

**Response to the Notice of Disapproval for the 2012 Monitoring Plan for
Los Alamos and Pueblo Canyons Sediment Transport Mitigation Project,
Los Alamos National Laboratory, EPA ID No. NM0890010515, HWB-LANL-12-016,
Dated April 16, 2012**

INTRODUCTION

To facilitate review of this response, the New Mexico Environment Department's (NMED's) comments are included verbatim. The comments are divided into general and specific categories, as presented in the notice of disapproval (NOD). Los Alamos National Laboratory's (LANL's or the Laboratory's) responses follow each NMED comment. This response contains data on radioactive materials, including source, special nuclear, and byproduct material. Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to NMED in accordance with U.S. Department of Energy (DOE) policy.

GENERAL COMMENTS

NMED Comment

- 1. Based on the multiple missed sampling opportunities in 2011, in the future, stormwater samples must be removed from the sampler and the samplers restored to ready condition within one business day after any event that triggers the sampler. In addition, during dry periods with no appreciable precipitation, field crews must inspect all gages and samplers on a weekly basis in order to repair any observed malfunctions (e.g., accidental triggering of the sampler or silting of the sampling line). If field crews are unable to repair damaged equipment at the time of sample retrieval or sampler inspection, the equipment must be repaired within two business days of discovery of the need to make repairs.*

LANL Response

1. LANL evaluated the sample retrieval, repair, and inspection requirements specified in NMED's comment to determine the effect on the sampling objective that would have occurred in 2011. The sampling objective is to retrieve samples for chemical and radionuclide analyses from all discharges exceeding 5 cubic feet per second (csf) at E050.1, E060.1, and E109.9 and from four discharges and the largest discharge at other gaging stations. As shown in Table 1, the outcome of the sampling would have been largely unchanged. Retrieval of samples within 1 business day would not have allowed retrieval of more samples. No sample collection was impacted by repairs made beyond 2 d. One discharge not collected at E040 on August 5 might have been collected if an inspection had been performed during the previous week. Overall, increasing collection, inspection, and repair frequencies would have had little benefit in 2011. LANL recognizes the importance of maintaining samplers in an operationally ready condition. LANL is engaged in process improvements that will continue to reduce the length of time between sample collection and sample retrieval and that will improve LANL's ability to keep samplers and gages in an operational state.

Although LANL will make reasonable efforts to achieve the targets identified in NMED's comment, LANL is unable to commit to removing samples from samplers within 1 business day of collecting them, to inspecting all gages and samplers weekly, or to repairing damaged equipment within 2 business days of discovering the need for repairs. A number of health and safety considerations and LANL-specific restrictions prevent access to sites in Los Alamos and Pueblo Canyons watersheds

that make these sample retrieval, inspection, repair, and maintenance targets unrealistic. For example, fieldwork is not permitted at LANL when lightning is present, when red-flag fire conditions are present, when heavy rains in the upper Los Alamos and Pueblo watershed threaten flash flooding, when radiological control technician support is unavailable, when access has been impaired by road damage or blockage from flooding, when San Ildefonso denies access onto its land at E109.9, or when LANL Facility Operations denies access into its facility in DP Canyon to access equipment at E038 and E039.1.

Table 1
Summary of Impact to Sampling of Requested Retrieval, Repair, and Inspection Frequency

Gage Station	Retrieve Samples within 1 Business Day of Collection	Repair Damaged Equipment within 2 Business Days of Discovery	Inspect All Samplers on a Weekly Basis
E026	No effect	No effect	No effect
E030	No effect	No effect	No effect
E042.1	No effect	No effect	No effect
E050.1	No effect	No effect	No effect
E109.9	No effect	No effect	No effect
E055.5	No effect	No effect	No effect
E056	No effect	No effect	No effect
E055	No effect	No effect	No effect
E059	No effect	No effect	No effect
E060.1	No effect	No effect	No effect
E038	No effect	No effect	No effect
E039.1	No effect	No effect	No effect
E040	No effect	No effect	May have allowed collection of discharge on August 5

NMED Comment

2. *In Section 2.4, Damage and Repairs, of the 2011 Los Alamos/Pueblo Watershed Stormwater Performance Monitoring Report (2011 Report) the Permittees state, “[t]he flume at E109.9 was cleared of sediment 19 times during the 2011 monitoring season.” In addition, the Permittees list at least eight events at E109.9 that were negatively affected by silting of the sampler intake. The Permittees must evaluate the effectiveness of the flume at E109.9 and determine if modifications to the flume will help to avoid sediment trapping in the future.*

The Permittees must also evaluate the effectiveness of the 5-cfs triggering flow criteria to determine if a higher flow trigger, i.e., 10-cfs, 20-cfs, 30-cfs, is more appropriate for this location. In 2010 and 2011 combined, only one sample was collected during a flow of less than 30-cfs at E109.9. Increasing the flow trigger criteria would allow raising the sample intakes further from the surface of the stream, thereby reducing the chances of sampler intake silting.

The Permittees must perform similar evaluations, and possibly implement modifications, at other stations that have silting issues in order to minimize missed sampling opportunities. In the future, the Permittees must identify recurring problems and develop solutions to mitigate the problems within the same stormwater sampling season.

LANL Response

- The silting at E109.9 was caused primarily by the effects of the Las Conchas fire on Guaje Canyon, which transported ash- and sediment-laden runoff to E109.9 numerous times in 2011. LANL expects much of the fire-related sediment from Guaje Canyon to have been transported in 2011, given previous experience after the 2000 Cerro Grande fire in which 90% of the fire-related sediment was transported from burned areas the year after the fire, and suspended sediment concentrations (SSCs) at upper boundary stations returned to pre-fire levels within 5 yr. However, 13% of the upper Los Alamos watershed was classified as high to moderate burn severity from the Las Conchas fire, and a major storm event did not occur over these burn areas during 2011. Therefore, LANL expects to find further sedimentation issues from upper Los Alamos watershed during the 2012 monitoring period. LANL plans to continue its efforts to remove sediment from the stilling well and flume at E109.9 after each storm event, as needed and is installing a Siemens Milltronics Ultrasonic Probe to replace the stilling well to trigger sampling and to replace the bubbler as a secondary stage measurement, thus avoiding sedimentation issues with the stilling well and bubbler. LANL will continue to assess making modifications to the concrete flume and channel at E109.9 to avoid sediment trapping. No silting issues occur at other Los Alamos/Pueblo stations.

At station E109.9, the Buckman Direct Diversion (BDD) memorandum of understanding (MOU) (DOE and BDD Board 2010, 206259) states, "The samplers shall be capable of collecting samples from flows greater than 5 cfs." Therefore, although LANL can evaluate the effectiveness of alternate flow triggers, any modification to the 5 cfs flow trigger would require approval by BDD and DOE. Because intake silting at E109.9 does take place frequently (particularly last year after the Las Conchas fire), LANL has recommended to BDD that the triggering discharge for sample collection be increased from 5 cfs to 10 cfs. If the BDD agrees, LANL will increase the height of triggering discharge from 5 cfs to 10 cfs. The table below presents the frequency of potential sampling for each year since E110/E109.9 was established, and a triggering discharge of 10 cfs seems reasonable.

Table 2
E110/E109.9 Frequency of Potential Sampling

Year	5 cfs	10 cfs	15 cfs	20 cfs
2003	17	8	4	5
2004	3	2	1	1
2005	12	9	6	4
2006	12	6	4	4
2007	3	1	1	1
2008	2	2	2	1
2009	2	0	0	0
2010	4	4	4	4
2011	20	16	13	12

LANL also proposes to increase the trigger discharge at E038 because of the large amount of potential sampling associated with a 10-cfs threshold. The table below presents the frequency of potential sampling for each year since station E038 was established. With the exception of drought years 2001–2003, a triggering discharge of 40 cfs seems reasonable. The 2012 monitoring plan was revised to change the trigger flow at E038 to 40 cfs.

Table 3
E038 Frequency of Potential Sampling

Year	10 cfs	20 cfs	30 cfs	40 cfs	50 cfs
2000	19	15	12	11	10
2001	5	3	3	3	3
2002	9	7	7	3	2
2003	12	12	7	5	4
2004	12	10	9	9	6
2005	26	20	19	17	15
2006	27	21	14	9	7
2007	22	17	14	14	11
2008	19	13	10	9	8
2009	23	17	13	10	7
2010	18	16	13	11	9
2011	13	7	7	6	4

LANL plans to develop performance metrics and track them such that recurring problems can be identified and solutions developed to mitigate issues within the current monitoring period.

NMED Comment

- In Section 3.2, Water and Sediment Transmission, of the 2011 Report, the Permittees state that, “the wide open channel makes it difficult to develop a reliable rating curve” for Guaje Canyon. Although difficult, it is possible. The Permittees must establish a rating curve for the E099 gage in order to estimate flow discharge from Guaje Canyon.*

LANL Response

- LANL surveyed station E099 in March 2012 and is in the process of developing a rating curve for this station for the 2012 monitoring period.

SPECIFIC COMMENTS

NMED Comment

4. Section 3.0, Monitoring Stormwater Runoff, Page 4, 1st paragraph

Permittees’ Statement: “As directed in the approval with modifications for the 2011 monitoring plan (NMED 2011, 203705), sampling was conducted in Graduation Canyon during 2011. The results of these analyses were reported in the March 2012 “Stormwater Performance Monitoring in the Los Alamos/Pueblo Watershed during 2011” (LANL 2012, 211396). Continued monitoring at this location is not proposed.”

NMED Comment: The data from this location was not evaluated in the Report and no reason is given in the Plan to discontinue sampling. The average level of PCBs in the suspended sediment at this

location in 2011 is the second highest of all the locations monitored and is second only to that below SWMU 01-001(f). Continue to monitor at this location. The Permittees may reduce the analytical suite to PCBs and SSC.

LANL Response

4. LANL will continue monitoring in Graduation Canyon and will reduce the analytical suite to polychlorinated biphenyls and SSC. The 2012 monitoring plan has been revised to include this sampling.

NMED Comment

5. Section 3.2, Sampling and Analysis, page 5, 2nd paragraph

Permittees' Statement: "Evaluation of stormwater data from the LA/Pueblo watershed and other parts of the Pajarito Plateau (e.g., LANL 2011, 207316) indicate that gross alpha, gross beta, radium-226, and radium-228 results are dominated by background conditions and are not useful for monitoring potential Laboratory impacts on stormwater quality. Therefore, the Laboratory proposes to discontinue these analyses in 2012 for the evaluation of sediment transport mitigation."

NMED Comment: Continue to monitor for gross alpha, gross beta, radium-226, and radium-228 only at E050.1, E060.1, and 109.9. Continue monitoring for filtered radionuclides, including Sr-90, at E0109.9 only. The need to monitor for radionuclides may be re-evaluated after the DOE-Buckman Direct Diversion Board memorandum of understanding discontinues the requirement and the effects of the Las Conchas fire have been adequately assessed.

LANL Response

5. LANL will continue to monitor for gross alpha, gross beta, radium-226, and radium-228 only at stations E050.1, E060.1, and 109.9 and will monitor for filtered radionuclides, including strontium-90, at E0109.9 only. The need to monitor for radionuclides will be reevaluated after the requirement is discontinued per the DOE and BDD MOU and the effects of the Las Conchas fire have been adequately assessed.

NMED Comment

6. Section 4.0, Reporting, page 6

Permittees' Statement: "Previous plans proposed reporting analytical and discharge data for each water year (October to September) and accompanying discussion, annually on February 28. Beginning in 2011, the Laboratory also included runoff events in October in the annual report because fall storms can be important in the total sediment transport in some years, and providing a complete set of calendar-year events seemed more appropriate than waiting to report on October events until the following year's report. Because the monitoring period has been extended by 1 mo, the Laboratory proposes to extend the reporting date by 1 mo as well, to March 31 of each year, to allow a more complete evaluation of data. This report delivery schedule will allow time to combine analytical data from off-site laboratories with finalized discharge data from the gage stations, the latter of which typically requires 3 mo for data processing (e.g., January 31 for discharge data obtained in October of the previous calendar year) and sufficient time for data evaluation."

“Because of the proposed changes to the annual report date to March 31, the Laboratory proposes also to change the date for the annual update of the monitoring plan to April 10. This later date to submit the plan will allow insights gained from evaluation of the previous year’s data to be better incorporated into the plan.”

NMED Comment: *The submittal dates for both the annual report and the annual update to the monitoring plan were negotiated with the Permittees in 2011. The dates were selected based on the ability of NMED and the Permittees to review and revise the updates to the monitoring plan based on the information from the previous year’s monitoring report within a timeframe that allowed the Permittees to implement changes before the start of the next sampling season.*

Later submittal dates would return both NMED and the Permittees to the same situation that initiated the change in submittal dates in 2011. The Permittees must submit the annual monitoring report by February 28 of each year and the annual update to the monitoring plan by March 10 of each year.

LANL Response

6. LANL will submit the annual monitoring report by February 28 of each year and will submit the annual update to the monitoring plan by March 10. The 2012 monitoring plan has been revised in incorporate these dates.

ADDITIONAL MODIFICATIONS TO THE MONITORING PLAN

The 2012 monitoring plan was also revised to incorporate two additional modifications. The sample volume collected for analyses of gamma spectroscopy radionuclides has been separated from sample volume collected for analyses of isotopic plutonium, isotopic uranium, and americium-241. Two liters of stormwater (if available) will be provided for analyses of isotopic plutonium, americium-241, and isotopic uranium. Tables 3.2-3, 3.2-4, 3.2-5, 3.2-6, and 3.2-7 of the monitoring plan have been modified to provide additional volume and separate analyses. Separating analyses and providing additional volume will support the analytical laboratory’s analyses of these radionuclides in samples containing elevated sediment concentrations.

Particle-size analyses will be conducted for selected samples collected for SSC analyses to support characterization of chemical and radionuclide transport in sediment-laden stormwater. Particle size will be determined in as many as three samples collected simultaneously with samples collected for chemical and radionuclide analyses. Tables 3.0-1, 3.2-1, 3.2-3, 3.2-4, 3.2-5, 3.2-6, and 3.2-7 of the monitoring plan have been modified to include particle-size analyses.

REFERENCES

- DOE and BDD Board (U.S. Department of Energy and Buckman Direct Diversion Board), May 12, 2010. “Memorandum of Understanding between the U.S. Department of Energy and the Buckman Direct Diversion Board Regarding Water Quality Monitoring,” Santa Fe, New Mexico. (DOE and BDD Board 2010, 206259)