Monthly Progress Report
Corrective Measures Study/Corrective Measures Implementation for
Consolidated Unit 16-021(c)-99
September 2009

This report summarizes Los Alamos National Laboratory (LANL) activities completed during September of fiscal year (FY) 2009 on the Corrective Measures Study (CMS)/Corrective Measures Implementation (CMI for Consolidated Unit 16-021(c)-99, the Technical Area 16 (TA-16) 260 Outfall. Activities outlined in the CMS plan ([LA-UR-98-3918] approved by the New Mexico Environment Department [NMED] Hazardous Waste Bureau [HWB] on 9/8/99) and other related activities are described herein.

Description of Activities and Contacts – Michael Dale of the NMED-HWB visited the permeable reactive barrier (PRB) site in Cañon de Valle on September 29, 2009, during the excavation of the test pits.

Best Management Practices (BMPs) – BMPs are inspected quarterly and following significant precipitation events. Multiple precipitation events occurred in September: none exceeded 0.5 in., and none required BMP repair in the 260 Outfall area. New BMPs were installed in Cañon de Valle in the vicinity of the PRB site during the excavation of the test pits.

CMS Hydrogeologic Investigations – Hydrogeologic investigations include periodic water sampling as outlined in the Phase II Resource Conservation and Recovery Act facility investigation (RFI) workplan as well as continuing investigations delineated in the CMS plan. The ongoing spring sampling program, currently focused on capturing high-flow events, includes biannual sampling at Martin, SWSC, and Burning Ground Springs, these activities are now conducted under the auspices of the interim facility-wide groundwater monitoring plan.

The hydrologic system in Cañon de Valle is moderately wet because of the monsoonal rains. Martin Spring is flowing at ~0.02 L/s, Burning Ground Spring is flowing at a rate of ~0.3 L/s, and SWSC Spring is flowing at ~0.01 L/s.

The 90s Line Pond remained wet throughout September. Downgradient surface locations in Martin Spring Canyon and Cañon de Valle remain wet. The alluvial wells in lower Cañon de Valle, lower Martin Spring Canyon and Fishladder Canyon are also wet. Surface water is present in Cañon de Valle from Burning Ground Spring to beyond the former location of Material Disposal Area P.

Ecological Risk Pilot – The ecological risk pilot study has been completed, and the results are presented in the Phase III RFI report.

CMS Bench and Pilot Studies – Write-up of bench and pilot studies, many of which were conducted under the auspices of the Innovative Technology Remediation Demonstration (ITRD) program, have been completed. The ITRD high explosives (HE) program was focused on two DOE sites: LANL and Pantex. Ongoing studies, mainly consisting of monitoring in support of the previous studies, include:

1. A study of the passive barrier technology of Stormwater Management, Inc.: potentially useful for removing HE and barium from water (LANL). The pilot unit at Martin Spring was turned off in July 2009 because of concerns it may require a National Pollutant Discharge Elimination System (NPDES) permit.
2. A study of in situ anaerobic bioremediation of HE using gas-phase carbon additions (Pantex)
3. Oxidation, reduction, and in-situ bioremediation studies of groundwater contamination (Pantex)

The CMS report from Pantex detailing these studies was reviewed and the results incorporated in the CME report submitted to NMED on August 31, 2007.

RFI and CMS/CME for Surface System – The surface system CMS report was completed and submitted to NMED on November 26, 2003; the RFI report was completed and submitted in September 2003. A response to the notice of deficiency on the RFI report was submitted on January 28, 2004, and an addendum to that response was submitted on February 25, 2004. An approval with modifications for the RFI was received June 23, 2004, and a response to the approval was submitted to NMED on July 23, 2004. The RFI text modifications were completed during December 2004 and submitted to NMED. A notice of disapproval (NOD) on the CMS report was received May 16, 2005. A response to that NOD was submitted on June 15, 2005.

NMED issued the "Intent to Public Notice Remedy Selection for the Solid Waste Management Unit 16-021(c)" on May 15, 2006. Public comments on this notice were due to NMED by July 14, 2006. LANL provided comments on this public notice. The remedy was approved by NMED in a letter dated October 13, 2006.

RFI/Investigation Report (IR) and CMS/CME for Deep Groundwater – The IR for TA-16 groundwater was completed and submitted to NMED on August 31, 2006; an approval with direction, dated November 29, 2006, was received by email the same day. This approval required an additional report assessing the quality of the wells in and around TA-16. Additional information requested in this approval, including borehole videos and X-ray diffraction data, was provided to NMED in a letter dated January 17, 2007.

The TA-16 well evaluation report was submitted to NMED on April 30, 2007, and an NOD was received on August 17, 2007. The response to that NOD and a revised report were provided to NMED on September 30, 2007. NMED approved the revised TA-16 well evaluation report on February 11, 2008. A response to this approval was submitted on March 15, 2008. Two drilling work plans [for CdV-R-15-1 and CdV-16-3(i)] were submitted as part of this approval response and were approved by NMED in letter dated March 28, 2008. An approval of the drilling work plan for the R-25b well, which was submitted in June 2007, was received in November 2007. A letter from NMED requiring completion of the CdV-16-3(i) as a regional well by July 30, 2008, was received in December 2008. The drilling work plan for R-25c was submitted during February 2008 and approved in a letter dated March 11, 2008. Drilling of well R-25c was completed in September and the well was constructed at that time. The well is not producing water. R-25b was drilled and the

well was constructed in October 2008. The well completion report for R-25c was submitted in September 2008, and the well completion report for R-25b was submitted in October 2008.

The groundwater CME report was submitted to NMED on August 31, 2007, and an NOD requiring submittal of a supplemental investigation work plan (IWP) was received on April 22, 2008. The supplemental IWP was completed and submitted on June 30, 2008. An approval with modifications of the supplemental IWP was received on January 26, 2009. Additional development activities for R-25b occurred in April 2009.

Initial attempts to deepen the CdV-16-3(i) well (renamed R-48) were conducted in June 2009 but were unsuccessful because the borehole was off vertical. A letter was drafted requesting drilling fluids (e.g., EZ-mud) be allowed to be used to complete this well while activities to determine a path forward for R-48 were underway. During September, the drillers continued drilling with reverse-circulation (RC) rods in an attempt to proceed without drilling fluid additives. Progress was very slow with a tricone bit, and no cuttings or fluids were returned to the surface. The drillers decided to switch to a hammer bit at a depth of 1438 ft. The borehole was completed to a total depth of 1705 ft during mid September. The well screen was installed at a depth of 1500-1520 ft in a rubbly, potentially productive zone within the Tschicoma dacite. During late September well construction was completed (NMED complete on 9/25).

The drill rig and crew moved to the site of R-47 at TA-14 in July and commenced drilling. During early September 2009, this borehole had reached a total depth of 1348 ft; perched water was encountered at approximately 835 ft. As of the end of September, the standing water level was ~1242 ft. Well construction was initiated in early September and continued as of September 30, 2009. Drilling and well construction activities at R-47 were slowed in September because of an accident in which a driller's hand and fingers were injured.

The plugging and abandonment of CdV-16-2(i) was completed in July 2009.

CMI – The CMI plan was submitted to NMED on May 10, 2007. An NOD was received on June 29, 2007; LANL's response was submitted on July 30, 2007. NMED updated the CMI schedule by letter on June 24, 2009, and added the summary report for those remedial activities to the fiscal year 2010 stipulated-penalty document delivery list.

Bench and pilot studies supporting the CMI continued and are almost complete. Permitting for CMI activities continued in September. The first three segments of the 401/404 permit were submitted to the Army Corps of Engineers on June 25, 2009, for the Carbon Filtration System at SWSC and Martin Spring and the PRB. These requests were approved in July 2009. Submittal of the 401/404 permit for the carbon filtration system at Burning Ground Spring is pending public comment on the associated wetland determination. Public comment was completed in September and the 401/404 permit can be submitted. Notices of intent (NOIs) to discharge for the construction of the PRB and the operation of the springs' carbon filtration systems were submitted to NMED Surface and Groundwater Bureaus on June 25, 2009. These NOIs were approved by NMED in mid September. It was determined that the storm filter systems in the springs required NPDES permits; LANL's permitting group began work on these permits. The "area of contamination letter" was submitted on June 15, 2009 and approved on August 10, 2009. A request for a "contained in" determination for the

springs and alluvial groundwaters impacted by the CMI was submitted to NMED on May 4, 2009. This was approved by NMED in a letter dated September 16, 2009.

The contract for the CMI was awarded to TerranearPMC in July 2009. This subcontractor completed all field preparatory activities and held a readiness review/management self-assessment on September 21, 2009. The subcontractor mobilized to the field and began CMI field activities on September 25, 2009. The PRB test pits were excavated. Depth to bedrock was significantly deeper (8 to 9 ft as opposed to 5 ft) than in well 16-2658, located upgradient from the PRB location. Based on the test pit information, a revised design will be prepared by the subcontractor.

The subcontractor provided a draft grouting plan for review.

Public and Stakeholder Involvement – A LANL representative discussed the ongoing cleanup activities at TA-16, including a discussion of the TA-16-260 outfall CMI, on radio station KRSN on September 28, 2009.

Percentage of CMS Completed

LANL estimates 100% of both the surface CMS and the groundwater CME have been completed. This estimate does not include additional work covered by the work plan submitted on June 30, 2008.

Problems Encountered/Actions to Rectify Problems

R-25c is not producing water, and the current level remains below the screen; R-25b is still showing high turbidity. LANL will continue to monitor the well screens.

Pilot studies at Martin Spring have been delayed because of differences in interpretation between NMED and the U.S. Environmental Protection Agency as to whether the studies require an NPDES permit. LANL's permitting group is currently working with the regulators to resolve the issue.

Key Personnel Issues – None

Projected Work for October 2009

BMPs

- Continuing inspection of existing BMPs following significant precipitation events
- Installation of new BMPs to support CMI implementation

CMS Hydrogeologic Investigations

- Site maintenance at the TA-16 trailers

- Checking for presence and levels of water in Cañon de Valle alluvial system
- Precipitation monitoring

Groundwater CME/CMI

- Continuation of well construction at R-47
- Continuation of well construction and development at CdV-16-3(i) (now R-48)

CMS/CME Bench and Pilot Studies – No activities are projected for October 2009.

CMI

- Finalizing lab scale tests to permit selection of the media for the PRB
- NPDES permitting
- Implementation of CMI remedies
- Submittal of grouting plan
- Finalization of modified engineering drawings for PRB

Public and Stakeholder Involvement – Meeting with NMED scheduled for October 9. 2009.