UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
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Via U.S. Postal Service and Email

MAY 1 0 2016

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Subject: Toxic Substances Control Act Polychlorinated Biphenyls - Lawrence Berkeley National Laboratory PCB Cleanup Application - EPA Approval, 40 CFR 761.61(c) and 761.79(h)

Dear Mr. Kubiak and Mr. Bazzell:

Thank you for submitting the "Application for Cleanup of Polychlorinated Biphenyls Old Town Demolition Phase I Project" (Application) dated February 2016 and received by the U.S. Environmental Protection Agency Region 9 (EPA) on February 22, 2016. Lawrence Berkeley National Laboratory (LBNL) amended the Application on March 25, 2016 to include cleanup of PCBs in the area of former Buildings 16 and 16A. Subsequent to that amendment, LBNL further modified the Application via its March 30, 2016 responses to comments (RTC) that EPA sent on March 19, 2016. In addition, EPA's April 28, 2016 email provided LBNL with clarifications on several of the responses in the RTC. Those clarifications further modify the Application.

EPA is conditionally approving the Application as amended by the RTC and EPA's April 28, 2016 email under the provisions in 40 CFR 761.61(c) (risk-based cleanup) and 40 CFR 761.79(h)(2) (alternative decontamination) of the Toxic Substances Control Act regulations for polychlorinated biphenyls (PCBs). LBNL submitted the Application under those provisions. The enclosed Approval is effective immediately.

EPA is issuing the Approval jointly to LBNL and the U.S. Department of Energy (the "Parties') as the owner of the property and operator of the LBNL facility, respectively. EPA will issue a separate approval for the Application amendment covering the PCB cleanup in the areas of former Buildings 16 and 16A.

In general, the Application covers the cleanup of PCBs in certain areas at the Lawrence Berkeley National Laboratory (LBNL facility), Old Town Demolition Phase I Project (Site). Among others, cleanup activities include excavation and offsite disposal of soils contaminated with PCBs, offsite disposal of concrete contaminated with PCBs, cleanup verification sampling, measures to prevent residual PCBs from further impacting nearby surface waters, cleanup verification sampling, and land use restrictions. Soils will be cleaned up to 0.94 milligrams/kilogram (mg/kg). This cleanup goal is EPA's Regional Screening Level (RSL) for PCBs applicable to soils in an industrial land use scenario. This RSL equates to a 10^{-6} excess lifetime cancer risk assuming an industrial exposure scenario.

The enclosed Approval also responds to two requests made by the Parties in the Application for: (1) an extension of the 30-day storage time frame in 40 CFR 761.65(c)(1) for containerized PCB wastes and (2) approval under 40 CFR 761.79(h)(2) of an alternative decontamination procedure to decontaminate large construction equipment that will be used during the PCB cleanup.

We appreciate the opportunity to being of assistance to LBNL and DOE on PCB matters. Please call Carmen D. Santos, Region 9 PCB Coordinator, if you have any questions concerning this letter.

Sincerely,

Jeff Scott, Director
Land Division

Enclosure (PCB Cleanup Approval)

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Enclosure 1

U.S. EPA Region 9 – Toxic Substances Control Act Polychlorinated Biphenyls (PCBs)

Approval of PCB Risk-Based Application – 40 CFR 761.61(c) and 40 CFR 761.79(h) Lawrence Berkeley National Laboratory Old Town Demolition Phase I Project

MAY 10 2016

I. Introduction

The Lawrence Berkeley National Laboratory (LBNL) transmitted the "Application for Cleanup of Polychlorinated Biphenyls Old Town Demolition Phase I Project" (Application) dated February 2016 to the U.S. Environmental Protection Agency Region 9 (EPA) via email on February 22, 2016. LBNL modified the Application via its March 30, 2016 responses to comments (RTC) that EPA sent on March 19, 2016 via email. In addition, EPA's April 28, 2016 email contains clarifications on several of the responses in the RTC that further modify the Application.

EPA is approving the Application as modified by the RTC and EPA's clarifications with the conditions in Sections V and VI consistent with the provisions in 40 CFR 761.61(c) (risk-based cleanup of PCB remediation wastes) and 40 CFR 761.79(h)(2) (proposed alternative self-implementing decontamination procedures), respectively. The Application contains procedures by which LBNL and the U.S. Department of Energy (DOE) will clean up polychlorinated biphenyls (PCBs) present in certain areas of the Old Town Demolition Phase I Project Area (Site) at the LBNL facility in Berkeley, California. The Site is a one-acre area within the 15-acre Old Town.

PCBs are present in soils and concrete, as well as in sediments in nearby surface waters (e.g., Chicken Creek). PCBs in soils range from non-detect to less than 2,000 milligrams/kilogram (mg/kg or ppm). Except for certain areas, based on Site data available at the time of this Approval, most of the PCB contamination found at the Site is below 50 ppm.

On March 25, 2016, LBNL and DOE submitted an amendment (Amendment 1) to the February 2016 Application that EPA will approve in a separate letter. Among other matters, the Application covers PCBs in the areas of former Buildings 52 and 52A, and the electrical pad adjacent to Building 52A. Amendment 1 covers the cleanup of PCBs in the areas of former Buildings 16 and 16A.

LBNL and DOE have requested in the Application that EPA extend the 30-day storage timeframe in 40 CFR 761.65(c)(1) for storage of non-liquid and liquid PCB remediation wastes that will be generated and stored in containers at LBNL's waste accumulation area during the PCB cleanup. Section V of this Approval responds to that request.

Further, LBNL and DOE have requested EPA's approval of the alternate self-decontamination procedure proposed in the Application. The proposed procedure will be used to decontaminate non-porous surfaces of large construction equipment to be used in the PCB cleanup. Section VI below addresses that request.

II. Parties Implementing the Approvals

EPA is issuing this Approval jointly to LBNL, as the current owner of the property, and DOE, as the operator of the LBNL facility. This Approval refers jointly to LBNL and DOE as the "Parties." The Parties are responsible for implementing this Approval and any future amendments that may be necessary. This Approval is effective immediately.

III. Facility Background and PCB Sources

A. General Background and Sources of PCBs

LBNL is located above the UC Berkeley campus. LBNL was known as the California Radiation Laboratory when it began operations in 1931 as an accelerator laboratory at the UC Berkeley campus. In 1939 the Laboratory relocated to the area now known as LBNL's Old Town. Extensive scientific research was conducted and among others, research projects involved the Horton Sphere and the 184-inch cyclotron accelerator. Building 6 housed the accelerator and until the 1940s was the center of the Laboratory. Shops and research laboratories were built around and beyond Building 6 between1940s and 1950s.

The LBNL Old Town area comprises about 15 acres; and the Old Town Demolition Phase I Project (Site) comprises about one (1) acre.

Based on historical uses, sources of PCBs appear to include and not be limited to electrical equipment (e.g., transformers, capacitors), vacuum pumps, hydraulic equipment, PCB–containing oils, and non-liquid PCBs.

B. Surrounding Land Uses

Current land uses to the north and west of the LBNL facility include the following:

- North: Single family homes. Closest residence about 1,500 feet north of the Old Town Demolition Phase I Project area.
- West: Multi-unit dwellings, student residence halls, and private homes.

LBNL also operates a guest house situated about 600 feet from the Site with a typical stay of three to five nights and an extended stay of usually less than six months. The guest house is used by visiting scientists and students that have business with LBNL and UC Berkeley.

C. LBNL's 2006 Long Range Development Plan

Specific development plans for the Site are not currently available. However, LBNL's 2006 Long Range Development Plan designates Old Town as a "research and academic" zone. According to LBNL's

Application, the Site is likely to be developed in the future as laboratory and office space with ancillary landscape and parking areas.

D. Storm Water Runoff and Surface Water

LBNL is located within the Upper Strawberry Creek watershed. In the vicinity of LBNL, the Upper Strawberry Creek Watershed is subdivided into the Blackberry Canyon and the Strawberry Canyon Watersheds. This watershed divide passes through the Site. The northern and northwestern portions of the LBNL stormwater system discharges to the North Fork of Strawberry Creek. The southern and eastern portion of LBNL stormwater system discharges to Chicken Creek, Ten Inch Creek, Ravine Creek, Cafeteria Creek, other small tributaries, and then to Strawberry Creek. The storm drain network serving the Site drains to Ravine Creek and Chicken Creek in the southern portion of Old Town and from the northwestern side to the North of Strawberry Creek.

PCBs are found at low levels (less than 0.1 mg/kg PCBs in sediments) in the North Fork of the nearby Strawberry, Ravine, and Chicken Creeks.

E. Old Town Demolition Phase I Project Area

The Parties demolished Buildings 5, 16, 16A, 40, 41, 52, and 52A as part of the Old Town Demolition Phase I Project. These former buildings were constructed between 1940s and 1950s. PCBs are present in soils and concrete in the area of former Buildings 16, 16A, 52, 52A, and the electrical pad adjacent to former Building 52A. PCBs are also present in shallow soil samples collected beyond a retaining wall on the east side of former Building 5. PCBs were also found in caulk, sealants, mastics, and paints in former Buildings 5, 16, and 16A. These PCB-containing materials were removed before demolition and disposed offsite consistent with applicable requirements in 40 CFR 761.

IV. Applicability and Determination of No Unreasonable Risk

This Approval is for cleanup of PCBs at the Site and does not cover cleanup of other contaminants that may be present. The California Department of Toxics Substances Control is involved with the cleanup of non-PCB contaminants (e.g., volatile organic compounds) at the Site. The California Regional Water Quality Control Board is involved with releases of PCBs from the Site to nearby surface waters. Both state agencies regulate PCBs as a hazardous waste.

This Approval also does not cover the water treatment system and related operation activities, PCB bulk product wastes, worker health and safety, and radiological wastes. The water treatment system is covered under a permit from the East Bay Municipal Utility District (EBMUD). Stormwater that may contain PCBs and fluids from the decontamination of equipment that was in contact with PCBs will be decontaminated via filtration with activated carbon.

A. Determination of No Unreasonable Risk

The PCB regulations in 40 CFR 761.61(c) require that EPA make a determination of no unreasonable risk of injury to health or the environment in connection with its risk-based cleanup approvals. We believe that implementation of the procedures described in the Application to sample and clean up PCBs at the Site will result in no unreasonable risks to human health or the environment, if implemented consistent with the Application as modified by EPA in this Approval and applicable requirements in 40 CFR 761. In addition, storage in containers of liquid and non-liquid wastes containing PCBs, as well as, the storage in tanks of liquid wastes containing PCBs must follow the requirements in Condition V.B.1 and V.B.2, respectively to assure no unreasonable risks to human health or the environment.

B. PCB Remediation Wastes and Cleanup Goals

This Approval applies to and covers sampling, cleanup, and offsite disposal of PCB remediation wastes at the Site and areas to where PCBs may have migrated from the Site. PCBs have migrated to nearby surface waters (e.g., Chicken Creek). This Approval also applies to any caps or fences that may be installed at the Site as a cleanup contingency measure. The cleanup goal for PCBs in soils at the Site is 0.94 mg/kg which is EPA's Regional Screening Level (RSL) for PCBs applicable to soils in an industrial land use scenario. This RSL equates to a 10^{-6} excess lifetime cancer risk assuming an industrial exposure scenario.

C. PCB/Radioactive Mixed Waste

This Approval covers removal and disposal of PCB/radioactive mixed waste as that waste is defined in 40 CFR 761.3 and 40 CFR 761.50(b)(7). Disposal and onsite storage of PCB/radioactive wastes must be consistent with the provisions in 40 CFR 761 including but not limited to 40 CFR 761.50(b)(7) and 40 CFR 761.65, respectively.

V. PCB Risk-Based Cleanup, 40 CFR 761.61(c) - Conditions of Approval

A. PCB Cleanup Verification Sampling

1. **Number of PCB cleanup verification samples, former Building 52, 52A, and adjacent electrical pad.** The Parties will collect a minimum of 77 cleanup verification samples as calculated via Visual Sample Plan (VSP) software using an alpha value of 0.05 and a grid spacing of 6.5 feet. This is a minimum number of samples.

   The results of cleanup verification samples must be statistically evaluated via EPA's ProUCL Program. The spatial distribution of the data set must also be evaluated. The Parties must assure that all decision units (DUs) as defined in the Application have a sufficient number of cleanup verification samples to determine if the PCB cleanup is complete and rule out the possibility of hot spots via an evaluation of the spatial distribution of the data set.

2. **Recalculation of cleanup verification samples.** The Parties must recalculate the number of cleanup verification samples to be collected due to site characterization data gaps that still remained when the Application was submitted. This recalculation may yield a number of cleanup verification samples higher than the 77 samples mentioned in Condition A.1. If the Parties use the VSP software to make this calculation an alpha value of 0.05 and a grid spacing of 6.5 feet must be used as inputs to VSP.

3. **Statistical evaluation of PCB cleanup verification data.** PCB cleanup verification data must be evaluated via EPA's ProUCL statistical program consistent with the decision rules or scenarios provided below.

   a. **Scenario #1:** The results of all PCB cleanup verification samples are all below the cleanup goal.
      - ProUCL calculation is not necessary and the cleanup may be considered complete.

   b. **Scenario #2:** The results of PCB cleanup verification samples include non-detects and concentrations above the cleanup goal. Re-cleaning involves additional excavation.

      - Option 1: Run ProUCL and evaluate the spatial distribution of all PCB cleanup verification samples. If the 95% UCL of the mean of the results of cleanup verification samples is at or below the cleanup goal and the spatial distribution of the data does not suggest the presence of potential hot spots or need for re-cleaning, the PCB cleanup may be considered complete.

      - Option 2: Re-clean the areas where the PCB results for cleanup verification samples are above the cleanup goal and resample those areas.

        - If the PCB results of all cleanup verification samples are non-detect after re-cleaning, follow Scenario #1.
        - If the PCB results of all cleanup verification samples are equal to or below the cleanup goal (including non-detects), follow Scenario #1.
        - If the PCB results of cleanup verification samples include detected PCB concentrations above the cleanup goal, follow Scenario #2, Option 1. The results of cleanup verification samples from re-cleaned areas should be used to run ProUCL in addition to the results of cleanup verification samples where re-cleaning was not necessary.

   c. **Scenario #3:** All or the majority of the PCB results of cleanup verification samples are detected above the cleanup goal. Re-clean the areas. Collect cleanup verification samples.

      - Follow Scenario #1 if the results of all the new re-cleaning verification samples are non-detect or below the cleanup level.

- Follow Scenario #2 if all or portions of the re-cleaned areas are still above the cleanup goal.

d. **Insufficient number of PCB cleanup verification samples.** If the number of PCB cleanup verification sample results is insufficient to determine the statistical distribution of the data set, then ProUCL recommends comparing the maximum sample result to the cleanup goal. If that maximum result is above the cleanup goal, then additional cleanup may be necessary. If the maximum result is below the cleanup goal then the cleanup may be considered complete.

e. **Situations where the data set contains a high proportion of non-detects relative to the entire data set:** ProUCL will be used to calculate the exposure point concentration which will be compared to the PCB cleanup goal. The inputs to ProUCL include all PCB sample results above the detection limit and the detection limit for that portion of the data set composed of non-detects. Consistent with EPA risk assessment guidance, LBNL may use half of the detection limit for non-detect results as input to ProUCL. The use of the detection limit or half of the detection limit is allowed provided the detection limit is below the cleanup level.

B. Onsite Storage of PCB Remediation Wastes

1. **Extension of storage time at LBNL's accumulation area and storage of liquid PCB remediation wastes in containers.** 40 CFR 761.65(c)(1) allows for storage of PCB wastes up to 30 days in an area not meeting the requirements of 40 CFR 761.65(b). The provisions in 40 CFR 761.61(c) allow EPA to modify waste storage requirements in 40 CFR 761.65. EPA is granting the Parties 60 additional days for a total of 90 days to store bulk and liquid PCB remediation wastes in containers at the LBNL waste accumulation area. The 90 days start on the first day of waste generation; and PCB wastes from any location within the Site can be stored at the accumulation area. This extension of the storage time frame is subject to the requirements established below and those included in Condition V.B.2 below. The Parties will:

   a. Implement the waste storage activities described in the Application as modified by this Approval; and as clarified by EPA in a subsequent letter.
   b. Adhere to the requirements in 40 CFR 761.65(c)(1), §761.65(c)(3) and (c)(4), §761.40(a)(10), and applicable requirements in §761.65(c)(6) and §761.65(c)(8), and 40 CFR 761 Subpart K (e.g., notification of PCB activity).
   c. Place all non-liquid bulk PCB remediation wastes immediately after generation directly inside the appropriate DOT containers.
   d. Place all liquid PCB remediation wastes in appropriate DOT containers.
   e. Adhere to the requirements in 40 CFR 761.65(c)(5) except that containers must be inspected weekly to assure they are not leaking and their physical integrity is not compromised.
   f. Store non-liquid and liquid PCB remediation wastes in containers for no longer than 90 days.
   g. Have a Spill Prevention, Control, and Countermeasures Plan for the temporary storage area where two above-ground 21,000 gallon tanks will also be used for storage of liquid decontamination wastes and water from excavations that may contain PCBs.

h. Post PCB warning signs on the fence at the LBNL designated PCB waste accumulation area.
i. Comply with any additional Federal requirements and all state and local requirements that may apply to packaging, temporary storage, and transportation for disposal of bulk and liquid PCB remediation wastes from the Site.

2. **Use of tanks for storage of water that contains PCBs.** EPA's extension of the time frame to store PCB remediation wastes at the LBNL waste accumulation area is also subject to the requirements of this condition. LBNL proposes to locate and use two above-ground 21,000 gallon tanks at its waste accumulation area for storage of liquid decontamination wastes and water from excavations that may contain PCBs. Before starting to use the tanks, LBNL must have in place a plan that details the equipment, workforce, procedures, and steps to prevent, control, and provide adequate protective measures to a release or discharge from any of the tanks during any situation including catastrophic events (e.g., earthquakes). Please provide the plan described herein within 14 days after the date of this Approval.

   The tanks must be inspected weekly and the inspections must demonstrate that leakage from the tanks is not occurring and the physical integrity of the tanks is not compromised. In addition, LBNL must abide by applicable requirements in 40 CFR 761.65(c)(6); and the tanks must be properly marked consistent with 40 CFR 761.65(c)(8). Storage of liquid wastes containing PCBs in tanks is not to exceed 90 days from the first date of waste generation.

C. Land Use Restrictions

1. **Land use covenant (LUC).** After completion of the PCB cleanup work at the Site, the Parties will arrange a meeting with EPA within 30 days after EPA receives the last set of cleanup verification data to discuss the contents of the LUC. This dialogue is to explore and reach mutual agreement on the best way to address in the LUC residual PCB levels remaining at the Site and any caps or fences installed as part of the PCB cleanup contingencies described in the Application. If LBNL wishes not to have a LUC, then PCBs need to be cleaned up to levels for unrestricted land use. LBNL may consider this option.

VI. Proposed Alternative Decontamination, 40 CFR 761.79(h)(2) – Conditions of Approval

The Parties proposed an alternate self-decontamination procedure under 40 CFR 761.79(h)(2) for large construction equipment in Section 4.8.2 (Decontamination of Large Equipment) of the Application. The equipment (e.g., backhoes and excavators), which will be used during the PCB cleanup, will be in contact with bulk PCB remediation wastes (contaminated soils and concrete) at various concentrations. The Parties want to use the proposed procedure to decontaminate the equipment before they return it to the supplier. Under the use authorization in 40 CFR 761.30(u), a person may use equipment previously contaminated with PCBs if decontaminated consistent with 40 CFR 761.79.

The provision in 40 CFR 761.79(h)(2) requires that applicants validate the performance of alternative self-implementing decontamination procedures that they propose. Under 40 CFR 761.79(h)(2), EPA is

approving with the conditions below the validation study described in Section 4.8.2 of the Application submitted under 40 CFR 761.61(c).

1. Standard wipe tests (as defined in 40 CFR 761.123) will be used to validate the performance of the proposed decontamination procedure for non-porous surfaces of large construction equipment being used in the remediation of PCBs.

2. A reasonable number of wipe samples must be collected that are representative of the equipment surfaces to be decontaminated. Each wipe sample must be collected within a 100 centimeter square area and be representative of that area.

3. Surface wipe samples must be extracted via EPA Method 3540C (Soxhlet) before analysis via EPA Method 8082A.

4. Upon receipt by the Parties, the analytical results for all wipe samples must be provided to EPA for review; and the analytical results must confirm that PCBs on equipment surfaces decontaminated with the proposed procedure meet the 10 ug/100 centimeter square standard in 40 CFR 761.79.

5. If the above conditions are met, the proposed alternative self-decontamination procedure will be deemed approved; and EPA will confirm its determination via an email addressed to the Parties.

6. After decontaminated consistent with the proposed procedure after approved by EPA or with the provisions in 40 CFR 761.79(c)(1), the Parties can return the equipment to the supplier.

7. Section 4.8.3 of the Application states that two 21,000 gallon tanks that will hold liquid PCB remediation wastes will be washed and rinsed using the same proposed self-decontamination procedure as for the large construction equipment. The Parties must meet Conditions VI.1 through VI.6 above before the tanks are returned to the supplier.

8. Consistent with 40 CFR 761.65(c)(4) no item of movable equipment that is used for handling PCBs and PCB items in the storage units and that comes in direct contact with PCBs shall be removed from the storage area or the Site unless it has been decontaminated as specified in this Approval or in 40 CFR 761.79.

9. Decontamination activities must not result in any releases of PCBs from the decontamination area to the environment or exposures to human health. The Parties must keep records of the implemented validation study for the alternate decontamination procedure including a description of the equipment, location of and number of wipe samples collected, analytical results for the wipe samples, and disposal of decontamination liquids. In addition, after deemed approved by EPA and implemented by the Parties, written records documenting adherence to the approved alternate decontamination procedure (e.g., photographs, notes) must be kept. Records of the validation study implementation and actual decontamination must be kept for a minimum period of five years.

10. Decontamination wastes and residues must be disposed of consistent with applicable provisions in 40 CFR 761. If decontamination fluids are going to be added to the 21,000 gallon tank and they contain hexane, the Parties must confirm with 5 days after the date of this Approval that filtration of the water by the method proposed in the Application will effectively remove hexane.

VII. Compliance with this Approval and Applicable Regulations

The Parties must comply and implement the conditions in this Approval which covers the risk-based cleanup of PCBs (40 CFR 761.61(c)) and alternative decontamination (40 CFR 761.79(h)(2) and (h)(5)). This Approval does not relieve the Parties and their consultants from complying with other applicable TSCA PCB and Federal regulations, or state and local regulations and permits. Departure from this Approval without prior written permission from EPA may result in revocation of this Approval. If additional information demonstrates that EPA cannot sustain the no unreasonable risk determination, EPA will modify or revoke this Approval. Nothing in this Approval bars EPA from imposing penalties for violations of this Approval or for violations of other applicable TSCA PCB requirements or for activities not covered in this Approval.

This Approval does not cover further requirements that may be imposed by state (e.g., DTSC), and county and local regulatory agencies regarding cleanup of PCBs at the Old Town Demolition Phase I Project.

VIII. Amendments to this Approval

The Parties may request in writing to EPA modifications to specific conditions in this Approval. In requesting a modification, include the reasons for the request and justification for a proposed modification. The Parties may schedule a conference call with EPA to discuss any proposed modification. EPA will make a decision on the request and discuss such decision with the Parties before the specific Condition of Approval is amended by EPA.