SCS ENGINEERS

PCB MANAGEMENT PLAN
ECDC ENVIRONMENTAL LANDFILL
EAST CARBON, UTAH

Presented to:

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October 2012
File No. 16210048.00 T.3

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Appendices

1 PCB MANAGEMENT PLAN

1.1 INTRODUCTION

This PCB Management Plan addresses the requirements contained in §761.75(b)(8). The plan discusses the procedures that the ECDC Environmental, L.C. (ECDC) landfill will use to receive, process, and dispose of PCB wastes. The following information is contained in this plan:

- *Regulatory Approval:* EPA Authorization to receive PCB Wastes.
- *Facility Description:* Brief summary of facilities where PCB wastes will be received, stored and disposed at the ECDC Landfill.
- *PCB Waste Receiving and Handling Procedures:* These sections describe procedures that ECDC Landfill uses to document the receipt and disposal of the various types of PCB waste.
- *Decontamination Procedures:* Describes equipment decontamination.
- *Personnel and Environmental Protection:* Details procedures to protect employees and the environment including training and spill response.
- *Recordkeeping and Documentation:* Addresses records documenting PCB management that are maintained on site.

2 REGULATORY APPROVAL

40 CFR §761.75 provides for disposal management of PCB wastes; and chemical waste landfills must be approved by the USEPA Regional Administrator before they can legally accept PCB-containing items for disposal. The ECDC landfill near East Carbon, Utah has TSCA permit approval from the USEPA Region 8 Administrator to accept certain types of PCB waste. ECDC landfill also obtained approval from Utah Department of Environmental Quality by permit modification to receive, process, and dispose of PCB wastes. Detailed permit approval information is provided in Appendix A – Regulatory Approval Conditions.

2.1 PCB WASTE AUTHORIZATIONS

The ECDC landfill will accept non-liquid PCBs from remediation wastes, bulk product wastes, and decontamination activities. The ECDC landfill will also accept small PCB capacitors as well as conditionally accepted PCB wastes listed in Section 4.1. PCB liquids from incidental sources will be accepted for disposal at the ECDC landfill provided they contain PCB concentrations < 500 ppm by volume. Section 4 contains a listing of accepted waste and prohibited PCB wastes.

2.2 CONDITIONAL PCB WASTE AUTHORIZATIONS

In order for the ECDC landfill to accept certain PCB items such as transformers, hydraulic machines, contaminated electrical equipment, or natural gas pipeline systems, the generator is required to provide ECDC landfill with a Special Waste Profile Form to verify if free-flowing liquids are present. If free-flowing liquids are present in the PCB items, they will be managed in accordance 761.60 and this PBC Management Plan. Additional guidance is provided in the checklist in Appendix B to determine if PCB items have been drained properly prior to their arrival at the ECDC landfill. This information will be provided to PCB generators and transporters to inform them of necessary procedures for PCB disposal acceptance at the ECDC landfill. Documentation shall be provided to ECDC landfill verifying that the wastes have been inspected to verify they are acceptable for disposal.

2.3 PCB WASTE PROHIBITIONS

All PCB liquids are prohibited from disposal in the ECDC landfill unless the liquid has PCB concentrations less than 500 ppm and was generated from incidental sources, such as precipitation, condensation, leachate, or load separation associated with PCB articles or non-liquid PCB wastes. Furthermore, if any PCB items such as transformers, hydraulic machines, contaminated electrical equipment, or natural gas pipeline systems have not been drained in accordance with 761.60 prior to arrival at the ECDC landfill, they will be managed in accordance with 761.60 and this PCB Management Plan. Regardless of prior draining procedures, large PCB capacitors (capacity greater than 3 lbs dielectric fluid) are not permitted for disposal at the landfill under any circumstances.

3 FACILITY DESCRIPTION

The ECDC landfill is located within the boundaries of East Carbon City, Carbon County, Utah adjacent to State Highway 123. It is owned and operated by Republic Waste Services, Ltd. (Republic). The site encompasses approximately 2,400 acres excluding the Union Pacific Railroad (UPRR) right-of-way. The ECDC landfill is an existing municipal and non-hazardous solid waste disposal landfill. The ECDC landfill consists of office buildings, support buildings, and active landfill cells. The initial cell was fully approved and operational in September 1992 and currently operates under permit number 9422 issued by the Utah Division of Solid and Hazardous Waste in 1996. The EPA TSCA PCB Approval, pursuant to 40 CFR§761.77 requires compliance with the permit and this document.

3.1 PCB WASTE MANAGEMENT AREAS

ECDC landfill will handle, store and dispose of PCB waste in the following areas:

- Railcar Rollover Unloading Facility;
- PCB Storage Facility Located at the TSCA Landfill Cell;
- Truck Staging Area Located at the TSCA Landfill Cell;
- TSCA Landfill Cell; and
- Intermodal Area.

4 PCB WASTE RECIEVING PROCEDURES

4.1 WASTE COLLECTION PROCEDURES

Republic Services Special Waste Management Plan procedures are followed when receiving PCB-containing wastes. Conditionally accepted PCB wastes must be inspected at the site of generation or transport prior to being shipped to the ECDC landfill for disposal. The Special Waste Profile Form contained in Appendix D, the inspection checklist in Appendix B, or a similar checklist, will be used to document the site inspection of conditionally accepted PCB wastes.

A special waste profile is required to be completed prior to disposing of PCB wastes at the ECDC landfill. Facility personnel will follow special waste approval procedures outlined in the latest addition of the Special Waste Management Plan developed by Republic Services and approved by the EPA and Utah DEQ as applicable to PCB waste.

Upon arrival at the ECDC landfill, all PCB wastes are identified and inspected by trained landfill personnel. Following the checklist in Appendix B, ECDC landfill personnel determine that only PCB-containing wastes authorized for disposal at the ECDC landfill will be accepted. The following are PCB wastes authorized to be accepted for disposal at the TSCA landfill cell:

Accepted PCB Wastes

- Remediation Waste;
- Bulk Product Waste;
- Sludge containing PCBs;
- Decontamination Waste;
- Small PCB Capacitors, cleaned, and rinsed; and
- Liquids from incidental sources as defined by 40 CFR 761.60(a)(3) provided that the liquids have been tested for TOC and PCBs prior to processing for disposal in the TSCA landfill cell.

Conditionally Accepted PCB Wastes

- PCB transformers (drained in accordance with §761.60(b)(1)(B));
- PCB hydraulic machines (§761.60(b)(3));
- PCB-contaminated electrical equipment (§761.60(b)(4));
- Natural gas pipeline systems containing PCBs (§761.60(b)(5));
- Other PCB articles (§761.60(b)(6));
- PCB containers; and
- PCB article containers;
- PCB articles that have not yet been drained.

Prohibited PCB Wastes

- Hazardous Wastes as defined by §261.3;
- PCB liquids at any concentrations other than incidental sources; and
- Large PCB Capacitors as described in §761.60(b)(2).

5 PCB WASTE HANDLING, STORAGE AND DISPOSAL PROCEDURES

5.1 WASTE RECEIVING AND STORAGE PROCEDURES

PCB wastes will be received at the ECDC landfill by one of three methods: rail, intermodal container, or truck. The primary method of PCB wastes receipt will be by rail. Typically PCB sludge will be received by rail and handled in accordance with these procedures. Shipments will typically arrive in multi-car loads for disposal. The PCB railcars will be separated from non-PCB loads for processing in one continuous batch. Operators will verify that incoming loads do not contain prohibited wastes prior to unloading. Railcars will then be cued up in the railcar shed for dumping at the Railcar Rotary Unloading Facility. Each car will then be unloaded on the tipping floor and the waste loaded into dump trucks with a front end loader. If incidental free liquids are present in loads dumped on the rotary tipping floor, the load will be solidified in place provided the wastes have been previously tested for PCBs and TOC. Otherwise the liquids will be contained and tested along with the wash water in accordance with Section 6 of this plan. Dump trucks will not track directly over the PCB waste. A loading ramp will be provided within the rotary building to allow the dump trucks to remain above the tipping floor. Front-end loaders used in the handling and loading of PCBs will not be used in non-TSCA operations without first being decontaminated. Truck wheels and tires will be inspected and cleaned as needed using a pressure washer, prior to exiting the railcar unloading building.

After unloading all of the railcars containing PCB waste, the railcars will be cleaned and decontaminated if necessary. Some railcars to be received at the ECDC landfill with PCB waste loads are expected to be lined with a geomembrane to avoid direct contact between the railcar surfaces and PCB waste. During the unloading process, each car will be visually inspected to determine if any PCB waste material has been in direct contact with the railcars. Any car that had come in contact with PCB materials will be cleaned and decontaminated prior to leaving the ECDC landfill. The rotary unloading area will be cleaned and decontaminated prior to using the Rotary for unloading non-PCB wastes. Decontamination procedures for railcars and the Rotary are described in Section 6.

PCB wastes may be received by ECDC landfill shipped inside intermodal containers. Containers will be unloaded from railcars and hauled by trucks directly to the TSCA Landfill Cell for unloading. After unloading of the PCB wastes, the inside surfaces of the containers will be cleaned and decontaminated if PCBs have directly contacted the container surfaces. All cleaning and decontamination will take place within a designated decontamination/solidification area located within the lined area of the TSCA Landfill Cell. All trucks will be inspected and cleaned as described in this section.

PCB wastes may also be received by trucks over the road. The site personnel will verify that proper documentation verifying that the PCB wastes in each truck meet the requirements for disposal at ECDC landfill and do not contain unauthorized wastes. Trucks will be directed to the TSCA Landfill Cell for unloading. Unloading procedures will be the same as other waste vehicles.

PCB wastes in containers or other articles that are suitable for storage may be kept in the PCB storage facility located near the TSCA waste cell. The storage facility shall be constructed and maintained in accordance with §761.65 - Storage for Disposal. ECDC Landfill will submit the required information required under §761.65(d) to Region 8 of the EPA to obtain approval for storage of PCBs prior to operation of the storage facility. All PCB items to be stored shall be properly labeled to identify the generator and date of arrival. All PCB wastes shall be logged for proper tracking and ultimate disposal. PCB waste shall be disposed within one year from the date of removal from service unless prior written approval is obtained from the EPA. Routine monitoring of the PCB storage area shall be conducted to verify that containers and other articles are not leaking. If any leaks are discovered, they will be handled in accordance with Section 8 of this plan.

ECDC landfill may receive PCB equipment and articles that have not been drained of free liquids. These items may be received and kept at the storage facility until all liquids have been removed and the items are properly prepared for disposal in accordance with 761.60. All drained equipment shall be inspected prior to disposal to determine if any residual liquids are present at <1% of the total container volume. Sufficient absorbent material will be added as needed to absorb any residual liquid present in PCB articles prior to disposal as described under 761.60(b)(2)(vi). All liquids drained on site will be stored in containers and tested in accordance with 761.60 unless liquids have previously been tested, to determine proper method of disposal.

ECDC may receive bulk waste loads that contain incidental liquids. These waste loads will be visually inspected to determine if the liquids exhibit an oily sheen that may indicate the presence of solvents or other petroleum based liquids. ECDC will verify that any waste loads containing incidental liquids include documentation that indicates the waste and incidental liquid complies with 761.60(a)(3) and this plan with regard to PCB concentrations and TOC levels, in order to proceed with processing the waste for disposal. Otherwise the waste loads will be rejected and returned to the generator. If practical, ECDC may test the wastes and liquid to verify acceptable PCB and TOC concentrations as an alternative to rejection of the loads.

5.2 WASTE DISPOSAL PROCEDURES

All PCB waste will be disposed in the dedicated TSCA Landfill Cell. Trucks will unload waste at the working face in such a manner to avoid tracking directly over previously dumped PCB waste. This will be accomplished by using a movable ramp and built-up haul roads that will allow trucks to avoid tracking directly over waste. Clean soil and aggregate materials will be used to construct the roads and the unloading area so that waste vehicles can avoid contact with previously dumped PCB wastes. Equipment will spread and place the waste within the TSCA cell. An operator will direct trucks to empty their loads at the proper location within the lined area. A truck wheel wash will be located inside the lined cell near the exit. Truck wheels and tires will be inspected and cleaned, as needed, using a pressure washer prior to exiting the TSCA cell.

All solidification of incidental sources of PCB liquids including wash water, leachate, and will be performed in the designated solidification area located within the lined area of the cell away

from the active disposal area. Initial disposal of PCBs will be in the TSCA landfill cell following receipt of USEPA approval.

5.3 LEACHATE COLLECTION, STORAGE, AND DISPOSAL PROCEDURES

Leachate generated from the TSCA landfill cell used for PCB waste disposal is collected via the leachate collection system (LCS) in the LCS sump. Leachate will be periodically removed from the LCS sump by vacuum truck or pump for disposal. The ECDC landfill will dispose of PCB-contaminated leachate in approved PCB disposal cells after the leachate has been solidified in the designated solidification area located within the TSCA landfill cell. If the ECDC landfill chooses to do so, leachate can be removed from the ECDC landfill by a tanker truck and transported to an approved offsite landfill for disposal. Sampling and analysis of the leachate disposed of offsite is limited to the approved offsite landfill's requirements. Leachate may also be used for dust control within the TSCA Landfill Cell provided the liquids are effectively absorbed by soil cover or waste materials and testing data indicate PCB concentrations below 1 ppb. Leachate will be tested for PCB concentrations monthly for the first year of operation and thereafter at a frequency approved by EPA and Utah DEQ.

5.4 VEHICLE MOVEMENT AND ROADWAYS

PCB wastes will be loaded into dump trucks at the Railcar Rotary Unloading Facility. Dump trucks used for loading PCBs at the railcar rotary facility will utilize an elevated ramp to avoid tracking over PCB waste dumped on the floor. Truck wheels will be washed prior to leaving the rotary building. The loaded trucks will haul PCB waste from the loading area to the landfill cell along an existing road or a newly constructed haul road that will serve the TSCA Landfill Cell. The proposed haul route is shown on the Site Plan, Figure 2 contained in the TSCA permit. The haul roads will have all weather surfaces consisting of aggregate or asphalt concrete. Typical roadway sections will be approximately 30 feet wide with a three to six-inch crown. Dump trucks will be directed into the cell to unload at the working face. The unloading area will include a clean area for trucks to maneuver and unload so that they can avoid direct wheel contact with previously landfilled PCB waste. The clean area will utilize a movable ramp to facilitate unloading of PCB wastes. The truck wheels and tires will be inspected and cleaned, as needed, in the wheel wash area located within a lined portion of the cell, away from the waste operation, prior to leaving the cell area.

Trucks hauling PCB waste over the road to ECDC landfill, as well as trucks carrying the intermodal containers, will utilize the same internal roadways leading to the TSCA cell. Trucks will remain on the built-up, clean area within the cell to tip their loads and avoid contamination of the vehicles.

5.5 ENVIRONMENTAL EMERGENCY CONTINGENCY PLANS

The ECDC Landfill Operations Plan contained in Appendix B-5 of the TSCA Permit outlines landfill emergency procedures. PCB spills will be handled as described in Section 7. The contingency plans will be made available to local emergency response authorities including police and fire departments. The plan will be updated at least every five years.

5.6 LIQUID WASTES

The ECDC landfill will not accept bulk PCB liquid waste. Liquids incidental to the disposal of PCBs will be handled in accordance with procedures outlined in this plan.

5.7 DUST CONTROL

Landfill leachate may be applied within the TSCA landfill cell to control dust if needed within the active area. Other dust control measures are included in the ECDC Landfill Operations Plan included in the TSCA Permit documents. The Landfill Operations Plan contains the Fugitive Dust Emissions Plan for the landfill that was approved by Utah DEQ. Dust control measures involving vehicles are outlined under section 5.4 of this plan.

5.7.1 Operating Practices to Minimize Airborne Contaminates

Railcar Rotary Unloading Facility – The railcar rotary unloading facility is equipped with dust suppression water sprayers as well as high pressure water hose sprayers, to be used as appropriate, for dust suppression. All incoming railcar loads containing PCB waste will be visually assessed by ECDC personnel to determine the potential for dust emissions. Based on this assessment, operators will determine the need for dust suppression measures before, during, and after unloading of the railcars. The intent of these procedures is to minimize dust within the railcar rotary dump facility as well as potential dust emissions from the loaded dump trucks in route to the TSCA cell.

TSCA Landfill Cell – PCB waste loads received at the landfill cell are expected to be of sufficient moisture content and consistency that will not require additional dust suppression measures during unloading and compaction. However, in the event that dust emissions are a concern, additional dust suppression measures will be taken at the landfill cell as described in the Fugitive Dust Emissions Plan contained in the Landfill Operations Plan. Detailed dust suppression procedures for unloading, hauling, compaction, and disposal of waste are included in this plan. These procedures will also apply to TSCA operations.

TSCA unloading and disposal operations will be suspended if sustained wind speeds exceed 25 mph for more than 20 minutes. Wind measurements will be determined from the nearest available weather station or ECDC landfill weather station on-site that has a wind sensor capable of recording and displaying wind speeds. Based on site specific data from air monitoring stations located on PCB remediation sites in the western US, the 25 mph threshold for suspending operations has proven to keep PCB concentrations in the air well below OSHA established PELs.

5.8 AIR MONITORING PROCEDURES

ECDC landfill will conduct air monitoring for PCBs during active unloading and landfilling operations of TSCA wastes. This monitoring will be conducted at two separate locations using air monitoring equipment capable of sampling the air in accordance with EPA TO-4A. All test results will be retained on-site as part of the operating record.

5.8.1 Locations and Sampling Procedures

Two air monitoring stations will be established approximately 200 – 300 ft downwind of the prevailing wind direction from the railway rotary dump facility and the TSCA landfill cell. Each monitoring station will have dedicated equipment to sample the ambient air concentrations in the vicinity of these two locations. The sampling and analytical procedures will conform to EPA TO-4A. The monitoring equipment will be capable of determining the 8-hour time weighted average (TWA) concentrations of PCB's at each location. Initially, air sampling will be performed on each day of active operations when PCB's are being received and disposed at ECDC landfill during the first month. Thereafter, monitoring will be performed quarterly during active TSCA operations. Prior to acceptance of PCB wastes, ECDC will perform at least one background air sampling event at the two monitoring stations to verify existing conditions prior to TSCA operations. Permissible exposure limits (PELs) are established for PCB concentrations by OSHA in 1910.1000, Table Z-1. The PEL for PCBs is 1 mg/cubic meter of air as determined from breathing zone air samples. In the event that air sampling data indicate PELs for PCB concentrations are exceeded, the EPA will be notified within 24 hours of receiving the data. ECDC will also implement procedures outlined in the Fugitive Dust Emissions Control Plan in Appendix G and the detailed Air Monitoring Plan for ECDC Landfill TSCA Operations in order to reduce concentrations to acceptable levels on site.

5.8.2 Air Monitoring Plan

After EPA approval of the basic air monitoring procedures in this document, ECDC Landfill will prepare and implement a detailed air monitoring plan that will contain detailed procedures for monitoring PCBs.

5.9 COVER OF THE WASTE

The PCB waste at the TSCA landfill cell will be routinely covered with six inches of soil or alternate material free of PCB waste material. The frequency of cover will depend on the type of waste and the local weather conditions. Cover will be applied at least once per week to active PCB waste disposal area. Landfill cover will be applied daily during windy conditions or if the waste is likely to produce dust due to its consistency and moisture condition. Other conditions may also necessitate increased frequency of cover. ECDC site personnel will determine the frequency of cover based on these factors, visual observations of the waste, and the type of PCB waste materials being landfilled at the time. ECDC landfill may use alternate cover materials such as synthetic tarps in place of the six inches of soil cover. When alternate cover materials are used, soil cover will be applied to the waste at least once every 30 days.

6 DECONTAMINATION PROCEDURES

All equipment used in transport, storage, and disposal of PCB-containing wastes will be decontaminated before being used in non-PCB landfill operations. The primary equipment expected to be used includes but is not limited to:

- Railcars used to transport the PCB waste;
- Front end loaders used to transfer waste from the tipping floor to the dump trucks;
- Dump trucks used to transport the PCB waste from the railcar rotary unloading facility to the landfill;
- Landfill equipment;
- Vacuum truck;
- Small wheeled loader with attachments for cleaning and removing materials from the Rotary unloading floor; and,
- Water truck.

The unloading equipment is decontaminated onsite with high pressure water cannons, sprayers or other similar equipment either within the rotary building or at a designated area within the TSCA Landfill Cell. The equipment used at the TSCA Landfill Cell that needs to be decontaminated will be cleaned and decontaminated within the lined cell at the designated wash-down area. All equipment, tools, and non-porous surfaces that come in direct contact with PCBs will be cleaned using the double wash/rinse procedure outlined in Subpart S of §761. Since this decontamination procedure is considered self-implementing by USEPA (761.79(c)), no confirmation testing is required prior to reuse of the equipment for non TSCA activities. Surfaces on non-porous equipment that have previously been in contact with non-liquid PCBs may also be cleaned using other methods, then visually inspected to verify that these surfaces have been cleaned to Visual Standard No. 2, Near-White Blast Cleaned Surface Finish, of the National Association of Corrosion Engineers (NACE) (NACE, 1994).

All liquids resulting from decontamination processes are periodically tested at least semi-annually for PCBs to determine proper disposal methods. During the first year of TSCA disposal operations the liquids will be tested quarterly for PCBs and TOC. Decontamination liquids will be tested initially to determine PCB concentration. If decontamination liquids have PCB concentrations <500 ppb, they are solidified within the rotary building, or in the dedicated area inside the TSCA Landfill Cell, before being disposed of in the PCB-approved landfill cell. If the decontamination liquids have PCB concentrations >500 ppb, they are transported to a landfill permitted to receive PCB-containing liquid waste. Subsequent testing of wash water may be performed if PCB waste being received changes significantly.

All surfaces within the railcar rotary unloading facility that come in direct contact with PCB wastes will be washed with high pressure water cannons or high pressure sprayers. All wash water will be contained within the building and solidified in place or removed by vacuum truck and hauled to the TSCA Landfill Cell for solidification and disposal. Following decontamination, concrete or other porous surfaces within the building that have previously been in contact with liquid PCBs will initially undergo a standard wipe test to verify that ≤10 µg/100 cm^2 are present on the equipment surfaces. Standard wipe tests will be performed within the

railcar rotary building initially to confirm that wash down procedures are effectively decontaminating the floor and other surfaces within the building coming into contact with PCB waste. One standard wipe test will be performed on each wall and two wipe tests will be performed on the unloading floor. After initial confirmation testing, additional wipe testing will be periodically performed at least semi-annually as further verification of decontamination procedures. Procedure descriptions for double wash/rinse and the standard wipe test are included as Appendix F

The ECDC landfill may use an alternative method of decontamination for equipment and facilities that are used in the processing and disposal of PCB wastes. Prior to implementing the alternative decontamination process, ECDC will obtain written approval from the USEPA Regional administrator in accordance with §761.79(h). The request for approval will include a description of the process and information demonstrating that it will effectively achieve the results required under §761.79(b).

7 PERSONNEL AND ENVIRONMENTAL PROTECTION

Personnel safety and environmental protection in the handling and disposal of PCB wastes is addressed through a variety of measures. The ECDC landfill strives to comply with all applicable Occupational Safety and Health Administration (OSHA) regulations for personnel safety. In addition to the environmental protection measures described in the previous sections, the following activities and procedures are in place at the ECDC landfill to minimize environmental impacts from PCB wastes disposed at the landfill:

- Storm water monitoring;
- Groundwater monitoring;
- Spill prevention planning;
- Spill response procedures; and
- Air Monitoring.

7.1 PCB SAFETY TRAINING

Employees involved in the management of PCB wastes receive training and instruction on the proper techniques for safety and protection around PCBs. Personal protective gear, such as dust masks or respirators, eye-protection, and non-porous gloves and boots, are worn by personnel involved with placement, inspection, and disposal activities for PCB waste. Personnel involved in the decontamination of equipment shall wear additional protective clothing to avoid potential skin contact. Waste management safety training will be updated at least every two years.

The landfill general manager, site manager, load inspectors, equipment operators, and gate attendants are trained in the contents of this TSCA Operations Plan as well as the ECDC landfill's operations plan by ECDC landfill personnel. In-house training addresses the following topics:

- Customer notification and load inspection procedures;
- Identification of PCB wastes;
- Waste handling procedures (acceptable and prohibited wastes);
- Health and safety;
- Fire safety;
- Recordkeeping; and
- Spill response and cleanup procedures.

Documentation of training is maintained electronically or physically at the site. Selected equipment operators, load inspectors, and other personnel receive training at Utah DEQ-sponsored or approved training courses as deemed appropriate by landfill management.

Detailed waste stream specific safety procedures will be developed and implemented for PCB management at the ECDC Landfill. These procedures will be incorporated into the periodic safety training for designated landfill personnel.

7.2 SPILL CONTROL METHODS

Railcars and containers transporting PCB wastes to the ECDC landfill will be covered or have waste fully enclosed to prevent exposure to wind or rain. Customers shipping waste to ECDC are informed of these requirements prior to shipment. Railcars containing PCB wastes are separated from other waste loads in order to process them in a continuous batch. ECDC has excess rail siding capacity to accommodate anticipated volume of waste containers or railcars.

In the event of an accident or spill that involves PCB-contaminated waste at the landfill, but outside the approved disposal area, ECDC landfill personnel will recover the material using onsite equipment such as front end loaders and trucks in order to return the material onto the disposal vehicle if practical. If the waste cannot safely be reloaded, it is taken directly to the landfill working face for proper disposal. The term "spill" in this document is defined by §761.123 of USEPA's TSCA rules which refer to the release or runoff of PCBs in concentrations greater than 50 ppm. The complete definition of "spill" and other related definitions are included in Appendix F. If any spills involving PCB wastes bound for the ECDC landfill occur within close proximity of the landfill, USEPA Region 8 and the Executive Director of the Utah DEQ will be notified along with the transporter. If any waste materials come into contact with surface water, the water will be tested for PCB concentration and will be managed as contaminated water. If the spill requires additional assistance, ECDC will contact a licensed spill clean-up contractor to perform the cleanup operation. All spills involving PCBs will be handled in accordance with 761 subpart G and this plan. A copy §761 Subpart G is included in Appendix F of this plan.

8 RECORDKEEPING AND DOCUMENTATION

8.1 PCB WASTE ACCEPTANCE AND RECORDS

All PCB wastes received at the ECDC landfill must be accompanied by a pre-approved waste profile form and waste profile documentation. The documentation must characterize the waste and describe the concentrations of PCBs that are contained within the solid waste to be disposed. Analytical data that provides PCB concentrations must be included with this documentation. At least one test per source of waste will be performed for PCB concentrations.

All records and documents are maintained at a centralized location at the ECDC landfill and are in either a physical or electronic format. Profile recertification is required every three years.

8.2 PCB LIQUID INSPECTIONS

Inspections of PCB waste for free-flowing liquids must be documented for each profile. Waste inspections will be performed as the waste is received and prior to unloading. These inspection forms are recorded, kept on file at the landfill, and contain the following:

- Name, date, and place of inspection;
- Name of the landfill inspector;
- Description of each PCB item inspected including serial numbers or markings that discretely identify the PCB item; and
- How the ECDC landfill inspector or generator verified that no bulk free-flowing liquids were present in each PCB item to be disposed.

8.3 LEACHATE SAMPLING RESULTS

Leachate sampling is performed by a third party contractor semiannually and analyzed for PCB's, pH, specific conductance, and chlorinated organics by an independent contractor. Test results of these analyses and the method used are kept on file in the site operating record at the ECDC landfill. Records will also be kept regarding when and where the leachate was disposed or solidified.

8.4 PAINT FILTER TEST RESULTS

All PCB solidified waste, leachate and contaminated water, must pass the Paint Filter Test (USEPA Method 9095, SW-846) before it is landfilled. Periodic, semi-annual at a minimum, testing of solidified waste will be performed in addition to visual confirmation by operators. Paint Filter Test results are recorded and kept on file at the landfill in the site operating record.

8.5 PCB STORAGE AND DISPOSAL LOGS

All PCB wastes are logged showing the date of arrival and the date the PCB or PCB item was disposed of in a landfill cell. The location of the PCB wastes disposed of within the landfill cells are recorded and kept on file in the site operating record. In similar manner all PCB wastes

stored on site are logged showing the date of arrival and verification that the waste has not been stored for more than one year.

8.6 SURFACE AND GROUNDWATER MONITORING RESULTS

All procedures and methods used for surface water and groundwater monitoring are recorded along with the data. Monitoring records are maintained and kept on file in the site operating record. The procedures in the ECDC landfill GWSAP are followed for groundwater sampling. Surface water monitoring is conducted in accordance with procedures in the ECDC landfill's storm water pollution prevention plan.

8.7 PCB SPILL CLEANUP RECORDS

Following each spill cleanup action, ECDC develops and maintains records of the cleanup. Records will be maintained for "Spill" incidents as defined under 761.123. The records include the following:

- Identification of the source of the spill;
- Estimated or actual date and time of the spill occurrence;
- Date and time cleanup was completed;
- Description of the spill location;
- Pre-cleanup sampling data used to establish spill boundaries if required because of insufficient visible traces, and a description of the sampling methodology used;
- Amount and type of waste cleanup material generated;
- Description of the solid surfaces cleaned and of the double wash/rinse method used, and if soil is the contaminated media, the depth of soil excavated and amount of soil removed for disposal;
- Post-cleanup verification sampling information if needed such as a description of the sampling methodology used, the number of samples analyzed, and the analytical data; and
- A certification by the appropriate landfill officials stating that the cleanup levels required by USEPA were achieved, and that the record is true to the best of his/her knowledge.

Reporting documentation for spills that require reporting as outlined under §761.125(a)(1).

APPENDIX B

PCB Waste Receiving Checklist

PCB WASTE RECEIVING CHECKLIST

1. Has a completed waste profile been provided for the waste shipment?

   - YES: Continue to #2.
   - NO: Require the generator/transporter to complete the waste profile, then continue to #2.

2. Does the waste contain polychlorinated biphenyls (PCBs) regulated under USEPA rules at TSCA 40 CFR Part 761?

   - YES: Continue to #3.
   - NO: PCB rules do not apply to determination of waste acceptance. Use of this checklist is complete.

3. Is the waste a prohibited waste (Form Code X#) listed in Table B-1?

   - YES: DO NOT ACCEPT WASTE. Waste cannot be accepted at the landfill.
   - NO: Continue to #4.

TABLE B-1
PCB WASTES NOT ACCEPTED

☑	Form Code	Prohibited Wastes	Description
	862	• PCB liquids except for PCB liquids at <500 ppm PCBs from incidental sources	• Incidental sources includes precipitation, condensation, leachate, or load separation associated with PCB articles or non-liquid PCB wastes
	863	• PCB Large Capacitors	• Capacitor that contains 3 lbs or more of dielectric fluid

4. Is the waste an accepted PCB waste (Form Code A#) listed in Table B-2?

   - YES: Continue to #5.
   - NO: Continue to #6.

APPENDIX A

Regulatory Approval Conditions

TABLE B-2
ACCEPTED PCB WASTES

☑	Form Code	PCB Waste Type	Description
Remediation waste			
	A1	Environmental media containing PCBs	• Soil and gravel • Dredged materials (sediments, settled sediment fines, and aqueous decantate from sediment)
	A2	Sludge	• Sewage sludge containing <50 ppm PCBs • PCB sewage sludge • Commercial or industrial sludge contaminated as from spill of PCBs including sludges from any pollution control device • Aqueous decantate from an industrial sludge
	A3	Buildings and other man-made structures	• Concrete floors, wood floors • Materials contaminated from leaking PCB or PCB-contaminated transformer • Porous surfaces and non-porous surfaces
Bulk product waste			
	A4	Non-liquid bulk wastes or debris from the demolition of buildings and other man-made structures manufactured, coated, or serviced with PCBs	
	A5	PCB-containing wastes from shredding of the list of items to the right	• Automobiles • Household appliances • Industrial appliances
	A6	Plastics	• Plastic insulation from wire or cable • Radio, television and computer casings • Vehicle parts • Furniture laminates
	A7	Preformed or molded rubber parts and components	
	A8	Applied dried paints, varnishes, waxes, or other similar coatings or sealants	
	A9	Caulking, adhesives, paper, Galbestos, sound deadening or other types of insulation, felt or fabric products such as gaskets	
	A10	Fluorescent light ballasts containing PCBs in the potting material	
Other waste			
	A11	Decontamination waste	• Waste generated from the decontamination of equipment, including personal protection equipment, rags, wipes, etc.
	A12	Small PCB capacitors	• Contains <3 lbs. dielectric fluid, or • If weight of fluid unknown, <100 cubic inches, or • If capacity >100 cubic inches, <200 cubic inches, and capacitor weighs <9 lbs.
	A13	PCB liquids at <500 ppm that come from incidental sources	• Incidental sources includes precipitation, condensation, leachate, or load separation associated with PCB articles or non-liquid PCB wastes and undrained PCB articles.

5. For PCB accepted wastes (listed in Table B-2), verify that the following information is recorded. Continue to #6.

☑	Required Information for Accepted PCB Wastes (listed in Table B-2)
	Unique number assigned by generator identifying waste (if applicable)
	Date waste was placed in the truck or was removed from service for disposal
	Total weight of PCB waste (in kilograms)
	Date waste was received at landfill
	Date waste was disposed of in landfill cell

	Unique profile number (if applicable)
	Name and address of landfill that generated the profile (if applicable)

6. Is the waste a conditionally accepted PCB waste (Form Code C#) listed in Table B-3?

- YES: Continue to #7.
- NO: Restart PCB Waste Receiving Checklist to properly identify PCB waste type.

TABLE B-3
CONDITIONALLY ACCEPTED PCB WASTES

☑	Form Code	PCB Waste Type	Description
	C1	PCB transformers	
	C2	PCB hydraulic machine	
	C3	PCB-contaminated electrical equipment	
	C4	Natural gas pipeline systems containing PCBs	
	C5	Other PCB articles	• Formed to specific shape or design during manufacture • Has end use function(s) dependent in whole or in part upon its shape or design during end use • Has no change of chemical composition during end use or only changes in composition in a way that has no commercial purpose
	C6	PCB containers	• Package, can, bottle, bag, barrel, drum, tank, or other device that contains PCBs
	C7	PCB article containers	• Package, can, bottle, bag, barrel, drum, tank, or other device that contains PCB articles or PCB equipment • Surface has not been in direct contact with PCBs

7. Has an inspection been conducted of PCB items at the site of PCB waste generation or transport prior to shipment for disposal at ECDC landfill and has inspector completed a Conditionally Accepted PCB Wastes Site Inspection Checklist or similar (Appendix C)?

- YES: Continue to #8.
- NO: DO NOT ACCEPT WASTE until Conditionally Accepted PCB Wastes Site Inspection Checklist has been completed. Inspection of Conditionally Accepted PCB Items is required to be conducted at the site of PCB waste generation or transport prior to shipment for disposal at ECDC landfill.

8. Perform conditional check for residual liquids. (Form Code A13) If present in amounts no greater than 1% total container volume, has sufficient absorbent been added to the container?

- YES: Tag for PCB Incidental Liquids. No additional action required prior to disposal at TSCA waste cell.
- NO: Add sufficient absorbent material to container or Tag item for further inspection and preparation at the PCB storage facility prior to disposal.

APPENDIX C

Conditionally Accepted PCB Waste Site Inspection Checklist

CONDITIONALLY ACCEPTED PCB WASTES SITE INSPECTION CHECKLIST

In order to receive conditionally accepted PCB wastes, an inspection shall be conducted at the site of PCB waste generation or transport prior to shipment for disposal at the ECDC landfill. Generator or transporter shall complete the following checklist to document the inspection.

Landfill Name:_____

Landfill Address:_____

Date of Inspection:_____

Inspector:_____

Describe each PCB Item. Refer to table on reverse side for proper waste code. For Waste Code F or G, provide a description of the contents of the container.

Waste Code	Description (include unique ID number or other identifying markings, as applicable)	Free-Flowing Liquids Present (P) Absent (A)	Date waste placed in truck or removed from service for disposal	Weight of PCB Waste (kg) 1 lb = 0.4536 kg

Describe inspector's method of verifying the presence/absence of free-flowing liquids (Document that free-flowing liquids verification requirements on C-2 have been adhered to):

_____

_____

_____

_____

CONDITIONALLY ACCEPTED PCB WASTE TYPES

Waste Code	Waste Type	Description
A	PCB transformers	
B	PCB hydraulic machine	
C	PCB-contaminated electrical equipment	
D	Natural gas pipeline systems containing PCBs	
E	Other PCB articles	• Formed to specific shape or design during manufacture • Has end use function(s) dependent in whole or in part upon its shape or design during end use • Has no change of chemical composition during end use or only changes in composition in a way that has no commercial purpose
F	PCB containers	• Package, can, bottle, bag, barrel, drum, tank, or other device that contains PCBs
G	PCB article containers	• Package, can, bottle, bag, barrel, drum, tank, or other device that contains PCB articles or PCB equipment • Surface has not been in direct contact with PCBs

REQUIREMENTS FOR REMOVAL OF FREE-FLOWING LIQUIDS

PCB Item	Verification Requirements
PCB Transformers	• The item must be filled with an approved solvent and allowed to stand for at least 18 continuous hours before the solvent is thoroughly removed
PCB Hydraulic Machine	• The item must be filled with an approved solvent and allowed to stand for at least 18 continuous hours before the solvent is thoroughly removed • Verify that the liquid removed from each machine is disposed of properly • If the liquid contains ≥1,000 ppm PCBs, the machine must be contaminated or flushed prior to disposal with a solvent
Natural Gas Pipeline System	• Verify that the natural pipeline system was characterized for PCB contamination by analyzing organic liquids collected at existing condensate points in the natural gas pipeline system • If no organic liquids are present, verify that the free-flowing liquids were drained and standard wipe samples were collected for analysis • Verify that condensate was collected within 72 hours of the final transmission of natural gas through the part of the system to be removed • Verify that the wipe samples were collected after the last transmission of gas through the pipe or during removal • Verify PCB concentration of organic phase of multi-phasic liquids was determined
PCB container, PCB article container, or other PCB article disposal	• Verify that all free-flowing liquid has been removed. Item must have been filled with an approved solvent and allowed to stand for at least 18 continuous hours before the solvent was thoroughly removed • Verify that drained liquids from PCB articles with concentrations >500 ppm are disposed of in an incinerator • Verify that all PCB containers disposed of as municipal solid wastes are at a concentration <500 ppm PCBs

Additional Documentation upon Shipment and Disposal of Conditionally Accepted PCB Waste:

- Date waste was received at landfill
- Date waste was disposed of in landfill cell
- Unique profile number (if applicable)
- Name of landfill that generated profile (if applicable)
- Address of landfill that generated profile (if applicable)

APPENDIX D

PCB Waste Profile Form

Republic Waste Services of Texas, LTD
Non-Hazardous Waste Profile
(MUST BE FILLED OUT COMPLETELY)

For more information, please call Republic CSC at (800) 256-9278

A. GENERATOR INFORMATION

1. Generator Name:_____
2. Site Location:_____
3. City:_____
   State:_____ Zip:_____
4. Phone: (_____)_____
5. Fax: (___)_____
6. State Facility I.D. #:_____
7. State Waste Code:_____

B. CUSTOMER INFORMATION

1. Customer Name:_____
2. Address:_____
3. City:_____
   State:_____ Zip:_____
4. Phone: (_____)_____
5. Fax: (___)_____
6. Contact: _____
7. Title:_____

C. WASTE STREAM INFORMATION

1. Common Name of Waste: _____
2. Detailed Description of Process Generating Waste and Material Description:_____

_____

_____

3. Industrial Generator [ ]Yes [ ]No 4. Municipal Generator [ ]Yes [ ]No
5. Does the waste contain polychlorinated biphenyls (PCBs) regulated under EPA rules at TSCA 40 CFR Part 761? [ ] Yes [ ] No
6. Were analytical tests to determine PCB concentrations performed using: [ ] EPA 8082 [ ] Other Procedure:_____
7. Has all required analytical testing data for this shipment been provided? [ ] Yes [ ] No
8. Does the waste contain radioactive or U.S. D.O.T. hazardous materials? [ ] Yes [ ] No
9. Form Codes: Which of the following best describes the PCB Containing Waste: *(See Form Code descriptions on the back of this form)*

X1	X2	X3				
A1	A1	A3	A4	A5	A6	A7
A8	A9	A10	A11	A12	A13	
C1	C2	C3	C4	C5	C6	C7

10. Odor: [ ] None [ ] Mild [ ] Strong (describe)_____
11. Color _____ 12. Flash Point _____ 13. Viscosity_____
14. Reactive [ ] Yes [ ] No If Yes, Reactive With: _____ 15.pH Range:_____
16. Free Liquid: [ ] Yes [ ] No 14. Water Content (% by Water): _____

D. SUPPLEMENTAL INFORMATION PROVIDED

[ ] None [ ] MSDS [ ] Analytical Data [ ] Memo/Letter [ ] Process Knowledge No. of Pages_____

E. SHIPPING INFORMATION

Estimated Volume:_____ [ ] Gallons [ ] Yards [ ] Other_____

F. GENERATOR / CUSTOMER CERTIFICATION

I hereby certify that all information submitted and all attached documents contain true and accurate descriptions of this waste. No deliberate or willful omissions of composition or properties exist, and all known or suspected hazards have been disclosed. I further certify that the waste is not designated a Hazardous Waste defined by the USEPA in 40 CFR 261.

I, _____, am employed by _____, and am authorized to sign this request for:
(Name, Please Print) (Company Name)

_____, _____, _____.
(Company Name) (Signature) (Date)

G. LANDFILL USE ONLY (DO NOT WRITE WITHIN THIS SPACE)

Compliance Officer_____
Date_____ [ ]Approved [ ]Rejected
Additional Information _____
_____
_____
_____

State Fee Applicable Class I [ ] Yes [ ] No
State Fee Applicable MSW [ ] Yes [ ] No
Waste Disposal Agreement On File [ ] Yes [ ] No
Surety Agreement on File [ ] Yes [ ] No [ ] N/A

JOB #_____

PCB Waste Form Code Descriptions

Form Code	Description	
X1	Debris from the demolition of buildings or other man-made structures that is contaminated by spills from regulated PCBs which have not been disposed of, decontaminated, or otherwise cleaned up	
X2	PCB liquids ≥500 ppm PCBs or from other than incidental sources	Incidental sources are precipitation, condensation, leachate, or load separation associated with PCB articles or non-liquid PCB wastes
X3	PCB Large Capacitors	Capacitor that contains 3 lbs or more of dielectric fluid
A1	Environmental media containing PCBs	• Soil and gravel • Dredged materials (sediments, settled sediment fines, and aqueous runoff from sediment)
A2	Sludge	• Sewage sludge containing <50 ppm PCBs • PCB sewage sludge • Commercial or industrial sludge contaminated as from spill of PCBs including sludges from any pollution control device • Aqueous runoff from an industrial sludge
A3	Buildings and other man-made structures	• Concrete floors, wood floors • Materials contaminated from leaking PCB or PCB-contaminated transformer • Porous surfaces and non-porous surfaces
A4	Non-liquid bulk wastes or debris from the demolition of buildings and other man-made structures manufactured, coated, or serviced with PCBs	
A5	PCB-containing wastes from shredding of the list of items to the right	• Automobiles • Household appliances • Industrial appliances
A6	Plastics	• Plastic insulation form wire or cable • Radio, television and computer casings • Vehicle parts • Furniture laminates
A7	Preformed or molded rubber parts and components	
A8	Applied dried paints, varnishes, waxes, or other similar coatings or sealants	
A9	Caulking, adhesives, paper, Galbestos, sound deadening or other types of insulation, felt or fabric products such as gaskets	
A10	Fluorescent light ballasts containing PCBs in the potting material	
A11	Decontamination waste	Waste generated from the decontamination of equipment, including personal protection equipment, rags, wipes, etc.
A12	PCB small capacitors	• Contains <3 lbs. dielectric fluid, or • If weight of fluid unknown, <100 cubic inches, or • If capacity >100 cubic inches, <200 cubic inches, and capacitor weighs <9 lbs.
A13	PCB liquids at <500 ppm that come from incidental sources	Incidental sources includes precipitation, condensation, leachate, or load separation associated with PCB articles or non-liquid PCB wastes
C1	PCB transformers	
C2	PCB hydraulic machine	
C3	PCB-contaminated electrical equipment	
C4	Natural gas pipeline systems containing PCBs	
C5	Other PCB articles	• Formed to specific shape or design during manufacture • Has end use function(s) dependent in whole or in part upon its shape or design during end use • Has no change of chemical composition during end use or only changes in composition in a way that has no commercial purpose
C6	PCB containers	Package, can, bottle, bag, barrel, drum, tank, or other device that contains PCBs
C7	PCB article containers	• Package, can, bottle, bag, barrel, drum, tank, or other device that contains PCB articles or PCB equipment • Surface has not been in direct contact with PCBs

APPENDIX E

Transportation Equipment Decontamination Waiver

TRANSPORTATION EQUIPMENT DECONTAMINATION WAIVER

PCBs are federally regulated toxic chemicals that are persistent in the environment. Transportation equipment that has come into contact with PCBs or PCB-containing items should be properly decontaminated before being used in other operations in accordance with 40 CFR §761.79. The following list summarizes proper decontamination procedures:

- Equipment should be swabbed with a solvent or undergo a double wash/rinse with a high pressure sprayer or other similar equipment,
- Decontamination should take place in a bermed and lined or paved area that will contain wash down water,
- All wash down water should be disposed of at a landfill that is authorized to accept PCB-contaminated liquid waste,
- Equipment previously in contact with liquid PCBs should undergo a standard wipe test to verify that ≤10 µg/100 cm2 are present on the equipment surfaces,
- Equipment previously in contact with non-liquid PCBs should be visually inspected to verify that the surfaces have been cleaned to Visual Standard No. 2, Near-White Blast Cleaned Surface Finish, of the National Association of Corrosion Engineers (NACE) (NACE, 1994).

DECONTAMINATION WAIVER STATEMENT: *"I have read the information provided to me above regarding proper decontamination of equipment that has been in contact with PCBs and PCB-containing items. I choose to waive the opportunity for decontamination procedures at the ECDC Landfill, and I will be fully responsible for conducting decontamination elsewhere."*	
Driver's Name:	
Vehicle Identification Number:	
Transportation Company:	
Transportation Company Address:	
Transportation Company Phone:	
Driver's Signature:	Date:

APPENDIX F

Selected EPA TSCA Rules

risk of injury to health or the environment because it is operating in compliance with the parameters and conditions listed in paragraph (a) or (b) of this section even though the oven or smelter does not have a RCRA or State air permit as required by paragraph (c)(1) of this section. The written request shall include a site-specific risk assessment.

(d) PCB liquids, other liquid waste qualifying as waste oils which may be used as provided for at §761.20(e), or PCB remediation waste, other than PCB-Contaminated articles, may not be disposed of in a scrap metal recovery oven or smelter unless approved or otherwise allowed under subpart D of this part.

[63 FR 35455, June 29, 1998, as amended at 64 FR 33761, June 24, 1999]

§761.75 Chemical waste landfills.

This section applies to facilities used to dispose of PCBs in accordance with the part.

(a) *General.* A chemical waste landfill used for the disposal of PCBs and PCB Items shall be approved by the Agency Regional Administrator pursuant to paragraph (c) of this section. The landfill shall meet all of the requirements specified in paragraph (b) of this section, unless a waiver from these requirements is obtained pursuant to paragraph (c)(4) of this section. In addition, the landfill shall meet any other requirements that may be prescribed pursuant to paragraph (c)(3) of this section.

(b) *Technical requirements.* Requirements for chemical waste landfills used for the disposal of PCBs and PCB Items are as follows:

(1) *Soils.* The landfill site shall be located in thick, relatively impermeable formations such as large-area clay pans. Where this is not possible, the soil shall have a high clay and silt content with the following parameters:

(i) In-place soil thickness, 4 feet or compacted soil liner thickness, 3 feet;

(ii) Permeability (cm/sec), equal to or less than 1×10^{-7};

(iii) Percent soil passing No. 200 Sieve, >30;

(iv) Liquid Limit, >30; and

(v) Plasticity Index >15.

(2) *Synthetic membrane liners.* Synthetic membrane liners shall be used when, in the judgment of the Regional Administrator, the hydrologic or geologic conditions at the landfill require such a liner in order to provide at least a permeability equivalent to the soils in paragraph (b)(1) of this section. Whenever a synthetic liner is used at a landfill site, special precautions shall be taken to insure that its integrity is maintained and that it is chemically compatible with PCBs. Adequate soil underlining and soil cover shall be provided to prevent excessive stress on the liner and to prevent rupture of the liner. The liner must have a minimum thickness of 30 mils.

(3) *Hydrologic conditions.* The bottom of the landfill shall be above the historical high groundwater table as provided below. Floodplains, shorelands, and groundwater recharge areas shall be avoided. There shall be no hydraulic connection between the site and standing or flowing surface water. The site shall have monitoring wells and leachate collection. The bottom of the landfill liner system or natural in-place soil barrier shall be at least fifty feet from the historical high water table.

(4) *Flood protection.* (i) If the landfill site is below the 100-year floodwater elevation, the operator shall provide surface water diversion dikes around the perimeter of the landfill site with a minimum height equal to two feet above the 100-year floodwater elevation.

(ii) If the landfill site is above the 100-year floodwater elevation, the operators shall provide diversion structures capable of diverting all of the surface water runoff from a 24-hour, 25-year storm.

(5) *Topography.* The landfill site shall be located in an area of low to moderate relief to minimize erosion and to help prevent landslides or slumping.

(6) *Monitoring systems*—(i) *Water sampling.* (A) For all sites receiving PCBs, the ground and surface water from the disposal site area shall be sampled prior to commencing operations under an approval provided in paragraph (c) of this section for use as baseline data.

(B) Any surface watercourse designated by the Regional Administrator

using the authority provided in paragraph (c)(3)(ii) of this section shall be sampled at least monthly when the landfill is being used for disposal operations.

(C) Any surface watercourse designated by the Regional Administrator using the authority provided in paragraph (c)(3)(ii) of this section shall be sampled for a time period specified by the Regional Administrator on a frequency of no less than once every six months after final closure of the disposal area.

(ii) *Groundwater monitor wells.* (A) If underlying earth materials are homogenous, impermeable, and uniformly sloping in one direction, only three sampling points shall be necessary. These three points shall be equally spaced on a line through the center of the disposal area and extending from the area of highest water table elevation to the area of the lowest water table elevation on the property.

(B) All monitor wells shall be cased and the annular space between the monitor zone (zone of saturation) and the surface shall be completely backfilled with Portland cement or an equivalent material and plugged with Portland cement to effectively prevent percolation of surface water into the well bore. The well opening at the surface shall have a removable cap to provide access and to prevent entrance of rainfall or stormwater runoff. The well shall be pumped to remove the volume of liquid initially contained in the well before obtaining a sample for analysis. The discharge shall be treated to meet applicable State or Federal discharge standards or recycled to the chemical waste landfill.

(iii) *Water analysis.* As a minimum, all samples shall be analyzed for the following parameters, and all data and records of the sampling and analysis shall be maintained as required in §761.180(d)(1). Sampling methods and analytical procedures for these parameters shall comply with those specified in 40 CFR part 136 as amended in 41 FR 52779 on December 1, 1976.

(A) PCBs.

(B) pH.

(C) Specific conductance.

(D) Chlorinated organics.

(7) *Leachate collection.* A leachate collection monitoring system shall be installed above the chemical waste landfill. Leachate collection systems shall be monitored monthly for quantity and physicochemical characteristics of leachate produced. The leachate should be either treated to acceptable limits for discharge in accordance with a State or Federal permit or disposed of by another State or Federally approved method. Water analysis shall be conducted as provided in paragraph (b)(6)(iii) of this section. Acceptable leachate monitoring/collection systems shall be any of the following designs, unless a waiver is obtained pursuant to paragraph (c)(4) of this section.

(i) *Simple leachate collection.* This system consists of a gravity flow drainfield installed above the waste disposal unit liner. This design is recommended for use when semi-solid or leachable solid wastes are placed in a lined pit excavated into a relatively thick, unsaturated, homogenous layer of low permeability soil.

(ii) *Compound leachate collection.* This system consists of a gravity flow drainfield installed above the waste disposal unit liner and above a secondary installed liner. This design is recommended for use when semi-liquid or leachable solid wastes are placed in a lined pit excavated into relatively permeable soil.

(iii) *Suction lysimeters.* This system consists of a network of porous ceramic cups connected by hoses/tubing to a vacuum pump. The porous ceramic cups or suction lysimeters are installed along the sides and under the bottom of the waste disposal unit liner. This type of system works best when installed in a relatively permeable unsaturated soil immediately adjacent to the bottom and/or sides of the disposal facility.

(8) *Chemical waste landfill operations.* (i) PCBs and PCB Items shall be placed in a landfill in a manner that will prevent damage to containers or articles. Other wastes placed in the landfill that are not chemically compatible with PCBs and PCB Items including organic solvents shall be segregated from the PCBs throughout the waste handling and disposal process.

(ii) An operation plan shall be developed and submitted to the Regional Administrator for approval as required in paragraph (c) of this section. This plan shall include detailed explanations of the procedures to be used for recordkeeping, surface water handling procedures, excavation and backfilling, waste segregation burial coordinates, vehicle and equipment movement, use of roadways, leachate collection systems, sampling and monitoring procedures, monitoring wells, environmental emergency contingency plans, and security measures to protect against vandalism and unauthorized waste placements. EPA guidelines entitled "Thermal Processing and Land Disposal of Solid Waste" (39 FR 29337, Aug. 14, 1974) are a useful reference in preparation of this plan. If the facility is to be used to dispose of liquid wastes containing between 50 ppm and 500 ppm PCB, the operations plan must include procedures to determine that liquid PCBs to be disposed of at the landfill do not exceed 500 ppm PCB and measures to prevent the migration of PCBs from the landfill. Bulk liquids not exceeding 500 ppm PCBs may be disposed of provided such waste is pretreated and/or stabilized (e.g., chemically fixed, evaporated, mixed with dry inert absorbant) to reduce its liquid content or increase its solid content so that a non-flowing consistency is achieved to eliminate the presence of free liquids prior to final disposal in a landfill. PCB Container of liquid PCBs with a concentration between 50 and 500 ppm PCB may be disposed of if each container is surrounded by an amount of inert sorbant material capable of absorbing all of the liquid contents of the container.

(iii) Ignitable wastes shall not be disposed of in chemical waste landfills. Liquid ignitable wastes are wastes that have a flash point less than 60 degrees C (140 degrees F) as determined by the following method or an equivalent method: Flash point of liquids shall be determined by a Pensky-Martens Closed Cup Tester, using the protocol specified in ASTM D 93-90, or the Setaflash Closed Tester using the protocol specified in ASTM Standard D-3278-89.

(iv) Records shall be maintained for all PCB disposal operations and shall include information on the PCB concentration in liquid wastes and the three dimensional burial coordinates for PCBs and PCB Items. Additional records shall be developed and maintained as required in § 761.180.

(9) *Supporting facilities.* (i) A six foot woven mesh fence, wall, or similar device shall be placed around the site to prevent unauthorized persons and animals from entering.

(ii) Roads shall be maintained to and within the site which are adequate to support the operation and maintenance of the site without causing safety or nuisance problems or hazardous conditions.

(iii) The site shall be operated and maintained in a manner to prevent safety problems or hazardous conditions resulting from spilled liquids and windblown materials.

(c) *Approval of chemical waste landfills.* Prior to the disposal of any PCBs and PCB Items in a chemical waste landfill, the owner or operator of the landfill shall receive written approval of the Agency Regional Administrator for the Region in which the landfill is located. The approval shall be obtained in the following manner:

(1) *Initial report.* The owner or operator shall submit to the Regional Administrator an initial report which contains:

(i) The location of the landfill;

(ii) A detailed description of the landfill including general site plans and design drawings;

(iii) An engineering report describing the manner is which the landfill complies with the requirements for chemical waste landfills specified in paragraph (b) of this section;

(iv) Sampling and monitoring equipment and facilities available;

(v) Expected waste volumes of PCBs;

(vi) General description of waste materials other than PCBs that are expected to be disposed of in the landfill;

(vii) Landfill operations plan as required in paragraph (b) of this section;

(viii) Any local, State, or Federal permits or approvals; and

(ix) Any schedules or plans for complying with the approval requirements of these regulations.

(2) *Other information.* In addition to the information contained in the report described in paragraph (c)(1) of this section, the Regional Administrator may require the owner or operator to submit any other information that the Regional Administrator finds to be reasonably necessary to determine whether a chemical waste landfill should be approved. Such other information shall be restricted to the types of information required in paragraphs (c)(1) (i) through (ix) of this section.

(3) *Contents of approval.* (i) Except as provided in paragraph (c)(4) of this section the Regional Administrator may not approve a chemical waste landfill for the disposal of PCBs and PCB Items, unless he finds that the landfill meets all of the requirements of paragraph (b) of this section.

(ii) In addition to the requirements of paragraph (b) of this section, the Regional Administrator may include in an approval any other requirements or provisions that the Regional Administrator finds are necessary to ensure that operation of the chemical waste landfill does not present an unreasonable risk of injury to health or the environment from PCBs. Such provisions may include a fixed period of time for which the approval is valid.

The approval may also include a stipulation that the operator of the chemical waste landfill report to the Regional Administrator any instance when PCBs are detectable during monitoring activities conducted pursuant to paragraph (b)(6) of this section.

(4) *Waivers.* An owner or operator of a chemical waste landfill may submit evidence to the Regional Administrator that operation of the landfill will not present an unreasonable risk of injury to health or the environment from PCBs when one or more of the requirements of paragraph (b) of this section are not met. On the basis of such evidence and any other available information, the Regional Administrator may in his discretion find that one or more of the requirements of paragraph (b) of this section is not necessary to protect against such a risk and may waive the requirements in any approval for that landfill. Any finding and waiver under this paragraph will be stated in writing and included as part of the approval.

(5) *Persons approved.* Any approval will designate the persons who own and who are authorized to operate the chemical waste landfill, and will apply only to such persons, except as provided by paragraph (c)(7) of this section.

(6) *Final approval.* Approval of a chemical waste landfill will be in writing and will be signed by the Regional Administrator. The approval will state all requirements applicable to the approved landfill.

(7) *Transfer of property.* Any person who owns or operates an approved chemical waste landfill must notify EPA at least 30 days before transferring ownership in the property or transferring the right to conduct the chemical waste landfill operation. The transferor must also submit to EPA, at least 30 days before such transfer, a notarized affidavit signed by the transferee which states that the transferee will abide by the transferor's EPA chemical waste landfill approval. Within 30 days of receiving such notification and affidavit, EPA will issue an amended approval substituting the transferee's name for the transferor's name, or EPA may require the transferee to apply for a new chemical waste landfill approval. In the latter case, the transferee must abide by the transferor's EPA approval until EPA issues the new approval to the transferee.

(Sec. 6, Pub. L. 94–469, 90 Stat. 2020 (15 U.S.C. 2605)

[44 FR 31542, May 31, 1979. Redesignated at 47 FR 19527, May 6, 1982, and amended at 48 FR 5730, Feb. 8, 1983; 49 FR 28191, July 10, 1984; 53 FR 12524, Apr. 15, 1988; 53 FR 21641, June 9, 1988; 57 FR 13323, Apr. 16, 1992; 63 FR 35456, June 29, 1998]

§ 761.77 Coordinated approval.

(a) *General requirements.* Notwithstanding any other provision of this part, the EPA Regional Administrator for the Region in which a PCB disposal or PCB commercial storage facility described in paragraphs (b) and (c) of this section is located may issue a TSCA PCB Coordinated Approval to the persons described in those paragraphs if the conditions listed in this section are

the non-TSCA waste management document which serves as the basis for a TSCA PCB Coordinated Approval. Changes in the ownership of a commercial storage facility which holds a TSCA PCB Coordinated Approval shall be handled pursuant to § 761.65(j).

(b) Any person who owns or operates a facility that he or she intends to use to landfill PCB wastes; incinerate PCB wastes; dispose of PCB wastes using an alternative disposal method that is equivalent to disposal in an incinerator approved under § 761.70 or a high efficiency boiler operating in compliance with § 761.71; or stores PCB wastes may apply for a TSCA PCB Coordinated Approval. The EPA Regional Administrator may approve the request if the EPA Regional Administrator determines that the activity will not pose an unreasonable risk of injury to health or the environment and the person:

(1)(i) Has a waste management permit or other decision or enforcement document which exercises control over PCB wastes, issued by EPA or an authorized State Director for a State program that has been approved by EPA and is no less stringent in protection of health or the environment than the applicable TSCA requirements found in this part; or

(ii) Has a PCB waste management permit or other decision or enforcement document issued by a State Director pursuant to a State PCB waste management program no less stringent in protection of health or the environment than the applicable TSCA requirements found in this part; or

(iii) Is subject to a waste management permit or other decision or enforcement document which is applicable to the disposal of PCBs and which was issued through the promulgation of a regulation published in Title 40 of the Code of Federal Regulations.

(2) Complies with the terms and conditions of the permit or other decision or enforcement document described in paragraph (b)(1) of this section.

(3) Unless otherwise waived or modified in writing by the EPA Regional Administrator, complies with § 761.75(b); § 761.70(a)(1) through (a)(9), (b)(1) and (b)(2), and (c); or the PCB storage requirements at §§ 761.65(a), (c), and (d)(2), as appropriate.

(4) Complies with the reporting and recordkeeping requirements in subparts J and K of this part.

(c) A person conducting research and development (R&D) into PCB disposal methods (regardless of PCB concentration), or conducting PCB remediation activities may apply for a TSCA PCB Coordinated Approval. The EPA Regional Administrator may approve the request if the EPA Regional Administrator determines that the activity will not pose an unreasonable risk of injury to health or the environment and the person:

(1)(i) Has a permit or other decision and enforcement document issued or otherwise agreed to by EPA, or permit or other decision and enforcement document issued by an authorized State Director for a State program that has been approved by EPA, which exercises control over the management of PCB wastes, and that person is in compliance with all terms and conditions of that document; or

(ii) Has a permit, which exercises control over the management of PCB wastes, issued by a State Director pursuant to a State PCB disposal program no less stringent than the requirements in this part.

(2) Complies with the terms and conditions of that permit or other decision and enforcement document.

(3) Complies with the reporting and recordkeeping requirements in subparts J and K of this part.

[63 FR 35456, June 29, 1998]

§ 761.79 Decontamination standards and procedures.

(a) *Applicability.* This section establishes decontamination standards and procedures for removing PCBs, which are regulated for disposal, from water, organic liquids, non-porous surfaces (including scrap metal from disassembled electrical equipment), concrete, and non-porous surfaces covered with a porous surface, such as paint or coating on metal.

(1) Decontamination in accordance with this section does not require a disposal approval under subpart D of this part.

(2) Materials from which PCBs have been removed by decontamination in accordance with this section may be distributed in commerce in accordance with §761.20(c)(5).

(3) Materials from which PCBs have been removed by decontamination in accordance with this section may be used or reused in accordance with §761.30(u).

(4) Materials from which PCBs have been removed by decontamination in accordance with this section, not including decontamination waste and residuals under paragraph (g) of this section, are unregulated for disposal under subpart D of this part.

(5) Any person decontaminating porous surfaces other than concrete under paragraph (b)(4) of this section and non-porous surfaces covered with a porous surface, such as paint or coating on metal, under paragraph (b)(3) or (c)(6) of this section must obtain an alternative decontamination approval in accordance with paragraph (h) of this section.

(6) Any person engaging in decontamination under this section is responsible for determining and complying with all other applicable Federal, State, and local laws and regulations.

(b) *Decontamination standards.* Chopping (including wire chopping), distilling, filtering, oil/water separation, spraying, soaking, wiping, stripping of insulation, scraping, scarification or the use of abrasives or solvents may be used to remove or separate PCBs, to the following standards, from liquids, concrete, or non-porous surfaces.

(1) The decontamination standard for water containing PCBs is:

(i) Less than 200 μg/L (i.e., <200 ppb PCBs) for non-contact use in a closed system where there are no releases;

(ii) For water discharged to a treatment works (as defined in §503.9(aa) of this chapter) or to navigable waters, <3 μg/L (approximately <3 ppb) or a PCB discharge limit included in a permit issued under section 307(b) or 402 of the Clean Water Act; or

(iii) Less than or equal to 0.5 μg/L (i.e., approximately ≤0.5 ppb PCBs) for unrestricted use.

(2) The decontamination standard for organic liquids and non-aqueous inorganic liquids containing PCBs is <2 milligrams per kilogram (i.e., <2 ppm PCBs).

(3) The decontamination standard for non-porous surfaces in contact with liquid and non-liquid PCBs is:

(i) For unrestricted use:

(A) For non-porous surfaces previously in contact with liquid PCBs at any concentration, where no free-flowing liquids are currently present, ≤10 micrograms PCBs per 100 square centimeters (≤10 μg/100 cm^2) as measured by a standard wipe test (§761.123) at locations selected in accordance with subpart P of this part.

(B) For non-porous surfaces in contact with non-liquid PCBs (including non-porous surfaces covered with a porous surface, such as paint or coating on metal), cleaning to Visual Standard No. 2, Near-White Blast Cleaned Surface Finish, of the National Association of Corrosion Engineers (NACE). A person shall verify compliance with standard No. 2 by visually inspecting all cleaned areas.

(ii) For disposal in a smelter operating in accordance with §761.72(b):

(A) For non-porous surfaces previously in contact with liquid PCBs at any concentration, where no free-flowing liquids are currently present, <100 μg/100 cm^2 as measured by a standard wipe test (§761.123) at locations selected in accordance with subpart P of this part.

(B) For non-porous surfaces in contact with non-liquid PCBs (including non-porous surfaces covered with a porous surface, such as paint or coating on metal), cleaning to Visual Standard No. 3, Commercial Blast Cleaned Surface Finish, of the National Association of Corrosion Engineers (NACE). A person shall verify compliance with standard No. 3 by visually inspecting all cleaned areas.

(4) The decontamination standard for concrete is ≤10 μg/100 cm^2 as measured by a standard wipe test (§761.123) if the decontamination procedure is commenced within 72 hours of the initial spill of PCBs to the concrete or portion thereof being decontaminated.

(c) *Self-implementing decontamination procedures.* The following self-implementing decontamination procedures are available as an alternative to the

measurement-based decontamination methods specified in paragraph (b) of this section. Any person performing self-implementing decontamination must comply with one of the following procedures.

(1) Any person decontaminating a PCB Container must do so by flushing the internal surfaces of the container three times with a solvent containing <50 ppm PCBs. Each rinse shall use a volume of the flushing solvent equal to approximately 10 percent of the PCB Container capacity.

(2) Any person decontaminating movable equipment contaminated by PCBs, tools, and sampling equipment may do so by:

(i) Swabbing surfaces that have contacted PCBs with a solvent;

(ii) A double wash/rinse as defined in subpart S of this part; or

(iii) Another applicable decontamination procedure in this section.

(3) Any person decontaminating a non-porous surface in contact with free-flowing mineral oil dielectric fluid (MODEF) at levels ≤10,000 ppm PCBs must do so as follows:

(i) Drain the free-flowing MODEF and allow the residual surfaces to drain for an additional 15 hours.

(ii) Dispose of drained MODEF according to paragraph (g) of this section.

(iii) Soak the surfaces to be decontaminated in a sufficient amount of clean (containing <2 ppm PCBs) performance-based organic decontamination fluid (PODF) such that there is a minimum of 800 ml of PODF for each 100 cm^2 of contaminated or potentially contaminated surface for at least 15 hours at ≥20 °C.

(iv) Approved PODFs include:

(A) Kerosene.

(B) Diesel fuel.

(C) Terpene hydrocarbons.

(D) Mixtures of terpene hydrocarbons and terpene alcohols.

(v) Drain the PODF from the surfaces.

(vi) Dispose of the drained PODF in accordance with paragraph (g) of this section.

(4) Any person decontaminating a non-porous surface in contact with free-flowing MODEF containing >10,000 ppm PCB in MODEF or askarel PCB (up to 70 percent PCB in a mixture of trichlorobenzenes and tetrachlorobenzenes) must do so as follows:

(i) Drain the free-flowing MODEF or askarel and allow the residual surfaces to drain for an additional 15 hours.

(ii) Dispose of drained MODEF or askarel according to paragraph (g) of this section.

(iii) Soak the surfaces to be decontaminated in a sufficient amount of clean PODF (containing <2 ppm PCBs) such that there is a minimum of 800 ml of PODF for each 100 cm^2 of contaminated or potentially contaminated surface for at least 15 hours at ≥20 °C.

(iv) Approved PODFs include:

(A) Kerosene.

(B) Diesel fuel.

(C) Terpene hydrocarbons.

(D) Mixtures of terpene hydrocarbons and terpene alcohols.

(v) Drain the PODF from the surfaces.

(vi) Dispose of the drained PODF in accordance with paragraph (g) of this section.

(vii) Resoak the surfaces to be decontaminated, pursuant to paragraph (c)(3)(iii) of this section, in a sufficient amount of clean PODF (containing <2 ppm PCBs) such that there is a minimum of 800 ml of PODF for each 100 cm^2 of surface for at least 15 hours at ≥20 °C.

(viii) Drain the PODF from the surfaces.

(ix) Dispose of the drained PODF in accordance with paragraph (g) of this section.

(5) Any person decontaminating piping and air lines in an air compressor system must do so as follows:

(i) Before decontamination proceeds, disconnect or bypass the air compressors and air dryers from the piping and air lines and decontaminate the air compressors and air dryers separately in accordance with paragraphs (b), (c)(1) through (c)(4), or (c)(6) of this section. Dispose of filter media and desiccant in the air dyers based on their existing PCB concentration.

(ii) Test the connecting line and appurtenances of the system to assure that there is no leakage. Test by introducing air into the closed system at from 90 to 100 pounds per square inch

(psi). Only if there is a pressure drop of <5 psi in 30 minutes may decontamination take place.

(iii) When there is no leakage, fill the piping and air lines with clean (containing <2 ppm PCBs) solvent. Solvents include PODF, aqueous potassium hydroxide at a pH between 9 and 12, or water containing 5 percent sodium hydroxide by weight.

(iv) Circulate the solvent to achieve turbulent flow through the piping and air lines in the air compressor system until the total volume of solvent circulated equals 10 times the total volume of the particular article being decontaminated, then drain the solvent. Calculate the total volume of solvent circulated by multiplying the pump rate by the time of pumping. Turbulent flow means a Reynolds number range from 20,000 to 43,000. Refill the system with clean solvent and repeat the circulation and drain process.

(6) Any person using thermal processes to decontaminate metal surfaces in contact with PCBs, as required by §761.62(a)(6), must use one of the following options:

(i) Surfaces in contact with liquid and non-liquid PCBs at concentrations <500 ppm may be decontaminated in a scrap metal recovery oven or smelter for purposes of disposal in accordance with §761.72.

(ii) Surfaces in contact with liquid or non-liquid PCBs at concentrations ≥500 ppm may be smelted in a smelter operating in accordance with §761.72(b), but must first be decontaminated in accordance with §761.72(a) or to a surface concentration of <100 μg/100 cm^2.

(d) *Decontamination solvents.* (1) Unless otherwise provided in paragraphs (c)(3) through (c)(5) of this section, the solubility of PCBs in any solvent used for purposes of decontamination under this section must be 5 percent or more by weight.

(2) The solvent may be reused for decontamination so long as its PCB concentration is <50 ppm.

(3) Solvent shall be disposed of under paragraph (g) of this section.

(4) Other than as allowed in paragraphs (c)(3) and (c)(4) of this section, solvents may be tested and validated for performance-based decontamination of non-porous surfaces contaminated with MODEF or other PCB liquids, in accordance with the self-implementing procedures found in subpart T of this part. Specific conditions for the performance-based testing from this validation study are determined in the validation study.

(e) *Limitation of exposure and control of releases.* (1) Any person conducting decontamination activities under this section shall take necessary measures to protect against direct release of PCBs to the environment from the decontamination area.

(2) Persons participating in decontamination activities shall wear or use protective clothing or equipment to protect against dermal contact or inhalation of PCBs or materials containing PCBs.

(f) *Sampling and recordkeeping.* (1) Confirmatory sampling is required under paragraph (b) of this section. For liquids described in paragraphs (b)(1) and (b)(2) of this section, sample in accordance with §§761.269 and 761.272. For non-porous surfaces and concrete described in paragraphs (b)(3) and (b)(4) of this section, sample in accordance with subpart P of this part. A written record of such sampling must be established and maintained for 3 years from the date of any decontamination under this section. The record must show sampling locations and analytical results and must be retained at the site of the decontamination or a copy of the record must be made available to EPA in a timely manner, if requested. In addition, recordkeeping is required in accordance with §761.180(a) for all wastes generated by a decontamination process and regulated for disposal under this subpart.

(2) Confirmatory sampling is not required for self-implementing decontamination procedures under paragraph (c) of this section. Any person using these procedures must retain a written record documenting compliance with the procedures for 3 years after completion of the decontamination procedures (e.g., video recordings, photographs).

(g) *Decontamination waste and residues.* Decontamination waste and residues shall be disposed of at their existing PCB concentration unless otherwise specified.

(1) Distillation bottoms or residues and filter media are regulated for disposal as PCB remediation waste.

(2) PCBs physically separated from regulated waste during decontamination (such as by chopping, shredding, scraping, abrading or oil/water separation, as opposed to solvent rinsing and soaking), other than wastes described in paragraph (g)(1) of this section, are regulated for disposal at their original concentration.

(3) Hydrocarbon solvent used or reused for decontamination under this section that contains <50 ppm PCB must be burned and marketed in accordance with the requirements for used oil in §761.20(e), disposed of in accordance with §761.60(a) or (e), or decontaminated pursuant to this section.

(4) Chlorinated solvent at any PCB concentration used for decontamination under this section shall be disposed of in an incinerator operating in compliance with §761.70, or decontaminated pursuant to this section.

(5) Solvents ≥50 ppm other than those described in paragraphs (g)(3) and (g)(4) of this section shall be disposed of in accordance with §761.60(a) or decontaminated pursuant to this section.

(6) Non-liquid cleaning materials and personal protective equipment waste at any concentration, including non-porous surfaces and other non-liquid materials such as rags, gloves, booties, other disposable personal protective equipment, and similar materials resulting from decontamination shall be disposed of in accordance with §761.61(a)(5)(v).

(h) *Alternative decontamination or sampling approval.* (1) Any person wishing to decontaminate material described in paragraph (a) of this section in a manner other than prescribed in paragraph (b) of this section must apply in writing to the Regional Administrator in the Region where the activity would take place, for decontamination activity occurring in a single EPA Region; or to the Director, Office of Resource Conservation and Recovery, for decontamination activity occurring in more than one EPA Region. Each application must describe the material to be decontaminated and the proposed decontamination method, and must demonstrate that the proposed method is capable of decontaminating the material to the applicable level set out in paragraphs (b)(1) through (b)(4) of this section.

(2) Any person wishing to decontaminate material described in paragraph (a) of this section using a self-implementing procedure other than prescribed in paragraph (c) of this section must apply in writing to the Regional Administrator in the Region where the activity would take place, for decontamination activity occurring in a single EPA Region; or to the Director, Office of Resource Conservation and Recovery, for decontamination activity occurring in more than one EPA Region. Each application must describe the material to be decontaminated and the proposed self-implementing decontamination method and must include a proposed validation study to confirm performance of the method.

(3) Any person wishing to sample decontaminated material in a manner other than prescribed in paragraph (f) of this section must apply in writing to the Regional Administrator in the Region where the activity would take place, for decontamination activity occurring in a single EPA Region; or to the Director, Office of Resource Conservation and Recovery, for decontamination activity occurring in more than one EPA Region. Each application must contain a description of the material to be decontaminated, the nature and PCB concentration of the contaminating material (if known), the decontamination method, the proposed sampling procedure, and a justification for how the proposed sampling is equivalent to or more comprehensive than the sampling procedure required under paragraph (f) of this section.

(4) EPA may request additional information that it believes necessary to evaluate the application.

(5) EPA will issue a written decision on each application for risk-based decontamination or sampling. No person may conduct decontamination or sampling under this paragraph prior to obtaining written approval from EPA. EPA will approve an application if it finds that the proposed decontamination or sampling method will not pose

an unreasonable risk of injury to health or the environment.

[63 FR 35457, June 29, 1998, as amended at 64 FR 33761, June 24, 1999; 72 FR 57240, Oct. 9, 2007; 74 FR 30233, June 25, 2009]

Subpart E—Exemptions

§ 761.80 Manufacturing, processing and distribution in commerce exemptions.

(a) The Administrator grants the following petitioner(s) an exemption for 1 year to process and distribute in commerce PCBs for use as a mounting medium in microscopy:

(1) McCrone Accessories Components, Division of Walter C. McCrone Associates, Inc., 2820 South Michigan Avenue, Chicago, IL. 60616.

(2) [Reserved]

(b) The Administrator grants the following petitioner(s) an exemption for 1 year to process and distribute in commerce PCBs for use as a mounting medium in microscopy, an immersion oil in low fluorescence microscopy and an optical liquid:

(1) R.P. Cargille Laboratories, Inc., 55 Commerce Road, Cedar Grove, N.J. 07009.

(2) [Reserved]

(c) The Administrator grants the following petitioner(s) an exemption for 1 year to export PCBs for use in small quantities for research and development:

(1) Accu-Standard, New Haven, CT. 06503.

(2) ManTech, Research Triangle Park, NC 27709.

(d) The Administrator grants the following petitioner(s) an exemption for 1 year to import (manufacture) into the United States, small quantities of existing PCB fluids from electrical equipment for analysis:

(1) Unison Transformer Services, Inc., Tarrytown, N.Y. 10591, provided each of the following conditions are met:

(i) The samples must be shipped in 5.0 ml or less, hermetically sealed vials.

(ii) The exemption is limited to no more than 250 total samples per year.

(iii) Unison makes quarterly inspections of its laboratories to ensure that proper safety procedures are being followed.

(iv) Unison annually notifies and describes to EPA its attempts to have samples analyzed abroad.

(2) [Reserved]

(e) The Administrator grants a class exemption to all research and development (R&D) facilities for a period of 1 year to manufacture or import PCBs for use solely in the manufacturer or importer's own research for the development of PCB disposal technologies. Each person that wishes to be part of the exemption must meet the following conditions:

(1) A petition for an exemption from the PCB prohibition on manufacturing PCBs must be received by EPA 60 days prior to engaging in these activities.

(2) Requests for renewal must be filed pursuant to §750.11 of this chapter. EPA will deem any properly filed request for the renewal of the exemption by any member of the class as a renewal request for the entire class.

(3) The quantity of the PCBs manufactured annually must not exceed 500 grams by total weight of pure PCBs. Any person who wishes to manufacture or import more than 500 grams of PCBs in 1 year must receive written approval from the Director, National Program Chemicals Division to exceed the limitations established by this provision. The Director, National Program Chemicals Division may grant approval without further rulemaking. Any increase granted will be in writing and will extend only for a maximum of the time remaining in a specific exemption year.

(4) The owner or operator of the facility must notify the EPA Regional Administrator in writing 30 days prior to the commencement of R&D activities that include the manufacture or import of PCBs under the exemption, unless the facility has obtained a PCB R&D approval from EPA pursuant to §761.60(e), §761.60(i)(2), §761.70(a), or §761.70(b) and the approval contains a provision allowing the manufacture of PCBs.

(5) Records are maintained of their PCB activities for a period of 3 years after ceasing operations. The records must include the sources and the annual amounts of PCBs received if imported and the type and annual amount of PCBs that were manufactured.

under special circumstances across the regions.

(d) *Excluded spills.* (1) Although the spill situations in paragraphs (d)(2) (i) through (vi) of this section are excluded from the automatic application of final decontamination standards under §761.125 (b) and (c), the general requirements under §761.125(a) do apply to these spills. In addition, all of these excluded situations require practicable, immediate actions to contain the area of contamination. While these situations may not always require more stringent cleanup measures, the Agency is excluding these scenarios because they will always involve significant factors that may not be adequately addressed by cleanup standards based upon typical spill characteristics.

(2) For the spill situations in paragraphs (d)(2)(i) through (vi) of this section, the responsible party shall decontaminate the spill in accordance with site-specific requirements established by the EPA regional offices.

(i) Spills that result in the direct contamination of surface waters (surface waters include, but are not limited to, "waters of the United States" as defined in part 122 of this chapter, ponds, lagoons, wetlands, and storage reservoirs).

(ii) Spills that result in the direct contamination of sewers or sewage treatment systems.

(iii) Spills that result in the direct contamination of any private or public drinking water sources or distribution systems.

(iv) Spills which migrate to and contaminate surface waters, sewers, or drinking water supplies before cleanup has been completed in accordance with this policy.

(v) Spills that contaminate animal grazing lands.

(vi) Spills that contaminate vegetable gradens.

(e) *Relationship of policy to other statutes.* (1) This policy does not affect cleanup standards or requirements for the reporting of spills imposed, or to be imposed, under other Federal statutory authorities, including but not limited to, the Clean Water Act (CWA), the Resource Conservation and Recovery Act (RCRA), and the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA). Where more than one requirement applies, the stricter standard must be met.

(2) The Agency recognizes that the existence of this policy will inevitably result in attempts to apply the standards to situations within the scope of other statutory authorities. However, other statutes require the Agency to consider different or alternative factors in determining appropriate corrective actions. In addition, the types and magnitudes of exposures associated with sites requiring corrective action under other statutes often involve important differences from those expected of the typical, electrical equipment-type spills considered in developing this policy. Thus, cleanups under other statutes, such as RCRA corrective actions or remedial and response actions under SARA may result in different outcomes.

[52 FR 10705, Apr. 2, 1987, as amended at 72 FR 57241, Oct. 9, 2007; 74 FR 30234, June 25, 2009]

§ 761.123 Definitions.

For purposes of this policy, certain words and phrases are used to denote specific materials, procedures, or circumstances. The following definitions are provided for purposes of clarity and are not to be taken as exhaustive lists of situations and materials covered by the policy.

Double wash/rinse means a minimum requirement to cleanse solid surfaces (both impervious and nonimpervious) two times with an appropriate solvent or other material in which PCBs are at least 5 percent soluble (by weight). A volume of PCB-free fluid sufficient to cover the contaminated surface completely must be used in each wash/rinse. The wash/rinse requirement does not mean the mere spreading of solvent or other fluid over the surface, nor does the requirement mean a once-over wipe with a soaked cloth. Precautions must be taken to contain any runoff resulting from the cleansing and to dispose properly of wastes generated during the cleansing.

High-concentration PCBs means PCBs that contain 500 ppm or greater PCBs, or those materials which EPA requires to be assumed to contain 500 ppm or greater PCBs in the absence of testing.

High-contact industrial surface means a surface in an industrial setting which is repeatedly touched, often for relatively long periods of time. Manned machinery and control panels are examples of high-contact industrial surfaces. High-contact industrial surfaces are generally of impervious solid material. Examples of low-contact industrial surfaces include ceilings, walls, floors, roofs, roadways and sidewalks in the industrial area, utility poles, unmanned machinery, concrete pads beneath electrical equipment, curbing, exterior structural building components, indoor vaults, and pipes.

High-contact residential/commercial surface means a surface in a residential/commercial area which is repeatedly touched, often for relatively long periods of time. Doors, wall areas below 6 feet in height, uncovered flooring, windowsills, fencing, bannisters, stairs, automobiles, and children's play areas such as outdoor patios and sidewalks are examples of high-contact residential/commercial surfaces. Examples of low-contact residential/commercial surfaces include interior ceilings, interior wall areas above 6 feet in height, roofs, asphalt roadways, concrete roadways, wooden utility poles, unmanned machinery, concrete pads beneath electrical equipment, curbing, exterior structural building components (e.g., aluminum/vinyl siding, cinder block, asphalt tiles), and pipes.

Impervious solid surfaces means solid surfaces which are nonporous and thus unlikely to absorb spilled PCBs within the short period of time required for cleanup of spills under this policy. Impervious solid surfaces include, but are not limited to, metals, glass, aluminum siding, and enameled or laminated surfaces.

Low-concentration PCBs means PCBs that are tested and found to contain less than 500 ppm PCBs, or those PCB-containing materials which EPA requires to be assumed to be at concentrations below 500 ppm (i.e., untested mineral oil dielectric fluid).

Nonimpervious solid surfaces means solid surfaces which are porous and are more likely to absorb spilled PCBs prior to completion of the cleanup requirements prescribed in this policy. Nonimpervious solid surfaces include, but are not limited to, wood, concrete, asphalt, and plasterboard.

Nonrestricted access areas means any area other than restricted access, outdoor electrical substations, and other restricted access locations, as defined in this section. In addition to residential/commercial areas, these areas include unrestricted access rural areas (areas of low density development and population where access is uncontrolled by either man-made barriers or naturally occurring barriers, such as rough terrain, mountains, or cliffs).

Other restricted access (nonsubstation) locations means areas other than electrical substations that are at least 0.1 kilometer (km) from a residential/commercial area and limited by man-made barriers (e.g., fences and walls) to substantially limited by naturally occurring barriers such as mountains, cliffs, or rough terrain. These areas generally include industrial facilities and extremely remote rural locations. (Areas where access is restricted but are less than 0.1 km from a residential/commercial area are considered to be residential/commercial areas.)

Outdoor electrical substations means outdoor, fenced-off, and restricted access areas used in the transmission and/or distribution of electrical power Outdoor electrical substations restrict public access by being fenced or walled off as defined under §761.30(l)(1)(ii). For purposes of this TSCA policy, outdoor electrical substations are defined as being located at least 0.1 km from a residential/commercial area. Outdoor fenced-off and restricted access areas used in the transmission and/or distribution of electrical power which are located less than 0.1. km from a residential/commercial area are considered to be residential/commercial areas.

PCBs means polychlorinated biphenyls as defined under §761.3. As specified under §761.1(b), no requirements may be avoided through dilution of the PCB concentration.

Requirements and standards means:

(1) "Requirements" as used in this policy refers to both the procedural responses and numerical decontamination levels set forth in this policy as constituting adequate cleanup of PCBs.

(2) "Standards" refers to the numerical decontamination levels set forth in this policy.

Residential/commercial areas means those areas where people live or reside, or where people work in other than manufacturing or farming industries. Residential areas include housing and the property on which housing is located, as well as playgrounds, roadways, sidewalks, parks, and other similar areas within a residential community. Commercial areas are typically accessible to both members of the general public and employees and include public assembly properties, institutional properties, stores, office buildings, and transportation centers.

Responsible party means the owner of the PCB equipment, facility, or other source of PCBs or his/her designated agent (e.g., a facility manager or foreman).

Soil means all vegetation, soils and other ground media, including but not limited to, sand, grass, gravel, and oyster shells. It does not include concrete and asphalt.

Spill means both intentional and unintentional spills, leaks, and other uncontrolled discharges where the release results in any quantity of PCBs running off or about to run off the external surface of the equipment or other PCB source, as well as the contamination resulting from those releases. This policy applies to spills of 50 ppm or greater PCBs. The concentration of PCBs spilled is determined by the PCB concentration in the material spilled as opposed to the concentration of PCBs in the material onto which the PCBs were spilled. Where a spill of untested mineral oil occurs, the oil is presumed to contain greater than 50 ppm, but less than 500 ppm PCBs and is subject to the relevant requirements of this policy.

Spill area means the area of soil on which visible traces of the spill can be observed plus a buffer zone of 1 foot beyond the visible traces. Any surface or object (e.g., concrete sidewalk or automobile) within the visible traces area or on which visible traces of the spilled material are observed is included in the spill area. This area represents the minimum area assumed to be contaminated by PCBs in the absence of precleanup sampling data and is thus the minimum area which must be cleaned.

Spill boundaries means the actual area of contamination as determined by postcleanup verification sampling or by precleanup sampling to determine actual spill boundaries. EPA can require additional cleanup when necessary to decontaminate all areas within the spill boundaries to the levels required in this policy (e.g., additional cleanup will be required if postcleanup sampling indicates that the area decontaminated by the responsible party, such as the spill area as defined in this section, did not encompass the actual boundaries of PCB contamination).

Standard wipe test means, for spills of high-concentration PCBs on solid surfaces, a cleanup to numerical surface standards and sampling by a standard wipe test to verify that the numerical standards have been met. This definition constitutes the minimum requirements for an appropriate wipe testing protocol. A standard-size template (10 centimeters (cm) × 10 cm) will be used to delineate the area of cleanup; the wiping medium will be a gauze pad or glass wool of known size which has been saturated with hexane. It is important that the wipe be performed very quickly after the hexane is exposed to air. EPA strongly recommends that the gauze (or glass wool) be prepared with hexane in the laboratory and that the wiping medium be stored in sealed glass vials until it is used for the wipe test. Further, EPA requires the collection and testing of field blanks and replicates.

[52 FR 10705, Apr. 2, 1987; 52 FR 23397, June 19, 1987]

§ 761.125 Requirements for PCB spill cleanup.

(a) *General.* Unless expressly limited, the reporting, disposal, and precleanup sampling requirements in paragraphs (a) (1) through (3) of this section apply to all spills of PCBs at concentrations of 50 ppm or greater which are subject to decontamination requirements

(d) The sampling scheme must include calculation for expected variability due to analytical error.

(e) EPA recommends the use of a sampling scheme developed by the Midwest Research Institute (MRI) for use in enforcement inspections: "Verification of PCB Spill Cleanup by Sampling and Analysis." Guidance for the use of this sampling scheme is available in the MRI report "Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup." Both the MRI sampling scheme and the guidance document are available on EPA's PCB Web site at *http://www.epa.gov/pcb*, or from the Program Management, Communications, and Analysis Office, Office of Resource Conservation and Recovery (5305P), 1200 Pennsylvania Ave., NW., Washington, DC 20460–0001. The major advantage of this sampling scheme is that it is designed to characterize the degree of contamination within the entire sampling area with a high degree of confidence while using fewer samples than any other grid or random sampling scheme. This sampling scheme also allows some sites to be characterized on the basis of composite samples.

(f) EPA may, at its discretion, take samples from any spill site. If EPA's sampling indicates that the remaining concentration level exceeds the required level, EPA will require further cleanup. For this purpose, the numerical level of cleanup required for spills cleaned in accordance with §761.125(b) is deemed to be the equivalent of numerical cleanup requirements required for cleanups under §761.125(c) (2) through (4). Using its best engineering judgment, EPA may sample a statistically valid random or grid sampling technique, or both. When using engineering judgment or random "grab" samples, EPA will take into account that there are limits on the power of a grab sample to dispute statistically based sampling of the type required of the responsible party. EPA headquarters will provide guidance to the EPA regions on the degree of certainty associated with various grab sample results.

[52 FR 10705, Apr. 2, 1987, as amended at 60 FR 34465, July 3, 1995; 72 FR 57241, Oct. 9, 2007; 74 FR 30234, June 25, 2009]

§ 761.135 Effect of compliance with this policy and enforcement.

(a) Although a spill of material containing 50 ppm or greater PCBs is considered improper PCB disposal, this policy establishes requirements that EPA considers to be adequate cleanup of the spilled PCBs. Cleanup in accordance with this policy means compliance with the procedural as well as the numerical requirements of this policy. Compliance with this policy creates a presumption against both enforcement action for penalties and the need for further cleanup under TSCA. The Agency reserves the right, however, to initiate appropriate action to compel cleanup where, upon review of the records of cleanup or EPA sampling following cleanup, EPA finds that the decontamination levels in the policy have not been achieved. The Agency also reserves the right to seek penalties where the Agency believes that the responsible party has not made a good faith effort to comply with all provisions of this policy, such as prompt notification of EPA of a spill, recordkeeping, etc.

(b) EPA's exercise of enforcement discretion does not preclude enforcement action under other provisions of TSCA or any other Federal statute. This includes, even in cases where the numerical decontamination levels set forth in this policy have been met, civil or criminal action for penalties where EPA believes the spill to have been the result of gross negligence or knowing violation.

Subparts H–I [Reserved]

Subpart J—General Records and Reports

§ 761.180 Records and monitoring.

This section contains recordkeeping and reporting requirements that apply to PCBs, PCB Items, and PCB storage and disposal facilities that are subject to the requirements of the part.

(a) *PCBs and PCB Items in service or projected for disposal.* Beginning February 5, 1990, each owner or operator of a facility, other than a commercial storer or a disposer of PCB waste, using or storing at any one time at

least 45 kilograms (99.4 pounds) of PCBs contained in PCB Container(s), or one or more PCB Transformers, or 50 or more PCB Large High or Low Voltage Capacitors shall develop and maintain at the facility, or a central facility provided they are maintained at that facility, all annual records and the written annual document log of the disposition of PCBs and PCB Items. The written annual document log must be prepared for each facility by July 1 covering the previous calendar year (January through December). The annual document log shall be maintained for at least 3 years after the facility ceases using or storing PCBs and PCB Items in the quantities prescribed in this paragraph. Annual records (manifests and certificates of disposal) shall be maintained for the same period. The annual records and the annual document log shall be available for inspection at the facility where they are maintained by authorized representatives of EPA during normal business hours, and each owner or operator of a facility subject to these requirements shall know the location of these records. All records and annual documents required to be prepared and maintained by this section prior to February 5, 1990 shall continue to be maintained at the facility for the same time as the annual records and the annual document log. The annual document required for 1989 shall cover the period from January 1, 1989 to February 5, 1990.

(1) The annual records shall include the following:

(i) All signed manifests generated by the facility during the calendar year.

(ii) All Certificates of Disposal that have been received by the facility during the calendar year.

(iii) Records of inspections and cleanups performed in accordance with §761.65(c)(5).

(2) The written annual document log shall include the following:

(i) The name, address, and EPA identification number of the facility covered by the annual document log and the calendar year covered by the annual document log.

(ii) The unique manifest number of every manifest generated by the facility during the calendar year, and from each manifest and for unmanifested waste that may be stored at the facility, the following information:

(A) For bulk PCB waste (*e.g.*, in a tanker or truck), its weight in kilograms, the first date it was removed from service for disposal, the date it was placed into transport for off-site storage or disposal, and the date of disposal, if known.

(B) The serial number (if available) or other means of identifying each PCB Article (*e.g.*, transformer or capacitor), the weight in kilograms of the PCB waste in each transformer or capacitor, the date it was removed from service for disposal, the date it was placed in transport for off-site storage or disposal, and the date of disposal, if known.

(C) A unique number identifying each PCB Container, a description of the contents of each PCB Container, such as liquid, soil, cleanup debris, etc., including the total weight of the material in kilograms in each PCB Container, the first date material placed in each PCB Container was removed from service for disposal, and the date each PCB Container was placed in transport for off-site storage or disposal, and the date of disposal (if known).

(D) A unique number identifying each PCB Article Container, a description of the contents of each PCB Article Container, such as pipes, capacitors, electric motors, pumps, etc., including the total weight in kilograms of the content of each PCB Article Container, the first date a PCB Article placed in each PCB Article Container was removed from service for disposal, and the date the PCB Article Container was placed in transport for off-site storage or disposal, and the date of disposal (if known.)

(iii) The total number by specific type of PCB Articles and the total weight in kilograms of PCBs in PCB Articles, the total number of PCB Article Containers and total weight in kilograms of the contents of PCB Article Containers, the total number of PCB Containers and the total weight in kilograms of the contents of PCB Containers, and the total weight in kilograms of bulk PCB waste that was placed into storage for disposal or disposed during the calendar year.

(iv) The total number of PCB Transformers and total weight in kilograms of PCBs contained in the transformers remaining in service at the end of the calendar year.

(v) The total number of Large High or Low Voltage PCB Capacitors remaining in service at the end of the calendar year.

(vi) The total weight in kilograms of any PCBs and PCB Items in PCB Containers, including the identification of container contents, remaining in service at the facility at the end of the calendar year.

(vii) For any PCBs or PCB item received from or shipped to another facility owned or operated by the same generator, the information required under paragraph (a)(2)(ii)(A) through (a)(2)(ii)(D) of this section.

(viii) A record of each telephone call, or other means of verification agreed upon by both parties, made to each designated commercial storer or designated disposer to confirm receipt of PCB waste transported by an independent transporter, as required by §761.208.

(ix) Whenever a PCB Item, excluding small capacitors, with a concentration of ≥50 ppm is distributed in commerce for reuse pursuant to §761.20(c)(1), the name, address, and telephone number of the person to whom the item was transferred, date of transfer, and the serial number of the item or the internal identification number, if a serial number is not available, must be recorded in the annual document log. The serial number or internal identification number shall be permanently marked on the equipment.

(3) [Reserved]

(4) For purposes of this paragraph, PCB Voltage Regulators shall be recorded as PCB Transformers.

(b) *Disposers and commercial storers of PCB waste.* Beginning February 5, 1990, each owner or operator of a facility (including high efficiency boiler operations) used for the commercial storage or disposal of PCBs and PCB Items shall maintain annual records on the disposition of all PCBs and PCB items at the facility and prepare and maintain a written annual document log that includes the information required by paragraphs (b)(2) of this section for PCBs and PCB Items that were handled as PCB waste at the facility. The written annual document log shall be prepared by July 1 for the previous calendar year (January through December). The written annual document log shall be maintained at each facility for at least 3 years after the facility is no longer used for the storage or disposal of PCBs and PCB Items except that, in the case of chemical waste landfills, the annual document log shall be maintained at least 20 years after the chemical waste landfill is no longer used for the disposal of PCBs and PCB Items. The annual records shall be maintained for the same period. The annual records and written annual document log shall be available at the facility for inspection by authorized representatives of the EPA. All records and annual documents required to be prepared and maintained by this section prior to February 5, 1990 shall continue to be maintained at the facility for the same time as the annual records and the annual document log. The annual document for 1989 shall cover the period from January 1, 1989 to February 5, 1990. From the written annual document log the owner or operator of a facility must prepare the annual report containing the information required by paragraphs (b)(3)(i) through (b)(3)(vi) of this section for PCBs and PCB Items that were handled as PCB waste at the facility during the previous calendar year (January through December). The annual report must be submitted by July 15 of each year for the preceding calendar year. If the facility ceases commercial PCB storage or disposal operations, the owner or operator of the facility shall provide at least 60 days advance written notice to the Regional Administrator for the region in which the facility is located of the date the facility intends to begin closure. d

(1) The annual records shall include the following:

(i) All signed manifests generated or received at the facility during the calendar year.

(ii) All Certificates of Disposal that have been generated or received by the facility during the calendar year.

(iii) Records of inspections and cleanups performed in accordance with §761.65(c)(5).

(2) The written annual document log shall include the following:

(i) The name, address, and EPA identification number of the storage or disposal facility covered by the annual document log and the calendar year covered by the annual document log.

(ii) For each manifest generated or received by the facility during the calendar year, the unique manifest number and the name and address of the facility that generated the manifest and the following information:

(A) For bulk PCB waste (*e.g.*, in a tanker or truck), its weight in kilograms, the first date PCB waste placed in the tanker or truck was removed from service for disposal, the date it was received at the facility, the date it was placed in transport for off-site disposal (if applicable), and the date of disposal, (if known).

(B) The serial number or other means of identifying each PCB Article, not in a PCB Container or PCB Article Container, the weight in kilograms of the PCB waste in the PCB Article, the date it was removed from service for disposal, the date it was received at the facility, the date it was placed in transport for off-site disposal (if applicable), and the date of disposal (if known).

(C) The unique number assigned by the generator identifying each PCB Container, a description of the contents of each PCB Container, such as liquid, soil, cleanup debris, etc., including the total weight of the PCB waste in kilograms in each PCB Container, the first date PCB waste placed in each PCB Container was removed from service for disposal, the date it was received at the facility, the date each PCB Container was placed in transport for off-site storage or disposal (as applicable), and the date the PCB Container was disposed of (if known).

(D) The unique number assigned by the generator identifying each PCB Article Container, a description of the contents of each PCB Article Container, such as pipes, capacitors, electric motors, pumps, etc., including the total weight in kilograms of the PCB waste in each PCB Article Container, the first date a PCB Article placed in each PCB Article Container was removed from service for disposal, the date it was received at the facility, the date each PCB Article Container was placed in transport for off-site storage or disposal (as applicable), and the date the PCB Article Container was disposed of (if known).

(E) Disposers of PCB waste shall include the confirmed date of disposal for items in paragraphs (b)(2)(ii)(A) through (b)(2)(ii)(D) of this section.

(iii) For any PCB waste disposed at a facility that generated the PCB waste or any PCB waste that was not manifested to the facility, the information required under paragraph (b)(2)(ii)(A) through (b)(2)(ii)(E) of this section.

(3) The owner or operator of a PCB disposal facility (including an owner or operator who disposes of his/her own waste and does not receive or generate manifests) or a commercial storage facility shall submit an annual report, which briefly summarizes the records and annual document log required to be maintained and prepared under paragraphs (b)(1) and (b)(2) of this section to the EPA Regional Administrator of the Region in which the facility is located by July 15 of each year, beginning with July 15, 1991. The first annual report submitted on July 15, 1991, shall be for the period starting February 5, 1990, and ending December 31, 1990. The annual report shall contain no confidential business information. The annual report shall consist of the information listed in paragraphs (b)(3)(i) through (b)(3)(vi) of this section.

(i) The name, address, and EPA identification number of the facility covered by the annual report for the calendar year.

(ii) A list of the numbers of all signed manifests of PCB waste initiated or received by the facility during that year.

(iii) The total weight in kilograms of bulk PCB waste, PCB waste in PCB Transformers, PCB waste in PCB Large High or Low Voltage Capacitors, PCB waste in PCB Article Containers, and PCB waste in PCB Containers in storage at the facility at the beginning of the calendar year, received or generated at the facility, transferred to another facility, or disposed of at the facility during the calendar year. The information must be provided for each of these categories, as appropriate.

(iv) The total number of PCB Transformers, the total number of PCB Large High or Low Voltage Capacitors, the total number of PCB Article Containers, and the total number of PCB Containers in storage at the facility at the beginning of the calendar year, received or generated at the facility, transferred to another facility, or disposed of at the facility during the calendar year. The information must be provided for each of these categories, as appropriate.

(v) The total weight in kilograms of each of the following PCB categories: bulk PCB waste, PCB waste in PCB Transformers, PCB waste in PCB Large High or Low Voltage Capacitors, PCB waste in PCB Article Containers, and PCB waste in PCB Containers remaining in storage for disposal at the facility at the end of the calendar year.

(vi) The total number of PCB Transformers, the total number of PCB Large High or Low Voltage Capacitors, the total number of PCB Article Containers, and the total number of PCB Containers remaining in storage for disposal at the facility at the end of the calendar year.

(vii) The requirement to submit annual reports to the Regional Administrator continues until the submission of the annual report for the calendar year during which the facility ceases PCB storage or disposal operations. Storage operations have not ceased until all PCB waste, including any PCB waste generated during closure, has been removed from the facility.

(4) Whenever a commercial storer of PCB waste accepts PCBs or PCB Items at his storage facility and transfers the PCB waste off-site to another facility for storage or disposal, the commercial storer of PCB waste shall initiate a manifest under subpart K of this part for the transfer of PCBs or PCB Items to the next storage or disposal facility.

NOTE: Any requirements for weights in kilograms of PCBs may be calculated values if the internal volume of PCBs in containers and transformers is known and included in the reports, together with any assumptions on the density of the PCBs contained in the containers or tranformers. If the internal volume of PCBs is not known, a best estimate may be used.

(5) For purposes of this paragraph, PCB Voltage Regulators shall be recorded and reported as PCB Transformers.

(c) *Incineration facilities.* Each owner or operator of a PCB incinerator facility shall collect and maintain for a period of 5 years from the date of collection the following information, in addition to the information required in paragraph (b) of this section:

(1) When PCBs are being incinerated, the following continuous and short-interval data:

(i) Rate and quantity of PCBs fed to the combustion system as required in § 761.70(a)(3);

(ii) Temperature of the combustion process as required in § 761.70(a)(4); and

(iii) Stack emission product to include O_2, CO, and CO_2 as required in § 761.70(a)(7).

(2) When PCBs are being incinerated, data and records on the monitoring of stack emissions as required in § 761.70(a)(6).

(3) Total weight in kilograms of any solid residues generated by the incineration of PCBs and PCB Items during the calendar year, the total weight in kilograms of any solid residues disposed of by the facility in chemical waste landfills, and the total weight in kilograms of any solid residues remaining on the facility site.

(4) When PCBs and PCB Items are being incinerated, additional periodic data shall be collected and maintained as specified by the Regional Administrator pursuant to § 761.70(d)(4).

(5) Upon any suspension of the operation of any incinerator pursuant to § 761.70(a)(8), the owner or operator of such an incinerator shall prepare a document. The document shall, at a minimum, include the date and time of the suspension and an explanation of the circumstances causing the suspension of operation. The document shall be sent to the appropriate Regional Administrator within 30 days of any such suspension.

(d) *Chemical waste landfill facilities.* Each owner or operator of a PCB chemical waste landfill facility shall collect and maintain until at least 20 years after the chemical waste landfill is no longer used for the disposal of PCBs the following information in addition to the information required in paragraph (b) of this section:

(1) Any water analysis obtained in compliance with §761.75(b)(6)(iii); and

(2) Any operations records including burial coordinates of wastes obtained in compliance with §761.75(b)(8)(ii).

(e) *High efficiency boiler facilities.* Each owner or operator of a high efficiency boiler used for the disposal of liquids between 50 and 500 ppm PCB shall collect and maintain for a period of 5 years the following information, in addition to the information required in paragraph (b) of this section:

(1) For each month PCBs are burned in the boiler the carbon monoxide and excess oxygen data required in §761.71(a)(1)(viii) and §761.71(b)(1)(viii);

(2) The quantity of PCBs burned each month as required in §761.71(a)(1)(vii) and §761.71(b)(1)(vii); and

(3) For each month PCBs (other than mineral oil dielectric fluid) are burned, chemical analysis data of the waste as required in §761.71(b)(2)(vi).

(f) *Retention of special records by storage and disposal facilities.* In addition to the information required to be maintained under paragraphs (b), (c), (d) and (e) of this section, each owner or operator of a PCB storage or disposal facility (including high efficiency boiler operations) shall collect and maintain for the time period specified in paragraph (b) of this section the following data:

(1) All documents, correspondence, and data that have been provided to the owner or operator of the facility by any State or local government agency and that pertain to the storage or disposal of PCBs and PCB Items at the facility.

(2) All documents, correspondence, and data that have been provided by the owner or operator of the facility to any State or local government agency and that pertain to the storage or disposal of PCBs and PCB Items at the facility.

(3) Any applications and related correspondence sent by the owner or operator of the facility to any local, State, or Federal authorities in regard to waste water discharge permits, solid waste permits, building permits, or other permits or authorizations such as those required by §§761.70(d) and 761.75(c).

(g) *Reclassification records.* If you reclassify electrical equipment using the procedures in §761.30(a)(2)(v) or §761.30(h)(2)(v), you must keep records showing that you followed the required reclassification procedures. Where these procedures require testing, the records must include copies of pre- and post-reclassification PCB concentration measurements from a laboratory using quality control and quality assurance procedures. You must make these records available promptly to EPA or to any party possessing the equipment through sale, loan, lease, or for servicing. You must retain the records for at least 3 years after you sell or dispose of the equipment.

(Sec. 6, Pub. L. 94–469, 90 Stat. 2020 (15 U.S.C. 2605)

[44 FR 31542, May 31, 1979. Redesignated at 47 FR 19527, May 6, 1982, and further redesignated at 47 FR 37360, Aug. 25, 1982; 49 FR 28191, July 10, 1984; 53 FR 12524, Apr. 15, 1988; 54 FR 52750, Dec. 21, 1989; 55 FR 26205, June 27, 1990; 58 FR 34205, June 23, 1993; 63 FR 35461, June 29, 1998; 66 FR 17619, Apr. 2, 2001]

§761.185 Certification program and retention of records by importers and persons generating PCBs in excluded manufacturing processes.

(a) In addition to meeting the basic requirements of §761.1(f) and the definition of excluded manufacturing processes at §761.3, manufacturers with processes inadvertently generating PCBs and importers of products containing inadvertently generated PCBs must report to EPA any excluded manufacturing process or imports for which the concentration of PCBs in products leaving the manufacturing site or imported is greater than 2 micrograms per gram (2 μg/g, roughly 2 ppm) for any resolvable gas chromatographic peak. Such reports must be filed by October 1, 1984 or, if no processes or imports require reports at the time, within 90 days of having processes or imports for which such reports are required.

(b) Manufacturers required to report by paragraph (a) of this section must transmit a letter notifying EPA of the number, the type, and the location of excluded manufacturing processes in which PCBs are generated when the PCB level in products leaving any manufacturing site is greater than 2 μg/g for any resolvable gas chromatographic

Appendix G

Fugitive Dust Emissions Control Plan

FUGITIVE DUST EMISSIONS CONTROL PLAN
ECDC ENVIRONMENTAL, L.C.

1. Introduction

This Fugitive Dust Emissions Control Plan has been developed by ECDC Environmental, L.C. (ECDC) to address methods of controlling on-site fugitive dust resulting from normal operations at the East Carbon landfill. It is the intent of ECDC to implement control strategies for the minimization of fugitive dust as required by Utah Code Rule R307-205 and prior negotiations between ECDC and the Utah Division of Air Quality.

2. Source Information

ECDC operates a solid waste landfill one mile west of East Carbon City, in Carbon County, Utah (UTM: 4,377,500 meters North, 548,000 meters East). This facility accepts non-hazardous solid waste as permitted by the Utah Department of Environmental Quality, Division of Solid and Hazardous Waste. This facility will also accept TCSA regulated wastes in accordance with the approval issued by Region 8 of the USEPA. In addition to normal waste processing operations, this facility will proceed under expansion construction approximately four months per year during the expected 250-year life. The process at the facility includes acceptance and final placement of non-hazardous and solid waste and TSCA regulated wastes. During normal facility operation, many sources of fugitive dust are possible. Each of these sources are described in Section 3 of this plan. The types of materials that could emit fugitive dust at ECDC are non-hazardous waste material, imported soil material, imported dried sludge and other remediation wastes and on-site soil materials. ECDC accepts approximately 1,000,000 tons of non-hazardous and soil waste materials per year. The waste that is accepted at ECDC is hauled to one of the operating landfill cells for final placement. The on-site soils which are produced are used for road and landfill construction. The individuals who are responsible for the implementation and maintenance of fugitive dust control measures at the site are as follows:

Mr. Kirk Treece	Mr. Jeff Green
Site Manager	Operations Supervisor
435-888-4418	435-888-4418

3. Description of Fugitive Dust Emission Activities

ECDC will implement this Fugitive Dust Control Plan to monitor and control fugitive dust emissions from the following sources:

3.1 Railcar Rollover Facility

The Railcar Rollover Facility operates to dump the contents of railcars. The waste material is then loaded into waste hauling vehicles with front-end loaders for transport to

the designated landfill cell. The operation includes the use of a railcar rollover mechanism, railcar washout water sprayers, front-end loaders, waste hauling vehicles, and dust suppression water sprayers. The facility is covered and enclosed on three sides with one side open for access. The wastes that could be encountered at this source and could emit fugitive dust include all types of sands and soils, demolition and construction debris, ash material, and exempt household wastes. The emission of dust is possible during the dumping of the imported waste material and loading the waste material into the waste hauling vehicles. The building that houses this activity is 110' X 126'. This fugitive dust source is identified in Attachment B.

3.2 Railcar Bottom Dump Facility

The Railcar Bottom Dump Facility operates to dump the contents of railcars. The waste material is then loaded into waste hauling vehicles with front-end loaders for transport to the designated landfill cell. This facility is rarely used. The operation includes the use of a railcar bottom dump mechanism, front-end loaders, waste hauling vehicles, and dust suppression water sprayers. The wastes that could be encountered at this source and could emit fugitive dust include all types of select (soils) waste. The emission of dust is possible during the dumping of the imported waste material and loading the waste material into the waste hauling vehicles. The activity site is 200 feet by 200 feet and has a maximum emission area of 0.0014 square mile (0.92 acre). This fugitive dust source is identified in Attachment A.

3.3 Paved Haul Roads

The Paved Haul Roads source consist of roadways for waste hauling vehicles, transportation vehicles, personal vehicles, and support vehicles. The operation includes the use of waste hauling vehicles, transportation vehicles, support vehicles, and a road cleaning vehicle. The average speed on the paved haul roads is 30 miles per hour. The wastes that could be encountered at this source and could emit fugitive dust include all types of sands and soils, demolition and construction debris, ash material, and exempt household wastes. Such materials exist on the paved haul roads due to spillage from the waste hauling vehicles. Also, waste exist on the paved haul roads because of waste material sticking to the waste hauling vehicles tires and then falling off on the roads. The emission of fugitive dust is possible during the travel of all vehicles on the paved roads and in high wind events. The total release area of paved haul roads during this activity is 0.0361 square mile (23.08 acres). This fugitive dust source is identified in Attachment A.

3.4 Landfill Cell Haul Roads

The Landfill Cell Haul Roads source consists of roadways in the two landfill cells. The operation includes the use of waste hauling vehicles, a water truck, transportation vehicles, waste placement equipment, construction material hauling vehicles, and support vehicles. The average speed on the landfill cell haul roads is 10 miles per hour. The

wastes that could be encountered at this source and could emit fugitive dust include all types of sands and soils, demolition and construction debris, ash material, and exempt household wastes. Such materials exist on the cell haul roads due to spillage from the waste hauling vehicles and wind blown waste materials from within the landfill cells. The emission of fugitive dust is possible during the travel of all vehicles on the unpaved landfill cell haul roads and in high wind events. The total length of landfill cell haul roads in use during this activity varies from day to day but is approximately three miles with a release area of 0.0121 square mile (7.76 acres). This fugitive dust source is identified in Attachment A.

3.5 Gravel/Dirt Haul Roads

The Gravel/Dirt Haul Roads source consists of roadways on the property for construction material hauling vehicles, waste hauling vehicles, transportation vehicles, and support vehicles. The average speed on the gravel/dirt haul roads is 30 miles per hour. The operation includes the use of construction material hauling vehicles, waste hauling vehicles, a water truck, transportation vehicles, and support vehicles. The source of fugitive dust for this activity include the materials that the unpaved haul roads are constructed of, the spillage of construction and waste materials from the material hauling vehicles, and waste tracked from loading areas by the waste hauling vehicles. The emission of fugitive dust is possible during the travel of all types of vehicles on the gravel/dirt haul roads and in high wind events. The total release area length of gravel/dirt haul roads is approximately 0.0374 square mile (23.94 acres). This fugitive dust source is identified in Attachment A.

3.6 Haul Vehicle and Container Unloading

The Haul Vehicle and Container Unloading activity operates to dump the contents of waste hauling end dump vehicles and various waste containers into the landfill cells. The waste material is end-dumped from the waste hauling vehicles and the waste containers. The operation includes the use of waste and container hauling vehicles, and dust suppression water sprayers. This activity takes place at several different areas in the two landfill cells during normal operation at the facility. The wastes that could be encountered at this source and could emit fugitive dust include all types of sands and soils, demolition and construction debris, ash material, and exempt household wastes. The emission of dust is possible during the dumping of the waste material from the waste hauling vehicles and the various waste containers. The size of each dumping area varies day to day but is approximately .0016 square mile (1 acre). This fugitive dust source is identified in Attachment C.

3.7 Rollover Waste Container Dumping

The Rollover Waste Container Dumping activity operates to dump the contents of large waste containers. The waste material is dumped into the landfill cell by using a large rollover mechanism. The material is then moved by dozing, placed in lifts, and

compacted. The operation includes the use of waste container hauling vehicles, rollover mechanism, track-type tractors, sheepsfoot landfill compactors, and dust suppression water sprayers. This activity takes place within the boundaries of the landfill cells. The wastes that could be encountered at this source and could emit fugitive dust include all types of sands and soils, demolition and construction debris, ash material, and exempt household wastes. The emission of dust is possible during the dumping of the containers, moving, placing, and compacting the waste material. The size of each dumping area varies day to day but is approximately 0.0031 square mile (2 acres). This fugitive dust source is identified in Attachment D.

3.8 Waste Compaction

The Waste Compaction activity operates to compact the waste material within the landfill cells. The waste material is compacted by using a sheepsfoot landfill compactor. The operation includes the use of sheepsfoot landfill compactors and dust suppression water sprayers. This activity takes place within the boundaries of the landfill cell. The wastes that could be encountered at this source and could emit fugitive dust include all types of sands and soils, demolition and construction debris, ash material, and exempt household wastes. The emission of dust is possible during the compacting of the various waste materials. The size of the compaction area varies day to day but is approximately 0.0031 square mile (2 acres). This fugitive dust source is identified in Attachment E.

3.9 Soil Excavation

The Soil Excavation activity operates primarily for excavation and moisture treatment of on-site construction materials. The construction material is excavated and moisture conditioned to allow use as embankment building materials and bedding materials. The operation includes the use of construction material hauling vehicles, track-type tractors, track-type excavators, a motor grader, a water truck, transportation vehicles, and support vehicles. This activity takes place on the ECDC property. The materials that could be encountered at this source and could emit fugitive dust include all types of silts, clays, and sands. The emission of dust is possible during the excavation and loading activities. The size of each excavation area is approximately 0.0313 square mile (20 acres). This fugitive dust source is identified in Attachment A.

3.10 Solidification Facility

The Solidification Facility operates to solidify liquid waste. The liquid waste material is mixed with coal ash. The mixed waste material is then loaded into waste hauling vehicles with front-end loaders for transport to the designated landfill cell. The operation includes the use of a front-end loaders, waste hauling vehicles, and dust suppression water sprayers. The wastes that could be encountered at this source and could emit fugitive dust include coal ash material from local power plants. The emission of dust is possible during the dumping of the imported coal ash material, mixing of liquid waste and coal ash material, and loading the mixed waste material into the waste hauling

vehicles. The activity is 70' X 100' with an area of 0.0003 square mile (0.16 acre). This fugitive dust source is identified in Attachment F.

3.11 Soil Screening and Stockpiling

The Soil Screening and Stockpiling activity operates to provide a soil cover for imported waste materials and cover for the geomembrane liner. The operation includes the use of cover material hauling vehicles, track-type tractors, track-type excavators, dust suppression water sprayers, a screen mechanism, and support vehicles. These activities take place within the landfill cell boundaries. The materials that could be encountered at this source and could emit fugitive dust include all types of silts, clays, and sands. The emission of dust is possible during screening, stockpiling, and loading activities. The size of operation area varies but is approximately 0.0078 square mile (5 acre). This fugitive dust source is identified in Attachment A.

3.12 Landfill Cell #7

Landfill Cell #7 operates as an area for final placement of imported waste materials. The waste material is placed, compacted, and covered within the boundaries of the landfill cell. The operation includes the use of sheepsfoot landfill compactors, waste hauling vehicles, a large rollover mechanism, construction material hauling vehicles, track-type tractors, track-type excavators, a motor grader, a water truck, transportation vehicles, dust suppression water sprayers, and support vehicles. The wastes that could be encountered at this source and could emit fugitive dust include all types of sands and soils, demolition and construction debris, ash material, and exempt household wastes. The size of the landfill area is approximately 0.0750 square mile (48 acres). This fugitive dust source is identified in Attachment A.

3.13 Landfill Cell #10

Landfill Cell #10 operates as an area for final placement of imported waste materials. The waste material is placed, compacted, and covered within the boundaries of the landfill cell. The operation includes the use of sheepsfoot landfill compactors, waste hauling vehicles, a large rollover mechanism, construction material hauling vehicles, track-type tractors, track-type excavators, a motor grader, a water truck, transportation vehicles, dust suppression water sprayers, and support vehicles. The wastes that could be encountered at this source and could emit fugitive dust include all types of sands and soils, demolition and construction debris, ash material, and exempt household wastes. The size of the landfill area is approximately 0.0211 square mile (13.5 acres). This fugitive dust source is identified in Attachment A.

3.14 Landfill Super Cell 1-A

Landfill Super Cell 1-A operates as an area for final placement of imported waste materials. The waste material is placed, compacted, and covered within the boundaries of the landfill cell. The operation includes the use of sheepsfoot landfill compactors,

waste hauling vehicles, a large rollover mechanism, construction material hauling vehicles, track-type tractors, track-type excavators, a motor grader, a water truck, transportation vehicles, dust suppression water sprayers, and support vehicles. The wastes that could be encountered at this source and could emit fugitive dust include all types of sands and soils, demolition and construction debris, ash material, and exempt household wastes. The size of the landfill area is approximately 0.0188 square mile (12 acres). This fugitive dust source is identified in Attachment A.

3.13 TSCA Landfill Cell

The TSCA Landfill Cell operates as an area for final placement of imported waste materials that are approved for disposal in accordance with 761.75 which governs the management and disposal of PCB wastes. The waste material is placed, compacted, and covered within the boundaries of the landfill cell. The operation includes the use of landfill compactors, waste hauling vehicles, a large rollover mechanism, construction material hauling vehicles, track-type tractors, track-type excavators, a motor grader, a water truck, transportation vehicles, dust suppression water sprayers, and support vehicles. The wastes that could be encountered at this source and could emit fugitive dust include all types of sands and soils, demolition and construction debris, dried sludge and other loose materials that have been approved for disposal in the TSCA waste cell. A wheel wash area will be located within the lined area of the cell to decontaminate vehicles that come into contact with waste materials. The size of the landfill area is approximately 0.0211 square mile (13.5 acres). This fugitive dust source is identified in Attachment A.

4. Description of Fugitive Dust Emission Controls

Opacity readings will be taken randomly to ensure compliance with this plan. The results of the readings will be recorded on a log and will be available for review by representatives of the Utah Division of Air Quality. Refer to Attachment G for an example of the log sheet.

Three different levels of control are proposed for each source. Level 1 will be implemented at an estimated opacity reading of 0 - 5%. Level 2 will be implemented at an estimated opacity reading of 5 - 15%. Level 3 will be implemented at an estimated opacity reading of 15%. ECDC will apply the levels of control for each of the following identified on-site fugitive dust sources:

4.1 Railcar Rollover Facility

Level 1 No action will be required due to the moisture condition of the imported waste material or operating weather conditions.

Level 2 Waste material will be partially wetted with the dust suppression water sprayers during dumping operations. Wet and dry waste materials will be mixed while waste hauling vehicles are loaded with front-end loaders.

Level 3 Material will be wetted with the dust suppression water sprayers prior to and during dumping operations. Additional water spray will be applied to the waste material after dumping as determined by the facility operator. Wet and dry materials will be mixed prior to and during loading of the waste material into the waste hauling vehicles.

This source of fugitive dust is not in operation during off hours. Therefore, no action will be required at those times.

4.2 Railcar Bottom Dump Facility

Level 1 No action will be required due to the moisture condition of the imported waste material or operating weather conditions.

Level 2 Waste material will be partially wetted with the dust suppression water sprayers during dumping operations. Wet and dry waste materials will be mixed while waste hauling vehicles are loaded with front-end loaders.

Level 3 Material will be wetted with the dust suppression water sprayers prior to and during dumping operations. Additional water spray will be applied to the waste material after dumping as determined by the facility operator. Wet and dry materials will be mixed prior to and during loading of the waste material into the waste hauling vehicles.

This source of fugitive dust is not in operation during off hours. Therefore, no action will be required at those times.

4.3 Paved Haul Roads

Level 1 No action will be required due to the conditions of the haul roads or operating weather conditions. All paved haul roads are washed and swept routinely as permitted by weather conditions.

Level 2 All haul roads will be sprayed with water or washed and swept as directed

by the Operations Supervisor, Site Manager or his representative. The water application rate will be determined on a daily basis to minimize fugitive dust emissions. The operation of the water truck and sweeper vehicle will be directed by the Operations Supervisor.

Level 3 — The application rate will be increased as determined by the Site manager or his representative to a level that will minimize fugitive dust emissions without compromising road safety. If the opacity readings exceed 20% as determined by the Operations Supervisor, Site Manager, his representative, or a representative of the Utah Department of Air Quality, the traffic pattern may be altered or halted until operating conditions improve.

This source of fugitive dust is not in operation during off hours. Therefore, no action will be required at those times.

4.4 Landfill Cell Haul Roads

Level 1 — No action will be required due to the condition of the haul roads or operating weather conditions. All roads within the landfill cells are routinely sprayed with water for fugitive dust control during normal operations as permitted by weather conditions. The operation of the water truck will be directed by the Operations Supervisor.

Level 2 — All haul roads will be sprayed with water as directed by the Operations Supervisor, Site Manager or his representative. The water application rate will be determined on a daily basis to minimize fugitive dust emissions by the Operations Supervisor.

Level 3 — The application rate of water will be increased as determined by the Operations Supervisor, Site Manager or his representative to a level that will minimize fugitive dust emission without compromising road safety. If the opacity readings exceed 20% as determined by the Operations Supervisor, Site Manager, his representative, or a representative of the Utah Department of Air Quality, the traffic pattern may be altered or halted until operating conditions improve.

This source of fugitive dust is not in operation during off hours. Therefore, no action will be required at those times.

4.5 Construction Haul Roads

Level 1 — No action will be required due to the condition of the haul roads or operating weather conditions. All haul roads are routinely sprayed with water for fugitive dust control during normal operations as permitted by weather conditions. The operation of the water truck will be directed by the Operations Supervisor.

Level 2 — All haul roads will be sprayed with water as directed by the Operations Supervisor, Site Manager or his representative. The water application rate
will be determined on a daily basis to minimize fugitive dust emissions by the Operations Supervisor.

Level 3 — The application rate of water will be increased as determined by the Operations Supervisor, Site Manager or his representative to a level that will minimize fugitive dust emission without compromising road safety. If the opacity readings exceed 20% as determined by the Operations Supervisor, Site Manager, his representative, or a representative of the Utah Department of Air Quality, the traffic pattern may be altered or halted until operating conditions improve.

This source of fugitive dust is not in operation during off hours. Therefore, no action will be required at those times.

4.6 Haul Vehicle and Container Unloading

Level 1 — No action will be required due to the condition of the imported waste material or operating weather conditions.

Level 2 — Imported waste materials will be treated with dust suppression water sprayers during unloading operations to minimize dust emissions. The water application rate will be determined by the Operations Supervisor.

Level 3 — The application rate of the water will be increased as determined by the Operations Supervisor, Site Manager or his representative to a level that will minimize fugitive dust emissions. If the opacity readings exceed 20% as determined by the Operations Supervisor, Site Manager, his representative, or a representative of the Utah Department of Air Quality, the unloading activity may be altered or halted until operating conditions improve.

This source of fugitive dust is not in operation during off hours. Therefore, no action will be required at those times.

4.7 Rollover Waste Container Dumping

Level 1 No action will be required due to the condition of the imported waste material or operating weather conditions.

Level 2 Imported waste materials will be treated with dust suppression water sprayers during dumping operations to minimize dust emissions. The water application rate will be determined by the Operations Supervisor.

Level 3 The application rate of the water will be increased as determined by the Operations Supervisor, Site Manager or his representative to a level that will minimize fugitive dust emissions. If the opacity readings exceed 20% as determined by the Operations Supervisor, Site Manager, his representative, or a representative of the Utah Department of Air Quality, the dumping activity may be altered or halted until operating conditions improve.

This source of fugitive dust is not in operation during off hours. Therefore, no action will be required at those times.

4.8 Waste Compaction

Level 1 No action will be required due to the condition of the imported waste material or operating weather conditions.

Level 2 Imported waste materials will be treated with dust suppression water sprayers during compaction operations to minimize dust emissions. The water application rate will be determined by the Operations Supervisor. Also, waste placement and compaction methods may be altered by the operators to minimize fugitive dust emissions.

Level 3 The application rate of the water will be increased as determined by the Operations Supervisor, Site Manager or his representative to a level that will minimize fugitive dust emissions. Waste placement and compaction methods may be altered by the operators as directed by the Operations Supervisor, Site Manager or his representative to minimize fugitive dust emissions without compromising operator safety. If the opacity readings exceed 20% as determined by the Operations Supervisor, Site Manager, his representative, or a representative of the Utah Department of Air Quality, the waste compaction activity may be altered or halted until operating conditions improve.

This source of fugitive dust is not in operation during off hours. Therefore, no action will be required at those times.

4.9 Soil Excavation

Level 1 No action will be required due to the condition of the excavated material or operating weather conditions.

Level 2 Excavated materials will be treated with dust suppression water sprayers during excavating and loading operations to minimize dust emissions. The water application rate will be determined by the Operations Supervisor.

Level 3 The application rate of the water will be increased as determined by the Operations Supervisor, Site Manager or his representative to a level that will minimize fugitive dust emissions. If the opacity readings exceed 20% as determined by the Operations Supervisor, Site Manager, his representative, or a representative of the Utah Department of Air Quality, the excavating and loading activity may be altered or halted until operating conditions improve.

This source of fugitive dust is not in operation during off hours. Therefore, no action will be required at those times.

4.10 Solidification Facility

Level 1 No action will be required due to the moisture condition of the imported waste material or operating weather conditions.

Level 2 Ash material will be partially wetted with the dust suppression water sprayers during dumping and mixing operations. Wet and dry waste materials will be mixed while waste hauling vehicles are loaded with front-end loaders. The water application rate will be determined by the Operations Supervisor.

Level 3 Ash material will be wetted with the dust suppression water sprayers prior to and during dumping and mixing operations. The application rate of the water will be determined by the Operations Supervisor, Site Manager or his representative to a level that will minimize fugitive dust emissions. Additional water spray will be applied to the waste material after dumping and mixing as determined by the facility operator, Operations Supervisor, Site Manager or his representative. Wet and dry materials will be mixed

prior to and during loading of the waste material into the waste hauling vehicles. If the opacity readings exceed 20% as determined by the Operations Supervisor, Site Manager, his representative, or a representative of the Utah Department of Air Quality, the solidification activity may be altered or halted until operating conditions improve.

This source of fugitive dust is not in operation during off hours. The area and facility is cleaned after it has be used. Therefore, no action will be required at those times.

4.11 Soil Screening and Stockpiling

Level 1 — No action will be required due to the condition of the screened material or operating weather conditions.

Level 2 — Screened materials will be treated with dust suppression water sprayers during screening and stockpiling operations to minimize dust emissions. The water application rate will be determined by the Operations Supervisor.

Level 3 — The application rate of the water will be increased as determined by the Operations Supervisor, Site Manager or his representative to a level that will minimize fugitive dust emissions. If the opacity readings exceed 20% as determined by the Operations Supervisor, Site Manager, his representative, or a representative of the Utah Department of Air Quality, the screening and stockpiling activity may be altered or halted until operating conditions improve.

This source of fugitive dust is not in operation during off hours. Therefore, no action will be required at those times.

4.12 Landfill Cell #7

Level 1 — No action will be required due to the condition of the landfill materials, cover materials, or operating weather conditions.

Level 2 — Landfill materials will be treated with dust suppression water sprayers to minimize dust emissions. The water application rate will be determined by the Operations Supervisor.

Level 3 The application rate of the water will be increased as determined by the Operations Supervisor, Site Manager or his representative to a level that will minimize fugitive dust emissions. The application of a hydromulch may be implemented under the direction of the Operations Supervisor, Site Manager or his representative. The hydromulch will be a cellulose fiber product manufactured using fiber stock.

This source of fugitive dust will be monitored during off hours and levels of control will be implemented as required.

4.13 Landfill Cell #10

Level 1 No action will be required due to the condition of the landfill materials, cover materials, or operating weather conditions.

Level 2 Landfill materials will be treated with dust suppression water sprayers to minimize dust emissions. The water application rate will be determined by the Operations Supervisor.

Level 3 The application rate of the water will be increased as determined by the Operations Supervisor, Site Manager or his representative to a level that will minimize fugitive dust emissions. The application of a hydromulch may be implemented under the direction of the Operations Supervisor, Site Manager or his representative. The hydromulch will be a cellulose fiber product manufactured using fiber stock.

This source of fugitive dust will be monitored during off hours and levels of control will be implemented as required.

4.14 Landfill Super Cell 1-A

Level 1 No action will be required due to the condition of the landfill materials, cover materials, or operating weather conditions.

Level 2 Landfill materials will be treated with dust suppression water sprayers to minimize dust emissions. The water application rate will be determined by the Operations Supervisor.

Level 3 The application rate of the water will be increased as determined by the Operations Supervisor, Site Manager or his representative to a level that will minimize fugitive dust emissions. The application of a hydromulch may be implemented under the direction of the Operations Supervisor,

Site Manager or his representative. The hydromulch will be a cellulose fiber product manufactured using fiber stock.

This source of fugitive dust will be monitored during off hours and levels of control will be implemented as required.

4.13 TSCA Landfill Cell

Level 1 — No action will be required due to the condition of the landfill materials, cover materials, or operating weather conditions.

Level 2 — Landfill materials will be treated with dust suppression water sprayers to minimize dust emissions. The water application rate will be determined by the Operations Supervisor.

Level 3 — The application rate of the water will be increased as determined by the Operations Supervisor, Site Manager or his representative to a level that will minimize fugitive dust emissions. The application of a hydromulch may be implemented under the direction of the Operations Supervisor, Site Manager or his representative. The hydromulch will be a cellulose fiber product manufactured using fiber stock.

SCS ENGINEERS

CHEMICAL WASTE LANDFILL PERMIT APPLICATION GROUNDWATER IMPACT ASSESSMENT

ECDC ENVIRONMENTAL LANDFILL EAST CARBON, UTAH

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September 2012
SCS File No. 16210048.00

Chemical Waste Landfill Permit
Groundwater Impact Assessment
ECDC Landfill
East Carbon, Utah

Table of Contents

1 INTRODUCTION

The ECDC Environmental, L.C. Landfill (Landfill) is located within the boundaries of East Carbon City, Carbon County, Utah. Figure 1 is a general location map. The site is owned and operated by Republic Waste Services, Ltd. (Republic). The site encompasses approximately 2,400 acres, excluding the Union Pacific Railroad (UPRR) right-of-way. The ECDC landfill is an existing municipal and non-hazardous solid waste disposal landfill. The ECDC landfill consists of office buildings, support buildings, and active landfill cells. The initial cell was fully approved and operational in September 1992 and currently operates under permit number 9422 issued by the Utah Division of Solid and Hazardous Waste in 1996.

Republic is seeking a chemical waste landfill permit pursuant to 40 CFR §761.75 authorizing the disposal of PCB waste with concentrations greater than or equal to 50 ppm PCBs, in the proposed chemical waste landfill cell at ECDC landfill.

This Groundwater Impact Assessment (GWIA) is being submitted in response to a request from EPA Region 8, to support ECDC's request for a variance from 761.75(b)(3), that requires a fifty-foot separation between the bottom of the liner and the historic high water table.

All site information presented herein is obtained from "*Chemical Waste Landfill, Permit Application Initial Report, ECDC Environmental Landfill, East Carbon Utah*", prepared by SCS Engineers, May, 2011.

2 LANDFILL DESCRIPTION AND PLAN

The ECDC landfill, in East Carbon, Utah seeks approval from United State Environmental Protection Agency (USEPA) to receive, process, and dispose of PCBs in accordance with 40 CFR §761.75. In order to properly manage PCBs, the ECDC landfill will utilize existing rail unloading facilities in conjunction with a new landfill cell designed and constructed in accordance with Toxic Substances Control Act (TSCA) standards. The ECDC landfill will construct the new landfill cell dedicated to the disposal of PCBs separated from the non-PCB landfill cells by containment berms and a multi-layered liner system.

3 SITE GEOLOGY AND HYDROGEOLOGY SUMMARY

The ECDC landfill is located on an alluvial sandy gravel deposit, underlain by the Mancos Shale Formation. The alluvial fan varies in thickness between 20 and 60 feet. The Mancos Shale is approximately 1,700 feet in thickness.

Shallow groundwater at the site occurs within the alluvial fan material. The groundwater level is approximately 30 to 40 feet below ground level; however, this unsaturated zone above the water table was conservatively disregarded for modeling purposes. The highest priority in the modeling demonstration was to use a conservative, environmentally protective approach that would provide confidence that the result was very reliable due to the many conservative selections made for model inputs. Consistent with this approach, the unsaturated section above the water table and below the base of the landfill was conservatively disregarded. If this unsaturated portion were included in the model, PCB travel times and dilution would be significantly higher, i.e. the result would be even more environmentally protective if the unsaturated zone were considered. The saturated thickness in the alluvial material is zero to approximately ten feet.

A detailed discussion of site geology is included in Section 4.

3.1 LANDFILL LINER SYSTEM

The proposed liner system for the TSCA Landfill Cell at ECDC landfill exceeds regulatory requirements under §761.75(b)(2). The TSCA Landfill Cell will have a bottom liner system consisting of:

- Three feet of compacted clay with permeability less than 1×10^{-7} cm/s
- 60-mil HDPE Geomembrane
- Geocomposite
- 60-mil HDPE Geomembrane
- Geocomposite
- Two foot protective soil cover

The TSCA Landfill Cell will have a sidewall liner system consisting of:

- Geosynthetic Clay Liner
- 60-mil HDPE Geomembrane
- Geocomposite
- 60-mil HDPE Geomembrane
- Two foot protective soil cover

The HDPE liner materials are chemically compatible with PCB waste and meet all requirements of §761.75(b)(2). All disposal operations for PCB waste will be conducted within the TSCA Landfill Cell lined as described herein. This cell is reserved for disposal of TSCA waste and will

be separated from municipal solid waste with earthen containment berms and the constructed multi-layer liner system.

The liner system used in the groundwater transport model (described in subsequent sections) is different from the liner described above. The proposed TSCA cell will be constructed with a triple liner and a leak detection system. Computer simulations of leachate leakage through such an extremely environmentally protective liner system will show no leachate escapes from the bottom of the liner. Zero leachate escape does not allow modeling the groundwater system in order to assess advective transport attenuation effects of leachate entrained in groundwater. Therefore, the liner system had to be modeled differently than the actual proposed design, such that it is not a completely impermeable barrier. This approach allows a simulated leachate leak to be used as input to the groundwater transport model. The liner system simulated in the model consists of a 60 mil flexible membrane liner (FML) and two feet of clay.

3.2 HYDROGEOLOGIC CONDITIONS

The ECDC landfill is located in the alluvial fan of Whitmore Canyon of the Book Cliffs. Shallow groundwater is present on top of the Mancos Shale and therefore is monitored for groundwater quality in accordance with applicable Utah DEQ rules. Groundwater generally flows east-northeast to west-southwest. The ECDC landfill is not located in a floodplain, shore land, or recharge zone of any major or minor aquifer. ECDC has been monitoring the groundwater at the site for approximately 20 years. Based on historical data, there is no evidence of groundwater contamination within the shallow groundwater zone located below the ECDC landfill.

761.75(b)(3) states that "The bottom of the landfill liner system or natural in-place soil barrier shall be at least fifty feet from the historical high water table." Republic requests a waiver from this specific requirement due to the limited nature of the groundwater present at this site and the features of the TSCA cell liner design that provide significant groundwater protection and separation from waste. Although the shallow groundwater present at this site is within the 50 foot limit, it is not a significant groundwater resource or defined as a major or minor aquifer. This zone will be monitored for potential contaminants, including PCBs.

The base of the landfill is within the alluvium above the Mancos Shale. The base grade of the proposed TSCA Landfill Cell will be approximately 10 feet above the historic high water table. As previously described, the bottom liner system proposed for the ECDC landfill cells consists of a compacted clay liner overlain by HDPE geomembranes with primary and secondary leachate collection layers. Based on the proposed bottom liner elevations and historic groundwater data, hydrostatic uplift will not be a factor at this site.

3.3 FLOOD PROTECTION (§761.75(b)(4))

The ECDC landfill is not located in a floodplain or subject to flooding from the 100-year storm. A perimeter berm is constructed around the TSCA Landfill Cell to prevent stormwater run-on.

All drainage features at the ECDC landfill are designed to prevent stormwater run-on as well as control of runoff from the active area of the ECDC landfill.

3.4 TOPOGRAPHY (§761.75(b)(5))

Elevations at the site range from approximately 6,030 feet mean sea level (msl) at the northeast boundary to 5,740 feet msl at the southwest corner of the site. Topography is moderately sloping from east to west, at approximately two percent. The elevations in the vicinity of the TSCA Landfill Cell are approximately 5,930-5,990 feet msl.

3.5 MONITORING SYSTEMS (§761.75(b)(6))

The ECDC landfill has a perimeter groundwater monitoring network consisting of three up-gradient and three down-gradient wells that monitor the uppermost groundwater zone present at the site. Figure 2 provides locations of existing and proposed monitoring wells at the ECDC landfill as well as groundwater contours. Background sampling will be performed for the groundwater and results will be kept onsite. Monitoring well water samples will be analyzed for pH, PCBs, specific conductance, volatile organic compounds, and semivolatile organic compounds.

Surface water sampling will be performed semi-annually on runoff that accumulates in the proposed stormwater pond located west of the TSCA cell. The proposed groundwater monitoring system will provide appropriate monitoring of the shallow groundwater that is present below the landfill, perched on the Mancos Shale.

Annual surface water sampling for PCBs will be conducted (assuming site access) at Big Springs (located in the center of Section 18, T15S, R13E) and East Spring (located NE/4, SE/4, SW/4 of Section 17, T15S, R134E).

Testing for PCBs will continue after closure of the ECDC landfill through the thirty-year post-closure maintenance period.

3.6 LEACHATE COLLECTION (§761.75(b)(7))

The leachate collection system (LCS) at the ECDC landfill is designed to efficiently remove leachate from the bottom liner. The LCS consists of two geocomposite drainage layers directly above each 60-mil HDPE liner that convey leachate to central collector pipes bedded in gravel trenches. These trenches lead to sumps where leachate accumulates and is removed regularly to maintain leachate levels below their maximum allowable level over the liner. Leachate levels in the sumps are maintained by pumping out excess leachate though the pump riser pipes. Leachate will be disposed of in the TSCA Landfill Cell. It will either be solidified at a dedicated location inside the cell so that it would satisfy a paint filter test, or applied directly in the landfill using a dedicated sprayer within the TSCA Landfill Cell as a means of dust control during dry conditions.

Leachate collected from cells that are used for PCB waste disposal will be tested on a semi-

annual basis in conjunction with groundwater sampling and analysis for the parameters listed in §761.75(b)(6)(iii). This parameter list includes PCBs, as well as other relevant constituents.

4 CONCEPTUAL MODELS

GEOLOGY, TOPOGRAPHY, SOILS, AND HYDROLOGY

The site is situated on the westward-sloping alluvial fan of Whitmore Canyon of the Book Cliffs, at elevations between 5740 and 6030 feet. Underlying bedrock is the Mancos Shale of upper Cretaceous age which has been warped with a gentle dip to the north-northeast of 3 to 5 degrees from horizontal. The San Rafael Swell uplift is located immediately to the south and its northern end is plunging beneath the subject area. Subsequent erosion of this uplift has stripped thousands of feet of sedimentary rock strata off from its top and sides, with the eroded materials being transported away by the Colorado River system via the Green River drainage.

The Site area is a dissected, arcuate-shaped valley between the Book Cliffs escarpment to the north, northeast and east, and the San Rafael Swell to the south. Later erosion of this valley has formed another steep escarpment which bounds the subject area on the immediate south and southwest. This has created the present-day, gently, westward-sloping, elevated plateau or bench upon which the proposed solid waste disposal site rests.

During late (Quaternary) geologic time as the Book Cliffs continues to erode, high water flows have periodically discharged from Whitmore Canyon, depositing a thick blanket of sand, silt, gravel, cobbles, boulders and some large sandstone blocks (up to 20 feet) on the eroded surface of the Mancos Shale. Subsequent erosion has removed part of this alluvial fan deposit

This soil consists mainly of silt and sand with some clay, cobbles, boulders and widely-scattered large blocks of sandstone within the upper five feet. Weakly cemented lime-caliche occurs in some areas.

Ancient sediment-laden stream flows, sufficient to transport such large masses of rock from the mountains on the east, have deposited a continuous blanket of permeable alluvium, extending from the bottom of Whitmore Canyon throughout the subject area. The alluvial fan deposits beneath the subject area generally have low to moderate permeability, but with some areas of higher permeabilities with relatively clean gravels.

Drill hole logs indicate the thickness of the alluvial fan materials blanketing the Site is 0 to 50 feet. Below the top five feet of mainly gravelly silt and sand, the alluvial fan materials consist of silty and sandy gravels, cobbles and boulders, lensing into gravelly silt and sand with some clay. Variable lime caliche weak cementation exists throughout the section. Permeability is low to high, reflecting wide variations in grain size in the alluvial deposits.

Underlying the capping, alluvial fan materials is the Mancos Shale of gray, clayey siltstone and silty shale which weathers at its contact to a tight clay, forming a permeability barrier to downward moving ground water. This serves as a floor to the perched groundwater aquifer within the overlying alluvium. Drill samples recovered frown the Mancos Shale below its upper, weathered, clay contact surface were dry, indicating the effectiveness of the clay seal at its top. The Mancos Shale is about 1,700 feet thick at the site.

The Landfill bottom lies approximately 10 feet above a shallow, unconfined aquifer perched on the Mancos Shale. The unsaturated zone was conservatively disregarded for modeling purposes. The saturated thickness of the aquifer is generally thin (0 to 10 feet).

No Holocene (within the last 10,000 years) faulting or lineations were found in or adjacent (within 3000 feet) to the subject area, as indicated by site observations and review of relevant geologic maps.

5 CONVERSION ASSUMPTIONS

Several assumptions were made in the conceptual model. These are:

1. All geologic units are homogeneous and isotropic with respect to all lithologic and hydrologic parameters. Most contaminant transport models assume these conditions within geologic materials.

2. All geologic units are of uniform thickness. These thicknesses are based on the average thicknesses found at the site. Therefore, the average values used here provide a reasonable estimate of the transport progresses at the site. Site-specific data were considered to develop models of alluvial fan thickness and aquifer thickness.

3. Geologic and hydrologic parameters used are mean values for site specific data, or mean values taken from literature research. The mean values analyzed provide a reasonable characterization of the site conditions.

4. The aquifer is of infinite lateral extent. This is generally a required assumption in mathematical models.

5. The liner system was modeled using parameters intended to induce leakage. The TSCA cell has a triple liner and a double leachate collection system. Any reasonable model of leachate leakage in an arid area through such an extremely environmentally protective liner system will show no leachate escapes from the bottom of the liner. While achieving "zero leakage" is certainly desirable, it does not allow modeling the groundwater system in order to assess advective transport attenuation effects of leachate entrained in groundwater. Therefore, the liner system had to be modeled differently than the actual proposed design, such that it is not a completely impermeable barrier. This approach allows a simulated leachate leak to be used as input to the groundwater transport model. The liner system simulated in the model consists of a 60 mil flexible membrane liner (FML) and two feet of clay.

6. The unsaturated zone between the base of the landfill liner and the underlying water table was conservatively disregarded for modeling purposes. The attenuating affects of the unsaturated zone were not incorporated into this model. This is an environmentally protective, conservative approach that will overestimate leachate impacts to groundwater.

6 TRANSPORT PROCESSES

Using the conservative design and geologic simplifications discussed previously, the transport process may be analyzed with respect to migration of the leachate constituents. Migration of contaminants is controlled by diffusion and advection. When the leachate constituents move into the aquifer, advection will be the dominant transport process, driven by groundwater flow.

7 MATHEMATICAL MODEL

An advection/diffusion one-dimensional computer model that adequately represents contaminant transport is POLLUTE® (version 7) by Rowe and Booker (1985, *1-D Pollutant Migration in Soils of Finite Depth"*, Journal of Geotechnical Engineering, ASCE, Vol. 111, GT4, pp.13-42).

This model provides for:

- Advective as well as diffusive transport,
- One-dimensional transport in either the horizontal or vertical direction,
- Multiple time and depth solutions to the transport equation,
- Retardation (sorption-desorption) of non-conservative constituents,
- A transport solution with no space or time discretization errors (Rowe and Booker 1994).

The assumptions inherent in POLLUTE® are:

1) Contaminant transport is governed by the one-dimensional advection/dispersion equation within a porous medium.

2) Sorption-desorption of a non-conservative species of contaminant is linearly controlled, such that:

$$S=Kc$$

where:

S = solute sorped per unit weight of soil

K = distribution/partitioning coefficient

c = concentration of contaminant in solution.

3) Contaminant migration in a given direction is one-dimensional and, for intact materials, is governed by:

$$n\frac{\partial c}{\partial t} = nD\frac{\partial^2 c}{\partial z^2} - nv\frac{\partial c}{\partial z} \cdot \rho K_d \frac{\partial c}{\partial t} \cdot \lambda c$$

where:

c = concentration of contaminant at depth z at time t,

D = coefficient of hydrodynamic dispersion at depth z,

v = groundwater (seepage) velocity at depth z,

n = porosity of the soil at depth z,

ρ = dry density of the soil at depth z,

K_d = distribution/partitioning (sorption) coefficient at depth z,

v_a = nv = Darcy velocity,

λ = decay constant of the contaminant species (i.e., the reciprocal of the species mean half life multiplied by the natural log of 2).

4) Multiple layers with different properties may be specified. It is assumed that there is continuity of concentration and flux at the boundary between two layers.

5) It is assumed that groundwater velocities do not vary horizontally with position within any layer of the deposit.

POLLUTE® permits a variety of top and bottom conditions. For the purposes of this study, the following assumptions have been made:

a) "Top" boundary set to equal a constant source boundary. Presuming a constant source over the entire life and post-closure of the facility is a highly conservative assumption. This implies that full leachate constituent concentrations are present from day one, and no elutriation or removal of the contaminants is occurring.

b) "Bottom" boundary is an infinite layer.

Using the conservative parameters listed in the conceptual models coupled with the conservative assumptions that POLLUTE® offers, the model produces a conservative representation of leakage from the facility.

8 MODEL INPUT

Input parameters have generally been determined from site specific data where such data exists. Parameters that are not site-specific are taken from literature values for comparable materials. The following section describes in more detail how each parameter was selected.

A. Source Concentration

A surrogate leachate constituent concentration of 1 milligram per liter (mg/l) is assumed in the model. By assuming the leachate acts as a conservative chemical with no adsorption, no biodegradation, and no decay, the simulation accounts for all constituents identified by the EPA as requiring landfill design protection criteria because the constituent concentration at the Point of Compliance (POC) is independent of chemical-specific properties. The model result is then expressed in terms of the Dilution Attenuation Factor (DAF), which is defined as the ratio of the input concentration to the concentration at the POC. POLLUTE® can be used to find the DAF by using an input concentration of 1.0 mg/L. The DAF is the reciprocal of the resulting concentration at the POC. Because the cell sump is at the lowest elevation and the most likely point of leachate escape, the flow path modeled for this demonstration is the downgradient flow path from the cell sump to the closest downgradient monitoring well (see Figure 2), which is 420 feet.

PCBs are a group of 209 individual compounds that were produced commercially in the 1970s for a diverse variety of applications including electrical equipment insulation fluid, lubricants, etc. PCBs are relatively insoluble in water and have low mobility in soil due to high sorption. If released into soil, PCBs experience tight adsorption. They generally do not leach significantly in aqueous soil systems (FAO Document Repository, Appendix 4, Fact Sheets on Chemical Compounds, available at internet address http://www.fao.org/docrep/003/x2570e/X2570E08.htm, accessed 09/04/2012).

The various PCB compounds have varying toxicity. The most toxic of the PCB compounds (and therefore most critical for this modeling study) have a Federally-promulgated Drinking Water Maximum Contaminant Limit (MCL) of 0.5 ug/L. This concentration is herein adopted as the Aquifer Protection Standard (APS) to be applied at the POC. Site-specific leachate data indicate PCBs have not been detected at this site. Therefore, other PCB leachate concentration data must be used for modeling purposes. Leachate data from a PCB-accepting landfill has been used (Landfill Clinton Landfill, DeWitt County, Illinois), as listed in "*Application for Permit to Develop a Non-Hazardous Landfill, Clinton Landfill No. 3, DeWitt County, Illinois", Groundwater Impact Assessment, Appendix N, Shaw, June 2006.* The results of leachate analysis at the Illinois site indicates the PCB with the highest concentration is aroclor 1016, at 200.0 ug/L. All other PCB compounds measured had consistently far lower concentrations of 0.5 ug/L. As a conservative safety factor, all PCB leachate concentrations were assumed to be the highest value (200 ug/L).

Arochlor 1016 has properties similar to the other PCB compounds. If released to soil, Aroclor 1016 is expected to have "no mobility" (US National Library of Medicine,

TOXNET Toxicology Data Network, PCB-1016 internet web page http://toxmap.nlm.nih.gov/toxmap/main/chemPage.jsp?chem=PCB-1016, accessed 09/05/2012).

The DAF required to be in compliance with the APS at the POC is 400 (unitless). This DAF is determined by dividing the input concentration by the required APS, i.e., 200/0.5. This DAF of 400 is an index that indicates the amount of dilution that must occur in order to meet regulatory standards. If POLLUTE® modeling results in a DAF higher than 400 for a generic chemical that is conservatively modeled with no absorption, no biodegradation, and no decay, it can be concluded that the proposed TSCA cell meets requirements no significant impact on the groundwater as measured at the POC. The actual DAF for a specific chemical would be higher than the result calculated by POLLUTE® under these circumstances, since real-world physical processes of absorption, biodegradation, and decay would act to reduce chemical concentrations at the POC to less than those predicted by POLLUTE®.

B. Layer Thickness

The modeled stratigraphy and layer thickness are based upon the average site geologic conditions as detailed previously.

C. Distribution Coefficient

Modeling was conducted without and with a distribution coefficient (i.e., without and with retardation incorporated in the model). For the initial model run, adsorption is not simulated and the absorption coefficient is set equal to zero. This is highly conservative given most leachate constituents will be subject to some measure of attenuation within the liner and the underlying units.

Additional modeling was conducted, incorporating retardation. For a model time period of 1,000 years of continuous release at maximum contamination incorporating the effects of retardation, the PCB release does not reach the Point of Compliance. Calculations are shown below; model results are included in Appendix A.

PCBs are relatively insoluble in water and have low mobility in soil due to high sorption. If released into soil, PCBs experience tight adsorption. They generally do not leach significantly in aqueous soil systems (FAO Document Repository, Appendix 4, Fact Sheets on Chemical Compounds, available at internet address http://www.fao.org/docrep/003/x2570e/X2570E08.htm, accessed 09/04/2012). Leachate data from a PCB-accepting landfill has been used (Clinton Landfill, DeWitt County, Illinois), as listed in "Application for Permit to Develop a Non-Hazardous Landfill, Clinton Landfill No. 3, DeWitt County, Illinois", Groundwater Impact Assessment, Appendix N, Shaw, June 2006. The results of leachate analysis at the Illinois site indicate the PCB with the highest concentration is aroclor 1016, at 200.0 ug/L. All other PCB compounds measured had consistently far lower concentrations of 0.5 ug/L. As a conservative safety factor, all PCB leachate concentrations were assumed to be the highest value (200 ug/L).

Arochlor 1016 has properties similar to the other PCB compounds. If released to soil, Aroclor 1016 is expected to have "no mobility" (US National Library of Medicine, TOXNET Toxicology Data Network, PCB-1016 internet web page http://toxmap.nlm.nih.gov/toxmap/main/chemPage.jsp?chem=PCB-1016, accessed 09/05/2012).

Distribution Coefficient Calculation

The distribution coefficient (aka sorption coefficient) is a measure of sorption of a constituent onto a solid surface such as a clay particle in the soil. Sorption retards chemical transport in the subsurface.

The distribution coefficient, Kd, is expressed in units of (volume/mass). Kd can be found by

Kd = Koc * foc (Sharp-Hansen, S.S., et al., 1990, A Subtitle D Landfill Application Manual for the Multimedia Exposure Assessment Model, p. 79

Koc is the chemical-specific soil organic carbon water partition coefficient (units: volume/mass). Foc is the fraction of organic carbon present in the soil [unitless] (Indiana Department of Environmental Management, Office of Land Quality, Determining the Fraction of Organic Carbon", 2007.

The partition coefficient K_{OC} is defined as the ratio of PCB concentration in a state of sorption (i.e. adhered to soil particles) and the solution phase (i.e. dissolved in the soil water). Sorption is generally in proportion to organic matter content. Because of the large range of K_{oc} values, use the logarithm of K_{oc}. A compound's mobility in soil is classified according to Table C.

The Koc value for Arochlor-1016 is 52,100-171,000 (US National Library of Medicine, TOXNET Toxicology Data Network, PCB-1016 internet web page http://toxmap.nlm.nih.gov/toxmap/main/chemPage.jsp?chem=PCB-1016, accessed 09/05/2012). Because lower values of Koc are less environmentally protective (i.e., allow higher PCB mobility), the lowest range value of 52,100 L/kg was used for Koc; this is the most conservative, environmentally protective approach to Koc selection.
Foc is generally assumed to be 0.2% [equivalent to 0.002] as the concentration of organic carbon in subsurface soils (EPA Soil Screening Guidance, Indiana Department of Environmental Management, Office of Land Quality, Determining the Fraction of Organic Carbon", 2007).

The equation to calculate the distribution coefficient is (see above)

Kd = Koc * foc

Koc = 52,100 L/kg (see above)

Foc = 0.002 (dimensionless, see above)

Substituting in the inputs:

Kd = 52,100 L/kg * 0.002

Kd = 104 L/kg

Convert L/kg to L/mg for program use:

To convert L/kg to L/mg, multiply by 1000,000:

Kd in L/mg= 104 * 1,000,000

Kd = 1.04×10^{8} L/mg

Utilizing this value of Kd and running the model for 1,000 years indicated no release to the Point of Compliance. See Appendix A Model Output Part Two incorporating retardation, page two, bottom value in the right column. This predicted concentration of 4.5×10^{-50} mg/L at the Point of Compliance at 1,000 years is essentially "zero" for all practical purposes.

D. Density

Density is considered in modeling attenuation only when retardation/absorption is simulated as a part of the modeling process. Because adsorption is not simulated (only advection is simulated), density values have no bearing on the predicted concentrations.

E. Effective Porosity

Fetter (*Applied Groundwater,* 1980) defines effective porosity as "the amount of interconnected pore space through which fluids can pass, expressed as a percent of bulk volume." A total porosity value of 0.3 was used, which is considered a representative value for those aquifer materials above the Mancos Shale.

F. Hydraulic Conductivity

Site-specific data were used to determine the aquifer hydraulic conductivity of 6.6×10^{-4} cm/sec (see *Groundwater Sampling and Analysis Plan"*, contained within *"Chemical Waste Landfill, Permit Application Initial Report, ECDC Environmental Landfill, East Carbon Utah"*, prepared by SCS Engineers, May, 2011).

G. Gradient

Site-specific data were used to determine the aquifer gradient of 0.014 ft/ft. See Figure 2. This gradient was calculated by dividing a five-foot vertical change in groundwater elevation by a 350-foot horizontal run.

H. Darcy Flux and Darcy Velocity

A vertical leachate Darcy Velocity (or Darcy Flux) through the composite liner was derived by the POLLUTE® program, using highly conservative input parameters that were selected in order to induce leakage for further advective transport modeling. The POLLUTE®-calculated Darcy Flux was 1.7 x 10^{-4} ft/yr through the modeled composite liner. The horizontal Darcy Velocity in the aquifer was based on the gradient and the hydraulic conductivity.

I. Diffusion Coefficient

The diffusion of chemical constituents at the site is based on data included in Freeze and Cherry, 1979, *Groundwater*, which explains that diffusion coefficients of a non-reactive species for unconsolidated materials can be somewhat higher than 1 x 10^{-10} square meters per second (m^2/s) but are less than the coefficients for chemical species in water (2 x 10^{-9} m^2/s). Therefore, for conservatism, a value of 1 x 10^{-9} m^2/s or 0.0315 square meters per year was chosen for the liner materials.

Dispersion Coefficient

Hydrodynamic dispersion (D_H) occurs as a result of mechanical mixing and molecular diffusion. The coefficient of hydrodynamic dispersion can be expressed in terms of two components:

$$D_H = a\ \bar{v}\ + D*$$

where:

$a = dispersivity\ (a_L\ for\ longitudinal\ and\ a_T\ for\ transverse)$

$\bar{v} = average\ linear\ velocity$

$D* = coefficient\ of\ molecular\ diffusion$

Freeze and Cherry (*Groundwater,* 1979) state that at low velocities, diffusion is the important contributor to the dispersion and therefore the coefficient of hydrodynamic dispersion equals the diffusion coefficient (D_H=D*). The clay and liner materials exhibit very low velocities and therefore were assigned dispersion coefficients equal to the diffusion coefficient used for the clay materials (0.0315 m^2/yr).

Within the aquifer, advection is the dominant transport process and is controlled by the hydrodynamic coefficient D_H. The dispersion coefficient is estimated as:

Dispersion Coefficient

$$D_H = a_L \bar{v} + D^*$$

Note that a_L (dispersivity) is calculated using the flow length modeled (420 feet), as follows:

$$a_L = 0.83[\log_{10}(420)]^{2.414} = 1.88 \text{ feet or } 0.57 \text{ meters}$$

The above value for dispersivity is based on a model by Xu and Eckstein (1995).

Within the aquifer, advection was assumed as the transport process and advection is controlled by the hydrodynamic coefficient D_H. Only the horizontal dispersion coefficient was calculated since the model for this unit is a one-dimensional model. The horizontal dispersion coefficient is estimated as:

Horizontal Dispersion Coefficient

$$D_H = a_L \bar{v} + D^*$$

Where $\bar{v}$ is the average linear velocity and D* is the molecular diffusion. The site-specific linear velocity of 34 feet/year was converted to 10.4 meters/year and used as follows:

$$D_H = 0.57 \text{ m} \times \left(10.4 \frac{m}{yr}\right) + 0.0315 \frac{m^2}{A} = 6.0 \frac{m^2}{A}$$

J. Lateral Distances

The lateral distance modeled was 420 feet, the distance from the TSCA cell sump invert to the closest downgradient groundwater monitoring well location (see Figure 2).

K. Integration

POLLUTE® uses a LaPlace transform to find the solution. The default parameters recommended in the *Pollute User's Manual* were used.

9 CONTAMINANT TRANSPORT RESULTS

Without Retardation

The time period for modeling was the active life of the TSCA cell (estimated to be 25 years), plus 30 years post-closure monitoring. The maximum period for modeling is therefore 55 years. Intermediate times between 1 and 55 years were also modeled, but 55 years is the most conservative model time input because the constant source input concentration is steadily contributing simulated leachate for the maximum time period of 55 years. The maximum surrogate concentration at the downgradient edge of the zone of attenuation predicted by the model is 1.508×10^{-8} mg/L, which is 1.508×10^{-5}ug/L. This model result can be seen in Appendix A, Model Output Part One, last page, far right column at the bottom. Because the input concentration was assumed to be 1.0 mg/L or 1,000 ug/L, this output concentration is multiplied by any assumed concentration of any constituent to determine the predicted concentration at the POC.

The previously described applicable APS for PCBs is 0.5 ug/L. The predicted PCB concentration at the POC is now calculated using: (assumed input concentration) * output model surrogate concentration at the POC). Assuming an input concentration of 200 ug/L (for arochlor 1016) multiplied by 1.508×10^{-5}, the predicted PCB concentration at the POC is 0.003 ug/L. The predicted concentration at the POC is approximately two orders of magnitude below the AQS.

With Retardation

Model results incorporating retardation are detailed on previous pages 12 through 14. In summary, running the model for 1,000 years while incorporating the effects of retardation indicated no release to the Point of Compliance.

10 CONCLUSIONS

The ECDC landfill near East Carbon, Utah is seeking permit approval from the USEPA Region 8 Administrator to accept certain types of PCB waste. This TSCA Groundwater Impact Assessment is submitted in accordance with a request by EPA Region 8.

The ECDC landfill is not located in a floodplain, shore land, or recharge zone of any major or minor aquifer. Groundwater occurrence at the site is limited to a shallow lens perched on the Mancos Shale. This shallow, perched groundwater is not a designated aquifer, is zero to ten feet in thickness.

The proposed liner system for the TSCA Cell exceeds regulatory requirements under §761.75(b)(2). Generally speaking, the liner system consists of a triple liner, and a double leachate collection system. Further, the cell will be monitored with dedicated groundwater monitoring wells that will be regularly tested for PCBs, along with other constituents. ECDC landfill has been monitoring the groundwater at the site for approximately 20 years. Based on historical data, there is no evidence of groundwater contamination within the shallow groundwater zone located directly below the ECDC landfill.

Extremely conservative assumptions have been used to model contaminate transport, using the one-dimensional computer model POLLUTE®. Leakage through the liner was impossible to simulate using the existing triple liner system and arid conditions; i.e., the leakage under these expected conditions is zero. Therefore, in order to simulate groundwater transport of a simulated landfill leak, a different, much less protective liner system was assumed that allowed some leachate into the groundwater system, for modeling of the groundwater flow process.

PCBs generally have low mobility when released in the environment. For modeling input purposes, the PCB concentration in leachate was assumed to be 200 ug/L, as documented in a PCB landfill located in Illinois. The purpose of the modeling was to determine if protective standards are exceeded at the Point of Compliance (POC). The POC is assumed to be a proposed TSCA Cell monitoring well, although this is well inside the site's 2,400-acre site boundary.

The assumed protective standard adopted as a regulatory limit is the federally-promulgated Maximum Drinking Water Contaminant Limit for PCBs, which is 0.5 ug/L. This is an extremely conservative regulatory limit, in view of the fact that Site does not lie over an aquifer used for water supply.

Several physical and chemical processes act to attenuate, decompose, or otherwise remove potentially leaked PCB compounds from groundwater. However, the modeling very conservatively disregarded all attenuating processes except simple dilution caused by advective groundwater flow. Accordingly, the model determines a Dilution Attenuation Factor that is applied to beginning, assumed PCB concentrations in a simulated landfill leak. The summary issue, therefore, is how the input PCB concentration compares to the concentration downgradient at a well, after the process of dilution reduces the PCB concentration.

Modeling without retardation incorporated indicated the PCB concentration at the Point of Compliance is well below the MCL of 0.5 ug/L during the active and post-closure portion of the

site life. Therefore, the Groundwater Impact Assessment results indicate the TSCA cell will not impact the area groundwater above applicable standards at the Point of Compliance throughout the operating life and 30 years past landfill closure. It is also reasonable to conclude the facility will not experience even a negligible release, in view of the numerous layers of extremely conservative assumptions applied to this analysis. Finally, incorporating the effect of retardation in the model indicates PCB will essentially never reach the Point of Compliance.

FIGURES

DUSCHENE COUNTY

CARBON COUNTY

GRAND COUNTY

Helper

Kenilworth

Spring Glen

Carbonville

PRICE

Wellington

Elmo

East Carbon

Sunnyside

PROJECT LOCATION

6

191

123

124

122

10

LEGEND

- COUNTY LINE
- PAVED HIGHWAY
- PAVED ROAD
- UNPAVED ROAD
- US ROUTE
- UTAH STATE ROUTE

REV	DATE	DESCRIPTION	BY

DRAWING TITLE: GENERAL LOCATION MAP

PROJECT TITLE: ECDC ENVIRONMENTAL LANDFILL GROUNDWATER IMPACT ASSESSMENT EAST CARBON , UTAH

CLIENT: REPUBLIC SERVICES

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS
1901 CENTRAL DRIVE, SUITE 950, BEDFORD, TX 76021
PH (817) 571-2288 FAX NO. (817) 571-2188

PROJ. NO. 25201048.00

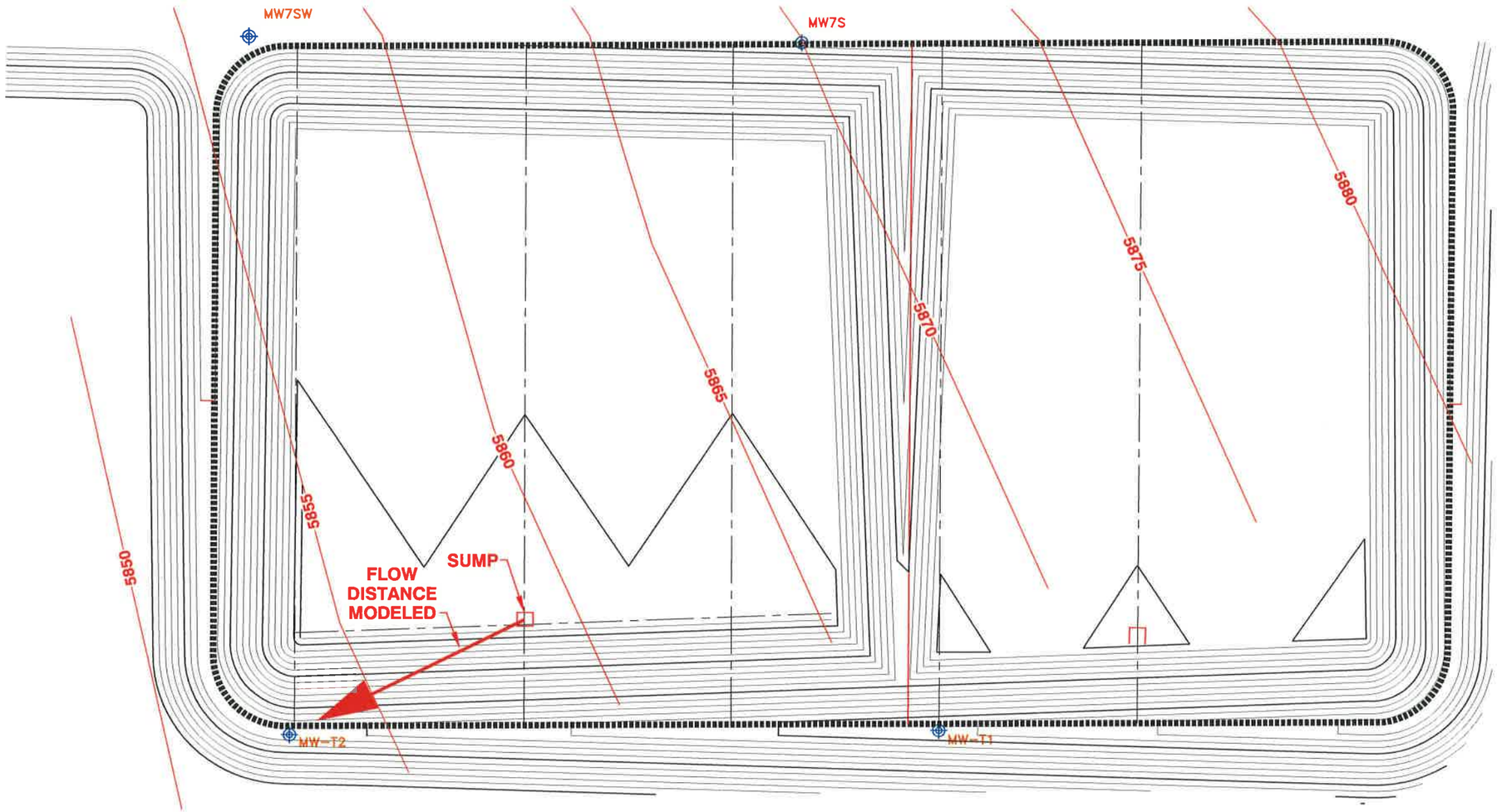
DSN. BY: JLJ | DWN. BY: JLJ | CHK. BY: JL | QA/A MGR BY: | APP. BY: JL

CADD FILE: GENERAL LOCATION MAP

DATE: 09/2012

SCALE: AS SHOWN

DRAWING NO. 1



0 100 200
SCALE IN FEET

N

LEGEND

- LIMIT OF WASTE
- MW7S — MONITORING WELL
- 5880 — GROUNDWATER ELEVATION CONTOUR

REV	DATE	DESCRIPTION	BY

DRAWING TITLE: **TSCA CELL MAP**

PROJECT TITLE: **ECDC ENVIRONMENTAL LANDFILL GROUNDWATER IMPACT ASSESSMENT EAST CARBON, UTAH**

CLIENT: **REPUBLIC SERVICES**

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PROJ. NO. 01004848.00
DES. BY: JLJ
DWN. BY: BJJ
CHK. BY: JL
QA/A ROW BY:
APP. BY: JL

CADD FILE: MONITORING WELL MAP

DATE: 09/2012

SCALE: AS SHOWN

DRAWING NO. **2**

APPENDIX A—MODEL OUTPUT

POLLUTEv7

Version 7.11

Republic ECDC TSCA Cell Landfill Groundwater Impact Model Part One

Layer Properties

Layer	Dimension	Number of Sublayers	Coefficient of Hydrodynamic Dispersion	Matrix Porosity	Distributon Coefficient	Dry Density
Geomembrane	60 mil	1	0.0315 m2/a	1	0 m3/kg	950 kg/m3
Clay Liner	2 ft	10	0.0315 m2/a	0.3	0 mL/g	1.9 g/cm3
Aquitard	420 ft	10	6 m2/a	0.3	0 mL/g	1.9 g/cm3

Boundary Conditions

Finite Mass Top Boundary
Initial Concentration = 1 mg/L
Volume of Leachate Collected = 0.00996217432 m/a
Width of Waste = 1080 ft
Waste Density = 600 kg/m3
Proportion of Mass = 0.1
Reference Height of Leachate = 0 ft

Infinite Thickness Bottom Boundary

Laplace Transform Parameters

TAU = 7 **N** = 80 **SIG** = 0 **RNU** = 8

Part One, Page One

Part One, Page Two

Calculated Concentrations at Selected Times and Distances

Time yr	Distance ft	Concentration mg/L
1	0.000E+00 1.000E+02 1.980E+02 3.007E+02 4.220E+02	1.000E+00 5.022E-18 2.077E-32 1.091E-46 0.000E+00
2	0.000E+00 1.000E+02 1.980E+02 3.007E+02 4.220E+02	1.000E+00 1.909E-14 3.928E-22 2.781E-33 3.738E-45
3	0.000E+00 1.000E+02 1.980E+02 3.007E+02 4.220E+02	1.000E+00 2.400E-11 2.014E-18 8.939E-27 9.799E-37
4	0.000E+00 1.000E+02 1.980E+02 3.007E+02 4.220E+02	1.000E+00 4.417E-09 1.488E-16 7.565E-23 1.968E-32
5	0.000E+00 1.000E+02 1.980E+02 3.007E+02 4.220E+02	1.000E+00 1.040E-07 2.009E-15 1.751E-20 8.848E-29
10	0.000E+00 1.000E+02 1.980E+02 3.007E+02 4.220E+02	1.000E+00 6.412E-05 6.680E-11 1.038E-15 6.371E-20
20	0.000E+00 1.000E+02 1.980E+02 3.007E+02 4.220E+02	1.000E+00 1.864E-03 1.472E-06 1.882E-11 2.086E-15
30	0.000E+00 1.000E+02 1.980E+02 3.007E+02 4.220E+02	1.000E+00 6.343E-03 4.524E-05 2.166E-08 1.638E-13

40	0.000E+00 1.000E+02 1.980E+02 3.007E+02 4.220E+02	1.000E+00 1.239E-02 2.649E-04 7.771E-07 6.505E-11
55	0.000E+00 1.000E+02 1.980E+02 3.007E+02 4.220E+02	1.000E+00 2.272E-02 1.197E-03 1.539E-05 1.508E-08

NOTICE

Although this program has been tested and experience would indicate that it is accurate within the limits given by the assumptions of the theory used, we make no warranty as to workability of this software or any other licensed material. No warranties either expressed or implied (including warranties of fitness) shall apply. No responsibility is assumed for any errors, mistakes or misrepresentations that may occur from the use of this computer program. The user accepts full responsibility for assessing the validity and applicability of the results obtained with this program for any specific case.

POLLUTEv7

Version 7.11

Republic ECDC TSCA Cell Landfill Groundwater Impact Model
Part Two--Incorporating Retardation

Layer Properties

Layer	Width	Number of Sublayers	Coefficient of Hydrodynamic Dispersion	Matrix Porosity	Distributon Coefficient	Dry Density
Geomembrane Clay Liner Aquitard	60 mil 2 ft 420 ft	1 10 10	0.0315 m2/a 0.0315 m2/a 6 m2/a	1 0.3 0.3	0 m3/kg 0 mL/g 104000000 L/mg	950 kg/m3 1.9 g/cm3 1.9 g/cm3

Boundary Conditions

Finite Mass Top Boundary
Initial Concentration = 1 mg/L
Volume of Leachate Collected = 0.00996217432 m/a
Width of Waste = 1080 ft
Waste Density = 600 kg/m3
Proportion of Mass = 0.1
Reference Height of Leachate = 0 ft

Infinite Thickness Bottom Boundary

Part Two, Page Two

Calculated Concentrations at Selected Times and Distances

Time yr	Distances ft	Concentration mg/L
100	0.000E+00 1.000E+02 1.980E+02 3.007E+02 4.220E+02	1.000E+00 1.646E-37 0.000E+00 0.000E+00 0.000E+00
200	0.000E+00 1.000E+02 1.980E+02 3.007E+02 4.220E+02	1.000E+00 1.149E-26 0.000E+00 0.000E+00 0.000E+00
300	0.000E+00 1.000E+02 1.980E+02 3.007E+02 4.220E+02	1.000E+00 8.617E-22 1.199E-42 0.000E+00 0.000E+00
400	0.000E+00 1.000E+02 1.980E+02 3.007E+02 4.220E+02	9.999E-01 2.607E-19 3.561E-37 0.000E+00 0.000E+00
500	0.000E+00 1.000E+02 1.980E+02 3.007E+02 4.220E+02	9.999E-01 8.540E-18 7.820E-34 1.689E-50 0.000E+00
600	0.000E+00 1.000E+02 1.980E+02 3.007E+02 4.220E+02	9.999E-01 9.115E-17 5.020E-31 6.205E-46 0.000E+00
700	0.000E+00 1.000E+02 1.980E+02 3.007E+02 4.220E+02	9.999E-01 5.096E-16 2.148E-28 2.391E-42 0.000E+00
800	0.000E+00 1.000E+02 1.980E+02 3.007E+02	9.999E-01 1.911E-15 2.439E-26 1.241E-39

	4.220E+02	0.000E+00
900	0.000E+00 1.000E+02 1.980E+02 3.007E+02 4.220E+02	9.999E-01 6.008E-15 9.947E-25 1.633E-37 0.000E+00
1000	0.000E+00 1.000E+02 1.980E+02 3.007E+02 4.220E+02	9.999E-01 2.435E-14 1.960E-23 8.223E-36 4.495E-50

NOTICE

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