Department of Energy
Los Alamos Area Office
Albuquerque Operations Office
Los Alamos, New Mexico 87544

AUG 5 1994

Barbara Hoditschek
RCRA Permits Program Manager
Hazardous and Radioactive Materials Bureau
New Mexico Environment Department
1190 St. Francis Dr., P. O. Box 26110
Santa Fe, NM 87502

Dear Ms. Hoditschek:

This transmits the report regarding the Technical Area (TA) 35, TSL-85 surface impoundment closure. The purpose of the report is threefold. First, it details the proposed plan to address the analytical interference from dielectric oil for the TA-35 TSL-85 surface impoundment at the Los Alamos National Laboratory. The primary concerns were that analytical limits of quantitation from some of the sampling exceed health-based action levels for six Semi-Volatile Organic Compounds (SVOC). These six SVOCs of concern are m-benzidine; n-nitrosodimethylamine; n-nitrosodi-n-propylamine; 3,3-dichlorobenzidine; 2,4-dinitrotoluene and 2,6-dinitrotoluene mixture; and hexachlorobenzene. The second purpose of the report is to address the three reasons for remediation of the dielectric oil that the New Mexico Environment Department listed in the Notice of Deficiency (NOD) dated May 5, 1994. The final purpose of the report is to discuss the issue of action levels, which are well below detection limits for the constituents.

It is requested that proposed plan, as well as the previously submitted responses to the NOD, be approved so that we can proceed with modifications to the amendment to the closure plan.

Should you have any questions, please feel free to contact Court Fesmire, Environment, Safety and Health Branch, at 665-4718.

Sincerely,

Theodore J. Taylor
Program Manager
Environmental Restoration Program

LESH:7TT-034

Enclosure

cc:
See page 2

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August 4, 1994

Proposed Plan to Address the Analytical Interference from Dielectric Oil for the TA-35, TSL-85 Surface Impoundment Closure

The purpose of this report is to address Item 4 of the Notice of Deficiency (NOD) from the New Mexico Environment Department (NMED) to the Los Alamos National Laboratory (LANL) dated May 5, 1994, for the "Amendment to the Closure Plan for the Technical Area 35, TSL-85 Surface Impoundment", dated October 1993. The following is Item 4 from the NOD:

> *Section 2.0, Response to NMED's Reason of Closure Plan Disapproval, page 2-3, paragraph 3.* ***"The presence of nonhazardous dielectric waste oil in the soils appears to have interfered with the SVOC analyses for the soils, resulting in samples with elevated LOQs."***
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> *Remediation of the dielectric oil is necessary for the following seasons:*
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> - *Inability to accurately determine the presence of semivolatiles as a result of the masking affect from the dielectric waste oil;*
> - *The presence of waste oil in the soil indicates that a leak occurred under the surface impoundment; and*
> - *Hazardous waste constituents were part of the over all waste stream generated at the surface impoundment.*

This report consists of three parts which collectively address the issues raised in Item 4 of the NOD. First, the report details the proposed plan to address the analytical interference from dielectric waste oil for the Technical Area 35 (TA-35), TSL-85 surface impoundment at LANL. The primary concerns were that analytical limits of quantitation (LOQ) from some of the sampling exceed health-based action levels for six semivolatile organic compounds (SVOCs). These six SVOCs of concern are m-benzidine; n-nitrosodimethylamine; n-nitrosodi-n-propylamine; 3,3-dichlorobenzidine; 2,4-dinitrotoluene and 2,6-dinitrotoluene mixture; and hexachlorobenzene. The second portion of the report addresses each of the three specific reasons for remediation of the dielectric waste oil that the NMED listed in Item 4 of the NOD. The final portion of this report discusses the issue of action levels which are well below detection limits for specific constituents.

The following is the proposed plan for addressing the analytical interference from the dielectric oil for the TA-35, TSL-85 surface impoundment closure. The plan is based on the previous work done at the site, the constituents of concern, and the concerns raised by the NMED in the May 5, 1994, NOD. The plan includes: resampling at the locations where elevated LOQs were obtained; analysis of the samples using techniques designed to reduce or eliminate interferences caused by petroleum products; a risk assessment, if necessary, to include any constituents detected; and remediation activities, as dictated by the risk assessment.

As detailed in the amendment to the closure plan, analytical data for the majority of the soil samples collected in Phases I through V either missed holding times, had surrogate recovery results outside of the U.S. Environmental Protection Agency's (EPA's) limits, or had interference

from nonhazardous constituents (dielectric waste oil). As a result, additional sampling, representative of the sampling that yielded poor analytical data, was proposed as Phase VI sampling in Section 3 of the amendment to the closure plan.

The previous sampling included only two locations for which the presence of total petroleum hydrocarbons (TPH) was assessed. At the two Phase V coreholes through the bottom of the impoundment, the surface samples, as well as a quality assurance surface sample, were found to contain TPH in the range of 97 to 314 parts per million. Therefore, it is proposed that all of the Phase VI samples be analyzed for TPH. This will help delineate the extent and magnitude of any TPH contamination in the areas where interference occurred. In addition, the samples collected during this event will be subjected to more rigorous analytical cleanup methods prior to analysis to ensure that the lowest possible LOQs are obtained. These cleanup methods include gel permeation chromatography (GPC) and, if necessary, acid/base partitioning. This approach is consistent with EPA's "Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A)" (RAGS) (EPA/540/1-89/002, December 1989). Section 5.3.2 of RAGS, which discusses unusually high quantitation limits, suggests reanalysis using cleanup methods to remove interferences.

GPC (EPA Method 3640) is a size exclusion cleanup technique for a broad range of semivolatile organics and pesticides. It is capable of separating high molecular weight material from the sample analytes. It has been used successfully for all of the semivolatile base, neutral, and acid compounds associated with the EPA priority pollutant and the Superfund target compound lists for gas chromatograph/mass spectrometer analysis for semivolatiles. This cleanup method will be applied to all of the Phase VI samples.

If the analytical results still indicate elevated LOQs, acid/base partitioning is proposed. Acid/base partitioning (EPA Method 3650) is a liquid-liquid cleanup method to separate analytes from base/neutral analytes using a pH adjustment. It can be used for cleanup of petroleum waste prior to analysis. Three of the SVOCs of concern (m-benzidine, n-nitrosodimethylamine, and n-nitrosodi-n-propylamine) are not included on the list of compounds currently known to be separated by this method. Therefore, it is proposed that this cleanup method first be applied to only a few samples collected at locations for which GPC cleanup was conducted but elevated LOQs were still obtained, if any. The results will then be evaluated to determine if the procedure has worked for all of the six SVOCs of concern. If so, the acid/base partitioning cleanup technique will be applied to samples collected from all of the previous locations for which high LOQs were obtained.

The final analytical results with the lowest LOQs possible will be evaluated to determine if any hazardous constituents were detected. Any constituents detected will be included in the aggregate risk calculation as detailed in Section 4 of the amendment to the closure plan. If the risk assessment shows an unacceptable risk, remediation activities will be initiated. A plan detailing the proposed cleanup actions will be submitted to NMED for approval.

If the analytical results still indicate elevated LOQs after the using acid/base partitioning cleanup technique, measures will be taken to remediate the TPH contamination. This will be conducted in association with any remediation activities driven by the risk assessment results. If the risk assessment does not indicate the need for cleanup measures, the TPH contamination will be remediated to a level which will not interfere with SVOC analysis. A plan for this remediation,

based on the analytical results for TPH, will be submitted to NMED for approval. This plan will include excavation of TPH-contaminated soils. An on-site mobile laboratory will provide quick turnaround TPH analyses. Once the soils with TPH contamination are removed to a level where no interference is present, confirmatory samples will be collected and sent to an analytical laboratory to determine the presence or absence of the SVOCs of concern. If the SVOCs are found to be present, the aggregate risk will be recalculated to determine if the site poses an unacceptable risk. If it does, remediation activities will be initiated and a plan submitted to NMED for approval.

NMED listed three reasons as to why remediation of the dielectric waste oil is necessary in the May 5, 1994, NOD. The following is a discussion of how the plan detailed above addresses each of the listed items.

The first reason NMED provided for the necessity of dielectric waste oil remediation is as follows:

> "Inability to accurately determine the presence of semivolatiles as a result of the masking affect from the dielectric waste oil."

The proposed plan, as detailed above, presents a course of action that includes various efforts to prevent further masking effects and to obtain representative data of high quality. This course of action includes extensive resampling of several areas associated with the former TSL-85 surface impoundment. These areas include the area beneath the location of the former surface impoundment, the area below the approximate location of the former underground storage tank and associated piping, and an area projecting downward into Mortandad Canyon along the most likely spill path. In addition to the Phase VI sampling event, rigorous cleanup techniques (i.e., GPC and acid-base partitioning, if necessary) are proposed prior to analysis of the samples collected during Phase VI to ensure the that lowest possible LOQs are obtained. Collectively, these efforts are specifically directed toward addressing the previous inability to determine the presence or absence of the SVOCs of concern and, thus, obtaining quality analytical data that can be used to further assess the need for additional closure activities at the TSL-85 surface impoundment site.

The second reason NMED gave for remediation of the dielectric waste oil is the following:

> "The presence of waste oil in the soil indicates that a leak occurred under the surface impoundment."

It is agreed that the presence of waste oil in the soil beneath the location of the former TSL-85 surface impoundment indicates that a leak may have occurred under the surface impoundment. However, analysis of the Phase V core samples from beneath the impoundment indicated that TPH contamination was only present in the surface soils. Therefore, the extent of vertical migration below the impoundment is not extensive. The proposed Phase VI sampling will include six soil samples collected at a depth of approximately two to three feet at locations within the former surface impoundment. Samples will be analyzed for volatile organic compounds (VOCs) by Method 8260, SVOCs by Method 8270, pesticides/herbicides and polychlorinated biphenols (PCBs) by Methods 8080/8150, and metals by Methods 6000/7000. This data will be used to determine the magnitude of any contamination below the impoundment.

It is also proposed to follow EPA guidance on evaluating aggregate risk as presented in EPA's RAGS. In accordance with RAGS, an aggregate risk will be calculated to determine if an unacceptable risk is being posed at the site. A discussion on the calculation of aggregate risk is included in Section 4.2 of the amendment to the closure plan. If it is determined that the site poses an unacceptable risk, additional cleanup will be performed to a degree agreed to by NMED and LANL. Cleanup of the site will be considered complete when it has been demonstrated that the site does not pose an unacceptable risk to human health or the environment.

The third and final reason for remediation of the dielectric waste oil is as follows:

> "Hazardous waste constituents were part of the overall waste stream generated at the surface impoundment."

Some confusion exists regarding this comment in that the word "generated" was used. No waste streams were generated at the former TSL-85 surface impoundment. LANL interprets this comment as referring to hazardous constituents that may have been present in the waste streams that entered the surface impoundment. Hazardous constituents may be present at the site because of their potential presence in the waste streams received in the impoundment. In addition, results of previous sampling and analysis indicated the presence of hazardous constituents at the site, although data quality was not high. The proposed Phase VI sampling will provide an accurate determination of the presence or absence of hazardous constituents at the site. If hazardous waste constituents are detected at the site, the aggregate risk potentially posed by these constituents will be evaluated in accordance with EPA's RAGS. The results of this in-depth risk assessment will be evaluated by NMED and LANL to determine whether the site poses an unacceptable risk to human health or the environment and whether or not further remediation activities will be necessary at the site.

Based on the results of the Phase VI sampling, an aggregate risk calculation may be necessary to determine if the site poses unacceptable risk. Any constituents detected will be included in the calculation. However, in some cases the constituent-specific action levels may be well below the quantitation limits attainable by the analytical laboratory. Sections 5.3.1 and 5.3.5 of RAGS discuss how to address action levels below quantitation limits when no hazardous constituents have been detected in any of the samples. The procedure for calculating aggregate risk and for dealing with action levels below LOQs, as presented in Section 4.0 of the amendment to the closure plan, is based on EPA's RAGS. The following is part of the procedure.

> If any of the sample-specific LOQs exceed the calculated health-based action level, additional consideration is necessary.
>
> - For a given constituent, if the action level is greater than or equal to one-half the LOQ for all samples, the constituent will not be included in the calculation of aggregate hazard index or aggregate risk. This is based on RAGS, which calls for one-half the LOQ to be used as the concentration for constituents below LOQs.

- For a given constituent, if the health-based action level for one or more of the samples is less than one-half the sample-specific LOQ, and if there is some reason to believe that the constituent may be present, the 95 percent upper confidence limit of the arithmetic average will be used based on one-half the sample-specific LOQ for each sample.

If a given constituent is not detected in any of the samples and if there is no reason to believe that it may be present (e.g., it was not identified through process knowledge and was not detected at any of the three sites associated with the TSL-85 surface impoundment), the constituent will not be included in the calculation of the aggregate hazard or aggregate risk (per RAGS, Sections 5.3.1 and 5.3.5).

In conclusion, this report has demonstrated that the proposed plan will address the concerns identified in the May 5, 1994, NOD. In addition, the proposed plan is consistent with EPA guidance on risk assessment. The proposed additional sampling and analysis (Phase VI) will provide an accurate determination of the magnitude of any contamination at the site. The analytical results will be evaluated using EPA risk assessment techniques to determine if the site poses an unacceptable risk. If an unacceptable risk exists, LANL will work with NMED to determine corrective actions necessary to reduce the risk to an acceptable level.