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NEW MEXICO
ENVIRONMENT DEPARTMENT



Hazardous Waste Bureau

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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

December 2, 2009

David Gregory
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Department of Energy
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David McInroy
Remediation Services Deputy Project Director
Los Alamos National Laboratory
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**RE: APPROVAL WITH MODIFICATIONS
WORK PLANS TO PLUG AND ABANDON WELLS TW-2, TW-2A AND TW-2B
EPA ID #NM0890010515
HWB-LANL-GW-MISC**

Dear Messrs. Gregory and McInroy:

The New Mexico Environment Department (NMED) has received the United States Department of Energy (DOE) and the Los Alamos National Security, L.L.C.'s (LANS) (collectively, the Permittees) *Work Plans for Plugging and Abandoning Wells TW-2, TW-2a, and TW-2b* (Plans) dated November 6, 2009 and referenced by EP2009-0596, EP2009-0597, and EP2009-0598, respectively. NMED has reviewed the Plans and hereby issues this approval with modifications.

Casing Extraction

The Permittees must attempt to extract all of the casing from each well followed by pressure grouting of the entire open borehole to ensure that all perched zones are adequately sealed off from the regional aquifer and to prevent mixing between perched zones. If the casing cannot be removed from any of the wells, the Permittees may perforate the casings and pressure grout as proposed in the Plans with the following changes.

Work Plan to Plug and Abandon Well TW-2



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The placement of an adequate seal beneath the contaminated perched aquifer located approximately 130 feet (ft) below ground surface (bgs) that is penetrated by TW-2 is critical for protecting the regional aquifer. The Permittees propose to perforate and seal zones between 725 – 775 ft bgs along the 8-inch casing, 380 – 420 ft bgs along the 10-inch casing, and 10 ft to 30 ft bgs along the 16-inch casing in TW-2.

At a minimum, the Permittees must make every effort to cut off and remove the 6-, 8-, and 10-inch diameter casings at the prescribed depths to ensure that the proper amount and distribution of sealant is placed at and beneath the perched zones to seal each zone from downward leakage via the borehole and/or into underlying strata. If the 10-inch diameter casing can be cut off and removed, the Permittees must perforate and pressure grout the 12-inch casing from depths of 130 ft to 160 ft bgs. If the 10-inch casing cannot be cut off and removed, the Permittees must overdrill the well to a depth of at least 200 feet and seal the borehole from this depth back to the ground surface. The Permittees must ensure that an adequate seal is emplaced at each zone to prevent downward leakage of groundwater to the regional aquifer whether or not the casing can be removed.

Work Plan to Plug and Abandon Well TW-2b

The same perched zone penetrated by TW-2 was likely encountered during the drilling of TW-2b. If the 6-inch diameter casing at TW-2b cannot be removed, the Permittees must perforate and pressure grout the 6-inch casing between depths of 130 to 160 ft bgs, assuming the 6-inch casing extends to a depth of 223 ft bgs. If the 6-inch diameter casing extends to only 130 ft bgs, the Permittees must perforate and pressure grout between depths of 110 to 130 ft bgs. If the casing cannot be removed, the Permittees must ensure that perforation of the casing and sealing of depths between 80 to 100 ft bgs and 10 to 30 ft bgs along the 12-inch casing at TW-2b is sealed adequately to prevent downward leakage of groundwater in the direction of the regional aquifer.

The Permittees shall provide written notification to NMED no less than 15 days prior to the start of plugging and abandonment of wells TW-2, TW-2a, and TW-2b. In addition, the Permittees must comply with the applicable New Mexico State Engineer Office requirements for *Well Driller Licensing: Constructing, Repair and Plugging of Wells* (19.27.4 NMAC). The Permittees must submit individual reports summarizing the plugging and abandonment activities as proposed in the Plans.

Messrs. Gregory and McInroy
December 2, 2009
Page 3

Should you have any questions or comments, please contact Michael Dale (505) 661-2673.

Sincerely,



James P. Bearzi
Chief
Hazardous Waste Bureau

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file: Reading and [REDACTED] Work Plans for Plugging and Abandoning Wells TW-2,
TW-2a, and TW-2b