Los Alamos
NATIONAL LABORATORY
EST.1943

Environmental Programs
P.O. Box 1663, MS M991
Los Alamos, New Mexico 87545
(505) 606-2337/FAX (505) 665-1812

Copy

National Nuclear Security Administration
Los Alamos Site Office, MS A316
Environmental Restoration Program
Los Alamos, New Mexico 87544
(505) 667-4255/FAX (505) 606-2132

Date: May 13, 2008
Refer To: EP2008-0179

Rebecca Wurzburger, Chair
Buckman Direct Diversion Board
200 Lincoln Avenue
P. O. Box 909h
Santa Fe, NM 87504

Subject: Los Alamos National Laboratory Support to the Buckman Direct Diversion Project

Dear Councilor Wurzburger:

The U.S. Department of Energy (DOE) and Los Alamos National Laboratory (the Laboratory) want to emphasize our commitment to a successful Buckman Direct Diversion (BDD) Project. Since the time of the BDD Board's November 1, 2007, letter to DOE and the Laboratory, the Laboratory has had frequent in-depth technical and programmatic discussions with the BDD Project staff and has provided comprehensive data sets to the BDD staff and their consultants for independent evaluation to assist in their application to the BDD Project. Additionally, a field tour focusing on past and ongoing Laboratory actions and their relation to the BDD Project and the Buckman well field was provided for BDD Project staff accompanying Mayor Coss and Santa Fe County Commission Chair Sullivan. The tour also included representatives from the New Mexico Environment Department (NMED) management and staff.

In the BDD Board's letter, you identified issues regarding pathways for contaminants that originated from Laboratory activities with respect to potential impacts to the BDD Project and to the Buckman well field. You also requested the Laboratory's commitment to support a successful BDD Project and requested six specific actions for DOE and the Laboratory to fund and implement. The pathway issues will be discussed below, and the attachment to this letter includes the BDD Board's six requests and our response to each.

Work on some of the BDD Board's requested actions has already begun, as summarized in the attachment. Our objective is to be open and supportive on questions raised by the BDD Project staff and to support their actions to advance this important water-supply project. As of this writing, both DOE and the Laboratory continue to support the BDD Project.

In your letter you identified issues with three different pathways by which Laboratory-originated contaminants have impacted ground and surface waters used by the City and County of Santa Fe as a drinking-water source. They are summarized here (in italics) with a response that is consistent with the data and presentations that have been made available to your staff and a perspective as to its impact to drinking-water production.

1. *Buried transuranic and other radiological contaminants in the Rio Grande sediments deposited in the 1940s through the 1960s in the former river channel (slough) located immediately upstream of the BDD river diversion site.*

   Although very low concentrations of contaminants have been documented as present in deposits near (and possibly at) the diversion project site, they are only partly of Laboratory origin, and available data indicate their levels are significantly below conservative risk levels established for construction workers. However, the Laboratory is working with BDD Project staff to provide analytical data and interpretation support to evaluate potential construction worker risk, as described in the attached response to the BDD Board's comment #3

2. *Contaminants in waters of the Rio Grande*

   Certain contaminants of Laboratory-origin have been historically measured in the Rio Grande and can still be detected following infrequent precipitation runoff events that flow to the Rio Grande. However, the measured concentrations are low, and Dr. Kerry Howe's report showed them to be generally below drinking water standards even in the unfiltered/untreated form. Dr. Howe's report further indicates that the planned treatment design for the plant will be effective at ensuring that treated water will meet all applicable regulations. Please note (as discussed in the response to the BDD Board's comment #5) that contaminants from other sources (including plutonium from global fallout and polychlorinated biphenyls from sources upstream of the Laboratory) can be measured in the Rio Grande. The issue of contaminants in the Rio Grande and the implications are discussed further in responses to the BDD Board's comments #4 and #5.

3. *Contaminants that have flowed downward and reached the regional aquifer that underlies LANL and provides water to the Buckman well field.*

   Issues of potential or known contaminant migration from Laboratory sites to the groundwater are addressed in accordance with the Compliance Order on Consent (Consent Order). The Consent Order requires that contaminant migration be addressed very near the release site to ensure protection against potential groundwater impacts. The Laboratory also has a large number of monitoring wells in three groundwater zones, including the regional aquifer, to monitor for potential impacts and for trends in known contamination while investigations are conducted to support remedy selection. The monitoring program includes numerous springs in White Rock Canyon, wells that address potential migration toward the Buckman well field, and monitoring directly in the Buckman water-supply wells. This network will also be enhanced over the next few years with additional wells.

The Laboratory is aware of the concerns and misinterpretations being expressed in various venues regarding the monitoring data derived from sampling of wells within the Buckman well field. Our detailed technical evaluation of the entire body of data from the well field does not indicate the presence of Laboratory-origin contaminants, which is consistent with the City of Santa Fe's own evaluation, presented in the City's 2006 annual water-quality report. Multiple lines of evidence, including notably different groundwater chemistry and ages between groundwater beneath Laboratory and in the Buckman well field, also support this interpretation.

However, because of the proximity of the Laboratory to the well field, both DOE and the Laboratory are committed to effective and complete groundwater monitoring to ensure protection of the water supply. We will also continue to work with local agencies to develop a more in-depth understanding of the complex groundwater hydrology related to production zones and potential contaminant pathways in the Buckman well field.

DOE and the Laboratory understand the importance of the BDD Board's need to address public and stakeholder concerns, the drivers and schedule for the diversion project, and the importance for the project to address key questions pertaining to the Laboratory. We sincerely hope that the technical perspectives provided by the Laboratory and by other independent parties using Laboratory and other independently acquired data will provide a level of confidence to the Board that the BDD Project can be successfully implemented.

If you have any questions, please contact Danny Katzman at (505) 667-6333 (katzman@lanl.gov) or Mat Johansen at 665-5046 (mjohansen@doeal.gov).

Sincerely,

for Susan G. Stiger, Associate Director
Environmental Programs
Los Alamos National Laboratory

Sincerely,

George J. Rael, Assisstant Manager
Environmental Operations
Los Alamos Site Office

SS/DG/PH/DK:sm

Attachment: a/s

Cy: Laurie King, EPA Region 6, Dallas, TX
Steve Yanicak, NMED-OB, White Rock, NM
Tom Skibitski, NMED-OB, Santa Fe, NM
David Coss, Mayor, City of Santa Fe
Rick Carpenter, City of Santa Fe, Sangre de Cristo Water Division
Ron Curry, Secretary, New Mexico Environment Department
Alison Bennett, DOE-LASO (date-stamped letter emailed)
Mat Johansen, DOE-LASO, MS A316
Danny Katzman, EP-LWSP, MS M992
Paul Huber, EP-LWSP, MS M992
Susan G. Stiger, ADEP, MS M991
Alison M. Dorries, WES-DO, MS M992
Peggy Reneau, WES-DO, MS M992
EP-LWSP File, MS
RPF, MS M707
IRM-RMMSO, MS A150

Attachment

The Buckman Direct Diversion (BDD) Board's comments are presented below as written and shown in bold. The Laboratory's responses follow each comment.

1. Stop migration of Laboratory contaminants to the Rio Grande and to groundwater.

Contaminant migration in surface water

Los Alamos National Laboratory (the Laboratory) recently submitted a work plan to the New Mexico Environment Department (NMED) for a project to reduce sediment and contaminant migration in the Los Alamos and Pueblo Canyon (LA/P) Watershed. The work plan was submitted pursuant to a requirement included in a letter from NMED dated August 23, 2007, and is driven by polychlorinated biphenyl (PCB) contamination. The proposed approach focuses on the trapping of sediments contained in high-flow storm events because the PCBs and other known contaminants in the LA/Pueblo Watershed strongly adsorb to sediment and organic particles.

The Laboratory has conducted extensive contaminant characterization in the LA/P Watershed addressing surface water, sediment, biota, and shallow alluvial, perched intermediate, and deep regional groundwater. The reports on this work have included human health and ecological risk assessments, both of which show that the levels of contamination are within acceptable limits for all NMED, U.S. Environmental Protection Agency (EPA), and U.S. Department of Energy (DOE) risk-based criteria. Additional independent assessments (Risk Assessment Corporation and Inter-Agency Flood Risk Assessment Team) have been conducted that address the potential risks associated with contaminants in post-Cerro Grande floods. These studies have been provided to staff on the BBD Project. These additional studies support the initial assessments and show that the risk levels are within applicable risk-based criteria.

The Laboratory is in compliance with the federal Clean Water Act and New Mexico Water Quality Act requirements. The Laboratory is continuing to revegetate areas of the watershed and to take other measures to stabilize soils and to reduce the volume and velocity of flows through Laboratory canyons. The LA/P Watershed is listed as impaired (303d list) for several constituents as a result of multiple sources, including Laboratory activities, natural sources, and municipal sources. The watershed is listed for PCBs, mercury, selenium, gross alpha, radium-226/228, and aluminum. This listing triggers a total maximum daily load (TMDL) assessment that identifies sources/causes of the impairment and prescribes a TMDL that is allowed for the watershed. The TMDL assessment is being conducted by the NMED Surface Water Bureau with an expected completion date in 2009. The contaminant transport mitigation work plan described above proposes work that is aligned with the types of actions that will follow from the TMDL allocations.

Contaminant migration in groundwater

The Laboratory is conducting groundwater investigations at sites across the Laboratory. These groundwater investigations are being conducted under the process set forth by the Compliance

Order on Consent (Consent Order) between NMED and DOE (and the Laboratory contractor). The goal of these investigations is "to determine the need for, and scope of, corrective action[s]." These investigations and the potential corrective actions are intended to address groundwater contamination at or near the source and therefore to minimize or eliminate the potential for contaminants to migrate away from sources at concentrations that might exceed standards or pose unacceptable risk to the public or environment. In addition, the Laboratory has implemented an aggressive program to control potential sources of contamination in permitted outfalls through reduction, consolidation, and improved treatment processes at remaining outfalls and is in full compliance with applicable regulations.

Further, the Laboratory conducted a series of five area-specific groundwater monitoring well network evaluations that consider a wide variety of factors in assessing the adequacy of the monitoring network. Among the factors considered are spatial distribution, well construction (packer isolation across multiple screens, filter pack and annular construction, etc.), geochemical performance, and screen position and length. All the factors were considered in the context of site-specific objectives for each of the areas (e.g., Mortandad Canyon, LA/Pueblo, Technical Area 54, Sandia Canyon, etc.). The monitoring objectives include having 95% confidence of detection of potential contaminants before they arrive at a water-supply well or at the Laboratory boundary. NMED has approved all the assessments. The evaluation reports have recommended some well rehabilitation (which is nearing completion) and drilling approximately 17 new wells. In combination, the rehabilitation and new wells will improve the ability of the monitoring network to meet the detection objectives described above and to support monitoring for nature and extent and fate and transport of contaminants. Based on the approved network assessments, it is expected that the completed network and the ongoing monitoring of water-supply wells in the Los Alamos County and Buckman well fields will provide comprehensive monitoring for potential off-site contaminant migration or impacts to water-supply wells.

The Laboratory is in the process of completing a package of information for the City of Santa Fe Water Division that will illustrate the protective monitoring system and provide a communication tool.

2. Properly monitor the transport of legacy contaminants in both the surface water and groundwater flow systems.

Under the Consent Order and the Federal Facility Compliance Agreement with the Environmental Protection Agency (EPA), the Laboratory is implementing a comprehensive monitoring network of stormwater, surface water base flow, and all groundwater. This monitoring network is among the most comprehensive networks at a facility of the scale of the Laboratory.

However, additional monitoring will be conducted that will directly serve the BDD Project, including the following:

- an increase in the sampling frequency of Rio Grande water above the diversion site from annual to bimonthly

- performance monitoring associated with the structures (the low-head weir in LA Canyon and the grade-control structure in Pueblo Canyon) implemented for the sediment and contaminant transport mitigation project
- an increase in monitoring frequency for water-supply wells within the Buckman well field
- the potential addition of a new well specifically targeted toward protective monitoring of the Buckman well field

3. Measure the radioactive and toxic contamination of buried sediments containing higher concentrations of post–World War II Laboratory legacy contaminants now buried in the slough upstream of the BDD diversion site.

At the request of the BDD Project staff, the Laboratory prepared a work plan to obtain analytical data from sediment deposits at the BDD Project site to support an assessment of construction worker safety or potential public exposure and to ensure that concentrations of Laboratory-derived contaminants do not exceed regulatory requirements in the context of the construction project.

The Laboratory understands that the City of Santa Fe has decided to conduct the drilling operations at the construction site using its own contractor and has also prepared its own work plan for characterization of the site. The Laboratory continues its commitment to support related aspects of the project, including field support, analytical services through our contracts with analytical laboratories, secondary data validation, and interpretation (if requested).

The Laboratory's commitment to support analysis of samples for the characterization of the construction site is contingent on the support being consistent with the objective to ensure worker safety as stated in the Record of Decision.

4. Provide an early warning system so that the BDD Project can temporarily cease diversion of any water from the Rio Grande when the Rio Grande is expected to contain elevated levels of contaminants of Laboratory origin.

The Laboratory is in compliance with applicable surface-water regulations. However, as stated in the BDD Board's November 1, 2007, letter, the Laboratory commits to providing an early-warning system to aid the BDD Project in its decision to periodically and temporarily cease diversion of water from the Rio Grande. The specific design of the system and its "link" to the diversion site will require some design development. Interaction with key representatives of the BBD Project during the design phase is expected. It is the Laboratory's goal to have this system in place before the diversion project comes online.

The Laboratory notes that the draft report on "Effectiveness of the Proposed Santa Fe City/County Water Treatment Plant for Removing Radiological and Other Specific Contaminants," prepared by Dr. Kerry Howe (dated January 30, 2008), states that the planned treatment technology is expected to be adequate to address the types and levels of constituents historically measured in the Rio Grande. As stated in the report, Dr. Howe's determination was based on three tiers of considerations: (1) concentrations in the river that are nearly always below

regulated levels, (2) an operation strategy that can prevent water possibly containing higher levels of contaminants entering the plant, and (3) a robust treatment process that removes or could be modified to remove all the contaminants of interest.

5. **Monitor the mass of any Laboratory-origin contaminants diverted with BDD raw water supplies and account for that mass in water treatment plant residuals and treated drinking water.**

The Laboratory does not agree that there should be a requirement for the BBD Project or the Laboratory to uniquely monitor the mass of Laboratory-origin contaminants or uniquely account for that mass in either water treatment plant residuals or in the treated drinking water. One consideration is that surface water from the Rio Grande, as well as the LA/P Watershed, has numerous constituents of potential concern that are derived from sources other than the Laboratory. For example, suspended sediments in the Rio Grande (and therefore taken into the diversion) include a substantial contribution of radionuclides derived from natural sources. In addition, roughly equal amounts of very small quantities of plutonium from Laboratory and global fallout move annually in the Rio Grande past the diversion site. The Laboratory has provided BBD Project staff with this information. This knowledge of "natural" or otherwise unidentified sources of potential contaminants should also play an important role in the City of Santa Fe's program for managing sludge waste or sediment returned to the Rio Grande. Waste management decisions should be "concentration" based, not "mass" based. Most important is that the proposed treatment methods are expected to fully treat the type of contaminants that may be found in the river, as described by Dr. Howe in his draft report, regardless of the source.

As for monitoring of treated drinking water, it is the Laboratory's understanding that the City of Santa Fe already requires monitoring treated drinking water under the Safe Drinking Water Act.

In summary, the Laboratory recommends that the BBD Project (1) characterize the sludge as necessary to support the waste acceptance criteria for the selected disposal facility and (2) sample the return sediment to meet the criteria set forth in the pending National Pollutant Discharge Elimination System permit for the return sediment.

6. **Provide funding for the BDD Board to retain independent peer review by qualified persons with regard to matters of Laboratory origin contamination of the public drinking water resources of Santa Fe County and the City of Santa Fe.**

DOE and Laboratory support this request and concur with the benefit of having an independent peer review. As part of this commitment, the Laboratory requests that it be allowed to concur with the BDD Project's selection and to jointly agree on the level of support to be provided by the independent peer reviewer(s). The Laboratory's interest is to review the qualifications and scope of the peer reviewers before committing funds for this purpose.