December 8, 2003
DRAFT FOR COMMENT

Reply To
Attn Of: WCM-127

Joel Hebdon, Director
Regulatory Compliance and Analysis Division
United States Department of Energy, Richland Operations Office
PO Box 550
Richland, WA 99352

James Rasmussen, Director
Environmental Division
United States Department of Energy, Office of River Protection
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Richland, WA 99352

Re: Approval of the Toxic Substance Control Act (TSCA) Risk-based Disposal Approval (RBDA) Application for Management of Polychlorinated Biphenyl (PCB) Remediation Waste at the 200 Area Liquid Waste Processing Facilities

Dear Mr. Hebdon and Mr. Rasmussen:

This letter constitutes approval under the authority of 40 Code of Federal Regulations (CFR) 761.61(c) to manage certain aqueous PCB remediation wastes at the 200 Area Liquid Waste Processing Facilities[1], subject to conditions established below. This written decision for a risk-based method for disposal of PCB remediation waste is based on the United States Department of Energy Richland Operations Office (DOE-RL) application for a risk-based disposal approval dated February 28, 2002, as well as additional information provided to the United States Environmental Protection Agency (EPA) in support of this application. Attachment A to this approval documents the administrative record that supports this determination. In granting this approval, EPA finds that the proposed management of PCB remediation wastes in the 200 Area Liquid Waste Processing Facilities (LWPF), subject to the conditions below, will not pose an unreasonable risk of injury to health or the environment.

Conditions

[1] The 200 Area Liquid Waste Processing Facilities (LWPF) consist of the 242-A Evaporator, the Liquid Effluent Retention Facility (LERF), and the 200 Area Effluent Treatment Facility (ETF). For further details, see Section 1.2 of the February 28, 2002 RBDA Application.

1) PCB remediation waste managed under this approval at the 200 Area Liquid Waste Processing Facilities [242-A evaporator, the Liquid Effluent Retention Basins (LERF) and the Effluent Treatment Facility (ETF)] shall have a maximum PCB content of 6000 µg/l, measured as the sum of Aroclors. Results of waste stream characterization to meet this condition must be in writing and placed in the facility operating record, along with supporting quality assurance information that documents the process knowledge or analytical sampling data used to demonstrate compliance with the 6000 µg/l limit are adequate for that purpose. Waste stream characterization may be carried out in whole or in part using the waste analysis procedures in the Hanford site-wide Resource Conservation and Recovery Act (RCRA) Permit, WA7 89000 8967.
2) Not less than 90 days prior to management of any wastes with total PCB concentration greater than 600 µg/l in the 242-A Evaporator, the Department of Energy, Office of River Protection (DOE-ORP) shall provide a written test plan, including a sampling and analysis plan and associated quality assurance/quality control (QA/QC) procedures, to EPA Region 10 and the Washington State Department of Ecology (Ecology) consistent with the feasibility study report dated (reference). The purpose of work to be conducted pursuant to this test plan shall be to validate the 242-A Evaporator engineering model developed in the February 28, 2002 RBDA application with respect to demonstrating that PCB air emissions from the 242-A Evaporator do not pose an unreasonable risk of injury to health or the environment.

   Following EPA approval of the test plan, DOE-ORP shall conduct work required by the test plan during the evaporator campaign in question. No later than one hundred and twenty (120) days following the completion of this evaporator campaign, DOE-ORP shall submit a post-test report to EPA and Ecology containing all analytical and QA/QC data, a validation analysis of the 242-A Evaporator engineering model with respect to the test plan analytical data, and recommendations, if any, for changes to the engineering model. If any changes to the 242-A Evaporator engineering model are recommended on the basis of this post-test report, the report shall also include an updated risk analysis of 242-A Evaporator PCB air emissions based on the updated engineering model and the risk evaluation methodology in the February 28, 2002 RBDA application. EPA will provide written approval of the test plan after comments, if any, are resolved.

   Based on the results of this model validation exercise as documented in the approved test plan report, EPA may revise the requirements of this approval to insure that PCB air emissions from the 242-A Evaporator and/or the 200 Area LWPF do not pose an unreasonable risk of injury to health or the environment. No additional evaporator campaigns with feed waste total Aroclor concentration greater than the feasibility study trigger point of 600 ug/l will occur other than work conducted pursuant to the approved test plan until EPA has approved the post-campaign feasibility study report. Feeds with total Aroclor concentrations less than 600 ug/l may occur without restriction pending EPA approval of the post-test report and any associated changes to this approval.

3) DOE-RL shall operate 200 Area Liquid Waste Processing Facilities according to applicable terms and conditions of the Hanford site-wide RCRA permit, WA7 89000 8967.
4) Treated effluents from ETF shall have a maximum PCB content of 0.5 µg/l, measured as the sum of Aroclors. Sampling and analysis, including quality assurance/quality control procedures, shall be conducted according to a written plan that complies with requirements of 40 CFR 761.79(f). This plan may be based in whole or in part on verification sampling plans required by the Hanford site-wide RCRA permit WA7 89000 8967 or other permit or authorization applicable to 200 Area ETF treated effluent.
5) The total quantity of all liquids processed by ETF, including wastewaters other than PCB remediation waste addressed by this authorization, shall be limited to 210 million liters/year.
6) Secondary wastes from disposal of PCBs in the 200 Area Liquid Waste Processing Facilities pursuant to this approval shall be managed according to applicable TSCA, RCRA, and Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) requirements and permits or authorizations.
7) DOE-RL shall comply with all other rules and regulations applicable to the 200 Area Liquid Waste Processing Facilities, and the state-authorized land disposal site (SALDS).
8) If, anytime before, during, or after disposal of PCB remediation waste in the 200 Liquids Waste Processing Facilities, DOE-RL possesses or is otherwise made aware of any data (including but not limited to site conditions that differ from those presented in the February 28, 2002 RBDA application) indicating that the concentration limits in Conditions 1 and 4 are exceeded or that the disposal activities approved herein may pose an unreasonable risk of injury to health or the environment, DOE-RL must report such data, in writing, to the Regional Administrator within 10 days of first possessing or being made aware of that data. DOE-RL shall also report new or different information related to a condition at the 200 Liquid Waste Processing Facilities, or units receiving treated effluent or secondary wastes from such disposal activities if the information is relevant to this approval.
9) EPA reserves the right to modify or revoke this approval based on information provided pursuant to Condition 8, or any other information available to EPA that provides a basis to conclude that the disposal activities covered by this approval pose an unreasonable risk of injury to health or the environment.

EPA's rationale for establishing each of these conditions is contained in the Statement of Basis appearing as Attachment B to this letter. EPA specifically intends that this authorization incorporate the analysis and conditions of the previously-issued authorization for disposal of Hanford K-basin aqueous PCB remediation waste, issued on October 22, 2003.

Should you have any questions or comments, please contact Dave Bartus at (509) 736-5704, or Bartus.dave@epa.gov.

Sincerely,

L. John Iani
Regional Administrator

cc: Mike Wilson, Washington State Department of Ecology
Richard Gurske, Fluor Hanford
Moses Jarayssi, CH2M Hill Government Services, Inc.
Phil Miller, CH2M Hill Government Services, Inc.

Attachment A

Supporting Documentation

Approval of the TSCA RBDA Application for Management PCB Remediation Waste at the 200 Area Liquid Waste Processing Facilities (LWPF)

1) "Application for Risk-Based Disposal Approvals for Polychlorinated Biphenyls, Hanford 200 Area Liquid Waste Processing Facilities," DOE/RL-2002-02, February, 2002.
2) "Dangerous Waste Portion Of The Resource Conservation And Recovery Act (RCRA) Permit For The Treatment, Storage, And Disposal Of Dangerous Waste At The Hanford Facility," Rev. 7, WA7 8900 8967.
3) "Framework Agreement for Management of Polychlorinated Biphenyls (PCBs) in Hanford Tank Waste," 8/31/00.
4) "200 Area Effluent Treatment Facility Delisting Modification," DOE/RL-98-62, Revision 1, November 29, 2001.
5) "Toxic Substance Control Act (TSCA) Risk Based Disposal Application of the Double-Shell Tank (DST) System for 2001," RPP-8393, August, 2001.
6) "Change in Operating Scenario for the Liquids Risk Based Disposal Approval Application," 03-RCA-0252, Letter from Joel Hebdon, DOE-RL to Rick Albright, EPA, May 28, 2003
7) "200 Area Effluent Treatment Facility Delisting Modification," DOE/RL-98-62, Revision 1, November 29, 2001.
8) "Transmittal of Toxic Substances Control Act (TSCA) Risk Evaluation of the 242-A Evaporator for the Evaporator Campaign 2001-01," 01-RCA-146, February 8, 2001.
9) Letter, Charles E. Findley, Acting Regional Administrator, EPA Region 10, to Joel Hebdon, Director, Regulatory Compliance and Analysis Division, DOE-RL, February 15, 2001.
10) Transmittal of 45-day Post Campaign Report for the 242-A Evaporator Campaign 2001-01," FH-0102477, May 7, 2001.
11) "Approval to Process Tank Waste in 242-A Evaporator," 02-RCA-0360, May 31, 2002.
12) Letter, Richard Albright, Director, Office of Waste and Chemicals Management, EPA Region 10 to Joel Hebdon, Director, Regulatory Compliance and Analysis Division, DOE-RL, "Extension of Pilot Risk Based Disposal Approval for the 242-A Evaporator," June 26, 2002.
13) "Transmittal of Toxic Substances Control Act (TSCA) Risk Evaluation of the 242-A Evaporator Post-Campaign Report of the Evaporator Campaigns 02-02, 03-01, and 03-02, 03-RCA-0215, April 18, 2003.
14) Letter, Richard Albright, Director, Office of Waste and Chemicals Management, EPA Region 10 to Joel Hebdon, Director, Regulatory Compliance and Analysis Division, DOE-RL, "Risk Based Disposal Approval for the 242-A Evaporator," May 29, 2003.

15) "Change in Operating Scenario for the Liquids Risk Based Disposal Approval Application," 03-RCA-0252, May 29, 2003.
16) "Transmittal of Risk-Based Disposal Approval Feasibility Study for the 242-A Evaporator Campaigns," 03-TOD-086, November 12, 2003.
17) "Response to October 7, 2003 Comments on the Risk-Based Disposal Approval (RBDA) for the Hanford 200 Area Liquid Waste Processing Facilities," 04-RCA-0035, November 25, 2003.
18) "Submittal of Supplemental Information for Application for Risk-based Disposal Approval for Polychlorinated Biphenyls (PCB) Hanford 200 Area Liquid Waste Processing Facilities," 03-TOD-089, November 26, 2003

Attachment B

Statement of Basis

Approval of the TSCA RBDA Application for Management of PCB Remediation Waste at the 200 Area Liquid Waste Processing Facilities (LWPF)

Background

On August 31, 2000, the United States Environmental Protection Agency (EPA), the United States Department of Energy (DOE) and the Washington State Department of Ecology (Ecology) entered into a Framework Agreement concerning management of polychlorinated biphenyl (PCB) remediation wastes regulated under the Toxic Substance Control Act (TSCA). As noted in the Framework Agreement, the signatories sought agreement on an integrated regulatory pathway for management of TSCA regulated wastes in Hanford's tank waste system. The signatories agreed that the preferred regulatory pathway would be exercise of risk-based disposal approval (RBDA) authority under 40 Code of Federal Regulations (CFR) 761.61(c).

Key to establishing the Framework Agreement was reaching agreement that several key Hanford waste management units function together as an integrated system for disposal of PCBs. These units include the double-shell tank (DST) system, the 242-A evaporator, the Liquid Effluent Retention Facility (LERF) basins, the Effluent Treatment Facility (ETF), and the waste treatment plant (WTP). Therefore, EPA envisioned a single RBDA approval for the entire disposal system as it relates to management of Hanford tank wastes.

After finalizing the Framework Agreement, EPA and DOE-RL discussed options for implementing the Framework Agreement and for preparations of the necessary RBDA applications. EPA and DOE-RL recognized that it would be neither practical nor defensible to craft the entire RBDA approval at once. A key rationale for this perspective was that design, construction and performance testing of the waste treatment plant had not yet begun, let alone been completed. However, EPA and DOE-RL also recognized that other components of the disposal system, particularly the 242-A evaporator, ETF, and DSTs were currently operating and managing TSCA-regulated remediation wastes. Therefore, EPA and DOE-RL agreed to a phased implementation approach to the tank waste RBDA.

EPA and DOE-RL agreed that the first step in this phased approach would be to prepare applications for the liquids portion of the tank waste disposal system (the 242-A evaporator, LERF and ETF, collectively referred to as the 200 Area Liquid Waste Processing Facilities [LWPF]) and DSTs. Once construction, permitting and performance testing of the WTP were underway and/or completed, DOE-RL would complete the RBDA application process with an application component focusing on the WTP component of the tank waste disposal system. Since the liquids and tank components of the RBDA would depend in part on assumptions made concerning WTP

performance, EPA and DOE-RL recognized that any approval granted for initial operations of the liquids and DST portions of the disposal system might need to be revisited or modified as new information became available concerning WTP operations. In this sense, the Framework Agreement RBDA was anticipated to be an evolving document.

During development of the liquids component of the RBDA application, DOE-RL recognized that the LERF and ETF facilities would likely be used to mange TSCA-regulated remediation wastes from sources other than Hanford tanks. A summary of these additional waste streams is shown in Figure 1-1 of the RBDA application.

As a separate action, EPA notes that DOE-RL has petitioned EPA to modify the existing RCRA delisting applicable to ETF treated effluents. See 60 Federal Register (FR) 6054, February 1, 1995. Although not yet proposed, EPA intends to include in this delisting rulemaking a delisting exclusion limit for PCBs based on the same TSCA decontamination limit being approved in this RBDA approval[2]. EPA believes this approach is necessary to insure protectiveness, as well as consistency between the various authorities and decision documents applicable to LERF/ETF.

EPA intends to propose in the near future approval of the RBDA for the double-shell tank (DST) component of the tank waste RBDA. EPA intends that this proposal will be consistent with the proposed approval provided by this letter, and will provide additional details of the relationship between the liquids, DST and waste treatment plant components of the tank waste RBDA.

Overview

During development of the Framework Agreement, EPA, DOE and Ecology sought to address two key issues. First, what was the original source and concentration of PCBs that have been detected in Hanford tank wastes and other generating sources that have or may be added to the tank systems, and second, how to reconcile the prohibition against dilution of PCBs to avoid treatment in 40 CFR 761.1(b)(5) with the practical realities of managing high-level radioactive waste in Hanford's 28 million-gallon double-shell tanks. This section provides and overview of how EPA has addressed these issues in the Framework Agreement, this proposed RBDA approval, and the remaining Framework Agreement implementation phases.

With respect to the first issue, the TSCA disposal amendments of 1998 created the new category of PCB wastes know as PCB remediation wastes. See 40 CFR 761.3 for the definition of PCB remediation waste. This definition depends largely on knowledge of PCB source concentration prior to a spill, release or other unauthorized disposal. Further, TSCA generally places the burden of evaluating the regulatory status of potential PCB wastes on the generating facility. Given the lengthy and complex operating history of the

[2] PCBs are defined as hazardous constituents under RCRA, and therefore subject to consideration under delisting authority. See 40 CFR 261.Appendix VIII and Washington Administrative Code (WAC) 173-303-9905 under Washington State's authorized dangerous waste program.

Hanford facility during its production era (when PCBs were generally expected to have been widely used in a variety of products, such as hydraulic and cooling oils, paints, sealants, gasket materials and so on), and lack of complete and accurate historical records of PCB usage, however, EPA and DOE-RL agree that documentation of PCB source concentration (or even generating source) is simply impracticable. On the other hand, DOE-RL has acknowledged that at least some transfers of waste into the DST system were of wastes that clearly met the definition of PCB remediation waste.

EPA and DOE-RL also recognized that, with respect to the waste treatment plant currently under construction, the principle goal of Hanford tank waste treatment is to produce a "good glass" vitrified waste form that effectively immobilizes radionuclides in a manner suitable for placement of the vitrified wastes in a national geologic repository (for high-level wastes) or at Hanford (for immobilized low-activity waste). Further, EPA and DOE-RL recognized that one of, if not the key function of the DST tank system is to blend and supply feeds to the waste treatment plant that meet the various feed envelope specifications for waste treatment plant operations. Preparation of the required quantities of feed to meet feed delivery specifications and schedules, however, inherently involves considerable blending and potentially dilution of tank wastes.

Through the framework agreement, EPA has established three principles related to dilution of PCBs in Hanford tank wastes. First, EPA acknowledged that dilution of PCBs is inherent in the legitimate function of Hanford DSTs in receiving wastes retrieved from single-shell tanks and other high-level waste sources at Hanford and in preparing feed for treatment at the waste treatment plant. Due to the unique nature of high-level wastes and the significant risks that they pose, DOE-RL has no practical alternatives to the DST tank system to manage these wastes in advance of vitrification in the waste treatment plant. Second, EPA established that this dilution is not for purposes of avoiding treatment, but rather is an integral part of the treatment plan established through the Hanford Federal Facility Agreement and Consent Order (HFFACO, or Tri-Party Agreement). Third, EPA agreed that the waste treatment plant should be designed and operated to manage PCB waste concentrations that will actually be "seen" by the waste treatment plant, not the highest concentration that might be added to DSTs as part of transfers from SSTs or other high-level waste sources.

The framework agreement treats the double-shell tank system, the 242-A evaporator, the LERF basins, ETF and the waste treatment plant as a single system that, for purposes of TSCA, serves as a means of disposing of regulated PCBs. In this sense, the Framework Agreement and implementing approvals seek to treat this system holistically under a single approval, even though EPA expects to issue the approval in phases. This concept is significant, in that even though dilution of PCBs is expected to occur in DSTs as part of feed preparation, it is still necessary to insure that PCBs are effectively destroyed or removed regardless of dilution. Therefore, approvals under the Framework Agreement must make two key demonstrations: First, treated wastes and waste treatment residuals from the tank waste treatment system must be below TSCA decontamination limits or other standards below which further controls under TSCA are not necessary; and second, that destruction or removal of PCBs from tank wastes is achieved after dilution in DSTs

to a degree equivalent to what would be required as if the wastes were disposed of prior to dilution in the DST system.

In a very general sense, EPA expects that destruction/removal of PCBs from tank wastes will occur principally in the waste treatment plant and in ETF. Within high-level and low-activity melters at the waste treatment plant, some PCBs may be destroyed in the melters, while others (perhaps the substantial majority of PCBs received by the waste treatment plant) will be volatized and managed in the WTP air emissions control system. Of the PCBs volatilized to the WTP air system, some may be destroyed in the air pollution control equipment, while others will be captured or condensed in scrubber water and sent to ETF for further treatment. ETF, in turn, is expected to be highly effective in destroying PCBs via application of ultraviolet oxidation (UV/OX) treatment, a technology generally recognized as being effective in permanently destroying PCBs.

At this time, absent a complete design and/or operating waste treatment plant, it is not possible to fully define exactly how PCBs will be partitioned in the plant. EPA intends to conduct exactly this analysis via review of DOE-RL's future submission of an application for the final implementing phase of the Framework Agreement RBDA. EPA expects that this application will largely be based on design and engineering work conducted to support RCRA permitting of the waste treatment plant, and evaluation and testing of the air pollution control system.

As part of the first implementing phase of the tank waste RBDA, EPA finds that ETF treatment results in treated effluents and secondary wastes that do not pose an unreasonable risk of injury to heath or the environment, and that ETF provides substantial destruction/removal of PCBs even after dilution of PCBs in the DST tank system or other components of the tank waste treatment system. The basis for this finding is based on DOE-RL's presentation of vendor-supplied kinetic reaction data and analysis of the organic oxidation/destruction reactions occurring in the ETF UV/OX treatment system. In particular, Section 2.3 of the 200 Area Liquid Waste Processing Facilities RBDA application states:

> "PCBs, when subjected to UV oxidation, undergo a first order kinetic reaction in which the PCB molecules are decayed or destroyed. This destruction follows a logarithmic decay rate, irrespective of the initial PCB concentration. This means that PCB decay follows essentially the same decay curve for any initial PCB concentration, based on an oxidation rate constant of 4.5 $(min)^{-1}$."

Therefore, based on first-principle chemical reaction kinetics, the ETF treatment process (specifically the UV/OX treatment process) provides exactly the needed treatment characteristics, which are that effective PCB destruction/removal occurs independent of influent concentration. This finding supports EPA's decision to grant approval for the 200 Area Liquid Waste Processing Facilities at this time in advance of phased decisions on the DST tank component and the waste treatment plant component of the overall tank waste treatment RBDA. More specifically, this reaction kinetics finding demonstrates

that EPA's decision satisfies the requirements of 40 CFR 761.61(c) and is consistent with the Framework Agreement principles.

At such time as EPA considers the DST component of the tank waste disposal RBDA, EPA expects to consider the following questions:

- Identification and analysis of bounding potential release or exposure mechanisms from treatment of PCB remediation waste in the DST tank system;
- Controls in place at the DST system to insure that unexpected exposure of workers, the public or the environment are prevented or appropriately controlled.
- The range of PCB remediation wastes (concentration and quantities) that can be managed by the DST system in compliance with the requirements of 40 CFR 761.61(c) and any waste analysis and/or waste acceptance criteria that may be necessary.

At such time as EPA considers the future WTP component of the tank waste disposal RBDA, EPA expects to consider several key technical questions. These include:

- How PCBs in the feed to the WTP are distributed between the glass treated waste, air emissions, liquid effluents (including air emissions control system scrubber waters), and secondary wastes from the WTP;
- The quantity and concentration of liquid effluents sent to the 200 Area Liquid Waste Processing Facility from the WTP to insure they are consistent with the treatment capability of ETF;
- The control efficiencies of air pollution control equipment, and the risk posed by potential air emissions of PCBs from the WTP;
- The quantities and concentration of PCBs that may be in secondary wastes from the WTP, and risks that may be posed by them via the expected management scenarios; and
- Controls in place at the WTP to insure that unexpected exposure of workers, the public or the environment are prevented or appropriately controlled.

A number of elements of this proposed approval are redundant with similar determinations already in place as part of EPA's approval for management of PCB remediation waste from the Hanford K-basins. If finalized, this RBDA approval will extend the approval, issued previously and specific to K-basin aqueous liquid PCB remediation wastes, to a more general approval. Conditions in the K-basin liquids RBDA specific to that approval will remain in effect.

Discussion of Conditions

This section contains a discussion of EPA's rationale for establishing each of the conditions established in granting this risk-based disposal approval for TSCA-regulated

PCB remediation waste that will be disposed of in the Hanford tank waste disposal system.

In the February, 2002 RBDA application, DOE-RL analyzed actual or potential risks from disposal of PCB remediation waste in the 200 Area LWPF through three key potential release mechanisms. As presented in Section 2.3 of the RBDA application, these include:

- Air emissions from process and other vents
- Spills or releases during treatment and processing operations
- Discharge of treated effluents and secondary wastes

EPA believes that these potential release mechanisms reasonably represent all significant sources of human and environmental threats that need be evaluated to support a demonstration that disposal of PCB remediation waste as proposed in DOE-RL's RBDA application do not pose an unreasonable risk of injury to health or the environment. Each of these potential release mechanisms is addressed by one or more conditions, as discussed in the following paragraphs.

Condition 1: PCB remediation managed under this approval at the 200 Area Liquid Waste Processing Facilities [242-A evaporator, the Liquid Effluent Retention Basins (LERF) and the Effluent Treatment Facility (ETF)] shall have a maximum PCB content of 6000 µg/l, measured as the sum of Aroclors. Results of waste stream characterization to meet this condition must be in writing and placed in the facility operating record, along with supporting quality assurance information that documents the process knowledge or analytical sampling data used to demonstrate compliance with the 6000 µg/l limit are adequate for that purpose. Waste stream characterization may be carried out in whole or in part using the waste analysis procedures in the Hanford site-wide Resource Conservation and Recovery Act (RCRA) Permit, WA7 89000 8967.

For purposes of this approval, DOE-RL's application discusses four air emissions sources from the 200 Area LWPFF. These include: 1) 242-A evaporator air emissions; 2) LERF basin vents; 3) Vented tanks in ETF (surge tank, secondary waste receiving tanks, etc.); and 4) degassing column/air stripper emissions from ETF.

There are several process units at the 242-A Evaporator that may contribute to PCB air emissions, including the evaporator vessel itself, condensers, and the condensate collection tank. The RBDA models air emissions from these sources on the basis of vapor/liquid equilibrium calculations. Since the PCB concentrations in tank wastes managed by the evaporator are expected to be quite dilute (the upper limit is established as 6000 µg/l by this approval), Henry's law may be used to calculate vapor concentrations in equilibrium with liquids in the evaporator system.

Calculations were performed for a range of PCB concentrations, ranging from 0.2 µg/l to 6000 µg/l. DOE-RL's rationale for selecting these PCB concentrations for analysis is found in Section 3.1.1 of the February 28, 2002 RBDA application. To summarize, the 0.2 µg/l value corresponds to the method detection limit (MDL) typically achieved for Hanford analyses, and the upper bound on PCB concentrations received to date at the 200 Area LWPF. The 600 µg/l value corresponds roughly to the highest solubility of Aroclors in water, while the 6000 µg/l roughly corresponds to the maximum PCB concentration that ETF can process while routinely meeting a treated effluent PCB concentration of 0.5 µg/l.

Details of the calculation methodology used to model 242-A Evaporator air emissions may be found in Section A.2.0 and Attachment 1 of the RBDA application. Results of 242-A evaporator air emissions modeling are presented in Section A.2.2 for each of the three feed concentrations considered in the RBDA application.

With respect to LERF air emissions, Section 2.2 of the RBDA application documents

> "The [LERF] basins are designed to have no air emissions, since the LERF is a bladder system. Each breather vent is equipped with drum containing 200 pounds of GAC [granulated activated carbon]. These GAC canisters are expected to be effective for removal of organic vapor, including PCBs, for the life of the LERF basins without requiring replacement."

Considering the engineering function of the LERF basin cover, the ambient temperature of liquids in the LERF basins that limit volatility of PCBs, and the passive air controls on the basins, EPA concurs that PCB emissions from LERF basins are negligible and do not warrant further evaluation for purposes of this approval.

For vented tanks at the ETF, similar equilibrium calculations similar to those applied to modeling of the 242-A evaporator are performed to estimate air emissions of PCBs. Certain operating data, such as air flow rates from the various tanks, are taken from the ETF Notice of Construction required by the Washington State Department of Ecology pursuant to Washington Administrative Code (WAC) 173-400. (See Section A.2.1.2 of the RBDA application). Operating temperatures for modeling purposes are determined from typical temperatures of the particular tanks observed during operations.

Emissions from the ETF degassing column are evaluated in a similar way, except that the degassing column is modeled as an air stripper, using a standard modeling approach for packed bed countercurrent mass transfer unit operations. See Section A.2.1.2 of the RBDA application.

The modeling of ETF PCB air emissions evaluation considers two key process configurations of ETF, which principally reflect whether ultraviolet oxidation (UV/OC) processing (the key unit operation at ETF for destruction/removal of PCBs) occurs

upstream or downstream of the vented tanks in question[3]. The application notes that Configuration 3 has the potential to emit greater quantities of PCBs than other configurations, since UV/OX treatment occurs downstream of other treatment processes. Configuration 3 is applicable to wastewaters with high dissolved solids.
Some of these PCBs considered in Configuration 3, specifically those in the secondary treatment train evaporator and thin-film dryer, are recycled back to the main treatment train, so that the emissions difference between these two configurations is only seven percent of ETF feed PCBs for the 6000 µg/l case. As noted in Section 3.1.1 of the RBDA application, Configuration 3 is considered the bounding case for PCB air emissions from the ETF. Therefore, the operating conditions established by this approval are based on a demonstration that ETF operations do not pose an unreasonable risk of injury to health or the environment for either ETF process configuration.

Details of this engineering emissions model may be found in Appendix 1 of DOE-RL's RBDA application.

Once PCB emission rates from 242-A Evaporator and ETF sources are calculated, DOE-RL's RBDA application then evaluates the effect of these emissions on various receptors. Receptors considered include Hanford site workers, potentially exposed members of the public, and environmental receptors. Details of how stack emissions calculated from the 242-A Evaporator and ETF were used for purposes of risk evaluation are found in Section A.3.1 of the RBDA application. Language in the second paragraph of Section A.3.1 of the original RBDA application was somewhat confusing, so DOE has provided the following revised text for this paragraph via letter dated November 26, 2003 to more clearly explain how engineering model results were used for risk evaluation:

> "Stack emissions from the Evaporator (Stack 296-A-22) and the ETF (Stack 296-E-1) were modeled to show the release rates, in grams per second, for the Polychlorinated Biphenyls (PCB) mixture (Aroclor). The model used three feed streams with varying PCB concentrations (0.2, 600, and 6,000 μg/l). The purpose of structuring the modeling calculations in this manner was to evaluate whether emissions rates of individual Aroclor mixtures varied significantly from one mixture to another. Model results presented in Section A.2.2 demonstrate that the calculated air emissions rates are roughly similar for all Aroclor mixtures, except for Aroclor 1232, which appears to be emitted at a significantly lower rate than other Aroclor mixtures. Therefore, for purposes of simplicity, air emissions of PCBs can be fairly represented by a single Aroclor mixture, selected for purposes of this analysis to be Aroclor 1254. This selection is also appropriate when considered in the context of evaluating air pathway exposures based on inhalation, since the inhalation cancer slope factor of 0.4 (mg/kg-d)$^{-1}$ applies to all PCB mixtures. Therefore, calculated air emission rates for Aroclor 1254 from the Evaporator and the ETF (Configuration 1 and Configuration 3) at feed concentrations of 0.2 µg/l, 600 µg/l (the approximate PCB aqueous solubility limit), and 6000 µg/l were used for the air dispersion modeling described below."

[3] The RBDA application actually considers three process configurations, but notes that Configuration 1 and Configuration 2 are similar if volatile organics are present. Only Configurations 1 and 3 are explicity considered in the RBDA application analysis.

Modeling of transport from the 200 LWPF emission sources to receptors is carried out using a standard EPA model, Industrial Source Complex 3, or ISC3, and Hanford-specific meteorological data. Use of the ISC3 model, and the selected locations of potentially exposed members of the public, is consistent with other air pathway risk evaluations at the Hanford site.

The February 28, 2002 RBDA application bases air emissions estimates from the 242-A Evaporator on one campaign of 1,000,000 gallons each for the years 2001 through 2009, and one campaign of 500,000 gallons each for the years 2010 through 2019. Subsequent to preparation of this RBDA application, the Department of Energy has established much more aggressive schedules for retrieval and treatment of Hanford tank wastes. Integral to this mission acceleration effort are plans to significantly increase the number of evaporator campaigns to insure sufficient DST space is available. DOE-RL reflected these mission acceleration plans in their May 29, 2003 letter updating the operating scenario for the 242-A evaporator. Data provided in this letter and the RBDA application supplement dated November 25, 2003 update air emissions and risk calculations in the original RBDA application to a basis of 300 days/year.

Human exposure risks to PCB emissions from the 200 Area LWPF are calculated for both the highest 24-hour average exposure and for annual average exposure. In the case of public receptors, affected individuals are assumed to be exposed 24 hours per day/seven days per week for a lifetime exposure of 70 years to both the calculated highest 24-hour average concentration and the highest annual average concentration. This calculation assumption is highly conservative, since the receptors are assumed to have a much longer exposure duration than physically possible based on 200 Area LWPF operations. In addition, the receptors are assumed to be exposed to the highest 24-hour average concentration for the entire 70-year exposure duration.

The assumed exposure duration for worker exposures are slightly different than the exposure duration for members of the public, reflecting the more limited time workers spend on the job at modeled worker exposure locations, and differ slightly between contributions from the 242-A evaporator and ETF emissions sources. For purposes of calculating risks from the maximum 24-hour average emissions, workers are assumed to be exposed for 30 days/year, or a total exposure of 0.38 years, based on 20 years of evaporator operation[4]. While this is somewhat less conservative than for public exposures, EPA still considers this a conservative bounding estimate, since it is highly unlikely that workers or members of the public will be exposed to the highest 24-hour average emissions levels for even a 30 day period. For annual average exposure from evaporator emissions, workers are assumed to be exposed to 300 days/year of emissions at the annual average emissions level, for a cumulative exposure duration of 3.8 years.

[4] Although the Hanford site is not expected to close until 2035, an assumption that the 242-A evaporator will operate for 20 years is not unreasonable, since evaporator operations are expected to terminate well before site closure.

The ETF is assumed to operate 85 percent of the time for a period of 20 years, for a cumulative exposure duration of 3.9 years based on a 2000-hour work year. This exposure duration is applied to both the highest 24-hour average exposure concentration and highest annual average exposure concentration scenarios. As noted above for public exposure calculations, an assumption that the highest 24-hour average exposure concentration occurs over an extended time period is highly conservative.

Results of risk analysis of air pathway emissions from the 200 Area LWPF disposal of PCB remediation waste show that there is no unreasonable risk of injury to any of the receptors evaluated. Details are provided in Section A.3 of DOE-RL's RBDA application. The RBDA application supplement dated November 25, 2003 provides a revised Table A.3-9 that summarizes these risks based on the expanded 242-A Evaporator operating scenario. This table, reproduced below, documents that the highest risk from 200 Area LWPF operations (combined 242-A Evaporator and ETF emissions sources) is 3.5×10^{-7} based on the highest 24-hour average concentration exposure to workers for the 6000 µg/l feed case. Additional explanatory details, reflecting the revised 242-A Evaporator operating scenario and supplemental RBDA application text, can be found in RBDA application supplement. EPA finds that this bounding risk value supports a conclusion that the proposed disposal of PCB remediation waste does not pose an unreasonable risk of injury to health or the environment.

Table A.3-9 Combined Evaporator and the ETF (Configuration 3) Human Risk Assessment Summary

Feed Concentration	0.2 μg/L	600 μg/L	6000 μg/L
Public Receptor Risk			
LIGO Receptor Risk Using Highest 24-hr. Average Concentration	5.7×10^{-12}	1.6×10^{-08}	1.6×10^{-07}
LIGO Receptor Risk Using Annual Average Concentration	1.6×10^{-13}	4.7×10^{-10}	4.7×10^{-09}
Energy Northwest Receptor Risk Using Highest 24-hr. Average Concentration	4.3×10^{-12}	1.3×10^{-08}	1.3×10^{-07}
Energy Northwest Receptor Risk Using Annual Average Concentration	1.6×10^{-13}	4.8×10^{-10}	4.8×10^{-09}
Site Boundary Receptor Risk Using Highest 24-gr. Average Concentration	5.6×10^{-12}	1.7×10^{-08}	1.7×10^{-07}
Site Boundary Receptor Risk Using Annual Average Concentration	2.2×10^{-13}	6.6×10^{-10}	6.6×10^{-09}
Worker Risk			
Worker Receptor Risk using Highest 24-hr. Average Concentration (Evaporator operating 30 days per year)	1.1×10^{-11}	3.5×10^{-08}	3.5×10^{-07}
Worker Receptor Risk Using Highest Annual Average Concentration (Evaporator operating 30 days per year)	6.9×10^{-13}	2.0×10^{-09}	2.0×10^{-08}
Worker Receptor Risk Using Highest Annual Average Concentration (Evaporator	2.0×10^{-12}	5.9×10^{-09}	5.9×10^{-08}

Operating 300 days per year)			

Ecological risk from disposal of PCB remediation waste in the 200 Area LWPF is based on the ecological receptor impact analysis performed as part of the double-shell tank component of the Hanford PCB Framework Agreement RBDA application. Briefly, the DST analysis examined the dose or exposure concentration (as appropriate on a species-specific basis) for selected ecological receptors of potential concern applicable to Hanford biota. This analysis considered species-specific exposure and uptake pathways from air emissions to the identified receptors. These values were then compared to corresponding species-specific and general biota class toxicity reference values (TRV). This analysis concluded that the hazard quotient[5] for all environmental receptors of potential concern were less than one, indicating no unreasonable risk of injury to the environment. This analysis does note that mammal species (white-tailed deer, mink, and meadow vole, exceeded biota class-based health quotients. EPA believes that species-specific TRV values provide a more representative evaluation of the environmental effects of PCB (and other contaminant) exposures. Therefore, EPA is basing its finding of no unreasonable risk of injury to the environment on the species-specific, not the general biota-class analysis.

The February 28, 2002 LWPF RBDA application calculated the environmental risks of LWPF air emissions by multiplying the species-specific dose or exposure concentration from the DST environmental risk evaluation by the ratio of the air emissions rate calculated from 200 Area LWPF sources to air emissions from DST sources. The RBDA application supplement dated November 25, 2003 clarifies that, for purposes of environmental risk evaluation, 8766 hours per year of operations are assumed for both the LWPF and DSTs (24 hours/day, seven days per week, and 52 weeks per year). Results of these calculations are presented in Tables A.3-10 through A.3-12 in the 200 Area LWPF RBDA application for the three feed concentration cases evaluated. In each case, the ratio of 200 Area LWPF air emissions to DST air emissions was less than 1.0, meaning environmental impacts from 200 Area LWPF operations are less than those calculated from DST operation. Therefore, the finding reached by the DST RBDA application that there is no unreasonable risk of injury to the environment also applies to air emissions from the 200 Area LWPF.

EPA finds that the requirement to measure PCB content on the basis of total Aroclors is appropriate, since the UV/OX treatment in ETF for this waste stream is well suited to effectively destroying all PCB cogeners. Therefore, it is not necessary to identify individual PCB cogeners to evaluate whether the wastes can be effectively destroyed in ETF or that the treated effluent meets decontamination standards.

The remaining elements of condition 1 relating to written waste stream characterization are intended to insure appropriate documentation and enforceability of the influent PCB concentration limit. The final element of condition 1 acknowledges EPA's expectation

[5] The hazard quotient for this analysis is defined as the dose or exposure concentration divided by the corresponding toxicity reference value. See Section 5.3 of the DST RBDA application.

that RCRA and TSCA requirements be integrated to the extent possible while still demonstrating compliance with RCRA and TSCA

Condition 2: Not less than 90 days prior to management of any wastes with total PCB concentration greater than 600 µg/l in the 242-A Evaporator, the Department of Energy, Office of River Protection (DOE-ORP) shall provide a written test plan, including a sampling and analysis plan and associated quality assurance/quality control (QA/QC) procedures, to EPA Region 10 and the Washington State Department of Ecology (Ecology) consistent with the feasibility study report dated (reference). The purpose of work to be conducted pursuant to this test plan shall be to validate the 242-A Evaporator engineering model developed in the February 28, 2002 RBDA application with respect to demonstrating that PCB air emissions from the 242-A Evaporator do not pose an unreasonable risk of injury to health or the environment.

Following EPA approval of the test plan, DOE-ORP shall conduct work required by the test plan during the evaporator campaign in question. No later than one hundred and twenty (120) days following the completion of this evaporator campaign, DOE-ORP shall submit a post-test report to EPA and Ecology containing all analytical and QA/QC data, a validation analysis of the 242-A Evaporator engineering model with respect to the test plan analytical data, and recommendations, if any, for changes to the engineering model. If any changes to the 242-A Evaporator engineering model are recommended on the basis of this post-test report, the report shall also include an updated risk analysis of 242-A Evaporator PCB air emissions based on the updated engineering model and the risk evaluation methodology in the February 28, 2002 RBDA application. EPA will provide written approval of the test plan after comments, if any, are resolved.

Based on the results of this model validation exercise as documented in the approved test plan report, EPA may revise the requirements of this approval to insure that PCB air emissions from the 242-A Evaporator and/or the 200 Area LWPF do not pose an unreasonable risk of injury to health or the environment. No additional evaporator campaigns with feed waste total Aroclor concentration greater than the feasibility study trigger point of 600 μg/l will occur other than work conducted pursuant to the approved test plan until EPA has approved the post-campaign feasibility study report. Feeds with total Aroclor concentrations less than 600 μg/l may occur without restriction pending EPA approval of the post-test report and any associated changes to this approval.

EPA has concluded that the engineering model for PCB air emissions from the 242-A Evaporator is based on sound scientific and engineering principles. At the same time, EPA recognizes that it is appropriate to validate any model that is used for decision-

making purposes. For purposes of this approval, the most important element of the 242-A Evaporator engineering model is the estimate of PCB emissions through the evaporator vessel vent, since these emissions directly enter the environment and contribute to risks of the proposed tank waste PCB disposal activities.

Conceptually, model validation can be accomplished by comparing measured PCB emissions in the vessel vent stream to the same quantity calculated by the engineering model. This process would require actual sampling and analysis of the vessel vent stream, and measurable (that is, quantifiable) levels of PCBs in the evaporator feed. Air sampling for PCBs in the evaporator vessel vent, while technically feasible, would require considerable planning and effort beyond tasks normally carried out as part of regular evaporator campaigns.[6] Therefore, EPA initially required DOE-RL to conduct several evaporator campaigns on a pilot basis to establish whether a mass balance approach could function as an alternative to direct model validation. Under this mass balance approach, vessel vent PCB emissions would be estimated by the difference between PCBs fed to the evaporator, and the sum of PCBs leaving the evaporator in the process condensate and the slurry returned to double-shell tanks. The vessel vent stream PCB content estimated by difference would then be compared to model predictions for the same PCB feed concentration and operating conditions.

EPA authorization to conduct these pilot evaporator campaigns was issued by approval letters dated February 15, 2001, June 26, 2002 and May 29, 2003. February 15, 2001 approval was specific to evaporator campaign 2001-01, and was based on an application for a risk-based disposal approval specific to campaign 2001-01 provided via letter dated February 8, 2001. The June 26, 2002 approval extended the February 15, 2001 approval to cover similar evaporator campaigns in 2002. The May 29, 2003 approval covered campaigns 2003-03 and 2003-04. As a condition of these approvals, DOE-RL was required to submit written reports providing results of the required feed, process condensate and slurry PCB analyses, and calculation of vessel vent PCB emissions. DOE-RL provided these reports via letters dated May 7, 2001 for campaign 2001-01, April 18, 2003 for campaigns authorized by the June 26, 2002 approval (specifically, campaigns 02-02, 03-01 and 03-02), and July 22, 2003 for campaigns 2003-03 and 04.

Results of these pilot evaporator campaigns proved inadequate for purposes of model validation, principally since no detectable PCBs were found in any of the liquid streams associated with the 242-A evaporator (feed, process condensate or slurry). Therefore, it was not possible to perform a mass balance around the evaporator to estimate air emissions. As a result, DOE-ORP prepared a feasibility study intended to evaluate the technical feasibility of directly sampling air emissions, provided to EPA via letter dated November 12, 2003. The purpose of this feasibility study is to identify the feed PCB "trigger" concentration which would result in PCB concentrations in the slurry and Vessel Vent stank sufficient to be above reasonably-available analytical quantitation

[6] Sampling ports are installed and available at an accessible location within the 242-A Evaporator building. However, sampling devices suitable for obtaining a representative air sample for PCB analyses are not, and would need to be acquired and installed prior to any air sampling for PCBs.

limits. Once validated analytical data are available, they can be used to answer two questions:

1) Do modeled air emissions rates represent measured stack air emissions rate? and
2) Do modeled slurry and/or process condensate PCB concentrations represent measured slurry PCB concentrations?

The primary goal of this validation process is to confirm model predictions of air emissions release rates. This verification goal will in turn allow verification of whether or not air emissions from 242-A operations pose an unreasonable risk of injury to health or the environment. A secondary goal of this validation process is to confirm model predictions of PCB concentrations in the slurry and process condensate streams. This verification will serve mainly insure completeness of model predictions, and as a secondary check on the veracity of air emissions model predictions.

This feasibility study established a "trigger" level of 600 µg/l feed PCBs. In doing so, the feasibility demonstrated that this PCB concentration is adequate to provide measurable PCBs in the relevant 242-A vapor and liquid streams. In addition, this feed concentration is well within the concentration range that the engineering model and risk evaluation predict as posing no unacceptable risks. Since the feasibility study was intended to be only a scoping document, EPA is requiring that DOE-ORP prepare a detailed work plan, including quality assurance/quality control requirements, prior to implementing this model validation study. Following approval of the work plan and implementation of the sampling, and analytical and engineering data analysis, EPA will evaluate whether the remaining conditions of this approval are appropriate to demonstrate that the proposed disposal of PCBs does not pose an unreasonable risk of injury to health or the environment, or if modifications may be necessary.

EPA is requiring this model validation exercise only for air emissions from the 242-A Evaporator, and not for other air sources from LERF and ETF. EPA's basis for this differentiation is that DOE-RL's RBDA application demonstrates that air sources other than the 242-A Evaporator are not likely to have significant contributions to air pathway risks. Therefore, EPA is focusing the model validation exercise on the specific air source that the existing analysis demonstrates has the potential to significantly affect 200 Area LWPF risks. Should the results of this model validation exercise suggest that in fact model validation for other 200 Area LWPF air emissions is prudent, EPA may require such actions based on Condition 9.

Condition 3 DOE-RL shall operate the 200 Area Liquid Waste Processing Facilities (242- A Evaporator, LERF and ETF) according to applicable terms and conditions of the Hanford site-wide Resource Conservation and Recovery Act (RCRA) permit, WA7 89000 8967.

DOE-RL's RBDA application does not contain an explicit analysis of risks of spills and accidental releases from treatment of PCB remediation waste at the 200 Area Liquid Waste Processing Facilities. EPA believes this is appropriate, since all of the waste

management units within the 200 Area Liquid Waste Processing Facilities are fully permitted by the Washington State Department of Ecology through the Hanford site-wide RCRA permit. This permit contains detailed design and operating conditions intended to insure safe and protective operations of each of these waste management units. Therefore, disposal of PCB remediation at the 200 Area LWPF will not pose an unreasonable risk of injury to health or the environment on the basis of spills or releases when these units are operated according to RCRA permit requirements.

This condition also insures that closure of the 200 Area Liquid Waste Processing Facilities waste management units is conducted in an environmentally protective manner. For purposes of this approval, this condition establishes that closure satisfying the RCRA-permitted closure plan is an adequate demonstration that the protectiveness standard of 40 CFR 761.61(c) is met with respect to closure activities. Therefore, EPA is establishing as a condition of this approval that management of PCB remediation waste under this approval be conducted according to the technical standards of the Hanford site-wide RCRA permit, WA7 89000 8967.

In establishing this condition, EPA recognizes that K-basin aqueous liquids are not expected to designate as hazardous wastes, and therefore are not legally subject to RCRA permitting requirement for management at LERF and ETF. EPA is not intending to extend RCRA jurisdiction to non-RCRA-regulated wastes. Rather, EPA is imposing under TSCA authority the technical standards developed through the RCRA permitting process. EPA believes that this approach will not only clearly demonstrate that management of PCB remediation waste in ETF does not pose an unreasonable risk of injury to health or the environment, but it will also insure a consistent set of operating standards and processes for all wastes managed at ETF.

Condition 4 Treated effluents from ETF shall have a maximum PCB content of 0.5 ppb, as measured by the sum of Aroclors. Sampling and analysis, including quality assurance/quality control procedures, shall be conducted according to a written plan that complies with requirements of 40 CFR 761.79(f). This plan may be based in whole or in part on verification sampling plans required by the Hanford site-wide RCRA permit WA7 89000 8967 or other permit or authorization applicable to 200 Area ETF treated effluent.

Condition 5 The total quantity of all liquids processed by ETF, including wastewaters other than PCB remediation waste addressed by this authorization, shall be limited to 210 million liters/year.

To insure that the discharge of treated effluents from the ETF system are fully protective, DOE-RL's RBDA application is based on treating K-basin aqueous PCB remediation wastes to 0.5 µg/l, which is the decontamination limit established by 40 CFR 761.79(b)(1)(iii) for unrestricted use of water. The sampling and analysis requirements are intended to insure compliance with TSCA, as well as more general expectations that

concentration-based compliance demonstrations are documented in writing and supported by appropriate quality assurance information.

EPA is including the provision that the 0.5 µg/l limit be met prior to discharge to allow DOE-RL the flexibility to retreat any batch of treated effluent that does not comply with the required concentration limit. EPA anticipates that circumstances where re-treatment may be necessary will occur rarely, if at all, but does feel it prudent accommodate this possibility. Such a provision will be consistent with the design of ETF and other authorizations applicable to ETF.

To insure that this decontamination limit can be routinely achieved, EPA is also establishing the annual volumetric treatment limit for ETF at 210 million liters/year. The technical basis for this limitation is found in Section 2.3 of the February 28, 2002 RBDA application. This section cites vendor data for the ETF UV/OX treatment process, which establishes that the chemical reactions occurring in the UV/OX treatment units follow first-order reaction kinetics. Therefore, the ratio of effluent PCB concentration to feed concentration is directly proportional to residence time. Once a specific residence time is established, the annual throughput or processing capacity of the UV/OX treatment process immediately follows, given the fixed physical size of the process equipment.

In this approval, EPA is establishing the required maximum effluent PCB concentration, and a maximum allowable influent PCB concentration based on a decontamination factor (DF) of 11,600[7] (The decontamination factor is the ratio of effluent to influent PCB concentrations. See page 3-5 of the February 28, 2002 RBDA application). Since this decontamination factor establishes a specific residence time (2.08 minutes, as cited on page 2-9 of the RBDA application) a maximum throughput immediately follows as noted above. The 210 MMl/y capacity reflects this maximum throughput, adjusted for the expected on-line operating efficiency of ETF (the fraction of time that ETF actually processes waste over an entire calendar year). For these calculations, an on-line operating efficiency of 70% is used. See Section 1.4 of the November 29, 2001 200 Area ETF delisting petition.

EPA is establishing this limit to apply to the total of liquids processed by ETF, not just PCB remediation wastes (including K-basin aqueous PCB remediation wastes previously authorized). Since the UV/OX system at ETF is of a fixed size and characterized by a maximum on-line operating efficiency, allowing treatment of more than 210 MM l/y would mean that the residence time and corresponding decontamination factor could not

[7] As noted in Section A.3.7, "Uncertainty Analysis," the DF value of 11,600 is based on the August, 1993 Delisting Petition for the 200 Area Effluent Treatment Facility (DOE/RL-92-72, Revision 1). This DF number, in turn, is based on a vendor-supplied first-order kinetic rate constant of 4.5 min^{-1}. Information presented in the November 29, 2001 200 Area ETF delisting petition (02-RCA-081) provides the technical basis for a DF value of 19,000. This higher DF is based on more recent vendor supplied EE/O value for PCBs of 15. See Section 4.1.2.2 of the November 29 2001 delisting petition for the definition of EE/O. EPA is basing this RBDA approval on the 11,600 DF value consistent with the corresponding RBDA application. This is a conservative approach, as use of the DF value of 11,600 in the ETF engineering model overstates potential PCB emissions by approximately one-third.

be achieved. Therefore, establishing the 210 MM l/y volume limit is integral to insuring that ETF can achieve the PCB destruction level upon which this approval is based.

While other operating conditions are certainly possible (increased peroxide addition rate, UV power input to the reaction unit, etc.), the RBDA application upon which this approval is based does not provide such data or analysis for EPA to evaluate. Therefore, EPA is establishing the volumetric treatment limit on the basis of the information that has been provided in the February 28, 2002 RBDA application.

As noted in footnote 1, EPA also intends to propose these volume and concentration limits as part of a revised RCRA delisting rulemaking applicable to discharge of treated effluent from ETF. See Section 2.3 of DOE-RL's RBDA application, and the November 29, 2001 delisting petition for further details of the relationship between this treatment volume and treated effluent decontamination limits.

Condition 6: Secondary wastes from disposal of PCBs in the 200 Area Liquid Waste Processing Facilities pursuant to this approval shall be managed according to applicable TSCA, RCRA, and Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) requirements and permits or authorizations.

The principle secondary wastes generated from operation of the 200 Area Liquid Waste Processing Facilities are secondary wastes (powder) from the secondary waste treatment train of ETF, and debris-like waste, such as spent filters, rags, wipes and personal protective equipment (PPE). Depending on the particular wastes being managed by the 200 Area Liquid Waste Processing Facilities and how these secondary wastes are generated, they may be regulated under RCRA and/or TSCA. While this condition does not impose any requirements not already in place under other authorities, EPA believes it is appropriate to insure a comprehensive analysis of all aspects of PCB remediation waste disposal in the 200 Area Liquid Waste Processing Facilities, and to insure consistency among all applicable authorities.

In some instances, CERCLA decision documents may authorize secondary wastes generated by the 200 Area LWPF to be disposed of in ERDF. EPA specifically notes that CERCLA decision documents are considered to authorizations in the context of this condition. In particular, EPA has previously authorized disposal in ETF of aqueous PCB remediation waste from the Hanford K-basins. This K-basin approval included a condition that secondary wastes from ETF be managed according to the 100-KR-2 Operable Unit Record of Decision.

Condition 7: DOE-RL shall comply with all other rules and regulations applicable to the 242-A Evaporator, LERF, ETF, and the state-authorized land disposal site (SALDS).

While this condition does not impose any new requirements beyond those already applicable to the enumerated units, EPA believes this condition is appropriate, in that the

protective function of permits and regulations other than RCRA (already explicitly accounted for in Condition 2) help insure that the approved disposal activities do not pose an unreasonable risk of injury to health or the environment. This condition also helps insure consistency between TSCA and other applicable authorities.

Condition 8: If, anytime before, during, or after disposal of PCB remediation waste in the 200 Liquids Waste Processing Facilities, DOE-RL possesses or is otherwise made aware of any data (including but not limited to site conditions that differ from those presented in the February 28, 2002 RBDA application) indicating that the concentration limits in Conditions 1 and 4 are exceeded or that the disposal activities approved herein may pose an unreasonable risk of injury to health or the environment, DOE-RL must report such data, in writing, to the Regional Administrator within 10 days of first possessing or being made aware of that data. DOE-RL shall also report new or different information related to a condition at the 200 Liquid Waste Processing Facilities, or units receiving treated effluent or secondary wastes from such disposal activities if the information is relevant to this approval.

Condition 9: EPA reserves the right to modify or revoke this approval based on information provided pursuant to Condition 8, or any other information available to EPA that provides a basis to conclude that the disposal activities covered by this approval pose an unreasonable risk of injury to health or the environment.

EPA finds that the application submitted by DOE-RL provides a defensible and complete analysis of actual and potential risks from the proposed disposal activities. However, both planned and unforeseen changes in waste streams, site conditions, or processing units may provide a basis for re-evaluating or modifying this approval. EPA believes it appropriate to include notification and re-opener provisions to help insure that new information not available to EPA at the time of this approval is timely available to the agency, and that EPA's ability to modify or revoke this approval as necessary to insure the protectiveness standard of 40 CFR 761.61(c) is not violated.