DIE CAST AREA EXCAVATION WORK PLAN FOR THE CARTER CARBURETOR SUPERFUND SITE

Prepared for:

ACF Industries LLC
101 Clark Street
St. Charles, Missouri 63301

Prepared by:

HRP *Associates, Inc.*
111 West Port Drive
Saint Louis, MO 63146

Project No. ACF0001.RA

September 29, 2014

IMPORTANT NOTICE

This report was prepared exclusively for ACF Industries, LLC. by HRP Associates, Inc. The quality of information, conclusions and estimates contained herein is consistent with the level of effort involved in HRP's services and based on: i) information available at the time of preparation, ii) data supplied by outside sources and iii) the assumptions, conditions and qualifications set forth in this report. This report is intended to be used by only, subject to the terms and conditions of its contract with HRP. Any other use of, or reliance on, this report by any third party is at that party's sole risk.

Die Cast Area Excavation Work Plan
for the
Carter Carburetor Superfund Site
St. Louis, Missouri

REVIEW AND APPROVALS:

Prepared by:

9/29/2014

Eric J. Boswell, LEP
Project Manager

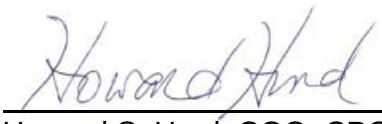
Date

Reviewed by:

9/29/2014

Thomas R. Battles, PE
Director of Civil Engineering

Date

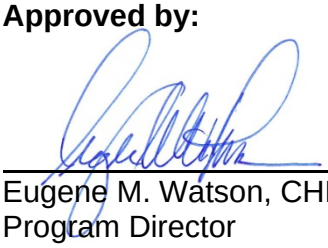


9/29/2014

Howard S. Hurd, COO, CPG, LEP
QA Reviewer

Date

Approved by:



9/29/2014

Eugene M. Watson, CHMM
Program Director

Date

Jeff Weatherford, Project Manager
U.S. EPA, Region 7

Date

DIE CAST AREA EXCAVATION WORK PLAN

TABLE OF CONTENTS

TABLE OF CONTENTS

List of Figures

List of Appendices

ABBREVIATIONS AND ACRONYMS

ACF	ACF Industries, LLC
bgs	below ground surface
BMP	Best Management Practices
CBI	Carter Building, Inc.
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
cm	centimeter
COC	contaminant of concern
CRQL	Contract Required Quantitation Limits
CY	cubic yards
DCAEWP	Die Cast Area Excavation Work Plan
DCEA	Die Cast Excavation Area
DWP	demolition work plan
EE/CA	Engineering Evaluation and Cost Analysis
EPA	US Environmental Protection Agency
ft	foot (or feet)
ft^2	square feet
HHBGC	Boys and Girls Club of Greater St. Louis, Herbert Hoover Chapter
HRP	HRP Associates, Inc.
LRA	Land Reutilization Action of the City of St. Louis
HASP	Health and Safety Plan
MDNR	Missouri Department of Natural Resources
mg/kg	milligram per kilogram
mg/L	milligram per liter
MSD	Metropolitan St. Louis Sewer District
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
PE	Professional Engineer
POTW	publicly owned treatment works
PPE	personal protective equipment
RAWP	Removal Action Work Plan
RC	reinforced concrete
RCRA	Resource Conservation and Recovery Act
Site	Die Cast Area
SOW	Scope of Work
SRE	Streamlined Risk Assessment
TCE	trichloroethylene
TCLP	toxicity characteristic leachate procedure
TSCA	Toxic Substances Control Act
TSDF	treatment storage and disposal facility
USC	United States Code
WCT	Water Collection Tank

DIE CAST AREA EXCAVATION WORK PLAN

1.0 INTRODUCTION

The purpose of the Die Cast Area Excavation Work Plan (DCAEWP) is to document the scope of work (SOW) to be executed to meet the guidance provided in the Administrative Settlement Agreement (ASA) and Administrative Order on Consent (AOC) CERCLA 07-2013-0008. Specifically, the DCAEWP was prepared in accordance with Section III Tasks paragraph A.3 Addendum C – Die Cast Area Plan Addendum.

This plan describes in detail the activities required for the successful removal of PCB impacted media, and backfilling of the Die Cast Area (Site);

- Pre-excavation activities,
- Excavation area procedures and management,
- Post-excavation confirmatory soil sampling,
- Slope stabilization and protection of the excavation area
- Dust control and monitoring,
- Transport and off-site disposal of remediation waste,
- Dewatering activities, and
- Reuse of building demolition materials as backfill into the DCEA, and

The Site Layout, Figure 1-1 depicts the expected layout of the Carter Carburetor Site during removal activities. The layout is based on existing conditions and anticipated activities. The more detailed layout at the Die Cast Area including the location of shoring, fencing, and extent of the excavation is shown on Figures EP-1 and EP-2 of this report. A proposed schedule, including the work involved with this DCAEWP is included as Appendix A.

1.1 Background

The Die Cast Area encompasses approximately 35,000 square feet. The area consists of building foundation remnants from the preexisting Die Cast Buildings located midblock along North Grand Avenue, and oriented length-wise in an east-west direction. The Die Cast Area excavation activity extends from the east exterior of the CBI building footprint to North Grand Avenue (see figure SP-2 for Die Cast Excavation Area limits). The Die Cast Area contains the former Die Cast Building concrete foundation slab, a one to two vertical feet of load bearing wall sections in some places (knee walls and foundations), and a crushed limestone cap, formerly 36-inches thick, now ranging in thickness from 4 inches to 24 inches over the entire foundation area.

As described in Section 2.0 of a separate report entitled, “Site Characterization of the Engineering Evaluation and Cost Analysis (EE/CA) for the Carter Carburetor Site. September 22, 2010; the Die Cast Area is impacted with polychlorinated biphenyls (PCBs). PCBs were detected in the soil below the foundation. The site characterization data generated for the

Streamlined Risk Assessment (SRE) and EE/CA has been combined with supplemental Field Investigation sampling results to delineate the extents where PCBs occur in the Die Cast Area.

These remediation goals were established during the development of the Engineering Evaluation and Cost Analysis (EECA) and will make the Site safe for reasonable reuse scenarios as described in the EECA and prevent migration of contaminants from the Site. The goals are based on limitations of future site use and activities that will be recorded on deed restrictions.

As described in the *CBI Building Demolition Work Plan*, a portion of the backfill materials for the excavation will be derived from on-site demolition debris that will be impacted with PCBs. An engineered cap will be constructed over the excavation area where these materials are used for backfill. The cap will be constructed in a manner generally consistent with TSCA requirements. Construction of the cap is presented under a separate work plan entitled *Die Cast Area Cap Construction Work Plan.*

1.2 Approach to Management of PCB Impacted Excavation Materials

Approval of the overall site cleanup and disposal of PCB remediation waste is requested under Title 40 CFR Part 761.61(c) of *the PCB Regulations (Mega-Rule)*. This regulatory information is governed by Code of Federal Regulation (CFR) Title 40, Protection of Environment; Chapter I, Environmental Protection Agency (EPA); Subchapter R, Toxic Substance Control Act (TSCA); Part 761, Polychlorinated Biphenyl (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions; Subpart D, Storage and Disposal; Section 761.61, PCB Remediation Waste; dated July 1, 2011.

The selected remedy for the Die Cast Area is physical removal of PCB impacted soils through excavation and off-site disposal. PCB impacted soils containing concentrations greater than the established removal action goals (below) will be removed from the Die Cast Area. The estimated volume of impacted soil requiring removal is 28,000 cubic yards.

- *Less than 1 mg/kg PCB within 3 feet of surface grade, and*
- *Less than or equal to 25 mg/kg PCB below 3 feet from surface grade.*

The Die Cast Area Excavation Work Plan contains special handling and disposal considerations for the management of PCB impacted soil and debris as well as worker, equipment and materials that come into contact with PCB impacted materials within the site. The following items were considered to facilitate the excavation on a timely basis and minimize the numerous project related risks:

- fugitive dust generation,
- worker exposure,

- management of PCB impacted storm water runoff,
- generation of PCB decontamination fluids, and
- on-site management of PCB impacted soils, and
- on-site management of PCB impacted demolition debris.

All in-situ material excavated from the Die Cast Area that are impacted with PCBs at concentrations greater than 1 mg/kg will be direct loaded for disposition off-site at a TSCA approved landfill. The approach is consistent with the previous characterization methods and risk evaluation results for the Site. This conservative approach is protective of human health and the environment.

Segregation of TSCA regulate remediation waste, which are those soils containing PCBs at concentrations greater than 50 mg/kg, non-TSCA remediation waste, containing less than 50 mg/kg, was considered. The approach to manage and dispose all PCB-impacted soil (containing greater than 1 mg/kg PCB) from the Die Cast Area as TSCA remediation waste was determined based on the limited volume of PCB impacted soil containing concentrations at less 50 mg/kg, site logistical constraints, and the level of effort necessary to assure the segregation of the low volume of material under the *Mega-Rule* requirements.

2.0 SEQUENCE OF OPERATIONS

This section provides an overall strategy for the excavation of the Die Cast Area and a framework for the remainder of this DCAEWP. Work will be sequenced and executed in a safe and efficient manner and according to all applicable regulations, including but not limited to, 29 CFR Part 1926.

2.1 Pre-Excavation Activities

There are several activities that must be performed prior to the start of excavation of the Die Cast Area. The order in which the activities are listed is not necessarily indicative of the order in which they are completed. Some of the activities have already been completed, as indicated below. The activities are:

- Identify and obtain approval of the facility receiving the impacted materials excavated from the die cast excavation area
- Provide a site specific health and safety plan, which will include employee HAZWOPER and OHSA training documentation.
- Contractor shall provide a detailed plan of the sequence and operations for excavation, disposal and backfill of the die cast area;
- Contact Missouri One Call System to conduct a utility clearance for the work area 3 days prior to the start of work.
- Secure a subsurface utility clearance service to mark-out underground public utilities within right of ways and/or private utilities on the Site;
- Obtain excavation permit (as required);
- Install shoring and protection features along North Grand Avenue (described in *Die Cast Area Excavation Shoring Work Plan)*
- Mobilize Personnel and Equipment;
- Utility Abandonment;
- Construct a decontamination area.

2.2 Site Mobilization

HRP will perform a pre-excavation inspection and retain video/photographic documentation of the existing site conditions, including the surrounding sidewalks and roadways, prior to commencement of Site activities. Additionally, any equipment mobilized to the Site will have a safety inspection performed and documented by the HRP Site Health and Safety Coordinator and a representative from the excavation contractor to ensure the equipment is functioning correctly and all safety devices are properly installed and functioning as designed.

Major equipment anticipated to be mobilized for the excavation of the Die Cast Area includes, but is not limited to:

- Tracked Excavator(s) with Hydraulic Hammer;
- Tracked Excavator(s) with Bucket and Thumb;
- Mini Excavator;
- Wheel Loader(s);
- Vibratory roller(s)/compactors(s)
- Dump Truck(s);
- Truck Scale;
- Decontamination Area;
- Dewatering Equipment,
- Water Storage Tank(s);
- Water Truck or similar;
- Wastewater Treatment System;
- Miscellaneous hand tools to include cutting torches;
- Storage Containers; and
- Mobile Office.

2.3 Description of the Excavation Process

The detailed description of the excavation process is provided in Section 5.0 of this DCAEWP. Specific details that are discussed include:

- Sequence of concrete slab and foundation demolition and disposal;
- Sequence of excavation;
- Soil stabilization considerations;
- Excavation technique;
- Excavated material management and offsite disposal; and
- Road closures.

2.4 Control Measures

The following is a list of control measures to be discussed in this DCAEWP:

- Entry and Exit Procedures;
- Dust Control for Material Movement Activities;
- Dewatering Operations for DCEA

3.0 QUALITY ASSURANCE SAMPLING & ANALYSIS PLAN

Field samples will be collected and analyzed for several different purposes during the excavation activities. The HRP technical staff will collect and document these samples under the supervision of the Site Manager. Quality assurance and quality control (QA/QC) measures will be implemented in an effort to maintain quality and evaluate the usability of the analytical results. Rationales and types of samples anticipated for collection include the following:

A. Confirmatory soil sampling will be performed following removal of PCB impacted soils from the Die Cast Area previously characterized. The sampling will be necessary to confirm the removal of PCB remediation waste to the site-specific cleanup levels and document the residual concentrations of contaminants in soil at the excavation limits.

B. Concrete chip samples will be collected from the foundation remnants to confirm consistency with off-site disposal requirements.

C. Wipe sampling will be performed on non-porous metal surfaces from excavation equipment in contact with PCB remediation waste following decontamination.

D. Wastewater samples will be collected to determine PCB impacts, treatment requirements and/or compliance with permit effluent limits. The types of wastewater samples will include: used decontamination wastewater, excavation dewatering wastewater, and dust suppression runoff, pre-treatment raw water, wastewater at monitoring points within the treatment train, and wastewater discharge. The date quality objective may vary for each of these wastewaters with the most stringent quality objectives applied to treated wastewaters and runoff.

3.1 Sampling Collection and Handling Procedures

Respective of type and purpose, samples will be grab or composites. Samples will be collected in accordance with procedures established in the EE/CA where possible. The four types of samples and method for collection are as follows:

A. *Confirmatory Soil Samples:*

Soil samples collected from excavation area will be grab and/or composite type. These samples will be collected from the excavation sidewalls and bottom (where soil is present). The soil samples will be collected into laboratory supplied containers, labeled, and placed within an ice-filled cooler. The grab samples or composite sample aliquots will be collected from a depth/thickness interval of less than 0.5 feet from the sidewall or bottom surface being sampled.

Composite Sampling Method

Composite sampling will be used to evaluate soil concentrations for all constituents of concern other than volatile organic compounds. Composite sample aliquots will be collected at rate of 1 per 25 square feet. No more than five aliquots will be used per composite sample to minimize sample dilution and ensure that the mathematical potential maximum concentration of each aliquot can be calculated using anticipated laboratory detection limits and will be sufficient to evaluate the lowest applicable cleanup criteria. For instance, a five aliquot composite sample for demolition debris, anticipated to contain less than 1 ppm of total PCB, must have a detection limit and result of less than or equal 0.2 ppm (0.2 mg/kg) to verify the material concentration category.

Each single composite sample will be equally distributed from the aliquots and consist of a minimum of 100 grams. Each 100 gram aliquot will be halved. One half of the aliquots will be containerized separately and stored properly for potential future analysis as a discrete grab sample. The remaining aliquot halves will be homogenized in single-use disposal bags or in a stainless steel container and then placed in laboratory supplied sample containers. All durable sampling equipment will be stainless steel and decontaminated using the double wash and double rinse procedure between uses.

B. *Concrete Chip Samples:*

Concrete chip samples from the foundations remnants will be collected following the procedure put forth in the Region I, EPA-New England Draft "Standard Operating Procedure for Sampling Concrete in the Field", 12/1/97. Small deviations from the procedure are necessary to lessen the chance of cross contamination of samples. The procedure for collecting samples is as follows:

1) Prepare surface - Surface preparation of the concrete will consist of scraping away residues and then wiping the sample area with a de-ionized water wetted paper towel.

2) After the surface is prepared, an inverted cone sufficient to contain fugitive dust will be placed over the sample location.

3) A rotary hammer will then be used to pulverize the concrete, brick and masonry to the appropriate depth. The rotary hammer will be fitted with a custom made depth gauge with the drilling depth verified before each sample location. The sampling intervals will be less than 1-inch thick.

4) Upon reaching the required depth, a stainless steel spatula will be utilized to collect the accumulated pulverized concrete, which will then be placed into laboratory supplied containers, labeled, and placed into an ice-filled cooler. If a duplicate sample is collected from the sample location, and the first hole did not provide sufficient sample volume for both samples, a second hole may be drilled adjacent to the first hole. The accumulated concrete from both holes will be placed into a single sample container, homogenized, and then divided into equal aliquots, labeled, and placed into the sample cooler.

5) Between each sample location, the dust suppression cones, the stainless steel spatulas, and the drill bits will be decontaminated. The equipment will be brushed to remove all visual residues, and the washed using a double wash and rinse of liquinox/water wash and DI water rinses.

C. *Wipe Samples of Non-Porous Equipment Surfaces:*

Wipe samples from equipment will be collected following final use and decontamination prior to demobilizing from the site to verify surface are clean. These wipe samples will be collected in a similar manner as described above.

D. *Wastewater Samples:*

Wastewater characterization samples will be collected directly from their storage containers, holding tanks, or sampling ports at a rate necessary to represent the waste stream and comply with local permitting from the Publically Owned Treatment Works (POTW). During wastewater treatment, one sample per week will be collected for monitoring of field parameters. The sample will be submitted for laboratory analysis of constituents of concern at rate of 1 per 100,000 gallons or as required for local permitting, whichever is less.

All field samples will be collected into appropriate laboratory supplied sample containers. Each sample container will then be appropriately labeled and preserved on ice or in a dedicated sample refrigerator pending submittal to the contract laboratory under chain of custody protocol.

The following information, as appropriate, will be documented in a field logbook and on chain of custody forms whenever samples are collected:

- Description of the sample that is being submitted to the laboratory including the physical characteristics of the sample (e.g., matrix, color, odor, and texture).
- Date and time
- Purpose of sample (waste characterization, stockpile, etc.)

- Approximate depth of the sample
- Sample designation and location

Each sampling location representative of residual media (i.e. soil) will be located by field measurements relative to pre-surveyed control points, existing grades, fixed site features, or benchmarks. Locations of media representing a remediation waste or other non-fixed point (i.e. demolition debris stockpiles, wastewater, building appurtenances) will be described in field records. Stockpiles will be identified and tracked separately until final disposal. Sampling nomenclature will indicate: sample date, origin (floor, stockpile, equipment, etc.), anticipated concentration group, and samples type (aqueous, composite, grab, or wipe).

3.2 Sample Laboratory Analysis

The samples will be provided to Pace Analytical Services, Inc. (Pace) for analysis for PCBs and other constituents of concern, as necessary. If readily available, the laboratory will be notified of the anticipated PCB concentration. All samples will be analyzed for PCBs by EPA Method 8082. Prior to analysis, samples of soil, concrete, brick and masonry, or other solid states will be subject to the similar extraction and analytical methodology used during site characterization and described in the EE/CA. The extraction method was used during the generation of data that was the basis to develop the site-specific risk-based cleanup criteria. Based on the historical analytical results, the extraction method has shown to be reliable and predictive.

3.3 Data Quality Objectives

The laboratory data generated during the cleanup activities will be used to determine remediation waste management requirements and compliance with relevant EPA and site-specific risk-based cleanup criteria. The quality of the laboratory analytical data and reporting will be in accordance with HRP Quality Assurance standards. The detection limits of the laboratory analysis will be requested to meet the appropriate regulatory criteria (Contract Required Quantitation Limits (CRQLs). Acceptable elevated detection limits may be allowed due to laboratory dilution necessary for quantifying the presence of a compound, but may not be allowed if PCBs are ultimately not identified in a sample.

3.4 Laboratory Data QA/QC

The laboratory utilized for project analyses will be required to perform all of the internal quality control procedures that are specified in the specific methods (e.g., SW846, CLP, etc.). The laboratory data will be evaluated in accordance with HRP's SOP for Laboratory Quality

Assurance and Quality Control Data Quality Assessment and Data Usability Evaluation. The review of the data to evaluate its usability will include checking of such items as:

- Holding times,
- Field and laboratory blanks;
- Field and laboratory duplicates;
- Laboratory QA/QC performance samples
- Surrogate recoveries, if applicable;
- Calibration checks;
- Spike recoveries, if applicable;
- Temperature.
- Laboratory qualifiers and case narratives
- EPA methods utilized
- Sample clean-ups

Items such as instrument tuning, initial calibrations, calculations, and raw data will be checked by the laboratory.

3.5 QA/QC Samples

Several different types of QA/QC samples will be analyzed to evaluate the validity of laboratory analytical results, which include, but are not limited to, the following:

- *Laboratory Blanks* - The laboratory will analyze method blanks prepared and analyzed with each set of samples. These are a check of the accuracy of the system and indicate if there are positive biases and include batch blanks (absent of compounds) and laboratory control samples (contain known compound concentrations).
- *Matrix Spike/Matrix Spike Duplicate* – A matrix spike and matrix spike duplicate are actual samples spiked with a known amount of one or more target compounds. The matrix spike/matrix spike duplicate recovery is calculated from the results of the analysis. This information is useful for estimating the effect of the sample matrix on the analytical procedure. At least one matrix spike/matrix spike duplicate sample will be analyzed per media. More than one matrix spike/matrix spike duplicate sample may be analyzed per media if significant changes to the media are identified.
- *Duplicate Samples* – Duplicate sampling will be performed at a rate of one per twenty samples submitted for laboratory analysis per analytical parameter, and at least one per media. Duplicate samples will be given a blind sample identifier. The purpose of duplicate samples is to evaluate reproducibility of laboratory analyses.

- *Equipment Rinsate* - Rinsate water will be collected from durable sampling equipment following decontamination. A minimum of one equipment rinsate sample will be collected each day that durable sampling equipment is used. The equipment rinsate samples will be analyzed for the same parameters as those samples collected with that equipment on that day. Similarly to duplicate samples, the equipment rinsate samples will be given a blind fictitious sample identifier. The analytical results from equipment rinsate samples will be evaluated to determine the effectiveness of the decontamination procedures for eliminating the potential of cross contamination of any constituent due to the reuse of durable sampling equipment.

3.6 Documentation and Reporting

The site supervisor will oversee the implementation of the Die Cast Excavation Work Plan; prepare, maintain and document a complete record of excavation and demolition activities performed at the Site and ensure that the project is completed in accordance with the specifications of general work plans, the HASP, and generally accepted industry/engineering standards.

3.7 Field Records

The site supervisor will maintain a field log on a daily basis of all activities associated with excavation and demolition progress. The following specific documentation and reporting requirements will be the responsibility of the site manager and site supervisor.

- Ensuring compliance with provisions of the site specific HASP and completion of its logs;
- Ensuring site safety and OSHA compliance;
- Ensuring proper management of PCB wastes, including excavating, relocating, stockpiling, loading for transport, etc.;
- Maintaining an accurate accounting of materials and equipment entering and leaving the site, including PCB impacted soil, debris, and other materials, contractor forces, and placement of each type of backfill material on the site;
- Documentation of excavation activities including all drawings, photographic and video logs;
- Sampling documentation, including copies of chain of custodies, a log of cooler temperatures, measurements of sample locations in reference to fixed site features;
- Documenting and reporting of any spills, leaks, or other discharges occurring at the site during implementation of excavation and/or demolition activities;

- Documenting and reporting of any disruption/damage to utilities.

4.0 PRE-EXCAVATION ACTIVITIES

Prior to the physical demolition of the existing foundation remains and excavation of the Die Cast Area, the following activities must be accomplished and verified complete:

- Installation of a shoring system in the Die Cast Area along North Grand Avenue as described in the *Die Cast Area Excavation Shoring Work Plan*.

This activity is described in detail in the Die Cast Area Shoring Work Plan. Other pre-demolition activities that will be accomplished prior to the beginning of physical excavation of the Die Cast Area include:

- Prepare/update site specific health and safety plan;
- Equipment mobilization;
- Demarcation and isolation of exclusion zones;
- Construction of decontamination areas;
- Utility clearance and abandonment;
- Establish dust control and decontamination measures;
- Excavation dewatering wastewater management;
- Stormwater runoff management; and
- Establish potential temporary stockpile locations
-

Prior to and/or during excavation of the Die Cast Area, demolition of the site buildings (WILLCO Plastics and CBI) will be performed. As discussed in the respective demolition work plans, demolition debris meeting specific contaminant levels and physical properties will be reused for backfill within the excavation area. The protocol for reuse of these materials is described in Section 7 of this work plan.

4.1 PCB Testing in Excavation Area

Multiple test borings were advanced and sampled within the Die Cast Area and vicinity to determine human health risk exposure due to compounds of concern (COC) present, soil properties, groundwater elevations, and refusal. Samples were collected and analyzed at various depths to determine both the concentrations of COC and soil properties. The sampling results were sufficient to delineate the extent of PCB impacted soils resulting from the former Die Cast operations. Copies of soil boring logs and a summary of the distribution of PCBs in the Die Cast Area, including a narrative, figures and data tables, are included in Appendix B and C, respectively.

4.2 Demarcation of PCB Impacted Excavation Area

Prior to excavation, the area of soil planned for removal will be marked on the ground and surveyed. A 3-foot high orange safety fence will be installed along the perimeter of the excavation activity (Figure EP-1). The fence will be maintained during the excavation activities and will serve as both a visual and physical barrier of the exclusion zone.

The planned removal area is based on the historical Die Cast Area PCB sampling from 2006 and 2007. The excavation can proceed with confidence based on prior 3-D GIS Modeling (large number of date points and accurate GPS sample locations) and boundary limits of the Aroclors present, as previously reported and summarized in Appendix C. Based on the site characterization results and in order to ensure that PCB impacted remediation wastes are tracked, managed, and disposed of appropriately; all remediation waste from the Die Cast Area will be treated as TSCA wastes (>50 mg/kg PCB).

4.3 Equipment Mobilization

Equipment will be mobilized on an as needed basis due to the limited area of the Site. All equipment that enters the exclusion zone will remain within the exclusion zone until no longer needed. All equipment will be decontaminated within a contaminant reduction area and prior to leaving the site.

4.4 Entry and Exit Procedures

Site Access Control is discussed in detail in Section 5.6 of the RAWP. Site Access will be controlled to prevent unauthorized access to the Site in accordance with the RAWP. For the purposes of this Work Plan:

Exclusion Zone includes the following areas:

- open excavation,
- active backfilling,
- stockpiles,
- truck loading,
- foot and vehicle traffic pathway between excavation and decontamination.

Contaminant Reduction Zone includes the following areas:

- truck wash station,
- personnel decontamination pad.

4.4.1 Decontamination and PPE

Areas of the site will be designated as contaminant reduction zones (Figure 1-1). In these areas, decontamination and personal protective equipment protocols will be applied. The contamination reduction zones will have a decontamination strategy which will identify, establish and determine:

1) the number and layout of the decontamination stations,
2) the decontamination equipment needed,
3) the appropriate decontamination methods,
4) procedures to prevent contamination of clean areas,
5) methods and procedures to minimize worker contact with contaminants during removal of personal protective clothing and equipment (PPE), and
6) methods for disposing of clothing and equipment that are not completely decontaminated when completed for a work shift.

All impacted soil will be transported off-site via tri-axles dump trucks or and dump trailers. The dump bodies will be direct loaded from the excavation of PCB impacted soils. The truck traffic will travel on-site through a designated (coned and/or flagged) corridor to limit direct contact with impacted soils within the exclusion zones. The outer surfaces of truck bodies and tires that come into contact with PCB impacted soils will be subject to a double wash and rinse the on-site truck wash decontamination pad described in Section 6.4.

All personnel entering the exclusion zone or performing equipment decontamination will be required to wear PPE prior to entry and continuously while in the exclusion zone or performing decontamination. The required PPE during all phases of work will include:

- High visibility shirts, vests, or similar garment(s),
- Hard hat,
- Eye protection,
- Hearing protection,
- Steel-toed shoes or boots,
- Boot covers,
- Tyvek chemical resistant suits, and
- Chemical resistant gloves.

Single use disposable PPE will be used to the maximum extent. Used PPE will be containerized and transported off-site for disposal as TSCA regulated waste (greater than 50 ppm).

Durable PPE and all other durable equipment that may have potentially been in contact with PCB impacted materials will be cleaned using the double wash and double rinse method consistent with Subpart S of the PCB Regulations prior to exiting the exclusion zone. Decontamination of personnel and equipment will be performed on an appropriately sized and constructed (i.e. sufficient to contain and clean the largest equipment) decontamination pad located within the contaminant reduction zone. The decontamination pad will be configured such that all wash-waters will be contained and can be easily collected. The used wash-waters will be containerized and transferred to the process wastewater treatment system.

5.0 EXCAVATION ACTIVITIES

5.1 Die Cast Area Excavation

Following the installation of the shoring system for the Die Cast Area along North Grand Boulevard, mobilization for the remedial excavation of the Die Cast Area will be performed. During mobilization, pre-excavation activities will be performed. Safety measures, including temporary chain link fence and precast concrete barrier will also be in place along the shoring line.

The planned excavation and backfilling operations will proceed from east to west (from the shoring line and North Grand Boulevard) toward the CBI building. Similarly, the excavation will be immediately followed by a backfilling and compaction process from east to west. The rate of excavation and backfilling will be dependent on the production rate of demolition, processing of demolition debris, characterization of the processed debris (i.e. sampling and laboratory analysis), and availability of transportation to off-site disposal facilities.

The excavation activities will begin with the removal of the limestone gravel placed over the former Die Cast Building floor slab. The concrete slab will then be removed and processed by excavator with hydraulic grapples and/or hammer attachments. The demolished slab will then be direct loaded and shipped off-site for disposal as TSCA remediation waste. The perimeter concrete foundation will be removed and disposed in the same manner. The soils below will then be excavated and direct loaded for offsite transport. In general, the excavation will proceed downward to the bedrock surface, unless historical characterization results indicated that a shallower depth is appropriate. Following excavation, confirmatory soil sampling will be performed, as described in Section 3.1 and Section 5.3.

The excavation and backfilling will be conducting using a “benching” operation, which is illustrated on Figure EP-2 (attached). The excavation and backfill method will allow the trucks to be direct loaded at grade, and minimize equipment contact with PCB impacted soils. The benching method will limit the need for roadway ramps in and out of the excavation area and will allow the trucks to travel within a non-PCB impacted corridor. The planned limit of the excavation activity including the area required for side slopes/benching is approximately 45,000 square feet.

Once excavation activities commence below the foundation **no personnel** will be allowed into the excavation area without the approval of the Site Health and Safety Coordinator who is responsible for ensuring that all safety standards are in place including those required by the site-specific Health and Safety Plan, OSHA, the State of Missouri, and the EPA. The goal is to utilize equipment for excavation and backfilling and limit worker exposure.

5.2 Confirmatory Soil Sampling

Soil samples will be collected from the excavation limits to evaluate whether concentrations in the remaining soil complies with the removal action goals. The soil samples will be handled, managed, and tested as described in Section 3. Composite or grab sampling will be performed as described in Section 3.1.

Prior to entry into the excavation, the area will be inspected by the Site Health and Safety Coordinator. To minimize risks associated with personnel entering open excavations, the soil samples may be collected using the bucket of the excavator when the excavation cannot be entered due slope stability and safety concerns.

5.2.1 Sidewall Sampling

Confirmatory soil samples will be collected from the excavation sidewalls along the vertical sections of sidewall benching. The sidewall samples will be collected immediately following exposure of the planned excavation limit for the removal of PCB impacted soil. Since the excavation will proceed downward and outward progressively with benches, opportunity to collect confirmatory sidewall samples from the known PCB impacted limits will be provided prior to removal of soil for side slope stabilization purposes.

5.2.2 Bottom Sampling

Confirmatory sampling will be performed from residual soil at the base of the excavation, where present following soil removal to the maximum planned depth.

5.2.3 Evaluation of Results

Upon receipt of the analytical data from the laboratory, HRP will evaluate the results relative to the removal action goals.

If the PCB concentrations in the confirmatory samples indicate that residual PCB levels are less than the removal action goal based on direct comparison, then no further excavation will be warranted. Results for grab type samples will be compared directly to the removal action goal of 25 ppm for PCBs (***USEPA Enforcement Action Memorandum, Page 9, March 30, 2011***). Results for composite samples will be mathematically multiplied based on the number of aliquots to determine the maximum potential PCB concentration that may occur in soil.

If results for confirmatory soil samples below three feet from surface grades are greater than the removal goal, but at a concentration that less than two-times, a statistical

analysis may be performed to determine compliance for subsurface soil. The 95% Upper Confidence Level (95%UCL) of the arithmetic mean will be calculated for confirmatory sampling results from a similar depth or side slope bench. The calculations will be performed using the latest version of ProUCL available from the EPA and its guidance. If the statistical mean is less than the goal (25 mg/kg PCB), then the removal action goal will be considered achieved and removal of additional less impacted soil will not be warranted. This provision will ensure that:

- any soil containing PCB at TSCA level is removed,
- the risk-based site-specific removal action goal is obtained,
- risk of excavation beyond the planned limits will be minimized, and
- the volume of remediation waste soil generated from excavation that contains non-TSCA levels of PCBs will be minimized.

In the event that any PCB concentrations are greater than two-times the removal action goal or the statistical analysis described does not demonstrate compliance, additional soil excavation and confirmatory sampling will be necessary to meet the project goals.

The removal action will be complete when the analytical results from all confirmatory soil samples indicate compliance with the site goals through either direct comparison or by the statistical analysis described above.

5.3 Excavation Material Management

The following two types of excavated materials will be generated that require management:

- Remediation Waste Soil, and
- Overburden Side slope Soil.

5.3.1 Management of Remediation Waste Soil

The material excavated from the Die Cast Area will be disposed of off-site at facility permitted to receive the remediation waste and approved by the Program Manager. All soils containing PCBs at concentrations greater than 25 mg/kg within the Die Cast Area will be removed for off-site disposal. The location and distribution of PCB impacted soil is documented in Appendix C. The planned excavation limits for PCB impacted soil is shown of Figure EP-1. The anticipated volume of Remediation Waste Soil is approximately 28,000 cubic yards.

5.3.2 Management of Overburden Side slope Soil

Following confirmatory soil sampling from sidewalls of the PCB impacted area, additional excavation from the sidewalls is necessary for side slope stability and access to impacted soil

at depth. The confirmatory sidewall soil sampling results will be reviewed to determine when the PCB removal action is complete for each benching level. Following completion of excavation for PCB impacted soil, the horizontal excavation limits will be extended as necessary. The anticipated volume overburden material to be excavated for side slope stabilization is approximately 6,800 cubic yards.

The overburden side slope soil may contain concentration of PCBs at less than 25 mg/kg. Therefore, these soils will be reused within the excavation area only and below 3 feet from surface grade. These overburden soils will be temporarily stockpiled adjacent to the excavation until reuse as backfill. The material will be staged on top of polyethylene sheeting to prevent contact with surface soil. The temporary stockpiles will be kept covered with poly sheeting when not in use to prevent airborne dust and erosion control. Given the simultaneous process of excavation and backfilling of the removal area, the volume of overburden material requiring staging is not anticipated to exceed 1,500 cubic yards at any one time.

5.4 Disposition of Excavated PCB Impacted Soil

Soil materials requiring excavation from the Die Cast Area will be loaded directly into trucks and immediately hauled off-site for disposal in a TSCA landfill. PCB impacted soil from the Die Cast Area will not be stockpiled or stored on-site. The remediation waste soils will be transported under waste manifests, which will serve as a chain of custody for each load.

5.5 NAPL Management

If any non-aqueous phase liquid (NAPL) are encountered in the excavation soil or water, samples will be collected and analyzed for the appropriate COCs, including PCBs. If PCBs are detected, the material containing the NAPL will be removed, handled, and disposed offsite as a TSCA-regulated waste.

5.6 Excavation Dewatering Management

Dewatering within the DCEA will be necessary during excavation and backfilling activities. The dewatering during excavation is necessary for slope stabilization, access to underlying impacted soil, and to meet transportation requirements (i.e. separate phase liquids cannot be loaded into trucks). A dewatered excavation is necessary to allow for placement and compaction of backfill. Based on the soil properties (clay content) and low hydraulic conductivity, conventional sumps are the anticipated method for accomplishing dewatering the excavation.

Pumped groundwater will be temporarily stored, tested, treated, and discharged using the same standards as described for the stormwater runoff. The Site Manager and Site Safety Coordinator shall coordinate on the pumping activities as needed to ensure the safety of all personnel and the proper compaction standards are achieved.

All measures will be taken on-site to insure that all surface water, process water, and storm water is captured, collected, treated and released to the POTW in accordance with the Metropolitan Sewer District (MSD) and United States Environmental Protection Agency standards for Stockpile Management Locations.

5.7 Waste Disposal Sampling

Samples from excavated material or soil designated for excavation will be collected and analyzed for waste characterization purposes. The results will be compared with the waste acceptance criteria for the RCRA licensed landfill designated to accept the remediation waste and the RCRA toxicity levels. These waste characterization samples will be grab type and handled in manner consistent with Section 3. Specific tests to be performed are:

- pH (corrosivity);
- Reactivity (Sulfide and Cyanide);
- Flash Point/Ignitibility;
- RCRA 8 metals by TCLP; and
- Volatile Organic Compounds;

The sampling frequency and testing parameters may vary depending on disposal facility requirements.

5.8 Dust Control

A fugitive dust suppression program will be implemented in accordance with the project specifications to prevent the off-site migration of particulate matter and/or dust resulting from excavation, loading, transportation, and filling operations associated with site materials. The following measures will be implemented continuously during site activities:

1) supervision and maintenance of fugitive dust control measures,
2) monitoring of airborne particulate matter (visual and metered), and
3) coordinate with the USEPA for perimeter air monitoring.

The area of the Site to be used for vehicle traffic, dry excavation surfaces, and backfill surfaces that contain fine materials and cause dust will be periodically wetted. The travel paths on-site will be swept on a weekly basis and wetted as-needed to prevent airborne dust. It is the intent of the dust control actions to avoid any fugitive dust generated from leaving the Site.

6.0 TRANSPORTATION AND DISPOSAL

Excavated remediation waste materials will be transported off-site to an appropriate and approved disposal facility. Transportation conveyances will be inspected prior to loading to ensure they are in good working order. Trucks with obvious safety defects, such as bald tires or leaking fluid, shall not be loaded or utilized and will not be allowed back onsite until defects are corrected. A vehicle inspection will be documented for each transportation conveyance. In addition, a tracking sheet will be developed to identify the date, time, weight/volume, waste/material, trucking company, driver, and vehicles used for each trip. All vehicles in contact with PCB remediation waste, other than the inner surface of the dump body, will be decontaminated prior to leaving the site.

A discussion for the traffic routes is included in **Section 11 of the RAWP**. This section discusses the road closures and traffic routes specific to the CBI Building demolition.

6.1 Material Loading

6.1.1 Off-site Transportation

Excavated material will be loaded in to permitted trucks for transport off-site and disposal at an appropriately regulated landfill. Material will be loaded in a manner to minimize spillage on the outside of the conveyance and minimize the generation of dust. This upfront care taken to load the conveyance will minimize any cleaning of the conveyance body or tires prior to further movement on the Site and subsequent transportation to the off-site disposal facility. A water mist will be used if material presents a fugitive dust generation issue. If waste material is noticed on the outside of the truck, it will be removed by dry wiping or by wet method (truck wash) to prevent the spread of demolition debris off-site.

6.1.2 On-Site Transportation

Demolition debris and excavated material will be generated from the point of structural demolition of the slab floor and the excavation pit. Fill material generated from the WILLCO/CBI demolition activity, former Die Cast Area slab floor demolition and excavation will be loaded into the on-site transportation conveyance in such a manner to minimize spillage on the outside of the conveyance and minimize the generation of dust. This upfront care taken to load the conveyance will minimize any cleaning of the conveyance body or tires prior to further movement on the site. Dust suppression measures will be utilized during all sizing and demolition operations to prevent fugitive dust from leaving the Site. Crushed reinforced concrete is expected to be moved either by wheel loader or tandem truck on-site to the sample piles for sampling and storage. The travel path of the loader or tandem truck will be wetted to prevent the generation of dust. Care will be taken not overload the loader bucket or the tandem truck to avoid spillage of material along the travel path.

6.2 Truck Scale

To ensure compliance with local, state and federal weight regulations, trucks loaded with demolition debris will be weighed before leaving the Site. On-site scales will be utilized to ensure trucks do not exceed 72,000 lbs or the maximum rating for the specific type of truck. Trucks that are overweight will be directed back to the material loading area to have excess material removed. The equipment operator and truck driver will communicate during loading operations to avoid overloading that would require removal of excess material from the truck. After initial setup, the truck scales will be calibrated by the contractor.

The scales will be maintained and re-calibrated based on the manufacture's recommendations. Additionally, weight tickets from the disposal facility will be used to verify the accuracy of outgoing loads. The scales will be inspected and cleaned as necessary to ensure proper operation. The contractor will perform calibration checks at least weekly to ensure the scales are within the manufacturer's tolerance limits. Scale calibration logs will be used to document scale calibration, inspections, and weekly calibration checks.

6.3 Visual Inspection

After the soil is loaded into the transport trucks, the soil shall be covered and otherwise contained to prevent material from blowing or spilling out of the truck during transport to the designated facility for final disposition. All vehicles shall be decontaminated by the Contractor prior to leaving the loadout areas. For track-out prevention and control, all truck exteriors shall be broom cleaned after loading. If this method is not successful, the truck will be directed to the truck wash for cleaning prior to leaving Site. The dump truck or roll-off bin portion of the truck shall then be covered with a tarp to prevent soil and/or dust from spilling out of the truck during transport to the designated facility for final disposition. Prior to leaving the loadout areas, each truck shall be inspected by the Contractor to ensure that the payloads are adequately covered, the trucks are cleaned of spilled material, and the shipment is properly manifested or documented. Proper hazardous waste placarding shall be required for transportation of hazardous waste.

6.4 Truck Wash

Trucks that have debris or material that that cannot be dry brushed off shall utilize the onsite truck wash before leaving the site and be re-inspected to verify the effectiveness of the cleaning procedures. The cleaning procedure will include a double-wash double-rinse of all areas where potential contact with PCBs may have occurred. The truck wash area will be constructed to contain the cleaning water and to prevent any demolition debris from contacting

non-impacted areas of the site. Trucks will not be allowed to leave the designated work zone or cleaning area until a designated representative has verified all material has been removed from the tires and outside of truck bed.

Once the trucks arrive at the designate RCRA/TSCA approved landfill location (to be determined at time of contract award) and are off-loaded; the trucks THAT REQUIRE decontamination will be cleaned and decontaminated within the designated wash-down area, as dictated by the designated, approved Landfill. In addition, all equipment, tools, and non-porous surfaces that come in direct contact with PCBs will be required to be cleaned using the double wash/rinse procedure outlined in Subpart S of §761 or equivalent. Since this decontamination procedure is considered self-implementing by USEPA (76 1.79(c)), no confirmation testing is required prior to reuse of the equipment for TSCA or non TSCA activities. 40CFR, Subpart S, Part 761, Subpart D, Section 761.79(c)) Decontamination Standards and Procedures - 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. Surfaces on non-porous equipment or surfaces 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) or equivalent standard. Any and all equivalent methods and/or standards that are being substituted must be submitted in writing in advance of the first load of inbound PCBs, of the implementation of the Work at the Landfill for the Carter Carburetor Superfund Site and approved by ACF, its contactor and the USEPA.

6.5 Public Road Inspection

Public streets utilized by the trucks transporting material for off-site disposal will be inspected at least daily in order to ensure that the trucks are being adequately cleaned and that no spillage is occurring. The street inspection will be conducted near the end of the daily work shift, with more frequent inspections to occur if spills of impacted material are documented in public streets. Any identified spills will be cleaned up immediately. The daily inspection will be documented in a log book to be maintained at the site.

7.0 SITE RESTORATION

Following the successful remove of PCB impacted soil and achievement of the removal action goals, the excavation will be backfilled and TSCA engineered control (i.e. cap) will be constructed. A detailed work plan and design for the construction of the cap will be documented under separate cover.

7.1 Reuse of Demolition Debris

Fill materials generated during the demolition of the WILLCO and CBI building will be placed in lifts and compacted within the excavated Die Cast Area as described below. Material types composing this fill are anticipated to include concrete, brick, and masonry materials. Disposition of materials containing the various levels of PCBs is discussed within the *CBI Demolition Work Plan*. A summary of how the PCB impacted demolition debris will be reused in the excavation area is provided below.

Excavation Depth Interval (feet below surface grade)	Maximum Allowable PCB Concentration (milligrams per kilogram)
0 to 3	1
3 to 10	25
10 to 25	100

The fill material will be placed according to their identified PCB levels and compacted to 95% using methods in accordance with ASTM standards.

7.2 Imported Fill

The volume of the demolition debris is anticipated to occupy a majority of the excavation volume. The remaining volume will be backfilled with materials imported to the site. The materials will be sampled and tested to ensure the absence of anthropogenic substances and to meet compaction specifications before being delivered to the site and installed into the excavation area.

Figures

Appendix A

Project Schedule

Appendix B

Boring Logs

Appendix C

Site Characterization Summary and PCB Distribution at Die Cast Area