS
Revised CMS Report	as determined