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August 1, 2006

Mr. David Cobrain
State of New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East
Building One
Santa Fe, New Mexico 87505-6303



Reference: Work Assignment No. 06280.100; State of New Mexico Environment Department, Santa Fe, New Mexico; LANL Risk Assessment Support; Review of CCNS Comment Concerning Subsistence Farming Scenario at the 260 Outfall, Task 2 Deliverable.

Dear Mr. Cobrain:

This letter addresses the above-referenced work assignment and provides discussion on a comment received from the Concerned Citizens for Nuclear Safety (CCNS). Summarizing the comment, CCNS would like to see all of Los Alamos National Laboratory (LANL) cleaned up to subsistence farming levels. As noted in your email and the email received from Darlene Goring (both date July 27, 2006), the concern by NMED is whether or not the comment is relevant to the 260 Outfall and to other sites at LANL. In addition, there is concern as to how this issue has been handled at other sites in the Department of Energy (DOE) complex (if at all).

In reading the below comment, it appears that several issues are being raised in this single comment. In an attempt to understand the comment and provide a response, the comment was divided into three separate issues:

1. Is an industrial land use scenario appropriate for the 260 Outfall?
2. How is LANL addressing off-site migration of known contaminants and what corrective measures are in place to ensure that off-site migration does not occur?
3. Is the LANL site-wide Risk-Based End Study (RBES) acceptable?

The following will address the above three questions along with provide some discussion of the New Mexico Environment Department (NMED) questions outlined in the emails.

Is an industrial land use scenario appropriate for the 260 Outfall?

When looking at a site and evaluating the level of remediation, consideration must be given to what the future use of the site will likely be, location of the site (e.g., is it in an industrial area), technical feasibilities to remediation, and to some extent, cost. This is re-iterated by EPA in that



EPA directives indicate that future land use assumptions allow the baseline risk assessment and the feasibility study to be focused on developing practicable and cost-effective remedial alternatives, and that these alternatives should lead to site activities which are consistent with the reasonably anticipated future land use. (U.S. EPA, OSWER Directive No. 9355.7-04) Given this, residential land use (including farming) is not always the most plausible or appropriate land use alternative.

The 260 Outfall is located on top of a mesa in the LANL complex. The area surrounding the outfall is industrial use and LANL does not have any plans to discontinue the industrial setting or transfer ownership of the land from DOE control. Based on the location of the 260 Outfall, continued industrial use appears to be appropriate. However, the CCNS comment appears to be more concerned with the areas affected by contamination from the outfall than with the outfall itself. Contamination from the outfall affects the canyon below the mesa where the outfall is located (Canyon de Valle and Martin Springs). The larger question is whether an industrial scenario is appropriate for Canyon de Valle and Martin Spring. These two areas are located within the LANL complex. Soil structure is not overly developed and underlying soil is comprised of tuff-like materials. Depth to groundwater is considerable, so use of groundwater as a source for irrigation water is not likely. Surface water is present in the canyon and from Martin Spring, however, flow rates would not likely be sufficient for irrigation to sustain crops. Further, the canyon is narrow. Given the above, and the fact that LANL is an active facility with no near-term intentions of closing, it is unlikely that the canyon area would be used for industrial or residential uses. The most plausible land use scenario is recreational. However, an industrial land use scenario is more conservative than a recreational scenario and was evaluated and deemed an appropriate land use. It is agreed that an industrial risk-based cleanup is the most plausible and therefore appropriate for the 260 Outfall and associated areas. In addition, remediation to industrial levels is consistent with EPA guidance.

How is LANL addressing off-site migration of known contaminants and what corrective measures are in place to ensure that off-site migration does not occur?

As noted in the discussion of the first question, it appears the CCNS is concerned with off-site transport of contaminants. Off-site migration could occur via the re-suspension of contaminant in soil and subsequent dispersion as particulates, sediment and/or surface water transport, and through groundwater. While industrial levels may be sufficient for the canyon, the question of "is there migration of contamination off-site that results in levels above residential levels" should be raised. For the 260 Outfall, contaminant transport was to the alluvial surface and subsurface system in Canon de Valle and Martin Spring Canyon. As noted in a clarifying email from Ms. Goering, "Sediment samples were originally collected the entire length of Canon de Valle. However, the Corrective Measure Study (CMS) will include the first 4000 feet of the canyon bottom starting from the confluence of the 260 drainage. The furthest alluvial groundwater well is located 3000 feet down canyon. Martin Spring Canyon sediments were investigated to approximately 200 feet from the head of the canyon. The furthest alluvial groundwater well is located 4500 feet down canyon. The 260 Outfall and the contaminated alluvial system are located approximately 10 miles upstream of the laboratory boundary (Rio Grande). The

possibility of offsite migration hasn't been investigated. Because Canon de Valle is a tributary of Water Canyon, that will be part of the Canon de Valle/Water Canyon investigation next year."

Thus, further investigation should be conducted to see if LANL has adequately characterized downstream and down-canyon contaminant levels. In addition, contaminant migration should be carefully reviewed to see if there is potential for any off-site migration of contamination. If there is off-site migration, sampling should be conducted to ensure residential levels and a monitoring plan in place to periodically check to ensure residential levels are not exceeded.

The question also concerns off-site migration from LANL as a whole. Prior to the Cerro Grande fire in May 2000, natural vegetation acted as a stabilizing mechanism for contamination in surface soil. With the loss of vegetation, soil erosion and wind dispersion increased the potential for contaminant migration. Although events, such as a fire, can change the dynamics of an area, it is not clear that the added transport mechanisms induced by the fire resulted in off-site contamination above residential levels or that clean up to industrial levels would translate into undue risk to off-site receptors. Industrial levels are acceptable, as noted by EPA policy, however, LANL should address the site-wide monitoring plan that will provide data to verify that off-site migration of contaminants is not occurring and resulting in levels above residential risk-based levels. Monitoring plans should be established for all plausible media, including soil, air, and water.

Is the LANL site-wide Risk-Based End Study (RBES) acceptable?

In working with EPA directive 9355.7-04, DOE has drafted policy concerning risk-based end states stating, "End states should be based on an integrated site-wide perspective (including the current and future use of surrounding land), rather than on isolated operable units or release sites. This is not a license to do less at individual release sites, but rather to better link narrowly considered decisions to a larger perspective. Multiple land use will be appropriate at some sites." (DOE Policy 455.1) In conjunction with this policy, DOE has directed that each DOE complex develop a Risk-Based End Study (RBES) in which overall site goals for final land use is addressed. According to the DOE Policy, the RBES should have input agreement from agencies (DOE, EPA, and State) as well as citizen advisory groups. LANL has posted a draft RBES identifying that the site will be closed under a mixture of industrial/commercial, recreational, and residential use.

Based upon the CCNS comment and other comments addressing the LANL RBES obtained on-line, it appears that consensus on the LANL RBES has not been obtained. The lack of finalization of the LANL RBES does not preclude remediating sites to industrial use. The following addresses some other DOE sites and identifies parallels between LANL and these sites.

1. Rocky Flats

Rocky Flats was a DOE site with both radiological and chemical contamination. The site was slated for closure and remediation has occurred. The site was remediated to levels

acceptable as a wildlife preserve. For Rocky Flats, ecological risk drove remediation over human health risk. While DOE retains legacy management and continues monitoring, the site has been transferred to the Department of Fish and Wildlife. CCNS provided a link to a report addressing the subsistence farming scenario at Rocky Flats. The paper provides an argument that the subsistence farming or ranching scenario should have been conducted at Rocky Flats. Rocky Flats has been approved and has been closed under a wildlife management scenario, with land use restrictions in place restricting the site to the designated use.

2. Fernald

Similar to Rocky Flats, Fernald is undergoing site closure, for both hazardous and radiological contamination. DOE will retain legacy management of the site. What is interesting about this site is that high levels of waste in soil overlay a sole source drinking aquifer. Waivers have been obtained to allow for on-site disposal of this waste, with monitoring systems to ensure protection of the aquifer. In addition, Fernald is located in the middle of an area where the predominant land use is farming and light industrial use. Despite the location in a farming community, EPA Ohio, EPA, DOE, and the citizen advisory board all agreed that a farming scenario was not appropriate for Fernald, and the site is being closed under a restricted, industrial use scenario with institutional controls.

Draft Risk-Based End State Vision – Fernald Closure Project (2003).

http://www.ohio.doe.gov/site/rbes/FernaldDraftRBESandVariance_11-11-03.pdf

3. Hanford

The Hanford site is a very complex site with several areas that will never be sufficiently clean up to be returned to any type of use, industrial or other. There are different standards for chemical constituents and radiological contaminants. These fall under different programs within the State, although currently Hanford is being clean up utilizing “mixed waste” criteria with the Resource Conservation and Recovery Act (RCRA) being the driving regulatory criterion and following a Tri Party Agreement.

At many of the sites at Hanford, negotiations as to the level of clean are still underway. Plans have been submitted to clean several sites (including site 300) to risk-based industrial standards. However, similar to LANL, there is some opposition; specifically, the City of Richland would like level to be to residential levels.

There is major concern that groundwater could contaminate the Columbia River from underground highly radioactive waste tanks. DOE is in the process of building a specialized treatment system to glassify (vitrification) this waste.

So in general, Hanford is undergoing active cleanup, and land use identification for all sites has not been finalized. However, several sites have been remediated and approved to industrial levels or are targeted to be cleaned up to industrial levels.

Contact: Tim Hall 509-372-7908

4. Pantex

There are 10 solid waste management units (SWMU) that have been clean up to Texas Risk Reduction Standard 2, which are industrial/commercial levels requiring deed restriction and other institutional controls. The DOE site is working to stabilize the groundwater contamination and have controls in place to limit off-site migration of any groundwater plumes. It is unclear whether hazardous wastes are managed differently than radiological releases.

Contact: Pat Shanely 952-556-5587

5. Oak Ridge National Laboratory (ORNL)

The contact person, John Oweley, indicated ORNL is using industrial land use levels based upon a non-intrusive industrial worker. Groundwater remediation is being conducted to Federal Maximum Contaminant Levels (MCLs), which are not risk-based values. In addition, ORNL has a few sites with groundwater contamination where technological and/or cost issues prevent remediation to the MCLs. In these areas, a State variance has been obtained.

For off-site releases (mainly along the river), ORNL is using residential risk-based levels to evaluate contamination along with several institutional controls. For instance, fish consumption warnings and other warning postings to limit exposure of surface water. Similar to LANL, the main concern for off-site migration at ORNL is via surface water and sediments transport. In evaluating off-site contamination, residential or "free release" clean up levels are driving any remediation.

Contact: John Oweley 865-481-0995; for more technical issues contact Doug McCoy at the same phone number.

In looking at just a few other DOE sites, it appears that most sites are utilizing land use controls and cleaning up areas to industrial levels. This is consistent with the approach being taken or proposed by LANL. There does not appear to be any trend in utilizing a subsistence farming scenario and remediating entire DOE sites to these levels.

However, it appears that off-site migration of contaminants should be limited and that any contamination off-site should be monitored to ensure levels are within residential levels. It is clear that leaving industrial levels of contamination on site does not result in exceedance of risk levels off site.

CCNS Comment

"We object to the use of the industrial land use exposure scenario for the SWMU 16-021(c) human health risk assessment, which was approved by the Department on October 15, 1998. There have been several events at LANL that necessitate a re-evaluation of use of an industrial land use exposure scenario. Since the May 2000 Cerro Grande fire, more contaminants have left LANL property through surface water pathways. Because LANL has not conducted adequate surface water sampling, we do not know the extent of contaminant movement toward the Rio Grande. Storm Water FFCA. Therefore, because of the large amounts of contaminants that may be moving towards the Rio Grande, the Department must take a precautionary approach to the proposed remedy and require cleanup to a subsistence farmer exposure scenario. Further, considering the amount of taxpayer funding which paid for LANL to conduct an Interim Measures cleanup of this area in 2000 and 2001, we demand that the Department order the most protective cleanup possible, which we believe would be based on the subsistence farmer exposure scenario.

We support a subsistence farmer exposure scenario for all cleanups at LANL. The subsistence farmer exposure scenario assumes that adults, pregnant women, children and grandchildren will live on the land, drink the water and eat locally grown food now and in the future. The subsistence farmer scenario is described in Setting Cleanup Standards to Protect Future Generations: The Scientific Basis of the Subsistence Farmer Scenario and Its Application to the Estimation of Radionuclide Soil Action Levels (RSALs) for Rocky Flats, a report by the Institute for Energy and Environmental Research. The full report may be found at <http://www.ieer.org/reports/rocky/fullrpt.pdf>. We request that the Department review this report and in the response to comments explain why it has chosen to adopt or not adopt a subsistence farmer exposure scenario for the proposed remedy. We also request that the report be placed in the administrative record for this matter."

This draft deliverable was emailed to you on August 1, 2006 at David.Cobrain@state.nm.us and to Ms. Darlene Goering at Darlene.Goering@state.nm.us. A formalized hard (paper) copy of this letter deliverable will be sent via mail. If you have any questions, please call me at (303) 464-6525 or Ms. Paige Walton at (801) 451-2978.

Sincerely,



June K. Dreith
Program Manager

cc: Darlene Goering, NMED
Dallas/TechLaw Citrix files
Ms. Paige Walton, TechLaw (email)