Environmental
Restoration
University of California
Environmental Science and Waste Technology (E)
Environmental Restoration, MS M992
Los Alamos, New Mexico 87545
505-667-0808/FAX 505-665-4747

U.S. Department of Energy
Los Alamos Area Office, MS A316
Environmental Restoration Program
Los Alamos, New Mexico 87544
505-667-7203/FAX 505-665-4504

Date: November 16, 1999
Refer to: E/ER:99-332`

Mr. John Kieling
NMED-HRMB
P.O. Box 26110
Santa Fe, NM 87502

SUBJECT: OCTOBER 1999 CMS PROGRESS REPORT FOR PRS 16-021(c)

Dear Mr. Kieling:

Enclosed is the October 1999 Corrective Measures Study (CMS) Progress Report for Potential Release Site 16-021(c), the 260 Outfall. This report is being submitted as part of the reporting conditions outlined in Section R, *Scope of work for a Resource Conservation and Recovery Act CMS at the Laboratory, Task IX, Reports, Part A, Progress* of Module VIII of the Laboratory's Hazardous Waste Facility Permit.

If you have any questions, please call Dave McInroy at (505) 667-0819 or Joe Mose at (505) 667-5808.

Sincerely,

Julie A. Canepa, Program Manager
Los Alamos National Laboratory
Environmental Restoration

Sincerely,

Theodore J. Taylor, Program Manager
Department of Energy
Los Alamos Area Office

JC/TT/NR/ev

Enclosure: October 1999 CMS Progress Plan for PRS 16-021(c)

Cy (w/enc.):
M. Buksa, E/ET, MS M992
D. Hickmott, EES-1, MS M992
J. Mose, LAAO, MS A316
N. Riebe, E/ET, MS M992
C. Rodriguez, E/ER, MS M992
T. Taylor, LAAO, MS A316
J. Parker, NMED-HRMB
S. Yanicak, NMED-AIP, MS J993
RPF, (ER Catalog # 19990171), MS M707

Cy (w/o enc.):
J. Canepa, E/ER, MS M992
D. McInroy, E/ER, MS M992
V. Rhodes, Aurora, MS M992
J. Bearzi, NMED-HRMB
E/ER File, MS M992

Monthly Progress Report
Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c)
October 1999

This report summarizes Los Alamos National Laboratory (LANL) activities that were completed during October of fiscal year (FY) 1999 on the CMS for PRS 16-021(c), the 260 outfall. Both the activities described in the CMS plan ([LA-UR-98-3918)], which was submitted to the New Mexico Environment Department-Hazardous and Radioactive Materials Bureau [NMED-HRMB] on 9/30/98, and approved by NMED-HRMB on 9/8/99), and other related activities are described herein.

Description of Activities and Contacts

RCRA Facility Investigation (RFI) Report and CMS Plan–There was no new activity.

Best Management Practices (BMPs)–BMPs were inspected weekly during October. All of these BMPs, including straw bales, diversion dams, and diversion piping, have been designed to minimize run-on and runoff from the contaminated outfall area.

CMS Hydrogeologic Investigations–CMS hydrogeologic investigations include ongoing Phase II RFI sampling as well as continuing investigations outlined in the CMS plan.

The ongoing Phase II RFI sampling included sampling the Sanitary Wastewater System Consolidation (SWSC) Spring, Burning Ground Spring, and Martin Spring every other day for bromide, other anions, and stable isotopes. The analyses from the October sampling are in process. No new bromide breakthrough has been observed in samples to date.

The wells, both alluvial and deep, were checked weekly for water level and presence of water. Four of the five alluvial wells contained water; the exception was alluvial well 2655, which is located in the steam plant drainage. None of the intermediate-depth boreholes contained water.

Stable isotope investigations, as outlined in Section 6.3.2 of the CMS plan, were also continued. In October, one snowmelt sample from a precipitation event was collected. The analysis is in progress.

The transducers and automated data loggers that were installed at the three springs mentioned above, and in the alluvial boreholes, appear to be producing good data for water level, temperature, and conductivity.

The flow-integrated ISCO samplers were deployed in the TA-16 springs.

A preliminary site was selected for deep borehole CdV-R-15-3, the TA-15 plume-chasing well. A contract for drilling support was put in place. The paperwork required to begin

drilling was initiated: this included the environment, safety and health identification (ESH-ID) and memorandum of understanding (MOU) with the operating group. The decision was made by the Laboratory's Groundwater Integration Team (GIT) following consultation with NMED representatives to drill this borehole with a casing-advance system rather than with mud.

Ecological Risk Pilot– The ecological team evaluated the results of the ecological risk screening assessment that was conducted in accordance with "Screening Level Ecological Risk Assessment Methods" (April 1999). They also identified exposure model issues and data issues that will be addressed by the ecological risk assessment problem formulation for Cañon de Valle.

CMS Bench and Pilot Studies–Bench and pilot studies continued in collaboration with the Innovative Treatment Remediation Demonstration (ITRD) Program. The ITRD HE program is focused on two DOE sites: LANL and Pantex. Four studies are ongoing under the auspices of ITRD, all of which may benefit the PRS 16-021(c) CMS:

1. A study of the passive barrier technology of Stormwater Management, Inc., which is potentially useful for removing HE and barium from waters. Water from Cañon de Valle is being used in the study.
2. A study of chemical treatment of HE-contaminated soil using zero-valent iron (ZVI). This is being completed by the University of Nebraska/H&H Ecosystems using PRS 16-021(c) soil. This soil was taken from a moderately contaminated location within PRS 16-021(c) and does not constitute a RCRA-regulated hazardous waste (based on results from laboratory analysis).
3. A study of in situ anaerobic bioremediation of HE using gas-phase carbon additions. This study is being completed by Idaho National Engineering and Environment Laboratory (INEEL), together with Texas Tech University, using Pantex soil and a Pantex field site.
4. A study of ex situ anaerobic bioremediation of Pantex soils using the W. R. Grace process, which combines anaerobic bioremediation with a ZVI treatment.

Regarding the first study, LANL is waiting on feedback from NMED as to how to proceed with a pilot of the passive barrier technology. LANL representatives inquired about the status of the dredge-and-fill paperwork during a meeting with NMED on October 14, 1999. A follow-up meeting and presentation by Jim Phelan of Sandia National Laboratory (SNL) will be scheduled with NMED for early December.

Regarding the second study, the University of Nebraska/H&H Ecosystems study of ZVI remediation in building TA-16-224 was continued in October 1999. Samples from all six experiments were collected at 80 and at 100 days; these were submitted for screening analysis. Results from 10- and 20-day laboratory analyses were received; the breakdown results look good for RDX and TNT but poor for HMX (based on non-validated data). These results were discussed at the ITRD meeting, which was held at Pantex on October 5 and 6 of this year. During follow-up conference calls it was decided to reapply ZVI to attempt to enhance the breakdown of HMX.

Regarding the third study, the principal investigators from Texas Tech University reported on the installation of performance-monitoring and sampling wells at the October ITRD meeting. The investigators are having difficulty achieving anaerobic conditions in the subsurface using nitrogen gas additions.

Regarding the fourth study, results of the Joliet Army Depot bioremediation test studies were presented at the October ITRD meeting by Wayne Sisk of the Army Environmental Center. He reported on the W.R. Grace process, and several other bioremediation processes, including white rot fungus and use of cotton-gin extracts for TNT and tetryl. The W. R. Grace process appeared to be the most successful bioremediation process, however, it was more costly to implement than originally anticipated. Pantex representatives reported that a "cook off" among composting, the W. R. Grace process, and the ZVI process is planned for Pantex during the next few months.

Due to the equivocal results from the ZVI pilot test for HMX, LANL and ITRD personnel have decided to implement a series of tests of HE composting as a backup to the ZVI process. The first of these tests will be performed on HE-free material to identify appropriate composting amendment mixes for northern New Mexico environmental media.

Interim Measure **(IM)** – Weekly ER Project meetings were held to discuss IM Planning.

In addition, planning for the IM was discussed with ITRD representatives. They strongly recommended that soil blending was necessary, for safety purposes. LANL representatives broached this subject with NMED representatives during the October 14 meeting. NMED representatives requested a letter in which LANL formally requested the blending of the high-level HE soils prior to treatment.

Preparations for IM fieldwork continued. The ESH-ID paperwork for the IM was almost completed. ESH-20 determined that there are no NEPA concerns with the project. The excavation permit is complete. The site-specific health and safety plan (SSHASP) has been submitted to the internal reviewers and is awaiting signatures. The waste characterization strategy form (WCSF) and waste analysis plan (WAP) are still in internal review.

LANL personnel continued to investigate using naturally occurring radioactive materials (NORM) and authorized limit determinations to expedite disposal of low-level uranium-contaminated soils.

A peer review of a rough draft of the IM plan was completed. Finalization of the IM plan is pending resolution of key regulatory issues with NMED. These issues include: the contained in determination for F-listed solvents, the approval to blend D003 soils in-situ, and possible RCRA permitting issues.

LANL asked NMED representatives whether portions of the IM fieldwork could be started "at risk" prior to submittal and approval of the IM plan. NMED representatives indicated that a letter notifying of such a start would be required.

Public and Stakeholder Involvement– HEPS team members participated in the quarterly review of Hydrogeologic Workplan activities on October 14, 1999.

HEPS team members presented a technical talk on monitored natural attenuation of barium in Cañon de Valle at the Technology Information Exchange (TIE) meeting in Las Vegas, Nevada, on October 26, 1999.

HEPS team members presented a technical poster session on the hydrogeochemistry of the TA-16 springs at the annual meeting of the Geological Society of America in Denver, Colorado, on October 27, 1999.

Percentage of CMS Completed

LANL estimates that 35% of the CMS has been completed to date. Note that this percentage does not reflect the deep wells that will be drilled per the CMS plan addendum.

Problems Encountered/Actions to Rectify Problems

CMS Hydrogeologic Investigations

Problem (1) The installation of alluvial wells was delayed by difficulties with updating SSHASPs to full Integrated Safety Management (ISM) compliance.

Problem (2) The lack of a completed well at R-25 remains a significant concern to the TA-16-260 team.

Problem (3) The change from mud drilling to casing-advance air rotary drilling of deep borehole CdV-R-15-3 yields significant logistical issues related to drilling the borehole. LANL does not currently have access to sufficient drill rigs and drill string to support parallel completion of two deep (greater than 1000 ft) wells.

Action to Rectify Problem (1): HEPS personnel are working with other institutional representatives to expedite the approval of these ISM-compliant SSHASPs.

Action to Rectify Problem (2): The Canyons Team will try to successfully complete the well.

Actions to Rectify Problem (3): The drilling support facility will investigate three possible actions to speed drilling the deep boreholes: (1) drilling during two daily shifts rather than one; (2) obtaining additional drill string; and (3) procuring an additional dual air rotary rig.

CMS Bench and Pilot Studies

Problem (1) The ZVI pilot test is not currently working effectively for HMX.

Action(s) to Rectify Problem (1) The protocols for this test are being changed. Another round of ZVI will be applied to several subtests. Composting is being investigated as a backup to ZVI.

IM

Problem (1) Collection of samples for NORM determination is delayed due to difficulties with updating SSHASPs to full ISM compliance.

Action to Rectify Problem (1) HEPS personnel are working with other institutional representatives to expedite the approval of these ISM-compliant SSHASPs.

Key Personnel Issues

Morrison-Knudsen personnel, including Andy Crowder and Mark Everett, will support the drilling of deep borehole CdV-R-15-3.

Projected Work for November 1999

RFI Report and CMS Plan

- No work is scheduled for this month.

BMPs

- Inspection of existing BMPs following significant rain events will continue.

CMS Hydrogeologic Investigations

- Continued bromide sampling of springs.
- Weekly checking of water levels and presence of water in alluvial and deep wells.
- Sampling of flow-integrated ISCO samplers.
- Continued precipitation monitoring and sampling for stable isotopes.
- Continued Canyons-type "reach investigations" in Martin Spring Canyon.
- Installation of alluvial wells in Martin Spring Canyon.

- Continued preparation of paperwork for the readiness review for deep borehole CdV-R-15-3.

Ecological Risk Pilot

- Completion of the review of the ecological risk screening results and selection of recommended issues to be discussed with NMED and EPA to support the problem formulation.

CMS Bench and Pilot Studies

- Application of additional ZVI to test plots.
- Sampling of the ZVI treatment test for performance at 20-day intervals.
- Follow-up with NMED on discussion items and requested letters from the October 14, 1999 meeting.
- Initiation of composting tests on HE-free materials.

IM

- Completion of submittal draft of the IM plan (pending resolution of key regulatory issues).
- Resolution of IM issues with operating group.
- Completion of readiness review.

Public and Stakeholder Involvement

- No public or stakeholder involvement activities are anticipated for November 1999.