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

This report summarizes Los Alamos National Laboratory (LANL) activities completed during November of fiscal year (FY) 2010 on the CMS/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 – LANL submitted a letter detailing changes to the permeable reactive barrier (PRB) design during November. These changes were discussed with NMED representatives on October 9, 2009. This letter also requested an extension to January 31, 2010, to complete the CMI remedies.

Best Management Practices (BMPs) – BMPs are inspected quarterly and following significant precipitation events. Several small precipitation events occurred in November, none of which exceeded 0.5 in. BMPs were installed and maintained in both the 260 Outfall area and PRB installation area in support of the CMI.

CMS Hydrogeologic Investigations – Hydrogeologic investigations include periodic water sampling as outlined in the Phase II Resource Conservation and Recovery Act facility investigation (RFI) work plan 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, activities now conducted under the auspices of the interim facility-wide groundwater monitoring plan.

The hydrologic system in Cañon de Valle is drying out following the monsoonal rains. Martin Spring is flowing at < 0.05 L/s, and Burning Ground Spring is flowing at a rate of <0.2 L/s. SWSC spring stopped flowing in mid-November.

The 90s Line Pond almost dried out during early November and downgradient surface locations in Martin Spring Canyon and Cañon de Valle have also dried up. The alluvial wells are drying up as well. Alluvial well samples were only able to be collected in October at 16-2556 and 16-2559 (Cañon de Valle) and 16-6294 and 16-6295 (Martin Spring Canyon). 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 corrective measures evaluation (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 on 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 in 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.

Deepening the CdV-16-3(i) well (renamed R-48) was completed in September 2009. Well construction was completed in late September (NMED complete on September 25, 2009). Installation of the dedicated pump and site restoration occurred during November.

The drill rig and crew moved to the site of R-47(i) at TA-14 in July 2009 and began 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 2009, the standing water level was ~1242 ft. In consultation with NMED, it was decided to complete this well as an intermediate well with a total depth of 895 ft in a perched zone. Well construction was completed during November (NMED complete on November 15, 2009). Well development was initiated during November.

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 FY2010 stipulated-penalty document delivery list.

Bench and pilot studies supporting the CMI were completed, and a report of these activities is in progress. Permitting for CMI activities continued in November 2009. The first three segments of the 401/404 permit were submitted to the U.S. Army Corps of Engineers on June 25, 2009, for the carbon-filtration system at SWSC and Martin Springs and the PRB. These requests were approved in July 2009. The 401/404 permit for the carbon-filtration system at Burning Ground Spring was submitted on October, 29, 2009, and approved in November 2009. 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 is working on these permits. The status of aluminum in these permits is problematic; negotiations with U.S. Environmental Protection Agency (EPA) will be initiated. 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 request was approved by NMED in a letter dated September 16, 2009.

The contract for the CMI was awarded to TerranearPMC (TPMC) in July 2009. TPMC continued CMI activities in November 2009. Soil removal within the 260 Outfall drainage was almost complete by the end of the month; remaining removals are in the lower drainage. Field-screening data were collected, and excavation continued until cleanup goals were attained. The concrete trough was excavated and the soils underlying the trough were field screened for HE and barium. Soil removals were performed at the eastern end of the trough and at approximately 132 ft because of elevated HE field-screening results. Site restoration activities were initiated in the upper drainage and troughs areas.

The grouting plan was submitted to NMED on October 30, 2009. Grouting activities in the 260 pond area, except for air-permeability testing, were completed in November 2009. The subsurface in the pond area was characterized by fractured tuff and highly-heterogeneous permeability. Surprisingly, over 80 cubic yards of grout were installed in the 260 pond area. Installation of the storm-filter system in SWSC Spring was completed.

Work on the pump test plan was initiated.

Public and Stakeholder Involvement – None.

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.

The status of aluminum under potential NPDES permits for the storm-filter systems is problematic. The systems are not designed to remove aluminum, which is above standards, but is most likely present as a naturally occurring material. Negotiations will be undertaken with EPA.

Bentonite present in R-47 necessitated completion of this well as an intermediate well. It is possible a new deep well at this site will need to be drilled.

Key Personnel Issues – None

Projected Work for December 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

- Aquifer pump test at R-47(i)
- Pump test at CdV-16-3(i) (now R-48)
- Continuation of work on pump test plan

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

CMI

- Write-up of lab scale tests conducted will be completed to finalize selection of the media for the PRB.
- NPDES permitting and discussions with EPA will be undertaken.
- Implementation of CMI remedies, in particular installation of the storm filter in Burning Ground Spring, will be completed and construction of the PRB will begin.
- Ecotoxicological samples in the SWSC cut will be collected.
- Site restoration activities will continue at all CMI remedy sites.

Public and Stakeholder Involvement – A meeting with NMED representatives concerning the aquifer test plan will be held.