TA-50

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

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Dr. Allyn M. Davis, Director
Multimedia Planning and Permitting
Division
U. S. Environmental Protection
Agency, Region 6
1445 Ross Ave., Suite 1200
Dallas, Texas 75202-2733

Dear Dr. Davis:

Subject: Los Alamos National Laboratory (LANL) Controlled Air Incinerator (CAI), Technical Area (TA) 50, Building 37, Cancellation of Authorization to Incinerate Polychlorinated Biphenyls (PCB)

The purpose of this letter is to request cancellation of the authorization to treat by incineration materials destined for disposal that are contaminated with PCBs, a dielectric compound, in LANL's CAI located in TA-50, Building 37. Further, this letter outlines how this facility will be decommissioned to ensure no threat to human health and/or the environment is created. Your concurrence with the decommissioning approach outlined in this letter is also solicited.

The Los Alamos Area Office (LAAO) of the Department of Energy (DOE) and members of the University of California (UC) (DOE's management and operations contractor) have been conferring with Jim Sales of your staff on these issues. This letter is a result of those discussions and serves as our request to the U. S. Environmental Protection Agency (EPA), Region 6, to cancel our authorization to operate the CAI as a PCB incinerator. DOE and UC are working to coordinate both the cancellation of the authorization from EPA to incinerate PCBs as allowed by the PCB regulations (40 CFR 761.70, Subpart D, Storage and Disposal, Incineration) and the Hazardous Waste Program closure from the New Mexico Environment Department (NMED) to ensure they happen simultaneously. NMED has stated their concern that EPA concur with the TSCA portion prior to NMED's approving the Hazardous Waste Program closure. For that reason we request your acceptance of our approach in writing as expeditiously as possible.

The original CAI was installed in 1977 and first operated in 1978. The CAI and associated systems were originally Research and Development (R&D) tools used to prove the viability of incineration as a treatment method for Transuranic (TRU) waste. R&D testing ceased in 1987 so modifications (upgrades) to the system, identified during the initial phase of operation, could be performed.

Further research on the capability of incinerators to break the chemical bonds of certain persistent chemicals was determined to be appropriate. These waste streams included both

PCBs and certain hazardous wastes for which regulations allowed incineration as a disposal option. A trial burn to determine destruction capabilities of the incinerator on PCBs was conducted on June 13, 1982. The trial burn was conducted under direct EPA supervision, as PCB combustion research, funded by the EPA Industrial Environmental Research Laboratory. This technology proved effective and LANL received PCB disposal authorization from EPA Region 6 on May 21, 1983. All activities involving the incineration of PCB waste after that date have been in accordance with that authorization. The authorization for disposal was renewed on October 9, 1992, and is currently in effect.

A review of the feed summary data for the CAI indicates that between May 1978 and March 1987, a total of 36 campaigns (a campaign is not a definitive term and could consist of an inventory of waste of a specific waste type, i.e., scintillation cocktails) had been completed. The CAI campaigns included equipment checks, treatability studies, efficiency studies, a PCB trial burn, incineration of PCB contaminated materials, a hazardous waste trial burn, incineration of ignitable hazardous waste, and burns of TRU wastes. Eight of the 36 CAI campaigns involved radioactive components.

The feed summary data indicates only two campaigns were conducted with PCBs. Campaign PCB-1 was the trial burn. That campaign consisted of a maximum of 110 gallons. The make-up of the feed was 61 percent Arochlor 1260 (PCB trade name) and 39 percent trichlorobenzene to which was added fuel oil. The second campaign consisted of approximately 400 gallons. The make-up of the waste was 33.3 percent Arochlor 1254 (PCB trade name), 19.2 percent Arochlor 1260 (PCB trade name), and 47.5 percent trichlorobenzene.

Initial action to be taken prior to disassembly of the CAI will be to collect samples to determine the presence or absence of PCB, radionuclide, and hazardous waste in the equipment exposed during operations. CAI equipment (combustion chambers, exhaust ducts, quenching tower, absorption tower, demister, exhaust heater, High Efficiency Particulate Air (HEPA) filter, absorption bed, exhaust stack, ash removal system, liquid waste feed system, gloveboxes, and scrubber filters and tanks) will be sampled to verify PCB concentrations below the cleanup levels of $10ug/100cm^2$. Recycling, reuse, cleanup, and/or disposal of the CAI equipment will be managed in accordance with the results from the verification sampling.

Any PCB wastes generated by the disassembly of the CAI will be stored at TA-54, Area L, pending disposal. Equipment contaminated with PCBs and radionuclides will be stored in the PCB Storage Facility at TA-54, Area L, Building 39, until disposal capacity is identified. Any non-radioactive PCB wastes found will be shipped off-site for disposal in a landfill and/or incinerator approved for PCB materials.

UC will decommission the CAI to ensure no risk to human health or the environment exists due to the presence of PCBs. UC will conduct sampling of the CAI to verify no PCB residues are present above the 40 CFR §761 Subpart G, *PCB Spill Cleanup Policy,* level for "other restricted access areas." Under the cleanup requirement for other restricted access areas, the CAI equipment must be shown to contain less than $10ug/100cm^2$ PCB contamination as measured by the standard wipe test defined at 40 CFR §761.123.

Radiological surveys will also be conducted to ensure the requirements of DOE Orders 5400.5, *Radiation Protection of the Public and the Environment,* and 5820.2A, *Radioactive Waste*

Management, are met. Hazardous waste closure activities of the CAI are also being conducted. The CAI will be surveyed for radioactive contamination prior to sampling. Once radiological boundaries are established, samples will be collected and analyzed to verify the absence of PCBs. Verification will consist of sampling the principal CAI components (identified earlier) throughout the system that have been in contact with material feeds, residues, or secondary wastes. Samples will be analyzed for PCBs using the Solid Waste (SW)-846 Method 8080A, *Organochlorine pesticides and polychlorinated biphenyls by gas chromatography* and 3550A, *Ultrasonic extraction* or method 608, *Organochlorine Pesticides and PCBs*, as prescribed in 40 CFR §136, Appendix A and modified in *Verification of PCB Spill Cleanup by Sampling and Analysis* (EPA 1985). Standard QA/QC procedures for these methods will be utilized.

Analytical results will be used to verify the absence of PCB contamination in the CAI equipment above the cleanup level. The presence of PCBs above cleanup standards will require those pieces of equipment showing contamination to be either handled as PCB waste or be subjected to further decontamination.

Sampling for verification will be based on a biased sampling plan. Sample locations are determined using engineering judgment, knowledge of the CAI system layout, and records of past operation, to obtain samples from principal treatment components with the highest likelihood for contamination. Additionally, a minimum of one sample will be collected from an area with a low probability of contamination as a check on the biased sampling location data. This approach will provide a conservative data base from which a determination that no PCB contamination above cleanup standards is present.

Wipe samples will be collected from non-porous surfaces. Porous surfaces will be sampled by brushing or scraping. Sampling locations are listed below:

- Solid waste feed glovebox (Control location)
- Liquid waste feed tanks
- Quenching tower
- Adsorption tower
- HEPA filters
- Activated carbon filter chamber
- Exhaust stack
- Ash removal system
- Combustion chamber

Samples will be taken, placed in bottles, sealed, tagged, and immediately packed in an insulated container with ice. Requirements for sample containers, preservation, and holding times are summarized in Table 1 (enclosed). Personal protective clothing and respirator protection will be worn at all times as identified by LANL's Industrial Hygiene and Safety Group and in the

approved Radiological Work Permit. Sampling activities will be conducted in a manner to ensure that worker exposure levels are maintained As Low as Reasonably Achievable (ALARA).

Quality Control (QC) activities will involve collection of field blanks. QC samples are described in this section and summarized in Table 2 (enclosed). QC samples will be analyzed using the same method as for verification samples. QC samples will be assigned unique identification numbers (similar to verification sample numbers) that do not indicate to the laboratory analyzing the samples they are for Quality Assurance (QA)/QC purposes.

Field blank samples are collected to assess the ambient conditions at the sampling site. They consist of a gauze pad or glass wool of known size which has been saturated with hexane and placed into a sample container under normal sampling conditions. Frequency of blank samples will be 1 in 20 samples. If fewer than 20 samples are collected, at least one blank sample will be collected.

Instrument calibration and maintenance are field activities subject to QC procedures. Field equipment requiring calibration will be calibrated and maintained using the manufacturer's instructions and appropriate standard operating procedures.

LANL will ensure the on-site or contract analytical laboratory operates under a Quality Assurance Program Plan (QAPP) which meets the requirements in the current update of SW-846. QC procedures in the analytical laboratory are guided by their QAPP. In order to assess the quality of the analytical data, the analytical laboratory is required to run QC samples to establish accuracy and precision. Laboratory QC procedures are summarized in Table 2.

To prevent cross-contamination of samples, sampling equipment will be cleaned prior to each use with a warm soap solution, rinsed several times with tap water, rinsed with distilled water, drained of excess water, and air-dried or wiped. A disposable sampler may be presumed clean if still in a factory sealed wrapper.

All collectable treatment residues have been removed from the CAI and therefore the only sampling of solids will be of the refractory lining in the combustion chamber. The refractory lining is a porous material that is imbedded with ash and is not amenable for ash removal using incinerator operating procedures. A representative sample of the refractory material will be obtained as follows:

- Use a clean brush to scrub small, equal portions of material from the surface of the refractory lining at several locations along the bottom of the chamber.
- Combine the material in the container until the gram volume of sample required for the analysis is obtained.
- Cap the sample container and attach a label and seal.
- Record sampling information in the field log book.
- Complete the sample analysis request form and chain-of-custody record.

Sampling of the actual CAI Equipment will utilize a standard wipe test as prescribed in 40 CFR §761.123, *Definitions*, and EPA's guidance document on PCB wipe sampling (1987). Samples will be collected as follows:

- Use a standardized template (10 centimeters (cm) x 10 cm) to delineate the area of sampling.
- Use a gauze pad or glass wool of known size saturated with hexane for the swiping medium. The gauze (or glass wool) will be prepared with hexane in the laboratory prior to entry to the field.
- Perform the swipe very quickly after the hexane is exposed to air to avoid losing the solvent medium.
- Store the wiping medium in sealed glass vials until it is used for the wipe test.
- Place wipes into sample containers immediately upon completion of the wipe.
- Close, label, and seal the sample container to ensure the integrity of the sample.
- Record sampling information in the field log book.
- Complete a LANL sample analysis request form and chain-of-custody record for each sample.

Samples will be analyzed either at LANL or at a commercial laboratory. In either case, each sample will be labeled, sealed, and accompanied by a chain-of-custody record and a sample analysis request form.

The chain-of-custody record will accompany every sample. This chain-of-custody record consists of two pages with the original accompanying the shipment and the copy retained by LANL. A separate sampling log book will be kept as part of the record of cancellation of PCB authorization/RCRA closure activities and housed in LANL's records storage and will contain all information pertinent to surveys and sampling. Samples will be collected as established in 40 CFR 761.130. Sufficient information will be recorded so the sampling situation can be reconstructed without relying on the collector's memory.

The sample shipment and chain-of-custody record is accompanied by a sample analysis request form. The sample analysis request form has two portions: field and laboratory. The field portion of this form will be completed by the person collecting the sample and include most of the pertinent information noted in the log book. The laboratory portion will be completed by the laboratory personnel when the sample is received.

An independent registered professional engineer and the owner/operator of the facility or his representative will ensure the decommissioning activities follow this plan. Upon completion, the engineer and DOE will prepare a letter certifying the facility has been successfully decommissioned. The letter will be dated and signed by each party, stamped by the registered professional engineer, and the original copy submitted by DOE to the Regional Administrator.

DOE will provide Mr. Sales of your staff with all of the analytical data as soon as it becomes available. As discussed with Mr. Sales, there is no precedent for the decommissioning of a PCB incinerator. We would appreciate your concurrence with our approach to this activity.

For further information or questions concerning this activity, please feel free to contact H. L. "Jody" Plum, Office of Environment and Projects, LAAO, at (505) 665-5042.

Sincerely,

for Larry Kirkman, P.E.
Acting Area Manager

LAAMEP:2JP-024

Enclosures

cc w/enclosures:
Jim Sales
U. S. Environmental Protection
Agency, Region 6
1445 Ross Ave.
Dallas, Texas 75202-2733
Benito Garcia, Bureau Chief
Hazardous and Radioactive Materials
Bureau
New Mexico Environment Department
2044 Galisteo St., Bldg. A
P. O. Box 26110
Santa Fe, New Mexico 87505
Barbara Hoditschek, Program Manager
RCRA Permitting Program
Hazardous and Radioactive Materials
Bureau
2044 Galisteo St., Bldg.A
P. O. Box 26110
Santa Fe, New Mexico 87505

bcc w/enclosures:
Jody Plum, AAMEP, LAAO
Ken Hargis, EMPO, LANL, MS-K591
Sara Helmick, CST-25, LANL, MS-J519
Jack Ellvinger, ESH-19, LANL, MS-K490
Teresa Sena, EPD, AL

Table 1. Summary of Laboratory Quality Control Procedures for PCB Analysis SW-849 Method 8080A/3550A[a]

QC check sample/procedure	Frequency	Acceptance criteria
GC column resolution	Prior to each initial calibration, or each column and instrument	Per method criteria
Initial calibration	Five concentration levels, prior to sample analysis, after resolution check	Calibration factors and retention times meet method criteria
Degradation check	Daily before continuing calibration	% breakdown per method
Continuing calibration	Every 12 hours or after every 10 samples	RFs and RTs meet method criteria
Internal standards (optional)	Added to all calibration standards, field samples, blanks, and QC samples	Per method
Surrogates	Added to all calibration standards, field samples, blanks, and QC samples	%R per method criteria
Method blank	One per analytical batch	Highest of the following: < MDL; <5% of PRQL; <5 concentration of analyte in sample
Equipment rinsate	One per sampling event	Highest of the following: < MDL; <5% of PRQL; <5 concentration of analyte in sample
Laboratory duplicate[c]	One per analytical batch	RPD per method
Matrix spike/duplicate	One per analytical batch	%R and RPD per method
QC check sample[d]	Per method	Per method

[a] Additionally, SW-846 methods 3620A and/or 3660A may need to be used for extract clean-up prior to analysis
[b] Corrective action to be taken if acceptance criteria are not met
[c] requirement may be met by analysis of matrix spike duplicate sample
[d] optional procedure, recommended by SW-846 method 8080A

PCB = polychlorinated biphenyls
QC = quality control
%R = percent recovery
RFs = response factors
RTs = retention times
RPD = relative percent difference

Table 2. Summary of Sample Information for PCB Analysis

Sample type/matrix	Swipe on cotton gauze or glass wool pad of known size
Preparation method	SW-846 3550A, Ultrasonic extraction
Analytical method	SW-846 method 8080A, Organochlorine pesticides and polychlorinated biphenyls by gas chromatography, low concentration method
Analytical instrumentation	Gas chromatograph with electron capture detector (ECD) or electrolytic conductivity detector (HECD)
Method detection limits (MDLs)	.002 - 0.24 ug/L in reagent-free water; estimated quantitation limits (EQLs) in low-concentration soil by sonication with GPC cleanup a factor of 670 times the MDLs in water
Sample container	250 mL wide-mouth glass jar with Teflon-lined lid; to contain swipe medium as described above
Sample preservation	Cool to 4°C
Sample holding times	14 days from collection to extraction, 40 days after extraction to analysis