RCRA FACILITY INVESTIGATION WORK PLAN

C&D TECHNOLOGIES
200 MAIN STREET
ATTICA, INDIANA

RCRA-05-2007-0003, U.S.EPA ID NO.: IND 000 810 754

Prepared for

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List of Acronyms and Abbreviations

AAF	Absorption Adjustment Factor
AOC	Area of Concern
AOI	Area of Interest
AST	Aboveground Storage Tank
BCC	Bioaccumulation Chemical of Concern
bgs	Below Ground Surface
bsw	Below Soil/Waste Interface
CCI	Cabinet Craft, Incorporated
CA	Corrective Action
CCJM	C.C. Johnson and Malhotra, P.C.
CCR	Current Conditions Report
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CMS	Corrective Measures Study
COC	Chemical of Concern
COI	Chemical of Interest
COEI	Chemical of Ecological Interest
CPR	Community Relations Plan
CS	Confirmatory Sampling
CSM	Conceptual Site Model
DMP	Data Management Plan
DQL	Data Quality Levels
DQO	Data Quality Objective
E&E	Ecology and Environment, Inc.
EA-L	Electric Auto-Lite Company
EC	Eltra Corporation
EI	Environmental Indicators
EPA	Environmental Protection Agency
ESV	Ecological Screening Value
FID	Flame Ionization Detector
FSP	Field Sampling Plan
ft	Feet
FPI	Forest Products, Incorporated
GIS	Geographic Information System
GPR	Ground Penetrating Radar
GPRA	Government Performance Results Act
GPS	Global Positioning System
HWC	Hannum, Wagle & Cline Engineering
HSP	Health and Safety Plan
HRC	Howard Radio Company
IDEM	Indiana Department of Environmental Management
LPM	Laboratory Project Manager
MCL	Maximum Contaminant Level
NFA	No Further Action
NPDES	National Pollution Discharge Elimination System
PAHs	Polynuclear Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl

List of Acronyms and Abbreviations

PCOI	Potential Chemicals of Interest
PID	Photoionization Detector
PMP	Project Management Plan
PQL	Practical Quantitation Limit
QA	Quality Assurance
QAO	Quality Assurance Officer
QAP	Quality Assurance Plan
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
QC	Quality Control
RBC	Risk Based Concentration
RCRA	Resource Conservation Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RG	Remediation Goal
RMC	Radio Materials Corporation
ROI	Receptors of Interest
SAP	Sampling and Analysis Plan
SDG	Sample Delivery Group(s)
SC	Screening Concentration
SSI	Screening Site Inspection
SOP	Standard Operating Procedure(s)
SVOC	Semivolatile Organic Compound
SW846	Test Methods for Evaluation of Solid Waste
SWMU	Solid Waste Management Unit
TCL	Target Compound List
TDD	Technical Directive Document
TRV	Toxicity Reference Value
URS	URS Corporation
U.S.EPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
VSI	Visual Site Inspection
WWPTP	Waste Water Pretreatment Plant

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C&D Technologies (C&D) has retained URS Corporation (URS) to develop and implement environmental investigative programs for C&D's Attica Indiana Facility located at 200 West Main Street, Attica, Fountain County, Indiana (the Site or Facility). This Work Plan describes the proposed programs for the Facility and fulfills the Resource Conservation Recovery Act (RCRA) Facility Investigation (RFI) Work Plan requirements set forth in Section 14.b. of the United States Environmental Protection Agency (U.S.EPA) Region 5 Administrative Order of Consent (Order) (RCRA-05-2007-0003, U.S.EPA ID NO.: IND 000 810 754), signed January 18th, 2007 and included as Appendix A.

This introduction includes discussions of the Order background and of the RFI Work Plan goals at the Attica Facility. Section 1.3 outlines the organization for the remainder of this RFI Work Plan.

1.1 Administrative Order of Consent Background

The Administrator of the U.S.EPA issued the Order to C&D on January 18, 2007 under Section 3008(h) of the Solid Waste Disposal Act, commonly referred to as RCRA, as amended by the Hazardous and Solid Waste Amendments of 1984. The Order states that C&D must identify and define the nature and extent of releases of hazardous constituents at or from the Facility, beginning with a Current Conditions Report (CCR). C&D submitted to U.S. EPA on March 1, 2007 the CCR that identified 15 solid waste management units (SWMUs) and areas of concern (AOCs) to be further evaluated as part of the RFI. U.S. EPA's April 20, 2007 letter to C&D concerning the CCR, questioned the location of PCB containing capacitors that were mentioned in the *Screening Site Inspection Report for Eltra Corporation C&D Batteries Division Attica, IN Facility* (SSI Report) by Ecology and Environmental, Inc. submitted to U.S.EPA on October 12, 1990. C&D responded in a June 7, 2007 letter to the U.S. EPA that low level PCBs were contained in two former DC Generators that were taken out of service in 1988. As a result of the DC Generators having contained PCBs, C&D has identified the area where the DC Generators were located as an AOC/SWMU that will be further investigated in the RFI. The CCR is incorporated into the RFI Work Plan by reference.

The Order also requires C&D to submit an RFI Work Plan preceding the RFI investigation. The RFI report must describe the nature and extent of any releases of hazardous waste and hazardous constituents at or from the Facility which do not pose an unacceptable risk to human health and the environment, and provide the basis for those conditions, including an evaluation of the risks.

The Order requires C&D to demonstrate by July 30, 2008, through submitting an Environmental Indicators (EIs) Report that all current human exposures to contamination at or from the Facility are under control and migration of all contaminated groundwater at or from the Facility is stabilized. Additionally, C&D must propose to U.S. EPA by August 1, 2009, the final corrective measures necessary to protect human health and the environment from all current and reasonably expected future unacceptable risks due to releases of hazardous waste or hazardous constituents at or from the Facility.

1.2 RCRA Facility Investigation Work Plan Goals

C&D has developed RCRA objectives at the Attica Facility to guide the approach to complete the RFI, meet the EIs, and propose final corrective measures if needed. C&D has, therefore, identified the following RFI Work Plan Goals:

- Ensure protection of human health and the environment through the development and use of a conceptual site model (CSM) based on a thorough understanding of Facility chemicals of concern (COCs), migration pathways, and exposure potential.
- Prioritize actions taken during the RFI using a risk-based phased approach to address potentially significant issues early in the process and focus, if needed, final corrective measure decision making.
- Appropriately comply with all regulatory requirements, focusing on obtaining positive Government Performance Report Act (GPRA) EI determinations in a timely manner.

The following general approaches have been established to meet each of the above stated goals.

1.2.1 Protection of Human Health and the Environment

C&D has incorporated the information from individual SWMUs and AOCs, along with more general Facility data, into a Facility-wide CSM. The CSM is developed from information on potential sources, physicochemical characteristics, potential constituent release mechanisms, potential environmental pathways, and potential receptors for the Facility. The CSM will allow development of reasonable exposure scenarios to focus future investigative activities and to support appropriate risk-based decision making. The CSM is dynamic and should be tested and refined as Facility-specific information, collected in a phased approach, is obtained. The CSM provides the remedial decision-making team a tool that more accurately allows for the realistic evaluation of the potential threats to human health and the environment so that investigative and risk management needs are addressed more efficiently. The CSM for the Attica Facility is presented in Section 3.3 of this Work Plan. Upon completion of the RFI, the CSM will be revised, as necessary, and form the basis for the scope and schedule for subsequent phases of the RFI, such that they and other future corrective measure if needed remain focused on the most important priorities.

1.2.2 Risk-Based Phased Approach

In an effort to facilitate efficient decision-making during the RFI process, C&D will utilize a risk-based phased approach at the Attica Facility. The primary objective of the risk-based phased approach is to focus the investigation on those COCs and units (i.e., SWMUs or AOCs) that most likely present a potential risk to human health and/or the environment. To this end, the initial phases of the RFI will collect sufficient information regarding the nature of environmental conditions at the Attica Facility to develop a prioritized approach for addressing corrective action needs for the Facility. Implementing the prioritized approach will result in one of the following decisions for each SWMU or AOC in the RFI:

- No Further Action Under the Current Use Scenario;
- Additional Data Collection and/or Risk Evaluation;

- Interim Measures (if needed); or
- Corrective Measures Proposal (CMP) or Corrective Measures Study (CMS) (if needed).

This approach will accelerate corrective action if needed where it is most necessary, rather than waiting until all units have been fully delineated and characterized before corrective measures are implemented.

1.2.3 Environmental Indicators Determination

Environmental Indicators are measures being used by the RCRA RFI program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment (U.S.EPA, 1999a). The two EIs developed "indicate the quality of the environment in relation to current human exposures to contamination" (EI RCRIS Code CA725) and the "migration of contaminated groundwater" (EI RCRIS Code CA750). A positive EI CA725 indicates that there are no "unacceptable" human exposures to "contamination" that can be reasonably expected under current land- and groundwater-use conditions, while a positive EI CA750 indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater".

1.3 DOCUMENT ORGANIZATION

The remainder of this RFI Work Plan includes descriptions of the RFI program elements required by the Order and is organized as follows:

- Section 2 provides background information including a brief description and history of the Facility and its environmental setting (e.g., land use, topography, geology and hydrogeology). Section 2 also includes a brief summary of the operational history of the Facility and a list of the SWMUs and AOCs;
- Section 3 provides the Project Management Plan (PMP) with an overview of the RFI technical approach, overall management approach, project team responsibilities and activities, and project communication;
- Section 4 provides the RFI scope of work and objectives for the soil and groundwater investigation, and proposed project schedule; and
- Sections 5 through 10 address those components identified in Section 14.b. of the Order which consist of the following: Field Sampling and Analysis Plan (FSP), RFI Quality Assurance Project Plan (QAPP), site specific Health and Safety Plan (HSP), and Community Relations Plan (CRP), respectively. With the exception of the Data Management Plan, all of the other above referenced project plans are presented in Appendices B through E.
- Section 10 provides references used in developing this RFI Work Plan.

This section presents an overview of the Attica Facility including location, a brief discussion of the environmental setting, operational and regulatory history, and a list of SWMUs and AOCs that require investigation. A more detailed description of these elements has been provided in the March 2007 Current Conditions Report (CCR) submitted to U.S. EPA by Clayton Group Services, Inc. (Clayton) on behalf of C&D.

2.1 GENERAL DESCRIPTION

2.1.1 Facility Location and Description

The Site is located within the Middle Wabash River Valley within west central Indiana. The Site is located along the eastern bank of the Wabash River approximately 900 feet northeast of US Highway 41 in Fountain County, Indiana. The elevation of the site is approximately 520 feet above mean sea level. A Site Location Map is included as Figure 2-1.

The physical setting surrounding the Site is characterized as the northwest border of the Tipton Till Plain physiographic province of Indiana. The Tipton Till plain is generally featureless, flat to gently-rolling plain, which is interrupted in places by very low-relief end moraines and extensive areas of ice disintegration features that resulted from the Wisconsinan glacial advancement. The border of the Tipton Till plain is marked by the Wabash River Valley, which is the principal feature beneath the Site (USDA, 2003).

The Site is located at 200 West Main Street in Attica, Fountain County, Indiana. The land use surrounding the Site is industrial, commercial, and residential with the Attica Wellhead Protection Area located southwest of the Site along the Wabash River. The Site is bounded on the southeast by Third Street; to the southwest by Main Street; the Wabash River to the northwest; and is located in a mixed area of industrial, commercial, and residential use.

The C&D Facility manufactures large motive and standby power lead acid batteries for commercial, industrial, and military applications. Manufacturing processes include casting / curing lead battery parts, pasting battery grids, plate processing, battery assembling, charging and finishing. Supporting operations at the Attica Facility include material receiving, product shipment, quality control laboratory analysis, equipment maintenance, wastewater pretreatment, waste management, and administration. The Facility is surrounded by chain-link fencing and occupies approximately 12.5 acres in which there are approximately 295,000 square feet of interconnected buildings existing on site.

2.1.2 Regional Geology and Hydrogeology

The regional geology consists of unconsolidated glacial deposits overlying clastic and carbonate bedrock units. The glacial deposits include till deposits of cobbles to sand mostly in the boundaries of the Wabash River channel. Bedrock consists of shale and sandstone with limestone that dips to the southwest (USGS, 1994).

The Wabash River basin was completely covered by Wisconsinan glaciation. As ice lobes advanced into the Wabash Valley, the Attica outwash fan was deposited that consists of cobbles, gravel, and sand. The Wabash River Valley is underlain by approximately 140 feet of unconsolidated, valley-train glaciofluvial deposits consisting of sand and gravel. The

unconsolidated deposits occur in a narrow band that parallels the Wabash River. Water is produced from the sand and gravel of Pleistocene age that is overlain by till (USGS, 1994). The well depths in the till range from 70 to 160 feet. These sand and gravel deposits can produce upwards of 1,600 gallons per minute (gpm), and have been test pumped at up to 2,500 plus gpm. The yields of these wells are more than adequate for domestic and stock use and are the main areas of municipal production wells.

The Attica city wells are completed in the Wabash River alluvial valley fill deposits (alluvium) of sand and gravel at a depth of approximately 110 to 120 feet below ground surface (bgs). The Wabash River alluvium has very steep sidewalls in connection with the bedrock valley walls that run approximately parallel to the river. Located below the unconsolidated deposits are Pennsylvanian age sandstones of the Raccoon Creek Group and Carbondale group and the Mississippian age and shales of the Borden Group (IDEM, 1999).

West of the Site lies the contact between the Pennsylvanian and Mississippian age bedrock units. The Raccoon Creek and Carbondale group consists of interbedded shale and sandstone with thin beds of limestone and coal. The Borden Group consists of siltstone and shale with minor sandstone and discontinuous limestone (USGS, 1994). The groundwater entering the bedrock in the upgradient areas east and southeast of the Site flows in a northwest direction to its discharge point, the alluvium, and the Wabash River (IDEM, 1999).

The following site specific geologic information was gathered during a preliminary hydrogeologic investigation conducted by Clayton (Clayton, 2006a). The unconsolidated materials encountered during investigation activities consist of 10 to 15 feet of topsoil, fill sand and silty or sandy clay. This sequence of materials overlie 35 to 40 feet of poorly sorted, light yellow to brown sand and gravel comprised of angular to well rounded rock fragments ranging in size from 2 to 25 mm in diameter. These surficial deposits generally occur to a depth of approximately 47 to 50 feet. A shallow water bearing zone occurs at a depth of approximately 40 feet within the coarse-grained sand and gravel deposit. This water bearing zone is separated from the underlying deposits by approximately 5 feet of a dense gray till. Below the till is approximately 30 to 40 feet of a brown/reddish brown, well sorted, fine- to coarse-grained sand. Underlying this sand is approximately 20 feet of a brown/reddish brown, well sorted fine- to coarse-grained sand and gravel. The depth of the valley train alluvium was determined to be 145 feet during the investigation. Due to poor sample recovery at depths below 120 feet, the subsurface lithology at greater depths was not characterized.

2.1.3 Water Resources

Surface Runoff and Surface Water Resources

Regional drainage flows in a southwestern direction off the western side of the Cincinnati Arch. The Wabash River is a trunk stream that flows generally to the southwest except in areas that were modified by ice age deposits or erosional surfaces of bedrock. The Wabash River flows across the Pennsylvanian sandstone in a shallow bedrock channel wall toward Attica where the river channel joins the deep buried bedrock channel that contains the thickest sand and gravel deposits.

Fountain County is within the drainage basin of the Wabash River. Most of the surface water in the county drains into the river through two main tributaries and their branches. In the northern part of the county, Shawnee Creek flows west and empties into the river south of Attica. Coal Creek, which drains a much larger area than Shawnee Creek, heads in Montgomery County, enters the east central part of Fountain County, and flows southwest. It empties into the Wabash River directly south of the county line. Several other creeks that have small watersheds empty into the Wabash River at various places (USDA, 2003).

At the Site, the deepest part of the buried channel is not under the Wabash River bed, but located beneath the Facility on the eastern bank of the Wabash River. There is more than 140 feet of sediment above the bottom of the buried channel beneath the Site.

One additional surface water body is the intermittent stream that is located upgradient approximately 1,400 feet to the southeast of the Site. The intermittent stream is located in Ravine Park which is south of the main plant of the former Radio Materials Corporation. The stream enters a lined culvert and is conveyed beneath the Facility through a subsurface drainage pipe that discharges to the Wabash River immediately northwest of the Site.

Groundwater Resources

The City of Attica water supply is withdrawn from production wells installed in the alluvium sand and gravel deposits along the east bank of the Wabash River. Some potable water is obtained from the Mississipian and Pennsylvanian shale and sandstone bedrock east and southeast of the Site. Regional groundwater flow is toward the northwest in the direction of the Wabash River. Beneath the Site, groundwater flow may be influenced by the Wabash River levels and by withdrawal from the City of Attica production wells.

Several aquifer types have been identified within the region of the Wabash River Basin, including (1) the unconsolidated aquifers (surficial sand and gravel outwash, buried alluvium sand and gravel deposits, and discontinuous buried sand and gravel) and the bedrock unit aquifers (upper weathered-bedrock zone of the Borden Group, sandstone of the Mansfield Formation, Mississippian and Silurian-Devonian carbonate rocks, and interbedded sandstone, shale, coal and limestone of the Raccoon Creek and Carbondale groups).

Primary recharge to the alluvium can be from seepage from the Wabash River, underflow from upstream areas, direct recharge from precipitation from topographically upgradient areas east and southeast of the Site (including intermittent streams (e.g., Ravine Park), and seepage from the buried bedrock unit that forms the east sidewall of the bedrock valley.

2.1.4 Soils

The soils in Fountain County were formed either during the Wisconsinan age glacial drift, outwash, and till, or from loess windblown silty and sandy material deposits, or from sandstone, siltstone, and shale residuum. Fountain County has been glaciated several times. Meltwater flowing from glaciers cut channels and rearranged the existing stream patterns. The glaciers and meltwater were the predominant source of soil deposition. The glaciers directly deposited till, a compact mixture of pebbles, sand, silt, and clay and the meltwater streams deposited sand and gravel known as outwash. Along the edges of some of the larger streams, the wind deposited dune sand. The wind also deposited blankets of silt, known as loess, over most of the county.

The youngest deposits include sand and silt in the valleys of the present streams. The county is covered by a mantle of glacial drift that ranges in thickness from less than 5 feet on rock terraces along the valley of the Wabash River to more than 200 feet in some of the preglacial valleys. The terrace material along the Wabash River was carried in by glacial meltwater. Fountain County is completely covered by a mantle of loess that ranges from a few inches to more than 6 feet in thickness and is underlain by the landforms that existed when the loess was deposited. Deposits as much as 7 feet thick have been found. In about half of the county, the mantle of loess is 20 to 40 inches thick (USDA, 2003).

2.1.5 Climate

The climate in Fountain County is a humid continental climate characterized by warm summers and cold winters with an average winter temperature of 29 degrees Fahrenheit (°F) and an average summer temperature of 72 °F. The average annual total precipitation is 36.21 inches. Of this, about 51 percent usually falls in May through September. Thunderstorms occur on about 43 days each year, and most occur between April and August. The average seasonal snowfall is 22.3 inches. The greatest snow depth at any one time was 21 inches. On an average, 37 days per year have at least 1 inch of snow on the ground.

The average humidity may range from approximately 60 percent to 85 percent depending on the time of day. The prevailing wind is usually from the southwest but is from the west-northwest from January to March. Average windspeed is highest, 11 to 12 miles per hour, from February to April. Winds from all directions are greater than 16 knots 1.0 percent of the time. The annual average wind speed is 5.6 knots, and the maximum is 50 knots, which occurred in May of 1998 (USDA, 2003).

2.1.6 Potential Receptors

The CCR presented a preliminary discussion on potential human and ecological receptors at the Facility. Section 3 of this RFI Work Plan provides additional details regarding potential receptors at the Attica Facility and the risk evaluation strategy to be implemented throughout the RFI program.

2.2 OPERATIONAL HISTORY

The site has been used as an industrial Facility since the late 1800s. The earliest available historical record (1886 fire insurance map) identified the subject property as the Jas Martin & Company Grain Elevator, residential properties, a vacant foundry and a lumber yard. The current site use as a battery manufacturing operation began in 1955. Prior to 1955, Sanborn fire maps identify the following companies or entities operating or occupying the site: Attica Bridge and Machine Works, H.C. Martin & Company Lumber Yard, chicken coop, grain elevators, Attica Saw Mill, William McMurtrie Planning Mill, Wabash Valley Canning Company, Mackemer & Means Lumber Company, wood working shop, general store, Timber Products Corporation Saw Mill, Cabinet Craft Corporation (casket and radio cabinet manufacturer), Howard Radio Company (HRC), restaurant and a gasoline filling station.

Aerial photographs, previous reports and interviews indicated that the west side of the subject property was utilized as an open dump for the city of Attica. Operators of the dump accepted household trash and materials from drive-up disposal, and may have accepted drums and industrial wastes, according to local citizens (E&E, 1990). The entire dump covered an area of approximately 6 acres and it is alleged that deposited material was placed up to the Wabash River edge (E&E, 1990). Dumping activities were observed along the west side of the property in very close proximity to the Wabash River's bank in aerial photographs reviewed. Previous reports reviewed indicated that the dump closed in 1958. Aerial photographs indicated dumping activities into the middle 1960s.

A portion of the original old foundry building observed on the 1886 fire insurance map is one of the central sections of the current east building. Major additions were completed in the 1940's and 1950's when the east side of the site was occupied by HRC. Prior to 1955 HRC became Radio Materials Corporation (RMC). In approximately 1945, an unknown portion of the RMC property was leased to American Express Field Warehousing Corporation, a company whose operations are unknown. At this time, the west building was owned by Cabinet Craft, Incorporated (CCI), a manufacturer of burial caskets and radio cabinets for RMC. CCI assembled, stained, and finished these products at the site. CCI also operated an on-site lumber mill, Forest Products, Incorporated (FPI). During this period, the drive up disposal area was operating in the area west of the buildings (E&E, 1990).

In 1955, the Electric Auto-Lite Company (EA-L) purchased a portion of the east building from RMC and began on-site battery manufacturing operations. RMC continued its operations in the remainder of the east building. The west building continued to house operations of CCI and FPI.

In 1960, EA-L purchased the west building and the remainder of the east building, although FPI's lumber mill remained. EA-L became a division of Eltra Corporation (EC) in 1963. New buildings were constructed west of the railroad track spur in 1963. EC purchased a 3.5-acre portion of the drive up disposal area in 1974. The purchased property was located northwest of the on-site buildings. Multiple additions were constructed on the southwest corner of the west building in the early and middle 1970s. EC also purchased the FPI property and the remaining Attica dump area in 1976. This property purchase consisted of land located west of the western-most building, and extended to the Wabash River (E&E, 1990). A portion of the dump was covered in 1978 by EC for construction of the on-site parking lot. In 1979, EC became a division of Allied Chemical Corporation and the Facility became known as C&D Batteries. The Facility became known as C&D Charter Power Systems, Inc., in 1986 (E&E, 1990).

Based on aerial photography the alley way enclosure was constructed circa 1990.

The front office building was added to the subject property in 2000, and the new tank farm building for the WWPTP was constructed in 2004.

2.2.1 Description of Processes

The Attica Facility manufactures large motive and standby power lead acid batteries for commercial, industrial, and military applications. Manufacturing processes include casting / curing lead battery parts, pasting battery grids, plate processing, battery assembling, charging and finishing. Supporting operations at the Attica Facility include material receiving, product

shipment, quality control laboratory analysis, equipment maintenance, wastewater pretreatment, waste management, and administration.

C&D produces lead oxide by heating one ton ingots in a melting furnace until a molten state is reached. The molten lead is transferred by gravity to a Barton pot where it is mixed with air to solidify, ground into a granular form, and under controlled atmospheric conditions it is combined with air to form lead oxide. The reaction is controlled by the amount of draft created by the exhaust fan at the discharge of the primary baghouse, and by the amount of lead charged. The lead oxide is drawn by draft into a baffled settling chamber where approximately 40% of the oxide is removed. From the settling chamber, the air is pulled to a high efficiency cyclone where an additional 50% of the oxide is removed by centrifugal force. The remainder of the product is removed from the air stream by a cloth filter baghouse. The discharged air is continuously monitored by electronic controls, and in the event of a malfunction, the draft is automatically switched to a backup baghouse. All the material is collected in a closed conveyor system and transferred to storage tanks for shipment or use in other plant operations.

Approximately 18 melting pots are used in the casting department to heat ingots into a molten state. The molten lead is poured into molds for battery plates, posts, lugs and other parts for the battery assembly. Emissions from the pots are controlled by a filter system.

At two stacking fixtures, finished industrial battery plates are piled in alternating positive and negative block formation with separators placed between them. The stack of plates is then transferred to the cast-on machine where plate lugs are submerged in a pot and strap mold. Molten lead is pumped from a lead melting pot to the mold where posts and straps are cast directly on battery plate lugs. The assembled battery elements are removed from the cast-on machine and placed in containers where sulfuric acid is added in a later operation. Emissions from this operation are controlled by a baghouse.

Lead oxide paste is applied to the battery plates in the pasting department. Excess paste is removed from the plates and they are conveyed to a drying oven. Emissions from this operation are controlled by a wet scrubber.

The battery charging area has five roof exhaust fans, which remove acid fumes. Each battery container is connected to a metering pump, which fills the container to the required liquid level. After the containers are filled, they are removed to a charging rack for the initial charge.

2.3 FACILITY RCRA HISTORY

U.S. EPA tasked the E&E Field Investigation Team to conduct a Screening Site Inspection (SSI) of the Eltra Corporation C&D Batteries Division site. C.C. Johnson and Malhotra, P.C. (CCJM), a subcontractor to E&E under the above contract, was responsible for conducting the investigation.

The site was initially identified to the U.S. EPA in the form of a notification pursuant to section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The notification was prepared by William M. Reiter, Corporate Director for Pollution Control of Allied Chemical, Corporation, of Morristown, New Jersey, the parent

company of Eltra Corporation. The notification form listed the waste type as acids and heavy metals, and the waste source as a lead-acid battery plant (U.S. EPA 1981). Subsequently, the Site was evaluated in the form of a Preliminary Assessment (PA), prepared by Scott McCone of E&E and dated March 8, 1983. A revised executive summary was added to the PA by Mary Anne Hunter of the Indiana Department of Environmental Management (IDEM) and dated June 9, 1987 (U.S. EPA 1987).

E&E prepared an SSI work plan for the C&D Site under Technical Directive Document (TDD) F05-8710-075, issued on October 15, 1987. The work plan for the C&D Site was approved on October 26, 1988. The SSI of the C&D Site was tasked on October 31, 1988, under the same TDD and was conducted on August 7, 8, and 9, 1989.

The E&E SSI included an interview with site representatives, a reconnaissance inspection of the Site, the collection of environmental samples (twelve soil samples, three municipal well samples, two surface water samples, and nine soil gas samples), and obtaining photographs of current Site conditions and sampling locations.

In February 2005, a meeting was held between the City of Attica, Hannum, Wagle & Cline Engineering (HWC), EPA, IDEM, C&D, and Radio Materials Corporation (RMC) to discuss the trichloroethylene (TCE) concentration detected in samples from the City of Attica drinking water supply wells. As a result of this meeting, C&D agreed to install monitoring wells around their property to investigate concentrations of any possible contaminants originating from their site. On January 5, 2006, C&D submitted to U.S. EPA a VOC Investigation Work Plan (Clayton 2006a). Clayton conducted detailed groundwater profiling at the C&D Facility in addition to the installation and sampling of five monitoring wells in January and February 2006. On April 12, 2006, C&D provided to EPA the VOC Investigation Report on the findings of the January and February 2006 sampling event performed by Clayton. The VOC Investigation Report (Clayton, 2006b) is included as Appendix F.

U.S.EPA Region 5 issued C&D the Order on January 18, 2007. As part of this Order, C&D submitted to U.S. EPA a Current Conditions Report on March 1, 2007. This RFI Work Plan is another required submittal under the Order.

2.4 RFI SAMPLING SWMUs AND AOCs

The RFI SWMUs and AOCs requiring investigation activities as identified in the CCR are listed below. Locations of the SWMUs and AOCs are illustrated on Figure 2-2.

- Wastewater Pretreatment Plant
- Current/Former Acid Lofts
- Lead Oxide Storage Silos
- Storm water sewers
- Exterior Former Hazardous Material Storage Areas
- Exterior Former Drum Storage Area and Transfer Pad
- Poly-mixing Room

- Historical Drive-Up Disposal Area
- Historical Former Waste and Dust storage Room
- Southwest Historical Former Container Storage Area
- Northeastern Historical Former Container Storage Area
- Central Vacuum Systems
- Former Oxide Mill Area
- Former Onsite Filling Station
- West Container Storage Area
- Former DC Generators Location

Physical descriptions of each SWMU and AOC and descriptions of the waste managed were previously provided in the CCR and are briefly provided in Section 4.2.3 of this RFI Work Plan.

This Project Management Plan (PMP) provides the technical approach, management approach, and personnel to be utilized for implementation of the RFI. Specifically, it identifies the interrelationships between the various members of the project team and discusses the overall technical approach for the RFI. It also presents the qualifications of the key personnel who will be assigned to this investigation.

3.1 INTRODUCTION

The PMP presented herein describes the administrative and technical management approach to assure that the RFI Work Plan meets the requirements of Section 14.b. of the Order. The plan specifically addresses the following areas:

- The technical approach for the RFI Work Plan;
- Overall management approach to implementation of the RFI Work Plan;
- Key project personnel responsibilities and qualifications; and
- Project communication.

The preliminary project schedule for implementation of the RFI is detailed in Section 4.6 (RFI Scope of Work & Objectives) of this RFI Work Plan.

3.2 TECHNICAL APPROACH

The RFI will consist of collecting and analyzing soil samples (from appropriate depths) from the identified SWMUs and AOCs, evaluating the results, and determining the need for corrective action (if any) using a tiered risk-based approach. Groundwater samples will be collected from new and existing wells to determine if any release to groundwater has occurred. The tiered approach to risk evaluation will play an important role throughout the RFI program in the evaluation of the potential for chemicals in soil and/or groundwater to pose unacceptable risks to human health and/or the environment.

Facility-specific risk evaluations will be conducted for soil on a SWMU-by-SWMU basis, or for groups of SWMUs, as appropriate, and for groundwater by geologic zone (shallow and deep). The risk evaluation will be conducted for each SWMU or groundwater zone when it is determined that all data necessary for the evaluation have been collected. By conducting the SWMU risk evaluations when sufficient and appropriate data are available, corrective measures, where needed, can be identified and implemented in a timely manner. This approach, then, allows for continued results-oriented progress throughout the RFI program.

- The tiered approach is presented in the flowcharts in Figures 3-1 and 3-2 and discussed in greater detail in Section 3.3.

The results of the tiered risk evaluations will be used to identify if no further action is appropriate and where further evaluations or remedial action are necessary at the Facility. The completion of the RFI will result in one of the following decisions for each SWMU or AOC to be investigated:

- No Further Action Under the Current Use Scenario;

- Additional Data Collection and/or Risk Evaluation;
- Interim Measures (if needed); or
- Corrective Measures Proposal (CMP) or Corrective Measures Study (CMS) (if needed).

A detailed description of the RFI scope of work is described in Section 4 of this RFI Work Plan.

3.2.1 RFI Soil Investigation

The purpose of the RFI soil investigation is to conduct confirmatory sampling at SWMUs and AOCs where there has not been a documented release to the subsurface; and to conduct more extensive sampling at SWMUs and AOCs where releases are known to have occurred to determine the nature and extent of any release. The scope of work for the RFI soil investigation is discussed in Section 4.2 of this RFI Work Plan.

3.2.2 RFI Groundwater Investigation

Low concentrations of trichloroethene (TCE) were detected in groundwater samples collected from three of the five on-site monitoring wells (MW-1, 2, and 3) during a groundwater VOC investigation conducted by Clayton in January and February 2006. Lithology of the subsurface soils recorded during installation of the five existing monitoring wells indicates a four to six feet-thick till layer is present at approximately 47 to 55 ft bgs that appears to separate the Wabash River alluvium present beneath the Site into two distinct water bearing zones. The existing on-site monitoring wells are screened in the deeper water bearing zone of the alluvium, as follows: MW-1 (95 to 105 ft bgs), MW-2 (85 to 95 ft bgs), and MW-3 (105 to 115 ft bgs). MW-4 and MW-5 were both screened at 55 to 65 ft bgs. Analytical results of groundwater samples collected during groundwater profiling at each monitoring well location indicate TCE was not detected in groundwater samples collected at depth intervals in the shallow water bearing zone above the till layer. The VOC Investigation Report is presented as Appendix F.

Therefore, the technical methodology for the RFI will focus the groundwater investigation toward the shallow water bearing zone above the till layer. URS will install four additional monitoring wells within the shallow water bearing zone to determine if TCE and/or other VOCs and lead are present that could potentially impact the deeper water bearing zone. Groundwater samples will also be collected from the existing (deeper zone) onsite monitoring wells and analyzed for TCE and lead. The hydraulic gradient and flow direction will be determined for both water bearing zones.

The scope of work for the initial phase of the groundwater investigation is detailed in Section 4.3 of this RFI Work Plan.

3.3 POTENTIAL RECEPTOR IDENTIFICATION PLAN

The Potential Receptor Identification Plan for both human and ecological receptors and conceptual site models for each scenario are discussed below.

3.3.1 Human Health Risk Evaluation Approach

Analytical results for environmental media collected under the RFI program will be evaluated using a tiered risk-based approach, consistent with U.S.EPA guidance (U.S.EPA 1989b). An overview of the tiered risk-based approach is presented in the following subsections. Briefly, the tiered risk-based approach consists of a Tier 1 screening evaluation to identify PCOCs. The PCOCs are quantitatively evaluated in Tier 2 in a Facility-specific human health risk evaluation. In Tier 2, cumulative risk levels/hazard indices will be calculated for PCOCs. If the cumulative risk level/hazard index for a particular PCOI exceeds its target risk level, it will be identified as a COC, and remedial goals (RGs) will be developed based on the exposure scenarios used in the risk evaluation.

Human Health Risk Evaluation Approach

The risk evaluation will assess potential risks to human receptors exposed to chemicals in environmental media at the Site. Because C&D is an active industrial Facility and will continue to remain so, the risk evaluation will focus on potential risks to on-site industrial receptors, i.e., industrial workers, and construction and maintenance workers. However, the Wabash River also lies adjacent to the Facility, and there is a vegetated riparian buffer between the river and the Facility. Therefore, potentially complete exposure pathways are present to recreational users that may be present in the vegetated riparian buffer, as well as anglers that catch and eat fish from the river.

The environmental data collected as part of the C&D RFI program will be evaluated, and the need for corrective action (if any) will be determined, using a tiered risk-based approach. The tiered approach to risk evaluation will play an important role throughout the RFI and the remainder of the corrective action program in the evaluation of the potential for chemicals in soil and/or groundwater to pose unacceptable risks to human health and the environment. The primary objectives of the tiered risk-based approach are to:

- Ensure the protection of human health and the environment;
- Facilitate efficient decision-making regarding the need for corrective measures;
- Aid in the development of the scope of work for the RFI, including the QAPP, to ensure collection of data appropriate for risk evaluation; and
- Streamline the investigation and remediation of SWMUs and AOCs by focusing on those chemicals and SWMUs and AOCs that are most likely to present a potential risk, thereby, reducing the number of chemicals and SWMUs and AOCs that are carried through a detailed risk evaluation.

Applying this approach, individual chemicals present at a Facility undergoing corrective action may be eliminated from further investigation/action by comparing Facility-specific chemical concentrations to predetermined screening concentrations. The purpose of the comparison is to support decisions for no further action for individual chemicals at a particular SWMU or AOC.

Facility-specific risk evaluations will be conducted on a SWMU-by-SWMU basis, or for groups of SWMUs, as appropriate, and for groundwater. Data will be evaluated using the Tier 1 screening process described below to: 1) aid in the determination of whether further investigation

is warranted, and 2) help define the scope of any further investigation, where appropriate. The fundamentals of the tiered risk-based approach are summarized below:

- Tier 1 – In Tier 1, chemical concentrations are compared to readily available conservative risk-based criteria and Facility-specific background concentrations to identify COCs. The Tier 1 screening will be conducted using a target risk level of 10^{-6} for potential carcinogens and a target hazard index of 0.1 for noncarcinogens.
- Tier 2 – The Tier 2 risk evaluation will consist of a Facility-specific risk evaluation conducted on the COCs identified in Tier 1. The risk evaluation will follow U.S.EPA guidance. The results will be compared to a cumulative target risk level of 10^{-4} for carcinogens and a cumulative target hazard index of one for noncarcinogens, the latter summed based on toxic effects on the same target organs.
- Tier 3 - If COCs are identified following the Tier 2 risk evaluation, further evaluation may be conducted, i.e., a Tier 3 risk evaluation. In a Tier 3 human health risk assessment, exposure assessment and risk characterization may be refined using several techniques. Examples of Tier 3 considerations include the following:
  - Exposure parameters may be estimated as probability density functions, using Monte Carlo analysis, rather than point estimates. The resultant risk characterization would express risks and hazards as a range of probabilities rather than as deterministic point estimates.
  - Site-specific exposure factors may be obtained; i.e., fish ingestion rates, fraction of fish ingested, etc. through local surveys.
  - Collection of fish tissue to provide actual measurements for the fish ingestion pathway.

The results of the tiered risk evaluations will be used to identify if no further action is appropriate, or where further evaluations or remedial action are necessary at the Facility. The quantitative risk evaluation will be performed using U.S.EPA standard risk assessment guidance (U.S.EPA, 1989b; 1991; 1992a, b; 1997a, 2004) and information from the scientific literature. RGs will be calculated for those COCs that are responsible for exceedances of the appropriate target risk levels based on the exposure scenarios used in the risk evaluation. If the measured chemical concentrations exceed RGs, then corrective measures may be implemented.

Human Health Conceptual Site Model

Conceptual Site Models (CSMs) are used to guide evaluation of the potential risks to human health and the environment associated with the Site. CSMs are living, evolving depictions of the current best understanding of exposure potential. They present graphical information about sources of chemicals and the movement of chemicals through environmental media to locations where human and ecological receptors may come into contact.

Exposure pathways are determined by environmental conditions (e.g., location of surface waters, groundwater, vegetative cover, prevailing wind direction, meteorological factors), by the potential for chemical migration from one environmental medium (e.g., soil, groundwater, surface water, or air) to another, and by the general activities of the potentially exposed populations (e.g., exposure frequency and duration, type of activity in the area of interest). Each

pathway describes a unique mechanism by which a population or an individual receptor may be exposed to a chemical(s). Although several potential pathways may exist, not all are usually complete or significant. For a pathway to be complete, the following conditions must exist (U.S.EPA 1989):

- A source and mechanism of chemical release to the environment;
- An environmental transport medium (e.g., air, water, soil);
- A point of potential receptor contact with the medium; and
- An exposure route at the contact point (e.g., inhalation, ingestion, dermal contact).

Those pathways identified as potentially complete will be used to define sampling needs in the RFI, and will be examined further in the risk evaluation process. Potentially complete exposure pathways found to be insignificant (i.e., those for which no chemicals are identified at concentrations greater than screening criteria) will not be retained for further evaluation in a baseline risk assessment.

Site Description

The site is currently industrial, and future use of the site will continue to be industrial. With the exception of a gravel covered area where trucks are parked, there are essentially no exposed soils at the Facility. However, there are exposed soils surrounding the Facility. These include residences to the northeast of the Facility, commercial buildings to the southeast and southwest, and a riparian area along the Wabash River to the west. The riparian area along the Wabash River is used as a recreational area as evidenced by the presence of trails, campfire residuals, and fishing paraphernalia. There is a municipal groundwater well located adjacent to the Facility to the south.

A description of each SWMU and AOC is presented in Section 4.2.3 of the Work Plan. A summary of potential exposure pathways and receptors associated with each SWMU and AOC is presented in Table 3-1.

Exposure Pathways and Receptor Identification

Exposure pathways for the Facility may be categorized based on whether 1) the SWMUs or AOCs are located interior to buildings or covered with pavement or concrete, or 2) they are, or in the past have been, located outside (i.e., exterior) and thus subject to wind and precipitation. A preliminary CSM is presented in Figure 3-3 that identifies potential sources of chemicals, environmental release mechanisms, exposure pathways, exposure routes, and human receptors specific to interior or covered SWMUs at the site. Potential exposure pathways have been identified as potentially complete or incomplete. The majority of the SWMUs at the Facility are located in enclosed areas of the Facility infrastructure or below concrete or pavement, and there is no longer any evidence of waste handling activities. In these areas, direct soil exposures to industrial workers are incomplete because there is a barrier (e.g., floors or pavement) between soils and workers. Rather, remnants of historical releases are associated with soils beneath floors or paved areas. In these areas, potentially complete direct exposure pathways exist for maintenance/utility workers, or future construction workers. If volatile chemicals are present in subsurface soils or groundwater, inhalation via vapor intrusion represents a potential complete

exposure pathway for industrial workers, as well as maintenance/utility, or construction workers. Chemicals in the subsurface soils may also leach to groundwater, where offsite migration may contribute to drinking water supplies. Groundwater may also discharge to the adjacent surface water in the Wabash River, where potentially bioaccumulative chemicals may accumulate in fish and subsequently be caught and ingested by anglers.

A preliminary CSM depicting potential transport and exposure pathways for exterior SWMUs and AOCs is shown in Figure 3-4. SWMUs and AOCs that are currently, or were historically exterior to buildings could be subjected to wind and precipitation. Windblown particulates may have been deposited on soils adjacent to the Facility, including offsite residential and recreational areas. Precipitation subjects materials to stormwater runoff. The majority of onsite runoff is currently captured in the stormwater management system which is subject to regular monitoring, although this was not always done historically. Soils on or adjacent to the site could also be subject to erosion, whereby particulates soils historically, transported downgradient toward the adjacent Wabash River and deposited in the riparian zone or in river sediments. However, sediments currently located adjacent to the site are not considered representative of historical releases because they are subject to constant change and impact from other upstream discharges and urban development.

Based on knowledge of current conditions at the sites and surrounding areas, the following text summarizes the exposure pathways evaluation for potential receptor populations at the Site:

- **Industrial Worker** – Industrial workers are unlikely to be exposed to soils because the majority of the site is covered with buildings or pavement. There is a gravel parking area to the north of the Facility; however, this area is limited in extent and covers any soils that may historically have been exposed. Vapor intrusion could occur in areas where solvents were historically released, and act as a continuing source to building interiors. Therefore, the only significant pathway for the current or future industrial worker is inhalation of surface soil or groundwater-derived vapors.
- **On-Site Construction Worker** - Construction workers may potentially be exposed to chemicals in surface and subsurface soils during future site construction activities. Subsurface soil depths are assumed to be 1 to 5 ft bgs. Potentially complete exposure pathways include incidental ingestion and dermal contact with surface and subsurface soils, and inhalation of soil-derived particulates and vapors. As groundwater depths are well below the top 1 to 5 ft, exposure to groundwater is considered an incomplete pathway for the construction worker.
- **On-Site Maintenance/Utility Worker** - A maintenance/utility worker may potentially be exposed to chemicals in surface and subsurface soils during the installation and repair of subsurface utility lines. Subsurface soil depths are identified as 1 to 5 ft bgs based on current and anticipated future industrial activities. However, local areas with utilities at greater depths (up to 20 ft bgs) occur to the northeast of the Facility; therefore, varying exposure depths must be considered in different areas of the Facility. Exposure pathways evaluated include incidental ingestion and dermal contact with soils, and inhalation of soil-derived particulates and vapors. Dermal exposure to chemicals present in groundwater may be complete if the assumed exposure depth of up to 20 ft bgs is below the water table. Water depths were measured at 25 to 36 ft bgs as reported in the VOC Investigation Report (Clayton, 2006).

- **Offsite Resident** – Windblown dust associated with past releases may have been deposited on soils of residents adjacent to the Facility. Dermal exposure and incidental ingestion of soils are potentially complete exposure pathways. As noted previously, a municipal groundwater withdrawal well is located south of the Facility. Groundwater flow direction is to the west northwest and away from the residences located to the northeast. Vapor intrusion could potentially occur if VOCs have contaminated groundwater plumes migrating offsite.
- **Recreational User** – There is evidence of recreational use of the riparian area adjacent to the Facility along the Wabash River. Exposure scenarios may be complete for a recreational receptor that may walk or picnic along the shoreline of the Wabash River and be exposed to floodplain soils or exposed sediments during low water periods. Dermal exposure and incidental ingestion of soils or exposed sediments are potentially complete exposure pathways. Swimming is not considered a likely exposure scenario.
- **Angler** – Potentially bioaccumulative chemicals transported via groundwater or surface water runoff may accumulate in fish, which are subsequently caught and ingested. Fish ingestion represents a potentially complete exposure pathway if bioaccumulative chemicals are present. Examples of bioaccumulative chemicals are PCBs. Lead is not considered a bioaccumulative chemical of concern.

Currently, there are no known on-site exposures to groundwater. However, as noted above, the future maintenance/utility and construction workers could potentially be exposed to shallow groundwater. In addition, the Attica municipal water withdrawal wells are located just to the south of the Facility. As reported by E&E (1990) the nearest private residential water well is located 0.7 miles east (upgradient) of the Facility.

RFI Risk Evaluation for Soils

The tiered risk-based evaluation process is described in greater detail in this section. Tier 1 is a screening step as discussed below. If the concentrations of any chemicals exceed the Tier 1 screening criteria, a quantitative Tier 2 risk evaluation may be conducted. Tier 3 may be used to further refine human health risk estimates. The application of the tiered risk-based process to the evaluation of soil analytical data collected under the RFI is described below.

Tier 1 Screening Evaluation

Chemical concentrations detected in soil samples collected during the RFI will be compared to the most current U.S.EPA Region 9 Preliminary Remediation Goals (PRGs), which are conservative risk-based criteria developed based on a target cancer risk of 10^{-6} and a target hazard index of one for noncarcinogens (U.S.EPA 2004). For the purposes of screening, the PRGs for noncarcinogens will be adjusted to a target hazard index of 0.1. For the C&D site, on-site land use is industrial and will remain so; therefore, the PRGs for industrial soil will be used. The U.S.EPA Region 9 PRGs for industrial soil are also appropriate screening criteria for the recreational user exposure scenario as the frequency and duration of exposure for this receptor is much less than the daily exposures assumed for the industrial scenario used to construct the Region 9 PRGs for industrial soil.

Per U.S.EPA guidance, a chemical whose maximum detected concentration exceeds its industrial soil PRG will be considered a COC for that SWMU or AOC and will be carried into the next tier

of the process (U.S.EPA, 1999a). Chemicals identified as essential nutrients (calcium, chloride, iodine, magnesium, phosphorus, potassium, and sodium) will not be included in the risk screening.

In addition, chemical concentrations in soil will be compared to Facility-specific natural and anthropogenic background concentrations. Background comparisons will be made following approaches outlined in U.S.EPA guidance (U.S.EPA 2004). Any chemical that exceeds its respective industrial PRG but is less than background will not be evaluated further.

Chemicals retained after this step are identified as COCs and are carried forward to the next tier of evaluation.

Tier 2 Quantitative Risk Evaluation

The Tier 2 risk evaluation will be a Facility-specific risk evaluation of a SWMU or AOC, or group of SWMUs or AOCs that may include varying degrees of sophistication depending on the Facility/SWMU-specific conditions and extent of impact. The results of the Tier 2 risk evaluation will be used to identify if no further action, additional evaluation, or corrective action is necessary. If a SWMU or AOC poses a cumulative cancer risk greater than 10^{-4}, or a hazard index greater than one for chemicals that act on the same organ, then additional information to support risk characterization may be collected to further support the evaluation, a Tier 3 risk evaluation may be conducted, or RGs may be calculated for those COCs that are responsible for the risk exceedances. If the target risk levels are not exceeded, then the SWMU or AOC will be designated as requiring no further action.

Risk Evaluation of Lead

The risk evaluation and toxicological approach used by USEPA and other agencies for lead is unique from other chemicals. Specifically, no USEPA-approved slope factors or reference doses are available for lead (USEPA, 2000). This is because there is uncertainty about the shape of the dose-response curve for lead.

Much of the toxicological information for lead describes dose-response in terms of blood lead levels rather than in terms of exposure or intake dose. Therefore, mathematical models have been developed to estimate blood lead levels that may result as a consequence of exposure to lead in the environment. Consistent with U.S. Steel's overall strategy towards risk evaluation, a tiered approach for human health risk evaluation for lead will be used.

Tier 1 Screening

The first tier will consist of comparison of facility concentrations to screening levels for lead, including background. USEPA Region 9 PRGs provide screening values for lead in soil. The most current industrial PRGs for lead at the time of conduct of the screening will be used. A screening level of 15 µg/L for lead in drinking water will be used (USEPA, 2000c).

The appropriate facility concentration to be used in conjunction with the child and adult lead model is the arithmetic mean concentration (USEPA, 1994; 1996). However, the Tier 1A screening step for lead will first be conducted using the maximum detected concentration. If an exceedance occurs, the arithmetic mean concentration will then be compared to the appropriate screening level. Areas with arithmetic mean concentrations of lead less than the appropriate screening level will not be considered to present a risk associated with lead, and will not be

considered further. If the arithmetic mean concentration exceeds the screening value, then the arithmetic mean concentration will be used in the appropriate models in Tier 2.

Tier 2 Quantitative Risk Evaluation

Tier 2 (for areas with lead concentrations exceeding background and Tier 1 screening levels) will involve the use of an appropriate mathematical model for lead exposure and health effects. The Tier 2 evaluation will use default and easily obtainable facility-specific parameter values in the models.

The adult lead exposure model (ALEM) is the model currently used by USEPA to evaluate adult exposures in the workplace (USEPA 1996). This methodology was developed by the USEPA Technical Review Workgroup for Lead to be protective of women of childbearing age. Because the model is designed to protect an unborn fetus, which is considered to be especially sensitive to elevated lead exposures, the 95% UCL target blood lead concentration of 10 µg/deciliter is used (Centers for Disease Control, 1991; USEPA, 1994). This approach is based on the original work of Bowers et al. (1994).

In Tier 2, facility-specific exposure parameters will be used as inputs to the lead model. Key parameters that may be evaluated for use in Tier 2 soil evaluations include fraction ingested from the source area, exposure frequency, bioavailability, meteorological factor adjustment, soil ingestion rate, dermal adherence, and calculating soil and dust ingestion as separate pathways. USEPA provides guidance on the use of the lead models at [http://www.epa.gov/superfund/health/contaminants/lead/index.htm]. This website will be consulted prior to making any site-specific modifications to the models.

Tier 3, if necessary, may entail facility-specific speciation, solubility, and bioavailability studies on lead in soil. In addition, Tier 3 may involve probabilistic analysis of blood lead levels.

RFI Risk Evaluation for Groundwater

A tiered risk-based approach also will be used for evaluating analytical results from groundwater. Groundwater represents a potentially complete exposure pathway as there is a municipal water withdrawal well south of the Facility. The application of the tiered risk-based process to the evaluation of groundwater analytical data collected under the RFI is described below.

Tier 1 Screening

Chemical concentrations detected in groundwater samples collected during the RFI will be compared to the most current federal drinking water standards or Maximum Contaminant Levels (MCLs). Where MCLs are not available, the U.S.EPA Region 9 PRGs for tap water will be used. For the purposes of screening, the PRGs will be based on a target cancer risk of 10^{-6} and for noncarcinogens the PRGs will be adjusted to a target hazard index of 0.1.

A chemical whose maximum detected concentration exceeds the Tier 1 screening criterion will be considered a COC and will be carried into the next tier of the process (Tier 2). Chemicals identified as essential nutrients (calcium, chloride, iodine, magnesium, phosphorus, potassium, and sodium) will not be included in the risk screening.

In addition, chemical concentrations in groundwater will be compared to regional and Facility-specific natural and anthropogenic background concentrations, if available, as part of Tier 1 screening. Where Facility-specific background data are available from upgradient wells for this screen, the maximum detected concentration of a chemical detected in a Facility well will be compared to two times the arithmetic mean concentration detected in the Facility-specific background samples. Any chemical that exceeds its respective Tier 1 screening criterion but is less than its background concentration will not be evaluated further.

Chemicals retained after this step are identified as COCs and are carried forward to the next tier of evaluation.

Tier 2 Quantitative Risk Evaluation

PCOCs identified in groundwater that exceed Tier 1 screening criteria may undergo a Tier 2 quantitative risk evaluation. Data used in Tier 1 will be reviewed to determine if additional data are needed to conduct the Tier 2 evaluation.

The Tier 2 risk evaluation will be a Facility-specific risk evaluation based on the CSM for groundwater developed using the results from the RFI. The Tier 2 risk evaluation will focus on complete exposure pathways at identified points of exposure (on-site or off-site). Fate and transport evaluation will be used to consider the potential for transport and attenuation of chemicals in groundwater. In addition, Tier 2 risk options may include the use of Facility-specific bioavailability data, Facility-specific exposure durations or frequencies and/or stochastic (Monte Carlo) analysis following U.S.EPA guidance (U.S.EPA, 1992a; 1997b, c; 1999b).

The results of the Tier 2 risk evaluation will be used to identify if no further action is appropriate and where remedial action is necessary. If groundwater poses a cumulative cancer risk greater than 10^{-4} for a receptor or a hazard index greater than one for chemicals that act on the same organ, then RGs will be calculated for those COCs that are responsible for the risk exceedances. If the target risk levels are not exceeded, then a no further action determination will be recommended.

3.3.2 Ecological Risk Evaluation Approach

As with the human health risk evaluation, the ecological risk evaluation will be carried out in a tiered manner. In areas that comprise ecological habitat, analytical data collected during Tier 1 sampling will be compared to conservative, ecologically protective ecological screening concentrations (SCs). SCs will be developed for ecologically relevant components of the ecosystem identified through the Problem Formulation process. Problem formulation is a systematic planning step that identifies major factors to be considered (U.S.EPA 1992a). Consistent with the Problem Formulation process, the following subsections discuss the ecological components relevant to the Site through development of an ecological conceptual exposure model and also presents assessment endpoints. Assessment endpoints are the relevant ecological values to be protected.

Ecological Conceptual Exposure Model

Habitat Description

There is no ecological habitat directly on the Site, as it is covered nearly in its entirety by buildings, pavement, or gravel. However, relevant ecological habitats are located in the riparian area along the Wabash River adjacent to the Site, comprising a terrestrial/ wetland habitat. Common vegetation observed during a site visit by a senior URS biologist in July 2007 included box elder, silver maple, cottonwood, mulberry and sycamore, with a sparse understory of herbaceous vegetation. The Wabash River represents a relevant aquatic ecological habitat that may have been influenced by Site releases.

Potential transport pathways include windblown dust; groundwater transport and discharge to the river; and surface water runoff from the SWMUs and AOCs to soils of the riparian buffer along the river, and surface water and sediments of the Wabash River. In the riparian buffer, potentially complete exposure pathways exist for soil invertebrates, plants, birds and mammals. In the Wabash River, potentially complete pathways exist for benthic macroinvertebrates, fish and plankton, birds and mammals. It is noted, however, that although historical releases to sediments may have occurred, sediments currently located adjacent to the Site are not considered representative of historical releases because they are subject to constant change and impact from other upstream discharges and urban development. The only relevant pathway that will be considered relevant to the site is transport of groundwater to sediment pore water, and susbsequent exposures to benthic organisms.

An ecological CSM is shown on Figure 3-5. It is noted that potentially complete pathways also exist for reptiles and amphibians in both the terrestrial and aquatic environments. These are acknowledged as potentially complete, but are not shown on Table 3-1, or Figure 3-5, as there is generally little or no information with which to evaluate the consequence of such exposures. For the purposes of the ecological CSM, terrestrial birds and mammals are assumed to forage only for terrestrial dietary items within the riparian area. Birds and mammals foraging within the Wabash River are assumed to forage via an aquatic foodweb and are termed semiaquatic.

Sensitive Receptors/Habitats

An important component of the ecological risk evaluation is to identify whether sensitive receptors or habitats are present in the area of interest (AOIs) that warrant special consideration. These include rare, threatened and endangered species, or habitats known or perceived to be worthy of special attention. This section will be completed prior to submittal to U.S.EPA.

Ecological Exposure Pathways

Ecological exposures are limited primarily to surface water and the upper few inches of soil or sediment. For organisms living directly in soil, sediment or surface water, exposure occurs by direct (i.e., dermal) contact. Examples include roots of vegetation or invertebrates in direct contact with soil/sediment, and fish and plankton in the water column. The primary exposure pathways for vertebrate receptors are incidental ingestion of environmental media and ingestion of dietary items containing chemicals as a result of bioconcentration/accumulation (i.e., food chain exposures). As discussed in EPA (1993), the inhalation pathway generally is not

quantified for ecological receptors and is not considered a significant pathway. Direct dermal contact with soil or sediment could potentially occur via digging or probing for food; however, most soil/sediment does not reach the epidermis of wildlife because of the presence of fur or feathers and is not quantified. Although the inhalation and dermal exposure pathways are potentially complete, they are not considered significant and will not be evaluated. However, it is acknowledged that this can contribute to uncertainty in the risk evaluation and will be discussed in the uncertainty analysis.

Selection of Assessment Endpoints

Assessment endpoints represent specific ecological values to be protected and are the focus of the ecological risk assessment (ERA). Based on the types of receptors in the study area and the media of interest, exposure pathways include direct contact or ingestion pathway exposures to riparian soils, and surface water in the Wabash River. Relevant ecological receptors are aquatic or semi-aquatic receptors. Based on the previous discussion of potential receptors and exposure pathways, the following preliminary (Tier 1) assessment endpoints are applicable to the AOIs.

Viability and Function of the Fish Community

Fish communities in the Wabash River play a key role in ecosystem functions such as energy flow, nutrient cycling and organic matter accumulation, and are an important food resource for higher trophic level species.

Survival, Growth, and Reproduction of Semiaquatic Birds and Mammals

The term semiaquatic as applied in this evaluation is applied to birds and mammals that are assumed to forage exclusively within the aquatic habitat of the Wabash River. Semiaquatic birds and mammals serve functions as herbivores, omnivores, and carnivores. They are important in energy transfer and nutrient processing, and contribute to a balanced community in terms of species diversity and abundance.

Viability and Function of the Soil Invertebrate Community

The soil invertebrate community of a terrestrial ecosystem plays a key role in ecosystem functions such as nutrient cycling and organic matter processing. Soil invertebrates can be an important food resource for upper trophic level species such as insectivorous mammals and birds.

Viability and Function of the Vascular Plant Community

The terrestrial rooted vascular plant community provides many functions within the ecosystem. Included within these functions are erosion prevention (both water and wind caused erosion), promotion of rainwater percolation, restriction of sheet water flow leading to reduced flooding potential, reduction of surface wind velocity, providing nesting and cover habitat for wildlife, primary production via photosynthesis, and a source of organic mater input (energy) to streams and soil systems.

Survival, Growth, and Reproduction of Terrestrial Birds and Mammals

The term terrestrial as applied in this evaluation is applied to birds and mammals that are assumed to forage exclusively within the riparian habitat along the Wabash River. Terrestrial birds and mammals function within the ecosystem the same as the semiaquatic birds and mammals discussed previously.

It is noted that reptiles and amphibians are also important within the ecosystem as they provide a link between the aquatic and terrestrial systems and act as both predators and prey. Predation by and of amphibians and reptiles contributes to balanced populations of other aquatic and terrestrial organisms, which are essential for normal ecosystem functioning. However, there are virtually no oral toxicity data available for amphibians, reptiles, or invertebrates with which to evaluate ingestion exposures for most chemicals. Though there may be adequate knowledge of an animal's behavior and physiology to estimate exposures with reasonable accuracy, it is of limited practical value to do so if there is no basis for evaluating the consequences of the exposures. For this evaluation, it is acknowledged that reptiles and amphibians may be present. However, in the absence of sufficient toxicological information, the evaluation of other assessment endpoints will be assumed to be reasonably representative and protective of reptiles and amphibians as well.

The application of the tiered risk-based process to the ecological risk evaluation in the RFI is described below.

Tier 1 Ecological Screening Evaluation

Chemical concentrations detected in soil, sediment, and surface water samples collected during the RFI will be compared to conservative ecological screening values (ESVs). If the maximum concentration detected is greater than the respective ESV for each assessment endpoint, and the chemical also exceeds background concentrations, then that chemical will be identified as a chemical of ecological interest (COEI) warranting further evaluation. SCs or screening approaches for each of the assessment endpoints are summarized in the following table.

Assessment Endpoint	Ecological Screening Values
Viability and Function of the Soil Invertebrate Community	Soil ESVs will be compiled from the following sources in order of priority, as available: • Lowest of the ecological soil screening levels (EcoSSLs) for the protection of plants and invertebrates (U.S.EPA 2007) • Lowest of the ORNL soil screening benchmarks for plants and soil invertebrates (Efroymson et al. 1997a, b)
Viability and Function of the Vascular Plant Community	
Survival, Growth, and Reproduction of Terrestrial Birds and Mammals	To evaluate the ingestion pathway for terrestrial birds and mammals, any bioaccumulative chemical detected will be considered a COEI. Bioaccumulative chemicals will be defined as those chemicals listed as bioaccumulative chemicals of concern (BCCs) under the Great Lakes Water Quality Initiative (40 CFR 1326, Table 6, Subpart A).

Assessment Endpoint	Ecological Screening Values
Viability and Function of the Fish Community	The preferred source of screening values for surface water will be Indiana chronic water quality criteria (Indiana 2007). Other sources, in order of preference, will be National Recommended Water Quality Criteria, (U.S.EPA 2007b), and Oak Ridge National Laboratory (ORNL) Tier II chronic aquatic benchmarks as available in Suter and Tsao (1996). Surface water data will not be collected during the first phase of the RFI. Rather, the relevant transport medium, i.e., groundwater, will be evaluated. For groundwater, it is important to recognize that there is no immediately direct exposure pathway. However, a complete pathway exists when groundwater discharges to the Wabash River. Because dilution occurs during migration and upon discharge of groundwater to surface water, 10 times the applicable surface water SV will be used as a groundwater ESV, consistent with the procedure used by the National Oceanic and Atmospheric Administration Coastal Protection and Restoration Division procedure for screening groundwater (NOAA 1999). The use of the dilution factor of 10 as prescribed by NOAA is also consistent with RCRA Guidance for estimating exposure concentrations of chemicals in groundwater to surface water receptors.
Survival, Growth, and Reproduction of Semiaquatic Birds and Mammals	To evaluate the ingestion pathway for semiaquatic birds and mammals, any bioaccumulative chemical detected in groundwater will be considered a potential COEI in surface water. Bioaccumulative chemicals will be defined as those chemicals listed as bioaccumulative chemicals of concern (BCCs) under the Great Lakes Water Quality Initiative (40 CFR 1326, Table 6, Subpart A).

Tier 2 Ecological Risk Evaluation

In Tier 1, conservative ESVs were based predominantly on concentrations where there is little potential for effect. In Tier 2, toxicity reference values (TRVs) will be selected based on both no-effect (no observed adverse effect levels), and lowest-effect (lowest observed adverse effect levels) concentrations or doses to provide a range in the potential for effects. The measurement endpoint in Tier 2 for each of the assessment endpoints will be a comparison of the exposure concentration (expressed as an ecological exposure concentration [EEC] or average daily dose [ADD]) to the TRV. This comparison is portrayed in a ratio termed the hazard quotient (HQ):

HQ = EEC/TRV (for plants, invertebrates, or fish)

HQ = ADD/TRV (for birds and mammals)

To develop a measurement by which each assessment endpoint and associated COEI is evaluated, an applicable ecological component will be identified that is representative of the assessment endpoint. For direct exposures, the ecological component is generically defined by the assessment endpoint (e.g., benthic macroinvertebrates, or plants). For ingestion pathway exposures associated with higher vertebrates, however, a specific receptor is generally selected to represent the assessment endpoint. These representative receptors are referred to herein as

receptors of interest (ROIs). ROIs are selected in Tier 2 because toxicity reference values (TRVs) used for comparing environmental exposures to potential effects are species-specific. The following will be taken into consideration in the selection of ROIs in Tier 2:

- Probable intensity/duration of exposure. In general, species were selected that are known or anticipated to be relatively common and abundant in and around the study area. Given a choice between an infrequent or seasonal immigrant and a year-round resident, the latter received preference.
- Availability of relevant behavioral and physiological data. In general, preference was given to relatively well-studied species for which most biological attributes are readily accessible. When appropriate, for example, candidate receptors were selected from among those covered in the *Wildlife Exposure Factors Handbook* (U.S.EPA 1993a).
- Availability of relevant toxicological data. For ingestion-pathway exposures, virtually no oral toxicity data are available for amphibians or reptiles for most chemicals. Therefore, amphibians and reptiles were not selected as ROIs as indicated previously. This is largely true for many potentially relevant ROIs as well. However, toxicological information in the literature based on similar types of organisms is considered reasonable surrogate information. Nevertheless, there is a substantial lack of toxicological information for some chemicals, especially for birds.

Other considerations are relative sensitivity or species warranting special consideration. In addition, size serves as an "index" to behavioral and physiological differences that may influence the animals' susceptibility (and sensitivity) to chemicals. Smaller animals tend to be shorter-lived, occupy smaller home ranges (and occur in greater densities), and have higher metabolic rates. Therefore, when multiple potential receptors of similar attributes in terms of trophic structure, guild, and relative sensitivity re available as potential candidate receptors, the smaller receptors are generally selected in preference to, or in addition to, larger receptors.

For direct exposures in Tier 2, the EEC will be expressed as the 95% UCL, calculated in accordance with U.S.EPA guidance (U.S.EPA 2002). For ingestion pathway exposures II, meaningful inferences about the potential hazards of ingesting COEIs requires an understanding of the relationship between exposures, expressed as doses or rates (i.e., mass of COEIs/unit of receptor body weight/unit of time), and responses. Doses are estimated using:

- The measured and/or predicted concentrations of each COEI in media assumed to be ingested (i.e., food, water, and sediment); and
- Estimations of the mass of each COEI consumed per day, obtained by multiplying the concentration (mg/kg or μg/L) in a medium by the amount of that medium (kg or L) assumed to be ingested by an individual in the population of the receptor species and expressed in terms of the mass (body weight) of the receptor (mg/kg-day).

Ingestion-pathway exposures to the vertebrate candidate receptors are estimated as *average daily doses* using the approach outlined in U.S.EPA (1993a) as follows:

(1) $$ADD = [(IR_{food}*C_{food}) + (IR_{water} * C_{water}) + (IR_{sed}*C_{sed}) * AUF/BW$$

where:

ADD = Average Daily Dose (mg/kg/day)

IR_{food} = Ingestion rate of food (kg/day)

IR_{water} = Ingestion rate of water (L/day)

IR_{sed} = Ingestion rate of sediment (kg/day)

C_{food} = Concentration of chemical in food (mg/kg) = [(diet composition[1]$_{food}$[1]*C_{food}[1]) + (diet composition$_{food}$[2]*C_{food}[2]) C_{food}[n]]/100

C_{water} = Concentration of chemical in water (mg/L)

C_{sed} = Concentration of chemical in sediment (mg/kg)

AUF = Area use factor (fraction)

BW = Body weight (kg)

Chemical concentrations in biota that constitute the diets of the ROIs will be derived using mathematical procedures (e.g., application of biological uptake factors).

To estimate the environmental dose for each ROI (i.e., the ADD), relevant information regarding the behavior and physiological attributes of potential receptors is required (i.e., area use, body weight, ingestion rates, etc.). These are referred to as measures of receptor characteristics. Relatively few empirical measurements of these attributes in wildlife species are available, and those that are available are often based on captive specimens. For these and many other reasons, assumed values for these attributes represent uncertainties. Uncertainty can never be totally eliminated, but prudent application of well-documented information about the behavior and physiology of the receptors minimizes uncertainty. For this reason, the U.S.EPA commissioned the compilation of the Wildlife Exposure Factors Handbook (U.S.EPA 1993a), which warns its readers that in any given ecological risk assessment it is crucial to apply site-specific or region-specific knowledge whenever possible. The assumptions used in this analysis are all based on formally-published information for the species, or plausible surrogate species. Generally-accepted principles and qualified-professional judgment will be used to derive assumptions from relevant literature (mainly U.S.EPA 1993a and primary sources cited herein) that could be representative of conditions at the site.

Ecological Risk Evaluation – Tier 3

Whether a Tier 3 evaluation or specific components of Tier 3 is warranted will be a function of Tier 2 results. Potential components of Tier 3 include use of probabilistic methods to refine exposures and risk estimates as well as collection of more refined chemical and biological data. Additional studies that might be considered to support interpretation of risk in a Tier 3 evaluation include:

- Bioaccumulation studies to refine estimates of trophic level transfer of COCs (e.g., biota tissue sampling);

[1] Diet composition is input as a percentage of the overall diet. The sum of all should equal 100.

- Toxicity studies to support interpretation of potential effects on the invertebrate or plant communities.
- Field observations to better define estimates of exposure, or to directly measure effects (e.g., reproductive success).

3.4 MANAGEMENT APPROACH

The C&D Project Manager will be responsible for utilizing appropriate technical resources to accomplish specific RFI tasks in a safe, efficient, and technically sound manner. The C&D Project Manager will work closely with the RFI Consultant to assure that project budget, schedules, and deliverables are completed to the satisfaction of C&D and U.S. EPA.

3.5 PROJECT ORGANIZATION AND RESPONSIBILITY

The project team for the RFI will consist of the following:

- C&D Technologies;
- The consulting team led by URS; and
- Various subcontractor(s).

The role of each of these entities is discussed in the following sections, and the lines of responsibility are shown on the Management Organization Chart on Figure 3-6.

3.5.1 C&D Technologies

Overall administrative control of the RFI will be the responsibility of the C&D Project Manager, Mr. Walt Kozlowski. Mr. Kozlowski will be the primary point of contact between C&D and U.S. EPA. In addition, he will act as the primary point of client contact for the RFI Consultant. In this role, he will be responsible for final C&D approval of Work Plan and technical and administrative procedures, as well as for ensuring that the necessary arrangements are made to facilitate the implementation of the RFI.

C&D contacts, which are listed in the Management Organization Chart (Figure 3-6), will provide the C&D Project Manager with additional technical support. These contacts include the following:

- Mr. Adam Haghighat – Manager, Environmental Engineering, C&D Technologies; and
- Ms. Aria Klees – Deputy General Counsel, C&D Technologies.

3.5.2 RFI Consultant

The RFI Consultant will be URS who will perform the investigation activities and will be responsible for the execution of the RFI Work Plan. The Management Organization Chart (Figure 3-6) outlines the principal technical professionals who are responsible for this project.

The Project Manager will be Mr. Jack Waggener who will oversee the implementation of the RFI project. He will directly manage budgets and project milestones as well as be the main point of contact with C&D.

Dr. Jay White will be the Senior Remediation Engineer who will assist Mr. Waggener in implementing the various tasks under the Order.

Mr. Craig Bernhoft will act as the Senior Hydrogeologist for the RFI soil and groundwater investigation. He will provide technical oversight and guidance during implementation of the RFI soil and groundwater investigation.

The Site Manager, Mr. Dylan Crouch, will oversee the implementation of the RFI soil and groundwater investigation.

The Health and Safety Officer, who has yet to be determined, will assist the Site Manager with the implementation of the HSP and will provide direction regarding health and safety issues.

Mr. Carl Crane will be the human health and ecological risk assessor, and will oversee the risk evaluations.

Data and records management, as discussed in the Data Management Plan (DMP), is the responsibility of the URS personnel. The following individuals will be specifically responsible for the management and validation of data and information:

- RFI Site Manager
  - The RFI Site Manager, Mr. Dylan Crouch, will ensure that adequate and relevant field data are collected and properly documented. He also has overall responsibility for observations and information generated as part of field work. He will be at the Facility on a part-time basis for field investigation work and will oversee proper collection and recording of data, as well as managing the subcontractors' work on the RFI;
- Quality Assurance Officer (QAO)
  - The QAO, Mr. Pete Ciarleglio, will be responsible for supervising and reviewing the validation of field and laboratory measurements. The QAO will ensure that approved sampling and analysis protocols, procedures, and methods used on this project conform to the requirements of the RFI Work Plan as well as relevant regulations and Standard Operating Procedures (SOPs);
- Database Manager
  - The database manager, yet to be determined, will be responsible for compiling and updating a computerized database for this project. Appropriate and relevant data (water levels, analytical chemistry, stratigraphic data, etc.) will be entered into the database and updated regularly as new information becomes available; and
- Sampling Manager
  - The sampling manager, who has yet to be determined, will be responsible for supervising and reviewing sample integrity.

3.5.3 Subcontractors

URS will hire subcontractors as required. At a minimum, the following support services will require subcontractors.

Analytical Laboratory

Test America, located in North Canton, OH has been chosen as the analytical laboratory for this project. URS will handle all subcontracting and coordination duties. The analytical laboratory will assign Frank Calovini as the Laboratory Project Manager (LPM) for the project.

The LPM will be the liaison to URS Site Manager, Quality Assurance Officer, sampling personnel, and laboratory staff. In addition, the LPM will assign specific duties for this project to the laboratory staff and provide orientation of the staff to the project-specific Quality Assurance/Quality Control (QA/QC) needs and requirements. The LPM will also ensure that laboratory-specific procedures and internally-prepared plans and reports meet project QA requirements. The LPM will serve as the liaison between the laboratory project staff and other internal or external organizations, and will also ensure that the laboratory's performance meets the requirement of the project's contract.

Drillers

URS will subcontract an Indiana-licensed driller who will be responsible for subsurface soil sampling, monitoring well installations, and other related drilling as needed. The drillers will work under the direction of the URS Project Manager and the URS Site Manager.

Surveyors

A registered Land Surveyor will be contracted to survey monitoring well locations, and other physical features as necessary to document field locations. Surveying activities will be supervised by the URS Site Manager. Soil boring and sampling locations will be surveyed using a Global Positioning System (GPS) unit.

3.6 QUALIFICATIONS OF KEY PROJECT MEMBERS

3.6.1 General

The following sections identify the selected RFI Consultant and RFI analytical laboratory.

3.6.2 RFI Consultant

C&D has selected URS as the primary RFI Consultant. The project team will consist of the following key personnel:

- RFI Project Manager: Jack Waggener, PE
- Senior Remediation Engineer: Jay White, D. Env.
- Senior Hydrogeologist: Craig Bernhoft, PG

- Site Manager: Dylan Crouch, CHMM
- Human Health and Ecological Risk Assessment Task Leader: Carl Crane
- Quality Assurance Officer: Pete Ciarleglio

Analytical Laboratory

The RFI Analytical Laboratory for the project will be Test America**.** The Quality Assurance Plan (QAPP) for Test America is provided as Appendix B.

3.7 PROJECT COMMUNICATIONS

Standardized project forms and formats will be developed for collecting field data and observations, recording laboratory information, and routine project communications. Routine project communications will be documented on standardized forms for telephone communications, project memoranda, and monthly reporting.

Project information will reside in a central project database and filing system at the C&D Facility. Field information collected by project personnel and subcontractors will be recorded using the uniform field data collection sheets. These records will be stored in the project data files and pertinent information for use in data assessment will be tabulated and entered into the project database for later merging with laboratory results as appropriate. This project database and filing system provides a means of tracking and assuring that all samples collected in the field can be accounted for through the laboratory and during subsequent stages of data analysis.

Laboratory analytical data will be tracked by project personnel through the evaluation of electronic and hard copy laboratory results. Upon receipt, laboratory results from a given sample or sample set will be evaluated and validated as required to meet the project objectives. Following quality review by the technical staff, the data, hardcopy and electronic form, will be submitted for inclusion in the project database. The laboratory analytical results will be merged with the corresponding field records. These data, field observations and records, and laboratory measurements will be subjected to a final quality control review by the technical staff. This quality assured information will then form a final data set in the project database and file system.

Further details regarding the RFI data management is presented in the Data Management Plan (DMP) discussed further in Section 7.

This Section presents the goals and objectives of the RFI as well as the scope of work to accomplish the RFI goals and objectives for the Attica Facility.

4.1 RFI GOALS AND OBJECTIVES

The goal of the RFI is to identify the nature and extent of any releases of hazardous waste and/or hazardous constituents from the Facility which may pose an unacceptable risk to human health and the environment. Data obtained during the RFI will be used to delineate the extent of chemicals of concern (COCs) previously detected in environmental media at the Site, conduct a human health risk evaluation of the Site, and to determine whether additional investigation is warranted. Findings of the RFI will result in one of the following determinations for each SWMU / AOC investigated:

- No further action under the industrial use scenario (or other scenarios applicable to the site);
- Additional data collection and /or risk evaluation;
- Interim measures (if needed); or
- Corrective Measures Plan (CMP) or Corrective Measures Study (CMS), if needed.

This RFI Sampling Plan presents approaches and rationale for sampling soils and groundwater at the Site. The locations and number of soil borings for the RFI were selected:

1) Using historical analytical data from previous site investigations to focus sampling (i.e., location, depth, parameters);
2) To provide sufficient coverage of the areas to delineate the nature and extent of COCs in surface and subsurface soils; and
3) To provide a sufficient number of samples of statistical characterization of the exposure point concentration for relevant receptors in the risk evaluation.

The groundwater investigation for the RFI will use existing and newly installed monitoring wells. The existing monitoring wells are used to monitor conditions in the deeper water bearing zone. New monitoring wells will be installed adjacent to the existing monitoring wells to monitor conditions in the shallow water bearing zone beneath the Site and determine if COCs are present.

Sampling activities and procedures that will be conducted at each SWMU and AOC as part of the RFI are presented in the following sections.

4.2 RFI INVESTIGATIVE PROCEDURE FOR SOIL

The general sampling approach proposed to complete the RFI objectives for soil is presented in the following subsections. The SWMUs and AOCs to be investigated during the RFI are discussed in Section 4.2.3 below and presented on Figure 2-2. The SWMU and AOC soil sampling strategies are summarized in Tables 4-1 and 4-2. RFI soil sample locations are presented on Figure 4-1.

4.2.1 General Sampling Approach

As discussed previously in this RFI Work Plan, the purpose of the soil investigation is to identify the nature and extent of any releases of hazardous waste or hazardous constituents; and to provide information for a risk-based evaluation of the environmental medium to which a release has occurred. The general approach applied to sampling for the RFI has, therefore, been devised on targeting locations that will most likely meet these goals. Soil samples will be collected from locations that are representative of each area. The value of the data from each sample will thereby be maximized reducing the need for additional sampling.

RFI SWMUs and AOCs were identified in the CCR based on current and historical site usage, documented releases, and materials management practices. During a preliminary field reconnaissance completed in March 2007 by URS personnel, a visual inspection of each SWMU and AOC was conducted to identify current manufacturing features, surface drainage patterns, and unit boundaries. The results of the reconnaissance (coupled with review of historical information) were then used to target the most likely locations and sample depths for confirmation of known and potential releases.

Sampling depths during the RFI are defined as follows:

- Surface samples – from 0 to 1 ft bgs
- Mid-depth samples – from 4 to 5 ft bgs
- Subsurface samples – unit specific (20 ft bgs at SWMU 8 and various depths at other SWMUs and AOCs based on subsurface drainage features)

Soil samples collected at the surface will be used in the risk evaluation for the industrial worker, maintenance/utility worker, construction worker, and trespasser. Samples collected at the mid-depth and subsurface depth intervals will be used along with surface samples to evaluate risks for the maintenance/utility worker and construction worker scenarios. Subsurface samples not associated with subsurface drainage features will be submitted and held for analysis; these will not be analyzed if analytical results indicate mid-depth samples are not impacted by the COCs. The intent of the subsurface samples collected at areas where subsurface drainage features are present is to determine if releases have occurred to the subsurface soils and groundwater from these drainage features.

As a result, data obtained from the sampling intervals will satisfy more than one purpose during the RFI soil investigation. Unless otherwise indicated, borings installed during the RFI soil investigation will be terminated at 5 ft bgs. Deeper soil borings will be terminated at 20 ft bgs or approximately 2 ft below subsurface drainage features, whichever comes first (hereafter known as the boring termination point).

4.2.2 Analytical Requirements

All soil samples will be analyzed for one or more of the following parameters:

- VOCs (SW-846 Method 8260B/5035)
- PAHs (SW-846 Method 8270C)
- 8 RCRA Metals (SW-846 Method 6010/7471)

- Lead (SW-846 Method 6010)
- PCBs (SW-846 Method 8082)

Based on historical analytical data, soil samples collected during the RFI will not be analyzed for SVOCs. The only SVOC detected in soil samples collected at the Site during the E&E SSI was bis(2-ethylhexyl)phthalate which was data qualified as laboratory contaminant. However, PAHs were detected in nine of twelve soil samples. Therefore, only PAHs will be analyzed for during the RFI.

During the E&E SSI, soil samples were also analyzed for TAL metals which include the 8 RCRA metals. The E&E SSI report indicates that TAL metals detected in soil samples were detected at similar concentrations that are considered naturally occurring. Therefore, URS will only analyze soil samples for the 8 RCRA metals.

Soil samples collected for analyses will be split with one-half of the interval transferred to the appropriate sample container and the other half placed in a plastic freezer bag for headspace analysis for VOCs. The plastic bag will be labeled according to content and allowed to site for period of 15 minutes. Headspace readings will be obtained using a PID and recorded in the project field book.

Soil samples collected for VOC analysis will be collected using TerraCore sample collection and field preservation kits. The TerraCore sampler is a single use device designed to collect soil samples from soil cores and transfer them to the appropriate containers for in-field preservation. Three 5-gram samples collected with the TerraCore device will be transferred to one of two pre-weighed vials containing bisulfate preservative for low level analysis and one pre-weighed vial containing methanol for high level analysis, if necessary.

4.2.3 RFI SWMUs and AOCs

Area 1 – Wastewater Treatment Plant

According to the CCR, releases of acids, acid impacted water, and lead impacted liquids have occurred in the WWTP area. This area includes the former exterior wastewater storage silos, concrete walkway, drainage ditch, and ground surface leading to a drainage ditch on the northwest side of site.

URS will install ten soil borings to a terminating depth of 5 ft bgs. Soil samples will be collected at surface and mid-depth intervals. All soil samples will be analyzed for lead.

Area 2 – Current and Former Acid Storage Lofts

Documented operational releases have been attributed to tanker overfills and spill/leak incidents. Area 2 was formerly located in a former alley/former railroad spur area. The alley was enclosed in the early 1990s. Spills of lead oxide documented in Area 3 may have impacted soils in Area 2.

URS will install two soil borings to a terminating depth of 5 ft bgs. Soil samples will be collected at surface and mid-depth intervals. All soil samples will be analyzed for lead.

Area 3 – Lead Oxide Storage Silos

Releases of lead oxide dust from the storage silos during tanker truck loading operations have been documented in Area 3. Areas beneath the storage silos, concrete alley and storm drains in the alley may have been impacted by releases of the lead oxide dust.

URS will install two soil borings to a terminating depth of 5 ft bgs. Soil samples will be collected at surface and mid-depth intervals. All soil samples will be analyzed for lead.

Area 4 – Stormwater Sewers

According to the CCR, releases which occurred at the various SWMUs/AOCs may have impacted the stormwater sewer. Documented releases include acids, lead oxide dust, and contact cooling water.

URS will install ten soil borings to terminating depths of 5 to 20 ft bgs (assuming subsurface drainage features are present at several boring locations). Soil samples will be collected at surface, mid-depth and subsurface depth intervals. All soil samples will be analyzed for VOCs and lead.

Area 5 – Exterior Former Hazardous Waste Materials Storage Area

According to the CCR, no documented releases were identified in the former hazardous waste materials storage area. Therefore, additional investigation is warranted to determine if impact of the potential COCs exist in this area.

URS will install two soil borings to a terminating depth of 5 ft bgs. Soil samples will be collected at surface and mid-depth intervals. All soil samples will be analyzed for VOCs and RCRA metals.

Area 6 – Exterior Former Drum Storage Area and Transfer Pad

Three storage areas have been documented in historical aerial photographs and previous site assessments. No documented releases from staged materials were noted in this area; however, this area is included within previous releases from Area 1.

URS will install two soil borings to a terminating depth of 5 ft bgs. Soil samples will be collected at surface and mid-depth intervals. All soil samples will be analyzed for VOCs and the RCRA metals.

Area 7 – Poly-Mixing Room

This area has been identified as a SWMU based on the historical use of and storage of solvents in this area, including tetrachloroethene, since 1982. The CCR report indicates no documented releases from this area were identified during site research. Additional investigation is necessary to determine if impacted soils in the vicinity of Area 2 exist based on the historical usage of this area.

URS will install a single boring in Area 2 to a terminating depth of 5 ft bgs. Soil samples will be collected at surface and mid-depth intervals. All soil samples will be analyzed for VOCs.

Area 8 – Historical Drive Up Disposal Area

According to the CCR, dumping activities occurred from the early 1900s through the 1960s in this area. The dump area reportedly accepted household trash and materials from drive-up disposal.

URS will install ten soil borings to a terminating depth of 20 ft bgs. Soil samples will be collected at surface, mid-depth and subsurface depth intervals. All soil samples will be analyzed for VOCs, PAHs, and RCRA metals.

Area 9 – Historical Former Waste and Dust Storage Room

Area 9 was identified as a SWMU based on a 1948 fire insurance map which identified the room as a "waste and dust storage room". The area is currently utilized as a compressor room.

URS will install one soil boring to a terminating depth of 5 ft bgs. Soil samples will be collected at surface and mid-depth intervals. All soil samples will be analyzed for VOCs, SVOCs, PAHs, and RCRA metals.

Area 10 – Southwest Historical Former Container Storage Area

A large container storage area was identified in a 1960s historical aerial photograph where the current Expander Mill and warehouse building is located. What appeared to be drums, ASTs, and other unknown items were staged in this area. This area was identified as a SWMU since the material storage practices are unknown. Additional investigation may be necessary to determine if subsurface soils in the vicinity of Area 10 exist based on the historical usage of this area.

URS will install two soil borings to a terminating depth of 5 ft bgs. Soil samples will be collected at surface and mid-depth intervals. All soil samples will be analyzed for VOCs, PAHs, and RCRA metals.

Area 11 – Northeastern Historical Former Container Storage Area

A container storage area was observed on the west side near the northeast end of the railroad spur/concrete alley in historical aerial photographs dated 1988 and 1993. The storage area appeared to be concrete. The area has been identified as a SWMU since the historical material storage practices in this area are unknown. The former container storage area is currently located under a concrete slab in the shipping building which also contains the Facility's hazardous waste storage area.

URS will install two soil borings to a terminating depth of 5 ft bgs. Soil samples will be collected at surface and mid-depth intervals and analyzed for VOCs and RCRA metals.

Area 12 – Central Vacuum System / Baghouses

This area consists of four former baghouse locations and has been identified as a SWMU based on the historical operations of the baghouses as the most likely locations for potential lead impacts to the site. The central vacuum system utilizes five internally located baghouses.

URS will install four soil borings (one at each baghouse location) to a terminating depth of 5 ft bgs. Soil samples will be collected at surface and mid-depth intervals and analyzed for total lead.

Area 13 – Former Oxide Mill Area

According to the CCR, historical operational releases to emissions and possible soil impacts were noted in documents reviewed during the CCR in the area around the former oxide mill. Potential lead impacts may exist around the perimeter of the oxide mill building and lead oxide loading area.

URS will install ten soil borings to a terminating depth of 5 ft bgs. Soil samples will be collected at surface and mid-depth intervals and analyzed for total lead.

Area 14 – Former Onsite Filling Station

A review of historical Sanborn fire insurance maps and aerial photographs indicates a gasoline filling station was located on the south side of the site (currently used for employee parking). The property was acquired by C&D in 2000. The previous owner indicated all USTs had been removed. However, during site development as a parking area, five USTs were excavated and removed. Thirty soil samples were collected from soils excavated from the tank pit and analyzed for total petroleum hydrocarbons (TPH). Analytical results indicate TPH was detected at 12 parts per million (ppm) in one soil sample. TPH concentrations in the remaining soil samples were below the laboratory detection limit of 10 ppm. Based on this information, no additional investigation is required for this area. The UST Closure Report is presented as Appendix G.

Area 15 – West Container Storage Area

Drums, an AST and other debris were observed along the western and northwestern perimeter of the former western employee parking areas during a review of aerial photographs. The parking area did not appear paved in the aerial photographs. Based on site interviews, containers in this area would have been empty.

URS will install four soil borings to a depth of 5 ft bgs. Soil samples will be collected at surface, mid-depth and subsurface depth intervals and analyzed for VOCs, PAHs, and RCRA metals.

Area 16 – DC Generator Area

C&D indicated that low level PCBs were contained in two former DC Generators used at the site. The generators were taken out of service in 1988. As a result of the DC Generators having contained polychlorinated biphenyls (PCBs), C&D has identified the area where the DC Generators were located as a SWMU/AOC that will be further investigated during the RFI.

URS will install two soil borings to a terminating depth of 5 ft bgs. Soil samples will be collected at surface and mid-depth depth intervals and analyzed for PCBs.

4.2.4 Background Sampling

During the RFI, soil samples will be collected to establish background concentrations of naturally occurring analytes (i.e., metals). Background soil samples will be collected from seven (7) soil boring locations in an area unlikely to have been impacted by Site activities. The location will be determined during the RFI field mobilization. The location must meet the following criteria:

- No stormwater runoff has affected these areas;
- No flooding from any adjacent streams has occurred in these areas;
- There have been no previous industrial activities in these areas; and
- There has been no inadvertent "dumping" from outside entities.

The background soil boring will be installed to a terminating depth of 20 ft bgs. Soil samples will be collected at surface, mid-depth and subsurface depth intervals. The soil samples will be analyzed for RCRA metals.

4.3 RFI INVESTIGATIVE PROCEDURE FOR GROUNDWATER

As requested by the U.S.EPA, a groundwater investigation was conducted by Clayton in January and February 2006 to determine if historical site activities were a potential source of TCE detected in groundwater in the general vicinity of the Site. Analytical results of the investigation indicate low concentrations of TCE were detected in groundwater samples collected from three of five on-site monitoring wells installed at the Site during the investigation. The existing onsite monitoring wells are screened in the deeper water bearing zone which is separated from a shallow water bearing zone by a dense gray till layer present at approximately 47 to 55 ft bgs. According to the VOC Investigation Report, TCE was not detected in grab groundwater samples collected from the shallow water bearing zone during vertical profiling conducted during the monitoring well installation. The VOC Investigation Report is included as Appendix F.

For the RFI, four additional monitoring wells will be installed using sonic drilling technology adjacent to existing monitoring wells MW-1, -2, -3, and -4 to monitor the shallow water bearing zone. The monitoring wells will be screened in the shallow water bearing zone at a depth determined to be immediately above the till layer. A core sample will be taken and logged from the till layer at each well installation location to investigate the horizontal extent of the layer across the Site.

Groundwater samples will be collected from each newly installed monitoring well and analyzed for VOCs and RCRA metals to determine if these COCs are present. Additional groundwater samples will also be collected from the existing deeper zone onsite monitoring wells and analyzed for the same parameters. The groundwater sampling strategies are summarized in Table 4-2. Existing and proposed monitoring well locations are presented on Figure 2-2.

4.3.1 Regional Hydrogeology

Descriptions of the regional geologic and hydrogeologic characteristics affecting groundwater flow at the Facility are discussed in Section 2.1.2. Groundwater flow for both the deep and shallow

groundwater bearing zones will be determined based on groundwater elevations recorded during the groundwater sampling event. In the absence of human influence (i.e., pumping) it is expected that groundwater flow for both zones would be from east southeast to west northwest towards the Wabash River.

4.3.2 Criteria for Continued Groundwater Investigation

If it is determined that the shallow water bearing zone is impacted with the COCs and potential migratory pathways to the deeper water bearing zone and/or Wabash River exist, additional groundwater investigation activities will be conducted to delineate the potential contaminant plume. To determine if migration of impacted groundwater at or from the Facility is stabilized, URS will use the following criteria:

1) Install additional "boundary" groundwater monitoring wells downgradient and upgradient of contaminant plume and analyze groundwater for appropriate analytical parameters.
2) Concurrently, review analytical data from soil samples collected during the RFI to identify potential source areas and collect additional soil samples as needed for chemical analysis for appropriate analytical parameters.
3) Compare groundwater analytical results to Tier 1 groundwater criteria (e.g., MCLs, including background groundwater data); if exceedances of Tier 1 criteria occur compare to appropriate Tier 2 criteria; if exceedances of Tier 2 criteria occur, conduct a Tier 3 evaluation. Groundwater concentrations to be compared to the relevant Tier 1 or Tier 2 criteria should be statistically derived based on analytical data from four consecutive sampling rounds (perform additional groundwater sampling events if four rounds have not occurred) to account for seasonal/laboratory variation/error.
4) Perform a fate and transport analysis on the soil sampling results and compare those results to Tier 1 groundwater criteria (e.g., MCLs); if exceedances of Tier 1 criteria occur, compare to Tier 2 criteria; if exceedances of Tier 2 criteria occur in either groundwater from the boundary wells or SWMU soils, evaluate the exceedances in the context of the conceptual site model, including the nature and location of potential sources, potential on-site and/or off-site receptors, and site geology/hydrogeology.
5) Groundwater screening techniques (e.g., cone penetrometer (CPT)/hydropunch, soil gas, etc.) may be used to aid in understanding the distribution of COCs in groundwater and to identify the locations of additional groundwater monitoring wells.
6) The information from this program can then be used to locate and install additional groundwater monitoring wells, if necessary. Monitoring well locations will be selected to provide data addressing the following:
   - Characterize the potential current and future risk to on-site and/or off-site receptors;
   - Evaluate fate and transport of COCs in groundwater; and
   - Define the nature and extent of chemicals in groundwater to characterize risk.

4.4 DATA EVALUATION

As discussed previously in Section 3.2 of this RFI Work Plan, a tiered risk-based approach will be used to evaluate the environmental data collected. Where groundwater monitoring data and SWMU or AOC release confirmation soil data are obtained, chemicals reported above the detection limit will be compared to risk-based screening levels. These risk-based screening levels will include those outlined in Section 3.2 of this RFI Work Plan.

Background soil data collected from seven onsite and offsite locations determined to be native and unimpacted by previous industrial use, will be evaluated in the context of published regional background values. These facility-specific soil background samples will be included in the screening process used to select COCs. Comparisons of Site data to background concentrations will be conducted in accordance with U.S.EPA guidelines. Any chemical that exceeds its respective industrial PRG but is less than its background concentration will not be evaluated further.

4.5 RFI REPORT PREPARATION

The RFI Report will be prepared in accordance with the Order, and will include the following items:

- Detailed discussion of all RFI activities conducted;
- All field boring logs, well installment logs, well development logs, and sample collection forms;
- Results of any material tests (i.e., grain size analyses, standard penetration tests, etc.);
- Information in tabular form documenting all water level measurements, total depth measurements, top of casing elevations, ground elevations at each well, and groundwater elevations for all monitoring wells installed;
- Groundwater flow direction and rate determinations;
- Regional and site specific geology and cross-sections;
- Regional and site specific hydrogeology (narrative description, groundwater flow velocities, description of any major areas of recharge and discharge, and cross-section);
- Topographic map of the area with the location of the Facility;
- Site map with locations of all SWMUs and AOCs;
- Figures illustrating all soil borings and monitoring wells;
- Copies of all original laboratory reports;
- Copies of the field notebooks that document all activities conducted by the field crew;
- Copies of all calibration records and modeling results; and
- Copies of all chain-of-custody forms.

Additionally, the RFI Report will include the following items:

- An analysis and summary of RFI efforts including nature and extent of PCOCs at the Facility;

- A discussion of sources and migration pathways; and
- Conclusions and recommendations based on results of the risk-based phased approach.

4.6 PROPOSED PROJECT SCHEDULE

C&D has developed the proposed project schedule presented in Figure 4-2. The schedule represents a realistic estimate of the time required to implement the investigations described in the RFI Work Plan. The project schedule assumes no unexpected delays in field activities or laboratory analysis time will be encountered. The schedule for future investigation activities will be determined by the findings from the RFI. C&D and URS will notify U.S.EPA a minimum of 10 days prior to initiation of field efforts.

The Field Sampling and Analysis Plan (FSP) was developed in general accordance with the RCRA Facility Investigation (RFI) Guidance, Volumes I through IV, published by the Waste Management Division, Office of Solid Waste, U.S.EPA, dated May 1989a. The FSP was developed to identify standard operating procedures and sample collection methodologies for the intended sample media to fulfill data collection objectives identified in this RFI Work Plan and QAPP requirements discussed in Section 6 and presented in Appendix C.

The FSP is included as Appendix B and is intended to be used as a separate guidance document during field investigation activities. Soil sample locations, depths, and COCs for each area are presented in Table 4-1. Groundwater sampling information is presented in Table 4-2. Soil and groundwater sample collection locations are presented on Figure 4-1.

This Quality Assurance Project Plan (QAPP) presents the organization, objectives, planned activities, and specific Quality Assurance/Quality Control (QA/QC) procedures associated with the RFI to be conducted at C&D Technologies, Inc. The QAPP fulfills the RFI Work Plan requirements set forth in Section 14.b. of the Order. All QA/QC procedures will be structured in accordance with applicable technical standards, U.S. EPA's requirements, regulations, guidance, and technical standards. This QAPP has been prepared in accordance with the U.S. EPA Region 5 QAPP policy as presented in *U.S. EPA RCRA QAPP Instructions*, and other relevant guidance documents. The complete QAPP is included as Appendix C and may be used as a stand alone document for the RFI implementation.

Data management requirements are an essential part of the RFI program. Data management requirements included in this section outline procedures necessary to document, track, and manage all field and laboratory data generated during the course of the investigation. The purpose of the RFI Data Management Plan is to identify:

- Data management personnel and responsibilities.
- All field, laboratory and development data to be recorded and maintained.
- Data coding requirements.
- Data to be included on progress and site investigation reports.

This Data Management Plan provides format requirements for presenting raw data, tabulated data, and summary data of field investigations and laboratory analyses.

7.1 ROLES AND RESPONSIBILITIES

7.1.1 RFI Project Manager

The RFI Project Manager will be responsible for ensuring that all field and laboratory information is collected and recorded accurately. The Project Manager will also be responsible for approving any changes in or deviations from the reporting of data as required under this Data Management Plan. Furthermore, the RFI Project Manager will be responsible for performing inspections related to the generation, collection, and storage of data under the scope of work required of a contractor.

7.1.2 RFI Field Manager

The RFI Field Manager will be responsible for maintaining and recording all information and data required in field logbooks. In addition, the RFI Field Manager will be responsible for ensuring that all laboratory data are accounted for and accurately reflect field sampling and COC information.

7.1.3 RFI Laboratory Project Managers

Independent laboratories may be contracted to analyze environmental samples collected during the RFI. Each laboratory will provide a Laboratory Manager responsible for ensuring that all laboratory data submitted to URS are recorded, documented, and presented in the proper formats.

7.2 RECORDING OF FIELD DATA

All field personnel will carry waterproof, bound notebooks for the keeping of chronological record of project field events. Field logbooks, calibration logs, and laboratory logbooks will be maintained by URS or by a designated contractor. The front cover of each logbook will typically be labeled with the following information:

- Person or organization to whom the book is assigned

- Book number
- Project name, number
- Start date
- End date

All logbook entries will contain accurate and detailed documentation of daily project activities. Because the information contained in these logbooks forms a basis for subsequent reports, the field logbook will typically include the information below:

- Site identification
- Location of sampling points
- Description of sampling points
- References to any photographs
- Sample identification numbers
- Number of samples taken
- Time of sample taken
- Reference to sample location map
- Number of QA samples taken (e.g., duplicates)
- Collector's name
- Field observations
- Sample distribution (e.g., QA laboratory, agency split)
- Detailed lithologic descriptions of each soil sample
- All field measurements

Any changes in weather, accidents or problems with equipment, quantities and manufacturer's of materials used, field measurements, construction logs, samples collected and sample identifications, and break times or down times will be recorded. Visitor names, purpose of visit, and duration at site should also be recorded.

Field personnel may also use field sampling data sheets and boring logs during investigation activities. These forms will be kept in the project file.

7.3 RECORDING OF LABORATORY DATA

A quality Data Management Plan requires that particular procedures related to management of data received from a laboratory be recorded. These forms will not be included, as part of a field logbook, but will be maintained as part of the project files. The Laboratory Manager will be responsible for storing all laboratory information and data recorded and related to the RFI, as specified by URS. This information may include:

- COC Forms

- Internal Laboratory Performance Audits
- Chromatograms
- Raw Data Printouts
- Tabulated Data Printouts
- Laboratory QA/QC Data

In addition, these data will be stored in a manner that protects their integrity.

7.4 DATA RECORD

For documentation purposes, each environmental sample or measurement will have the following applicable record details:

- A unique sample or field-measurement identification number
- Sample or field-measurement location
- Date sample or field-measurement was taken
- Sample or field-measurement type
- Sample or field-measurement raw data
- Laboratory analysis ID number
- Property or component measured
- Result of analysis (i.e., concentration)

7.5 ANALYTICAL DATABASE

The primary objective for developing an analytical database is to ensure that a detailed record of data collection, analysis, verification, and reporting is maintained. In particular, environmental sampling data will be stored in a way that facilitates data evaluation, statistical analyses, and reporting.

7.5.1 Tabular Displays

Tabular displays will be used in the final report to present laboratory data, where appropriate. These displays may include:

- Unsorted (raw) data
- Data reduced for statistical analysis
- Sorted data by medium monitored
- Sorted data by constituent monitored
- Sorted data by potential stratification factors (e.g., location, soil layer, topography, etc.)
- Summarized data

7.6 DOCUMENTATION OF SAMPLE COLLECTION

All sample collection will be documented in the formats described in the FSP attached as Appendix B.

7.7 CUSTODY AND DOCUMENT CONTROL

The following information will be recorded:

- COC from field to laboratory
- Laboratory custody through designated laboratory-sample custodian
- Sample designation number(s)
- Identify of sample-taker
- Date of sample collection, shipping, and laboratory analysis

7.7.1 Physical Data

The following information will be recorded:

- Sampling date, time and location
- Sampling personnel
- Physical description of sampling location (e.g., portion of plant sampled, etc.)
- Sample collection technique
- Field preparation techniques (e.g., filtering, sieving, compositing, etc.)
- Visual classification of sample using an accepted classification system
- A description of the methodology used

A site-specific Health and Safety Plan (HSP) has been developed for this project. The intent of the HSP is to assign responsibilities, establish personnel protection standards, specify safe operating procedures, and provide for contingencies that may arise during RFI field activities conducted at the C&D Site. The HSP has been developed in accordance with the URS Health and Safety Management System and is in compliance with the requirements set forth in 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response.

The HSP is included as Appendix D and is intended to be used as a separate guidance document during field investigation activities.

On January 18, 2007, the United States Environmental Protection Agency (EPA) Region V issued an Administrative Order on Consent to the C&D Technologies battery manufacturing facility in Attica, Indiana. The Order specifies that C&D Technologies will: “Perform an investigation [*otherwise referred to as the RCRA Facility Investigation or RFI*] to identify the nature and extent of any release of hazardous wastes and/or hazardous constituents at or from the facility which may pose an unacceptable risk to human health and the environment.” Further, it stated that C&D Technologies will (1) “establish a public repository in the City of Attica for information regarding [the aforementioned] RFI activities and [(2)] conduct timely public outreach and involvement activities”. The reference to "timely public outreach and involvement activities" takes the form of the Community Involvement Plan exhibited in Appendix E. The purpose of this Community Involvement Plan is to outline potential steps, options and means by which relevant information concerning the aforementioned environmental investigation activities and public involvement will be expedited. This plan will attempt to document for the public, both historic and emerging environmental issues and answer relevant questions. It will define mechanisms to create greater public access to information relevant to the Order and future actions. This plan also seeks to contribute to better decision outcomes that benefit the affected community. Since the Community Involvement Plan was written in the early stages of the facility investigation process, it outlines actions and procedures that anticipate and expedite information when analysis has been completed. After the plan and study results have been reviewed, the Plan will be completed and filed for public review, subject to the satisfaction and approval of U.S. EPA. The plan was in part modeled after Federal Register guidance concerning community involvement planning. URS staff located recent examples of U.S. EPA Region V approved, superfund Community Involvement Plans and used them as models to guide the development of the attached Community Involvement Plan.

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TABLES

Table 3-1. Relevant Human and Ecological Receptor Groups

AREA	BACKGROUND	POTENTIAL TRANSPORT PATHWAYS	Human Health						Ecological					
			Industrial Worker	Construction Worker	Maintenance/ Utility Worker	Offsite Resident	Recreational User	Angler	Soil Invertebrates	Terrestrial Plants	Terrestrial Birds and Mammals	Benthic Macroinvertebrates	Fish/Plankton	Semiaquatic Birds and Mammals
SWMU 1 – Wastewater Pretreatment plant	Releases of acids, acid tainted water and lead impacted liquids	The former wastewater pretreatment plant has been replaced with a new plant, and only portions of the former plant remain. Potential pathways are seepage of liquids into soils; translocation and leaching to groundwater; and subsequent groundwater transport to surface water of the Wabash River		√	√	√							√	√
SWMU 2 – Current/Former Acid Storage Lofts	Releases attributed to tanker overfills and spill/leak incidents	This area is located in the interior of the plant. Potential pathways are seepage of liquids into soils; translocation and leaching to groundwater; and subsequent groundwater transport to surface water of the Wabash River.		√	√	√							√	√
SWMU 3 – Lead Oxide Storage Silos	Documented releases of lead oxide dust from storage silos during tanker truck loading operations	This area is enclosed, but there is a large open truck door. Particulates potentially released from silos or transfer equipment may have historically been subject to wind and stormwater transport. Potential current/future exposures are likely associated with soil where particulates were deposited in the past, potential migration to groundwater; groundwater discharge to surface water; soil transport to offsite soils and sediments		√	√	√	√		√	√	√		√	√
SWMU 4 – Storm Water Sewers	Releases of acids, lead oxide dust and contact cooling water into storm sewers			√	√								√	√
SWMU 5 - Exterior Former Hazardous Materials Storage Area	Existence of former hazardous material storage area			√	√	√	√		√	√	√		√	√
SWMU 6 - Exterior Former Drum Storage Area and Transfer Pad	Existence of storage areas, no documented releases identified. However, area is included within releases from Area 1	This area is now brick covered and enclosed. Particulates potentially released from silos or transfer equipment may have historically been subject to wind transport; particulates and liquids via stormwater transport. Potential current/future exposures are likely associated with soil where particulates were deposited in the past, potential migration to groundwater; groundwater discharge to surface water; soil transport to offsite soils and sediments		√	√	√	√		√	√	√		√	√

SWMU 7 – Poly-Mixing Room	Area historically utilized for the storage and use of various solvents, no documented releases identified	Enclosed within building. Concrete floor. Low use at present; workers currently enter about once per week as no ongoing operations. Estimate workers present three to four days per week during regular operations. There is currently a cleaning solvent station. Inhalation pathway considered insignificant as room ventilation system present. Most likely pathway associated with past activities is migration to soil beneath the floor, and subsequently to groundwater.	√	√	√	√	√		√	√	√		√	√
SWMU 8 – Historical Drive Up Disposal	Drive-up disposal activities from early 1900s through circa 1960.	This SWMU is partially paved over, partially under buildings, and partially open along the Wabash River riparian area. Potential pathways are historically disposed soils leaching to groundwater; soil erosion and transport to the river riparian zone and deposition to river sediments; groundwater transport to surface water.	√	√	√	√	√	√	√	√	√		√	√
SWMU 9 – Historical Former Waste and Dust Storage Room	1948 fire insurance map identified "waste and dust storage room", no corroborating evidence to suggest hazardous waste storage	This area is enclosed within the building. There is currently no waste storage. The floor is concrete. Most likely pathway associated with past activities is potential migration to soil beneath the floor, and subsequently to groundwater.		√	√	√							√	√
SWMU 10 – Southwest Historical Former Container Storage Area	Container storage area observed in single aerial photograph, no corroborating evidence	This area is internal to the building and is currently a warehouse (e.g., observed lead plates and battery cases). The floor is concrete. Most likely pathway associated with past activities is potential migration to soil beneath the floor, and subsequently to groundwater.		√	√	√							√	√
SWMU 11 – Northeastern Historical Former Container Storage Area /Current Hazardous Waste Storage Area	Unknown historic material storage practices, storage area observed in multiple aerial photographs and current location of hazardous waste storage area		√	√	√	√	√	√	√	√	√		√	√
SWMU 12 – Central Vacuum System/Baghouses	Historical release related to system emissions of lead oxide dust at one baghouse location (4 total former exterior baghouse locations)	Particulates potentially released from baghouses may have historically been subject to wind and stormwater transport. Potential current/future exposures are likely associated with soil where particulates were deposited in the past, and potential migration to groundwater.		√	√	√	√		√	√	√		√	√

SWMU 13 – Former Oxide Mill Area	Historical releases related to emissions	This area is internal to the building, locked and generally unused except for some storage. The floor is concrete. A portion is also a former truck unloading area which is open to the outside at two ends. Former activities may have generated particulates that were subject to wind and stormwater transport. Potential current/future exposures are likely associated with soil where particulates were deposited in the past, and potential migration to groundwater.		√	√	√	√		√	√	√		√	√
AOC 14 – Former Onsite Filling Station	Historical onsite gasoline station observed in fire insurance maps and aerial photographs, underground storage tanks (USTs) removed and appropriate sampling conducted			√	√	√							√	√
AOC 15 – West Container Storage Area	Unknown material storage practices (drums, AST and other debris), storage area observed in aerial photographs	This is an exterior area along the river riparian zone. Potential historical releases via wind transport or stormwater runoff to soils in the river riparian area, and deposition to river sediments.		√	√	√	√		√	√	√		√	√

Table 4-1
RFI Analytical Parameters - Soil
C D Technologies, Attica, Indiana

Area	Soil Boring ID	Unit Specific Boring ID(s) at Same Location	No. of Samples Per Boring	Max Depth (ft)	VOC 8260B / 5035	PAH 8270C	Total RCRA Metals 6010/7470	Lead	PCB	Comments
Area 1 (Lead)	CD-SB-1	CD-1-1						-		Lead included with RCRA Metals
		CD-6-3	2	5	2		2			
	CD-SB-2	CD-1-2	2	5				2		
	CD-SB-3	CD-1-3	2	5				2		
	CD-SB-4	CD-1-4						-		Lead included with RCRA Metals
		CD-6-2	2	5	2		2			
	CD-SB-5	CD-1-5						-		Lead Included with RCRA Metals
		CD-8-6	3	20	3	3	3			
	CD-SB-6	CD-1-6						-		Lead included with RCRA Metals
		CD-4-1			-			-		VOC & Lead requirements combined
		CD-8-1	3	20	3	3	3			
	CD-SB-7	CD-1-7	2	5				2		
	CD-SB-8	CD-1-8	2	5				2		
	CD-SB-9	CD-1-9						-		Lead included with RCRA Metals
		CD-4-7			-			-		VOC & Lead requirements combined
		CD-8-2	3	20	3	3	3			
	CD-SB-10	CD-1-10						-		Lead included with RCRA Metals
		CD-8-7	3	20	3	3	3			
Area 2 (Lead)	CD-SB-11	CD-2-1	2	5				2		
	CD-SB-12	CD-2-2	3	15				3		
Area 3 (Lead)	CD-SB-13	CD-3-1						-		Lead included with RCRA Metals
		CD-4-4	2	10	2			2		
	CD-SB-14	CD-3-2						-		Lead included with RCRA Metals
		CD-4-3	2	5	2			2		
	CD-SB-15	CD-3-3	2	5				2		

Table 4-1
RFI Analytical Parameters - Soil
C D Technologies, Attica, Indiana

Area	Soil Boring ID	Unit Specific Boring ID(s) at Same Location	No. of Samples Per Boring	Max Depth (ft)	VOC 8260B / 5035	PAH 8270C	Total RCRA Metals 6010/7470	Lead	PCB	Comments
Area 4 (VOC, Lead)	X	CD-4-1								Collected at soil boring CD-6
	CD-SB-16	CD-4-2	3	15	3			3		
		CD-12-2						-		Lead included with RCRA Metals
	X	CD-4-3								Collected at soil boring CD-14
	X	CD-4-4								Collected at soil boring CD-13
	CD-SB-17	CD-4-5	2	5	2			2		
	CD-SB-18	CD-4-6	2	10	2			2		
	X	CD-4-7								Collected at soil boring CD-9
	CD-SB-19	CD-4-8	2	10	2			2		
	CD-SB-20	CD-4-9	2	10	2			2		
	CD-SB-21	CD-4-10	2	10	2			2		
Area 5 (VOC, RCRA)	CD-SB-22	CD-5-1	2	5	2		2			
	CD-SB-23	CD-5-2	2	5	2		2			
Area 6 (VOC, RCRA)	CD-SB-24	CD-6-1	2	5	2		2			
	X	CD-6-2								Collected at soil boring CD-4
	X	CD-6-3								Collected at soil boring CD-1
Area 7 (VOC)	CD-SB-25	CD-7-1	2	5	2					
	CD-SB-26	CD-7-2	2	5	2					
Area 8 (VOC, SVOC, RCRA)	X	CD-8-1								Collected at soil boring CD-6
	X	CD-8-2								Collected at soil boring CD-9
	CD-SB-27	CD-8-3	3	20	3	3	3			
		CD-15-5			-	-	-			VOC, PAH, & Lead requirements combined
	CD-SB-28	CD-8-4	3	20	3	3	3			
		CD-15-4			-	-	-			VOC, PAH, & Lead requirements combined
	CD-SB-29	CD-8-5	3	20	3	3	3			
	X	CD-8-6								Collected at soil boring CD-5
	X	CD-8-7								Collected at soil boring CD-10
	CD-SB-30	CD-8-8	3	20	3	3	3			
	CD-SB-31	CD-8-9	3	20	3	3	3			
		CD-15-6			-	-	-			VOC, PAH, & Lead requirements combined
	CD-SB-32	CD-8-10	3	20	3	3	3			
Area 9 (VOC, SVOC, RCRA)	CD-SB-33	CD-9-1	2	5	2	2	2			
Area 10 (VOC, SVOC, RCRA)	CD-SB-34	CD-10-1	2	5	2	2	2			
	CD-SB-35	CD-10-2	2	5	2	2	2			
Area 11 (VOC, RCRA)	CD-SB-36	CD-11-1	2	5	2		2			
	CD-SB-37	CD-11-2	2	5	2		2			

Table 4-1
RFI Analytical Parameters - Soil
C D Technologies, Attica, Indiana

Area	Soil Boring ID	Unit Specific Boring ID(s) at Same Location	No. of Samples Per Boring	Max Depth (ft)	VOC 8260B / 5035	PAH 8270C	Total RCRA Metals 6010/7470	Lead	PCB	Comments
Area 12 (Lead)	CD-SB-38	CD-12-1	2	5				2		
	X	CD-12-2								Collected at soil boring CD-16
	CD-SB-39	CD-12-3	2	5				2		
	CD-SB-40	CD-12-4	2	5				2		
		CD-13-10	2	5				-		Lead included with RCRA metals
Area 13 (Lead)	CD-SB-41	CD-13-1	2	5				2		
	CD-SB-42	CD-13-2	2	5				2		
	CD-SB-43	CD-13-3	2	5				2		
	CD-SB-44	CD-13-4	2	5				2		
	CD-SB-45	CD-13-5	2	5				2		
	CD-SB-46	CD-13-6	2	5				2		
	CD-SB-47	CD-13-7	2	5				2		
	CD-SB-48	CD-13-8	2	5				2		
	CD-SB-49	CD-13-9	2	5				2		
	X	CD-13-10								Collected at soil boring CD-40
Area 14										
Area 15 (VOC, SVOC, RCRA)	CD-SB-50	CD-15-1	2	5	2	2	2			
	CD-SB-51	CD-15-2	2	5	2	2	2			
	CD-SB-52	CD-15-3	2	5	2	2	2			
	X	CD-15-4								Collected at soil boring CD-28
	X	CD-15-5								Collected at soil boring CD-27
	X	CD-15-6								Collected at soil boring CD-31
Area 16 (PCB)	CD-SB-53	CD-16-1	2	5					2	
	CD-SB-54	CD-16-2	2	5					2	
Background	CD-SB-55	NA	2	20			2			
	CD-SB-56	NA	2	20			2			
	CD-SB-57	NA	2	20			2			
	CD-SB-58	NA	2	20			2			
	CD-SB-59	NA	2	20			2			
	CD-SB-60	NA	2	20			2			
	CD-SB-61	NA	2	20			2			

Indicates soil boring was installed at location identified in comments
X Soil boring will be installed at location identified in comments
\- One or more individual soil boring analytical requirements combined

Table 4-2
RFI Analytical Parameters - Groundwater
C9/20/2007 Technologies, Attica, Indiana

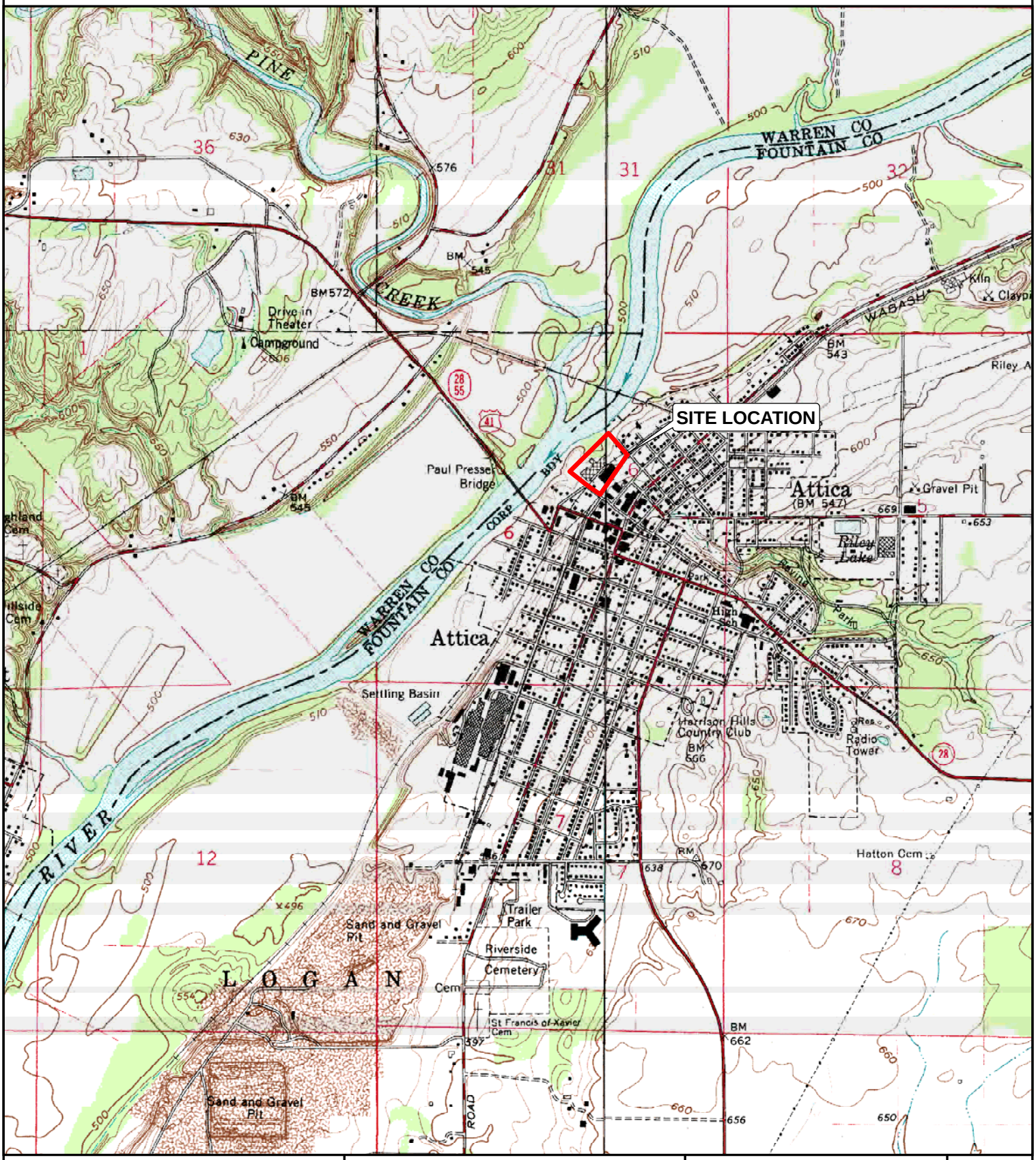
Area	Well ID	No. of Samples Per Boring	VOC 8260B / 5035	PAH, SVOC 8270C	Total RCRA Metals 6010/7470	Lead	PCB	Comments
Sitewide (Existing)	MW-1		1		1			
	MW-2		1		1			
	MW-3		1		1			
	MW-4		1		1			
	MW-5		1		1			
Sitewide (New)	MW-1S		1		1			
	MW-2S		1		1			
	MW-3S		1		1			
	MW-4S		1		1			

FIGURES

UNITED STATES DEPARTMENT
OF THE INTERIOR
GEOLOGICAL SURVEY

N

ATTICA AND WILLIAMSPORT
7.5 MINUTE QUADRANGLES



C & D TECHNOLOGIES, INC.

200 West Main Street
Attica, Indiana

URS
Franklin, Tennessee

SCALE:	DRAWN BY: RL	DATE: 08/24/07
1:24,000	CHECKED BY: DC	DATE: 08/24/07

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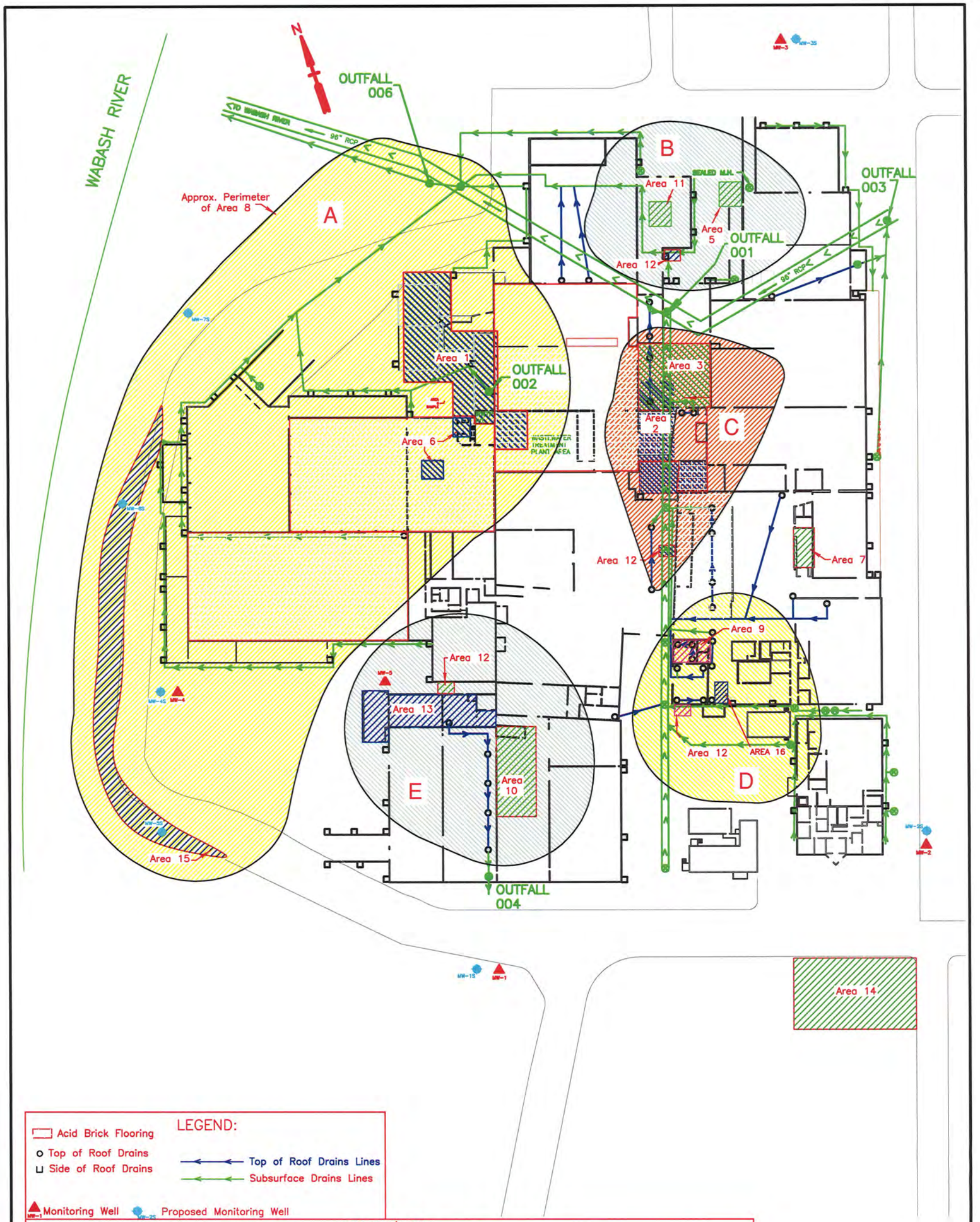
SITE LOCATION MAP

PROJECT NO: 20500205 .00001

FIGURE NO: 2-1



LEGEND:

- Acid Brick Flooring
- Top of Roof Drains
- Side of Roof Drains
- Top of Roof Drains Lines
- Subsurface Drains Lines
- Monitoring Well
- Proposed Monitoring Well

SWMU/AOCs

1 Wastewater pre-treatment plant
2 Current/former acid lofts
3 Lead oxide storage silos
4 Storm water sewers
5 Exterior former hazardous material storage area
6 Exterior former drum storage area and transfer pad
7 Poly-mixing room
8 Historical drive-up disposal area
9 Historical former waste and dust storage room
10 Southwest historical former container storage area
11 Northeastern historical former container storage area
12 Central vacuum systems
13 Former oxide mill area
14 Former onsite filling station
15 West container storage area
16 Former DC Generators Location (Potential PCB Containing Equipment)

SCALE IN FEET

0 40 80 160

RFI WORKPLAN
SWMU/AOC GROUPINGS

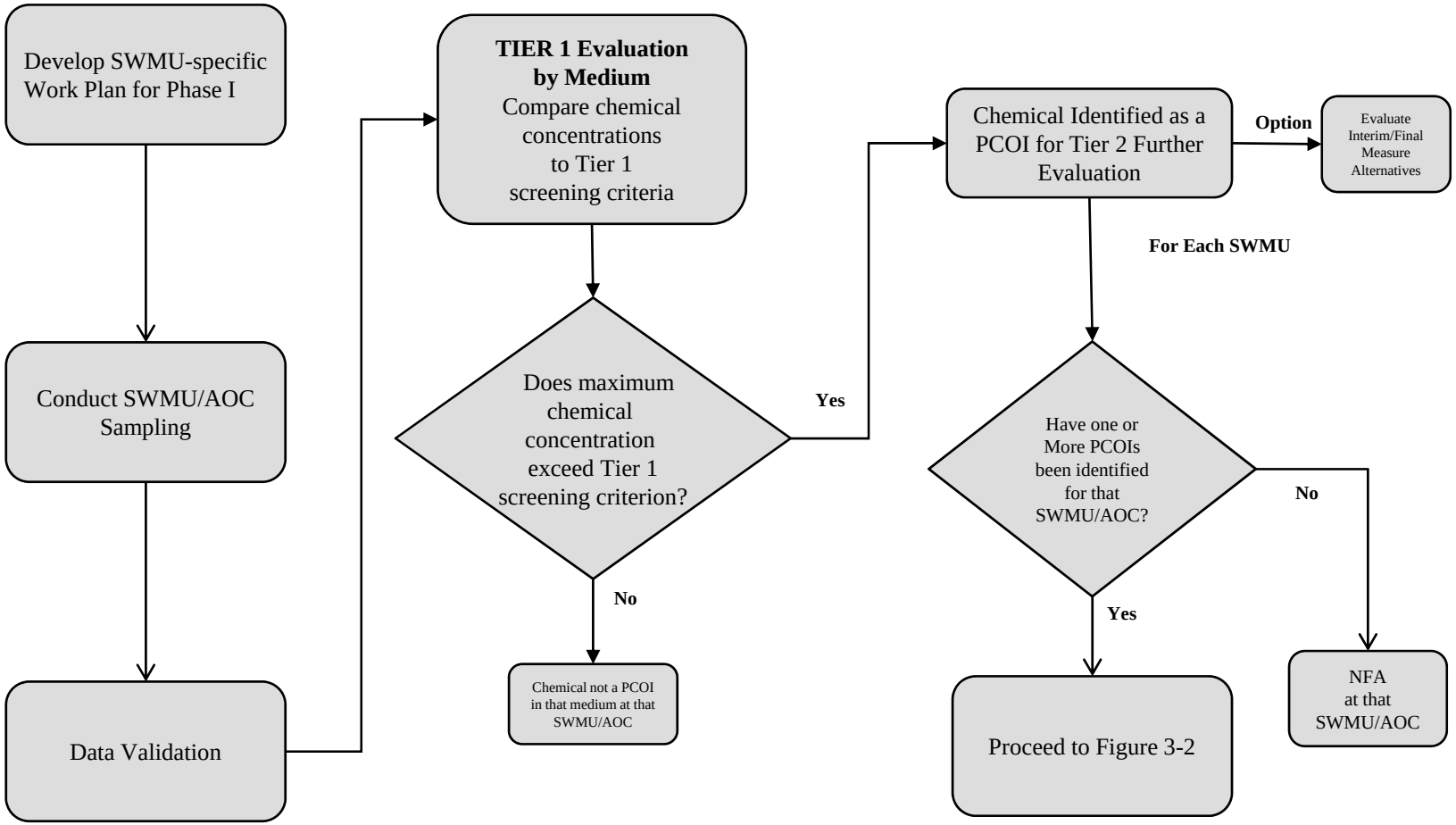
S:\2007\C&D Technologies\RFI Work Plan\CADD files\RFI Work plan Figure 2-2.rev.1.dwg

URS

1000 CORPORATE CENTRE DRIVE
ONE CORPORATE CENTRE, SUITE 250
FRANKLIN, TN 37067
(P): 615-771-2460
(F): 615-771-2480

C&D TECHNOLOGIES, INC.
200 WEST MAIN STREET
ATTICA, INDIANA
ATTICA, INDIANA FACILITY

DRAWN BY:	CHECKED BY:	REVISED:	DWG. NO.
MGT	PGR	11/01/2007	2-2



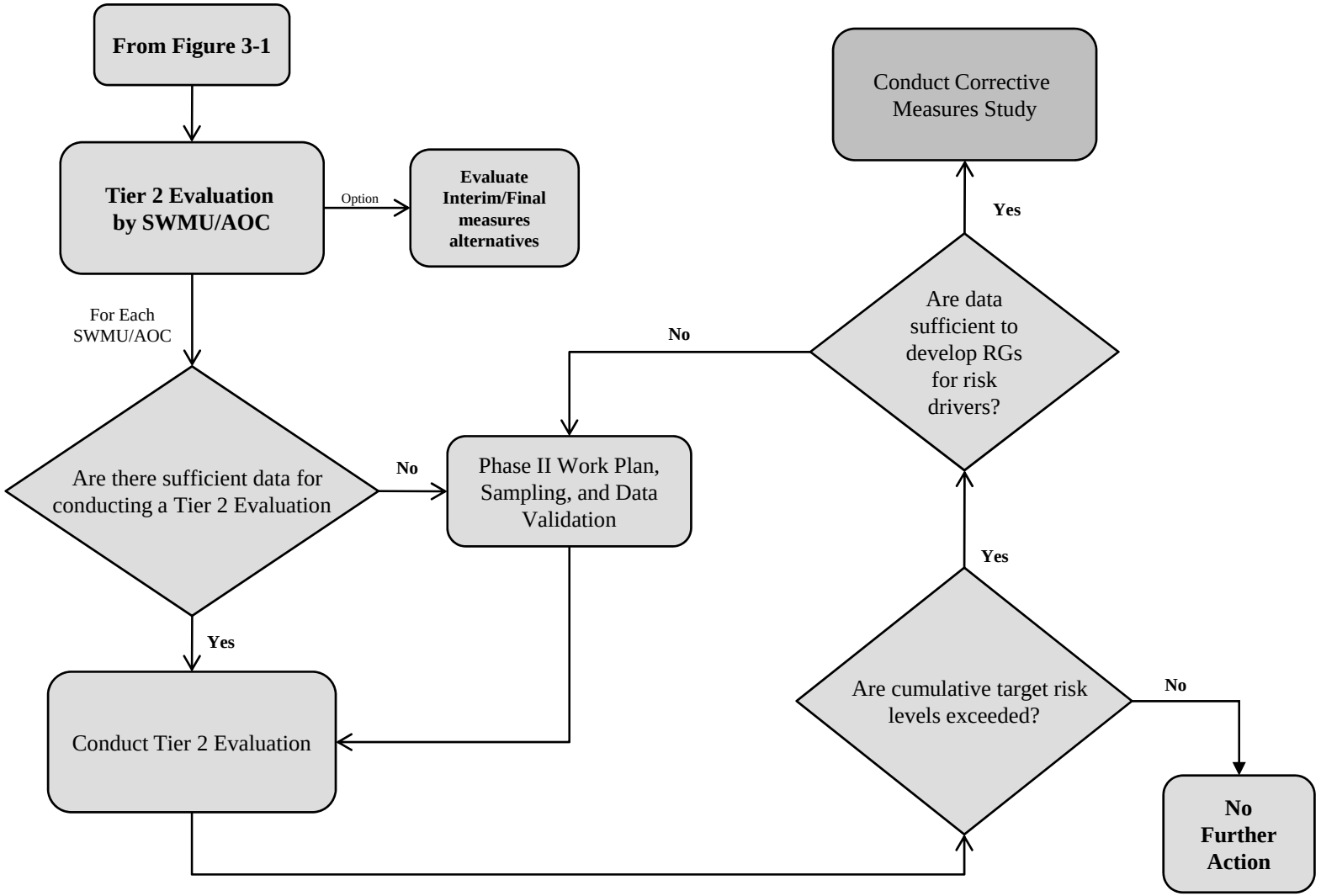
AOC – Area of Concern
COI = Chemical of Interest
NFA = No Further Action
PCOI = Potential Chemical of Interest
SWMU = Solid Waste Management Unit

URS

SCALE:	DRAWN BY:	DATE:
	CHKD. BY:	DATE:

Tier 1 Risk Evaluation Flowchart

FIGURE 3-1



AOC – Area of Concern
COI = Chemical of Interest
RG = Remedial Goal
PCOI = Potential Chemical of Interest
SWMU = Solid Waste Management Unit

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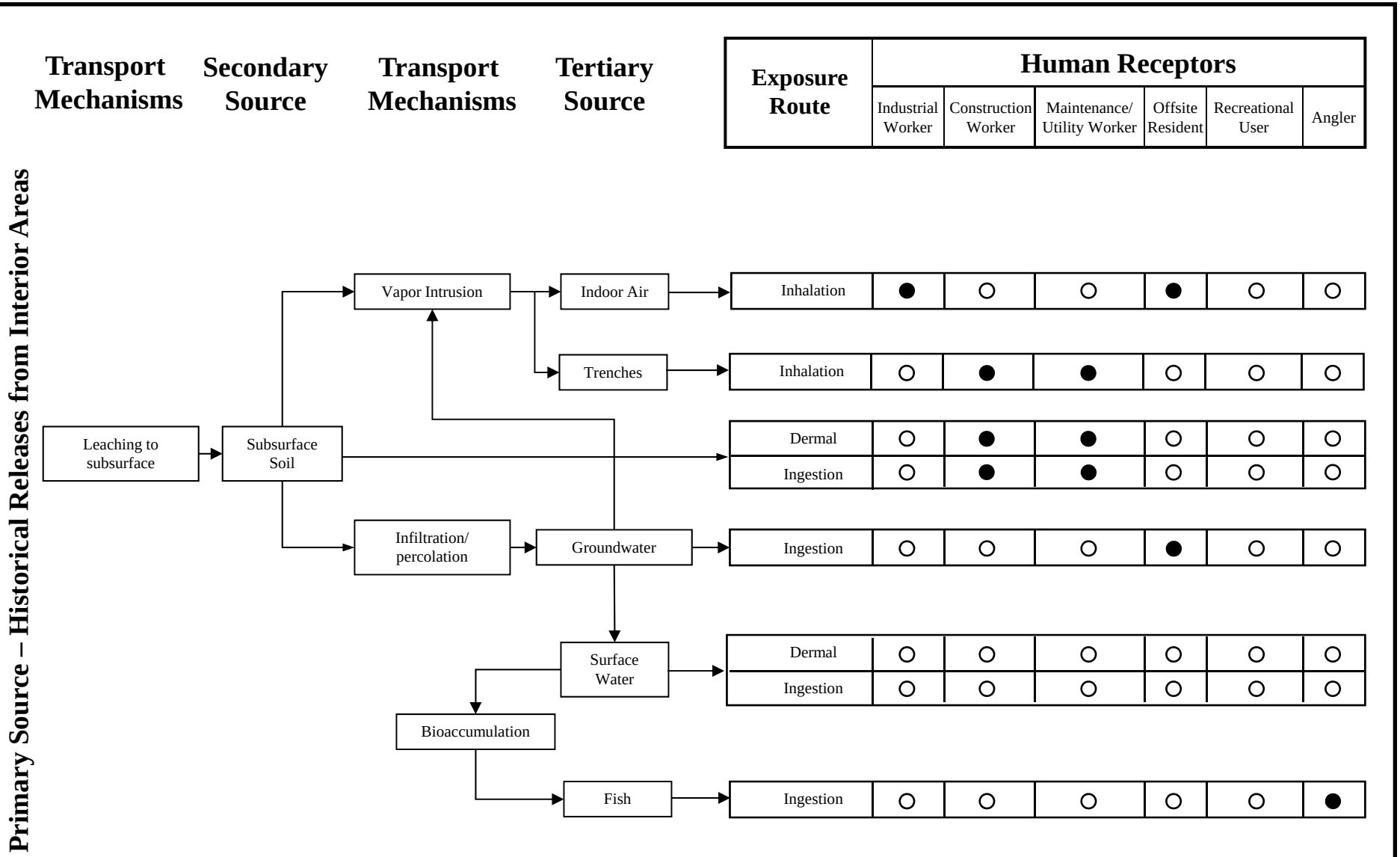
	CHKD. BY:	DATE:

Tier 2 Risk Evaluation Flowchart

FIGURE 3-2



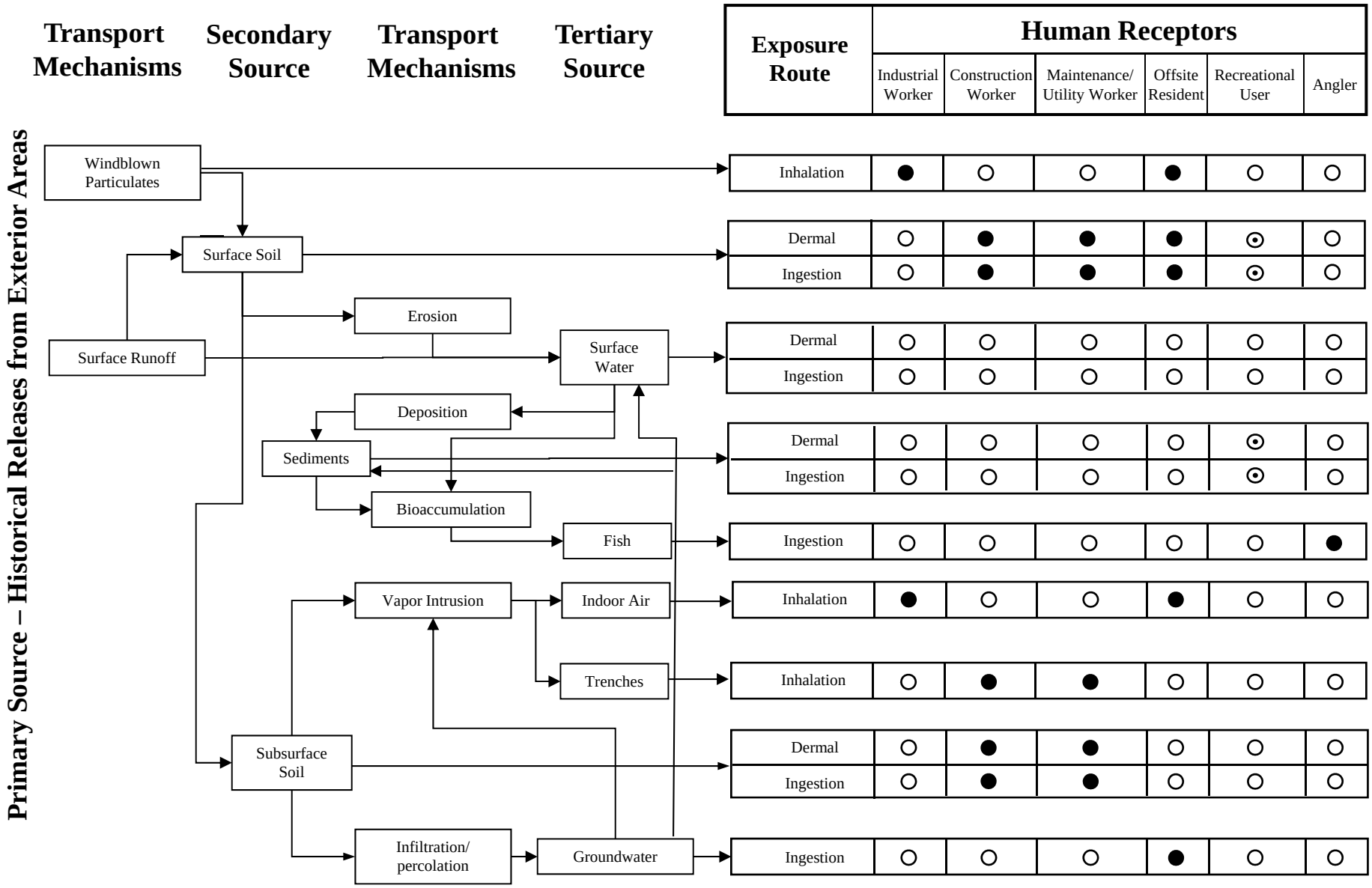
● Potentially Complete Pathway

⊙ Potentially Complete but Insignificant

○ Pathway Incomplete

Human Health Conceptual Site Model – Interior Areas

Date	Job Number		Figure
07242007	20500205	URS	3-3



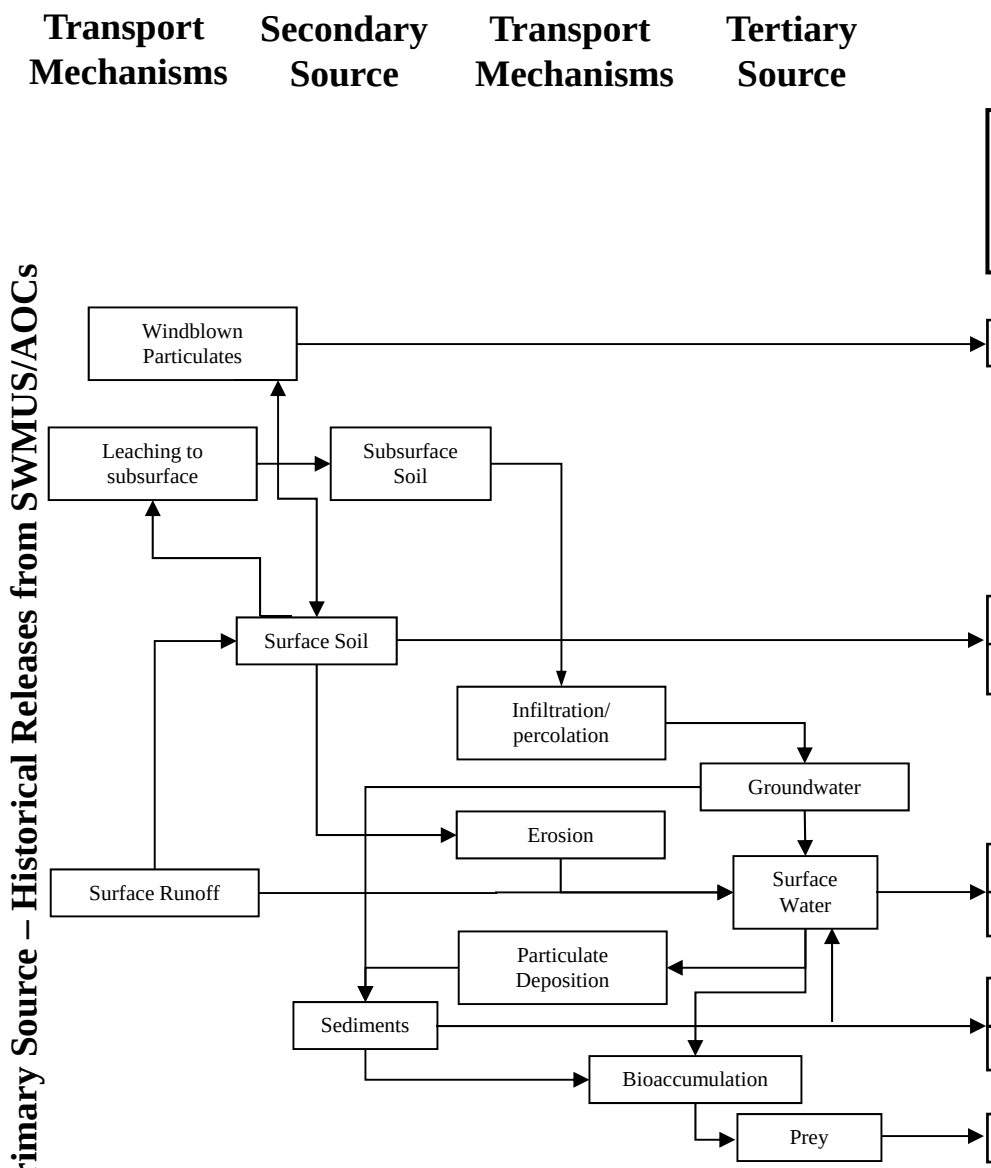
● Potentially Complete Pathway

⊙ Potentially Complete but Insignificant

○ Pathway Incomplete

Human Health Conceptual Site Model – Exterior Areas

Date	Job Number		Figure
07242007	20200205	URS	3-4



Exposure Route	Aquatic			Terrestrial		
	Benthic Inverts	Fish/ Plankton	Birds and Mammals	Terrestrial Inverts	Plants	Birds and Mammals
Inhalation	○	○	⊙	○	○	⊙
Direct	○	○	○	●	●	⊙
Ingestion	○	○	○	○	○	●
Direct	●	●	⊙	●	●	○
Ingestion	○	○	●	○	○	●
Direct	●	●	⊙	○	○	○
Ingestion	○	○	●	○	○	○
Ingestion	○	○	●	○	○	●

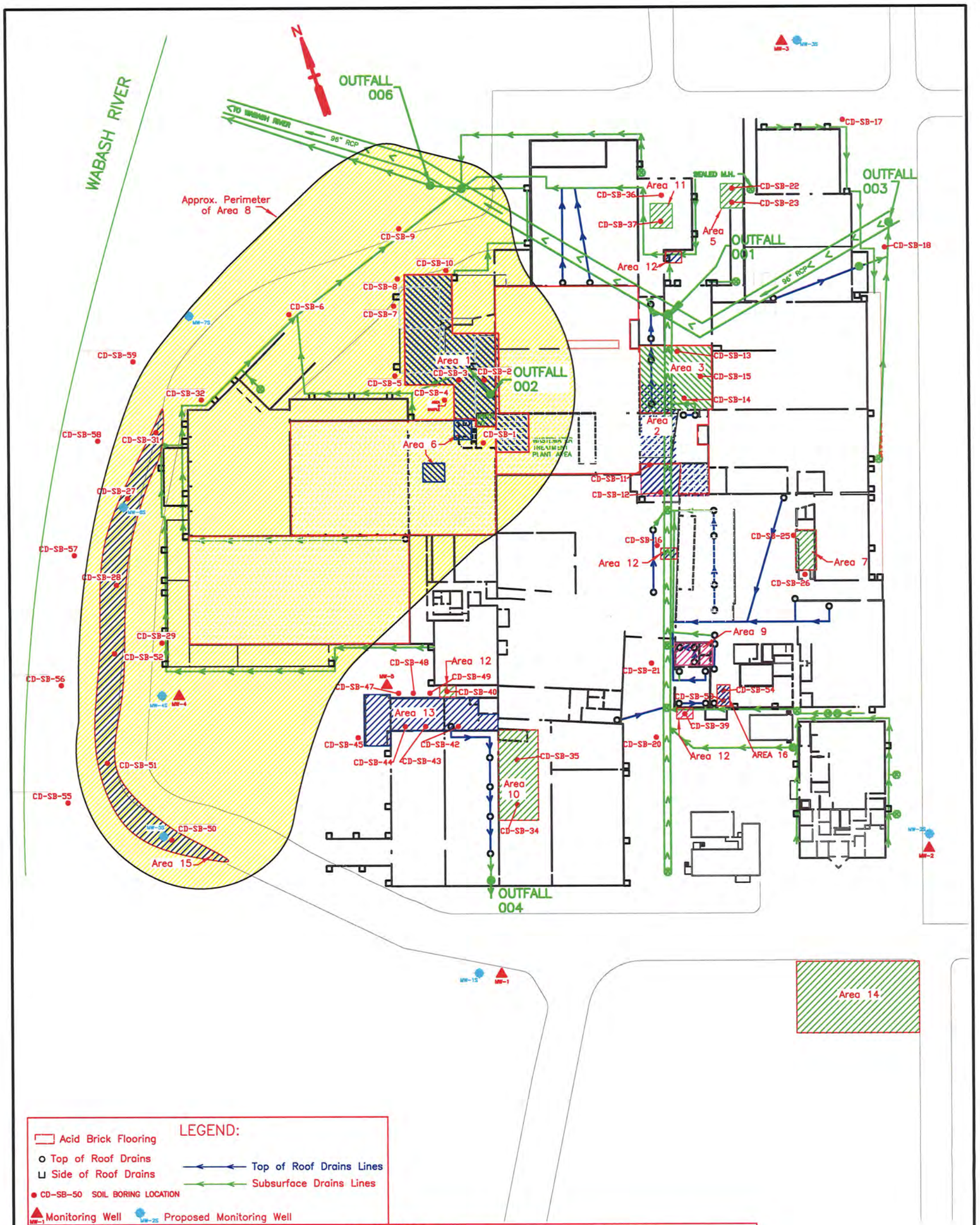
● Potentially Complete Pathway

⊙ Potentially Complete but Insignificant

○ Pathway Incomplete

Ecological Conceptual Site Model

Date	Job Number	URS	Figure
07242007	20500205		3-5



LEGEND:

- Acid Brick Flooring
- Top of Roof Drains
- Side of Roof Drains
- CD-SB-50 SOIL BORING LOCATION
- MW-1 Monitoring Well
- MW-25 Proposed Monitoring Well
- Top of Roof Drains Lines
- Subsurface Drains Lines

SWMU/AOCs

1 Wastewater pre-treatment plant
2 Current/former acid lofts
3 Lead oxide storage silos
4 Storm water sewers
5 Exterior former hazardous material storage area
6 Exterior former drum storage area and transfer pad
7 Poly-mixing room
8 Historical drive-up disposal area
9 Historical former waste and dust storage room
10 Southwest historical former container storage area
11 Northeastern historical former container storage area
12 Central vacuum systems
13 Former oxide mill area
14 Former onsite filling station
15 West container storage area
16 Former DC Generators Location (Potential PCB Containing Equipment)

SCALE IN FEET

0 40 80 160

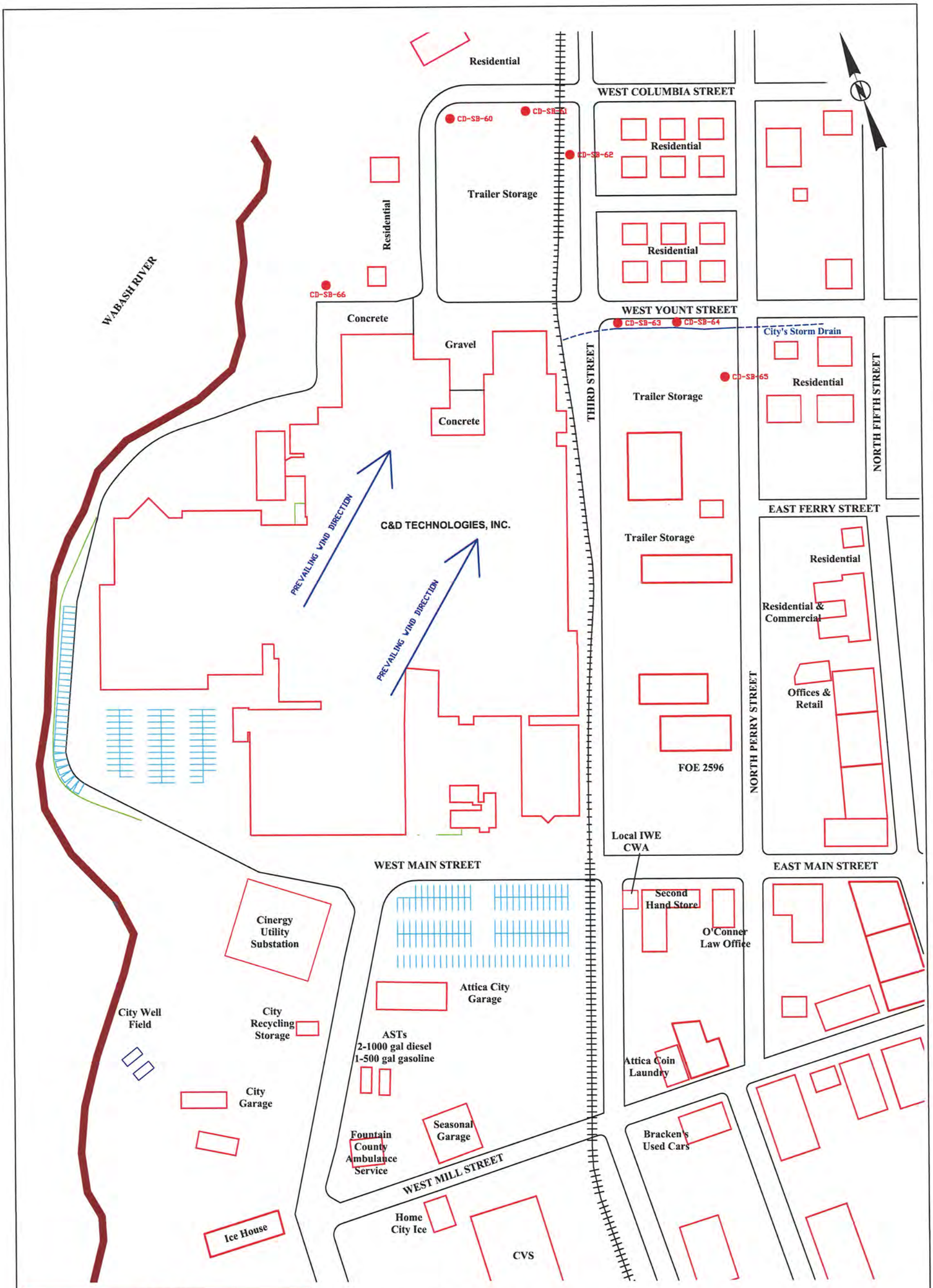
RFI WORKPLAN
SWMU/AOC SOIL BORING LOCATION MAP

S:\2007\C&D Technologies\RFI Work Plan\CADD files\RFI Work plan Figure 4-1.rev.1.dwg

URS
1000 CORPORATE CENTRE DRIVE
ONE CORPORATE CENTRE, SUITE 250
FRANKLIN, TN 37067
(P): 615-771-2460
(F): 615-771-2480

C&D TECHNOLOGIES, INC.
200 WEST MAIN STREET
ATTICA, INDIANA
ATTICA, INDIANA FACILITY

DRAWN BY:	CHECKED BY:	REVISED:	DWG. NO.
MGT	PDR	11/01/2007	4-1



PROPOSED OFF-SITE BORING LOCATIONS MAP

(Base Drawing Obtained from 2007 Current Conditions Report)

S:\2007\C&D Technologies\RFI Work Plan\CADD files\RFI Work plan Figure 4-2.dwg

URS

1000 CORPORATE CENTRE DRIVE
ONE CORPORATE CENTRE, SUITE 250
FRANKLIN, TN 37067
(P): 615-771-2480
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C&D TECHNOLOGIES, INC.
200 WEST MAIN STREET
ATTICA, INDIANA
ATTICA, INDIANA FACILITY

DRAWN BY:	CHECKED BY:	REVISED:	DWG. NO.
MGT	PQR	11/01/2007	4-2

APPENDIX A

Administrative Order of Consent
(RCRA-05-2007-0003, U.S.EPA ID No.: 000 810 754)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

January 18, 2007

Mr. John M. Kyle, III
Barnes & Thornburg
11 South Meridian Street
Indianapolis, Indiana 46204-3535

Re: C&D Technologies, Inc., Attica, IN
U.S. EPA ID No.: IND 000 810 754
Administrative Order on Consent
under Section 3008(h) of RCRA
RCRA-05-2007-0003

Dear Mr. Kyle,

Thank you for your assistance in having C&D Technologies, Inc. sign the RCRA 3008(h) Administrative Order on Consent (AOC) for the C&D Technologies, Inc facility in Attica, Indiana. A fully executed copy of the original AOC is enclosed for C&D Technologies files. The fully executed original has been filed with the Regional Hearing Clerk. Your cooperation in resolving this matter is appreciated.

In accordance with Paragraph V of the agreement, I am hereby designating Tammy Moore as the U.S. EPA project manager for this project. We look forward to working closely together to make sure that all of the work will be completed by the deadlines contained in the agreement.

If you have any questions, please contact Ms. Moore at (312) 886-6181.

Sincerely,

George J. Hamper, Chief
Corrective Action Section
Enforcement and Compliance Assurance Branch
Waste, Pesticides and Toxics Division

Enclosure

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5

RECEIVED
REGIONAL HEARING CLERK
US EPA REGION V
2007 JAN 18 AM 11: 27

IN THE MATTER OF:	)	ADMINISTRATIVE ORDER ON CONSENT
	)	
C & D Technologies Attica, Indiana	)	U.S. EPA Docket No: RCRA-05-2007-0003
	)	
EPA ID#: 000-810-754	)	Proceeding under Section 3008(h) of the Resource Conservation and Recovery Act, as amended, 42 U.S.C. § 6928(h).
RESPONDENT.	)	

I. JURISDICTION

1. The Administrator of the United States Environmental Protection Agency (U.S. EPA) is issuing this Administrative Order on Consent (Order) to C & D Technologies (C&D) under Section 3008(h) of the Solid Waste Disposal Act, commonly referred to as the Resource Conservation and Recovery Act of 1976 (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984, 42 U.S.C. §6928(h). The Administrator has delegated the authority to issue orders under Section 3008(h) of RCRA to the Director; Waste, Pesticides and Toxics Division; U.S. EPA Region 5.

2. C&D owns and operates a battery manufacturing plant at 200 W. Main Street in the city of Attica, Fountain County, Indiana (the Facility). The Facility is located on approximately 12.5 acres in the north-northwestern portion of the city. The Wabash River borders the Facility on the west and northwest. Residential and commercial properties surround the remaining sides of the Facility. The Facility terrain slopes northwest, toward the river.

3. The Facility contains an active battery manufacturing area, a former landfill, and riverbank property along the Wabash River. The city of Attica's municipal drinking water well field is located approximately .25 miles south of the Facility.

4. U.S. EPA conducted a *Screening Site Investigation Report for Electra Corporation C&D Batteries Division, Attica, Indiana*, dated October 12, 1990 (SSI Report) which included a site history of the Facility and described its physical setting.

5. By letter dated April 19, 2006, C&D submitted to U.S. EPA a VOC Investigation Report providing data from one round of groundwater sampling for volatile organic compounds (VOCs) to assess if a former landfill at the Facility was a potential source of VOCs that had been detected in the municipal drinking water wells (the VOC Investigation Report). The VOC Investigation Report provided data from monitoring wells that C&D installed pursuant to the

U.S. EPA-approved Investigation Work Plan. Although inconclusive, in part because the data reflected only one round of sampling, the VOC Investigation Report stated that at the time of the sampling, this preliminary sampling did not demonstrate that the former landfill at C&D was a current source of VOCs to the municipal well field.

6. C&D agrees not to contest U.S. EPA's jurisdiction to issue this Order, to enforce its terms, or to impose sanctions for violations of the Order.

7. C&D waives any rights to request a hearing on this matter pursuant to Section 3008(b) of RCRA and 40 C.F.R. Part 24, and consents to the issuance of this Order without a hearing under Section 3008(b) of RCRA as a Consent Order issued pursuant to Section 3008(h) of RCRA.

II. DEFINITIONS

8. This Order incorporates the definitions in RCRA, 42 U.S.C. §§ 6901- 6922k, and the regulations promulgated under RCRA unless otherwise specified.

III. PARTIES BOUND

9. This Order applies to and binds U.S. EPA, C&D and its agents, successors, assigns, trustees, receivers, and all persons, including but not limited to contractors and consultants, acting on behalf of C&D. C&D will be responsible for and liable for any violations of this Order, regardless of C&D's use of employees, agents, contractors, or consultants to perform work required by this Order.

10. No change in ownership or corporate or partnership status relating to the Facility will alter C&D's obligations under this Order. Any conveyance of title, easement, or other interest in the Facility, or a portion of the Facility, will not affect C&D's obligations under this Order. C&D will give written notice of this Order to any successor in interest prior to transferring ownership or operation of the Facility or a portion thereof and will notify U.S. EPA in writing within five days of the transfer. This written notice will describe how C&D has assured that, despite the transfer, all institutional controls that may be required now or in the future for the Facility will be implemented and maintained. This paragraph will not apply if U.S. EPA and C&D agree that this Order has terminated as to the Facility or any relevant portion of the Facility.

IV. DETERMINATIONS

11. After consideration of the Administrative Record, the Division Director, Waste, Pesticides and Toxics Division, U.S. EPA Region 5 has made the following conclusions of law and determinations:

a. C&D is a "person" within the meaning of Section 1004(15) of RCRA.

b. C&D is the owner or operator of a facility that had operated under interim status subject to Section 3005(e) of RCRA.

c. Certain wastes and constituents found at the Facility are hazardous wastes and/or hazardous constituents pursuant to Section 1004(5), 3001 of RCRA and 40 C.F.R. Part 261.

d. There is or has been a release of hazardous wastes or hazardous constituents into the environment from the Facility.

e. The actions required by this Order are necessary to protect human health or the environment.

V. PROJECT MANAGER

12. U.S. EPA has designated Tammy Moore as the agency's Project Manager. C&D must designate a Project Manager and notify U.S. EPA in writing of the Project Manager (Jack Waggoner) selected within 14 days of the effective date of this Order. Each Project Manager will be responsible for overseeing the implementation of this Project. The parties must provide prompt written notice whenever they change Project Managers.

VI. WORK TO BE PERFORMED

13. Pursuant to Section 3008(h) of RCRA, C&D agrees to and is hereby ordered to perform the actions specified in this section, in the manner and by the dates specified herein. C&D represents that it has the technical and financial ability to carry out corrective action at the Facility. C&D must perform the work undertaken pursuant to this Order in compliance with RCRA and other applicable federal and state laws and their implementing regulations, and consistent with all relevant U.S. EPA guidance documents as appropriate to the Facility. This guidance includes, but is not limited to, the Documentation of Environmental Indicator Determination Guidance, relevant portions of the Model Scopes of Work for RCRA Corrective Action, Risk Assessment Guidance for Superfund (RAGS), Ecological Risk Assessment Guidance (ERAGS) and other appropriate U.S. EPA guidance.

14. C&D must identify and define the nature and extent of releases of hazardous waste and hazardous constituents at or from the Facility. This work includes: Jan. 18 + 60 days

a. Provide to U.S. EPA, within 60 days after the effective date of this Order, a brief Current Conditions Report covering all areas of the Facility, including areas leased to other parties or operators and the former landfill. The Current Conditions Report must include any recent sampling data from the Facility, a summary of historic operations, any known waste spills, the physical setting of the area of the Facility; including maps of all tank areas, buildings, paved areas, easements, and other features, any hazardous waste treatment, storage and disposal areas, waste underground piping, and information about surrounding land uses (i.e. residential, commercial, agricultural, recreational) and aerial photos.

The Current Conditions Report in total must describe, at a minimum, conditions at locations specified in the SSI Report; conditions at areas of the Facility leased to other parties or operators; and conditions at any other locations at the Facility for which C&D knows of past treatment, storage, or disposal of hazardous waste or hazardous constituents. C&D may also include information regarding previous clean closure activities, other remedial activities, and groundwater data to demonstrate the TCE contamination at the City of Attica's municipal drinking water well field originated from an unrelated off-site facility and did not originate from the C&D facility (which includes a former landfill).

b. Perform an investigation to identify the nature and extent of any releases of hazardous waste and/or hazardous constituents at or from the Facility which may pose an unacceptable risk to human health and the environment, and provide a report to U.S. EPA. C&D must submit a RCRA Facility Investigation (RFI) Work Plan preceding the RFI investigation which provides the:

1. RFI scope
2. Potential Receptor Identification Plan (The plan will include a Conceptual Site Model (CSM) that will identify primary and secondary contaminant fate and transport (migration) to all media, including chemical transformation and ecological, human and groundwater conceptual site receptors. The initial CSM should be as comprehensive as possible, based upon the Current Conditions Report, SSI Report, site reconnaissance, current and historical facility operations, current data and other information. As data is gathered through the RFI process, the site model(s) will be updated every 90 days if new data alters the prior model or indicates that the prior model was incomplete. The Potential Receptor Identification Plan may be submitted separately from the RFI Workplan, however, the Potential Receptor Identification Plan must be initially submitted no later than the RFI Workplan.)

3. RFI Work Plan Objectives
4. Environmental Setting and Characterization Plan
5. RFI Project Management Plan
6. RFI Sampling and Analysis Plan
7. RFI Quality Assurance Project Plan
8. Data Management Plan
9. Health and Safety Plan
10. Community Relations Plan [redacted] Chicago (George Varela 312-939-1000)
11. Schedule for Implementation of the Work Plan, including preparation and submission of preliminary and final reports to U.S. EPA.

C&D will submit a RFI Report that must describe the nature and extent of any releases of hazardous waste and hazardous constituents at or from the Facility which do not pose an unacceptable risk to human health and the environment, and provide the basis for those conclusions, including an evaluation of the risks. C&D

may prepare and submit the RFI Report in two phases to provide timely support for the demonstrations described in paragraph 16, below, and for the determinations described in paragraph 17 and any proposal(s) described in paragraph 18, below.

15. C&D may proceed with interim measures to limit site investigation or risk assessment activities to complete the work as defined in paragraphs 17 through 19, below.

16. C&D must demonstrate by July 30, 2008, through submitting an Environmental Indicators Report and by performing any other necessary activities, consistent with this Section, that:

a. All current human exposures to contamination at or from the Facility are under control; that is, significant or unacceptable exposures do not exist for all media known or reasonably suspected to be contaminated with hazardous wastes or hazardous constituents above risk-based levels, for which there are complete pathways between contamination and human receptors.

b. Migration of contaminated groundwater at or from the Facility is stabilized. That is, the migration of all groundwater known or reasonably suspected to be contaminated with hazardous wastes or hazardous constituents above acceptable levels is stabilized to remain within any existing areas of contamination as defined by monitoring locations designated at the time of the demonstration. In addition, any discharge of groundwater to surface water is either insignificant or currently acceptable according to an appropriate interim assessment. C&D must collect monitoring and measurement data in the future as necessary to verify that migration of any contaminated groundwater is stabilized

If C&D is unable to complete the groundwater EI Report by July 30, 2008, for valid technical reasons, it may present those reasons and supporting rationale to EPA, and request a reasonable extension of time to submit the groundwater EI report.

17. To prepare for and provide the demonstrations required by paragraph 16, above, C&D must:

a. Determine appropriate risk screening criteria under current use scenarios and provide the basis and justification for the use of these criteria.

b. Determine any current unacceptable risks to human health and the environment and describe why other identified risks are acceptable.

c. Control any unacceptable current human exposures that C&D identifies. This includes performing any corrective actions or other response measures (corrective

measures) necessary to control current human exposures to contamination to within acceptable risk levels.

d. Stabilize the migration of contaminated groundwater. This includes implementing any corrective measures necessary to stabilize the migration of contaminated groundwater

e. Conduct groundwater monitoring to confirm that any contaminated groundwater remains within the original area of contamination.

f. Prepare a report, either prior to or as part of the Environmental Indicators Report, that describes and justifies any interim actions performed to meet the requirements of this Section, including sampling documentation, construction completion documentation and/or confirmatory sampling results.

18. C&D must propose to U.S. EPA by August 1, 2009, the final corrective measures necessary to protect human health and the environment from all current and reasonably expected future unacceptable risks due to releases of hazardous waste or hazardous constituents at or from the Facility. Depending upon the extent and complexity of environmental issues that may be identified at the Facility, C&D will submit either a Corrective Measures Proposal (CMP) or Corrective Measures Study (CMS). The data and information gathered during the Current Conditions Report, the RFI, and any interim measure will determine whether a CMP or CMS is appropriate and the scope of the CMP or CMS.

a. If the Facility has limited or simple environmental issues, C&D may submit a CMP. The CMP will include supporting documentation for the obvious or presumptive corrective measures that C&D proposes to remediate releases at the Facility.

b. If the Facility has extensive or complex environmental issues, C&D must submit a CMS. The CMS will identify and evaluate potential remedial alternatives for releases that pose an unacceptable risk to human health or the environment and contain supporting documentation for the corrective measures that C&D proposes to remediate such releases at the Facility.

c. The CMP or CMS containing the final proposed corrective measures must also include a detailed schedule to construct and implement the final corrective measures, and to submit a Final Remedy Construction Completion Report. C&D must complete as much of the initial construction work as practicable within one year after U.S. EPA selects the final corrective measures. C&D must complete all final corrective measures within a reasonable period of time to protect human health and the environment.

19. As part of developing its CMP or CMS, C&D must propose appropriate risk screening criteria, cleanup objectives, and points of compliance under current and reasonably expected future land use scenarios and provide the basis and justification for these decisions.

20. U.S. EPA may request supplemental information from C&D if U.S. EPA determines that the CMP or CMS and supporting information do not provide an adequate basis to select final corrective measures that will protect human health and the environment from the release of hazardous waste and hazardous constituents at or from the Facility. C&D must timely provide to U.S. EPA any supplemental information that U.S. EPA requests in writing.

21. U.S. EPA will provide the public with an opportunity to review and comment on its proposed final corrective measures, including a detailed description and justification for the proposal (the Statement of Basis). Following the public comment period, U.S. EPA will select the final corrective measures, and will notify the public of the decision and rationale in a "Final Decision and Response to Comments" (Final Decision).

22. Upon notice by U.S. EPA, C&D must implement the final corrective measures selected in U.S. EPA's Final Decision according to the schedule in the Final Decision.

23. Reporting and other requirements:

Review Lgo

a. C&D must establish a publicly accessible repository in the City of Attica for information regarding site activities and conduct timely public outreach and involvement activities.

b. C&D must provide quarterly progress reports to U.S. EPA by the fifteenth day of the month after the end of each quarter. The report must list work performed to date, data collected, problems encountered, project schedule, and percent project completed.

c. The parties will communicate frequently and in good faith to assure successful completion of the requirements of this Order, and will meet via teleconference or in person on at least a semi-annual basis to discuss the work proposed and performed under this Order.

d. C&D must provide a Final Remedy Construction Completion Report documenting all work that it has performed pursuant to the schedule in U.S. EPA's Final Decision.

e. If ongoing monitoring or operation and maintenance is required after construction of the final corrective measures, C&D must include an operations and maintenance plan in the Final Remedy Construction Completion Report. C&D must revise and resubmit the report in response to U.S. EPA's written comments, if any, by the dates U.S. EPA specifies. Upon U.S. EPA's written approval, C&D must implement the approved operation and maintenance plan according to the schedule and terms of the plan.

f. Any risk assessments C&D conducts must estimate human health and ecological risk under reasonable maximum exposure for both current and reasonably

expected future land use scenarios. In conducting the risk assessments, C&D will follow the RAGS, ERAGS or other appropriate U.S. EPA guidance. C&D will use appropriate, conservative screening values when screening to determine whether further investigation is required. Appropriate screening values include those derived from Federal Maximum Contaminant Levels, RAGS, ERAGS, U.S. EPA Region 9 Preliminary Remediation Goals, U.S. EPA Region 5 Ecological Screening Levels, and U.S. EPA Region 5 Risk Based Screening Levels.

g. All sampling and analysis conducted under this Order must be performed in accordance with the Region 5 RCRA Quality Assurance Project Plan Policy (April 1998) as appropriate for the site, and be sufficient to identify and characterize the nature and extent of all releases as required by this Order. U.S. EPA may audit laboratories C&D selects or require C&D to purchase and have analyzed any performance evaluation samples selected by U.S. EPA which are compounds of concern. C&D must notify U.S. EPA in writing at least 14 days before beginning each separate phase of field work performed under this Order. At the request of U.S. EPA, C&D will provide or allow U.S. EPA or its authorized representative to take split or duplicate samples of all samples C&D collects under this Order.

24. The Project Managers for C&D and U.S. EPA can agree in writing to extend any deadline in this Section. The Division Director; Waste, Pesticides and Toxics Division, must approve an extension of more than three months.

25. C&D is required to identify and define the nature and extent, and remediate as necessary, releases of: 1) hazardous waste and hazardous waste constituents originating at the Facility (which includes the former landfill) and 2) hazardous waste and hazardous waste constituents both originating at and migrating from the Facility as required by this Order. However, this Order shall not require C&D to perform any acts that are already being performed or required to be performed pursuant to the Consent Decree entered in the case designated *United States of America vs. C&D Technologies, Inc.*, Cause No. 1:03-CV-413-DFH-TAB, pending before the United States District court for the Southern District of Indiana.

VII. ACCESS

26. Upon reasonable notice, and at reasonable times, U.S. EPA, its contractors, employees, and any designated U.S. EPA representatives may enter and freely move about the Facility to, among other things: interview Facility personnel and contractors; review C&D's progress in carrying out the terms of this Order; conduct tests, sampling, or monitoring as U.S. EPA deems necessary; use a camera, sound recording, or other documentary equipment; and verify the reports and data C&D submits to U.S. EPA. C&D will permit such persons to inspect and copy all non-privileged photographs and documents, including all sampling and monitoring data, that pertain to work undertaken under this Order and that are within the possession or under the control of C&D or its contractors or consultants. C&D may request split samples, or copies of

all photographs, tapes, videos or other recorded evidence created by U.S. EPA and releaseable under the Freedom of Information Act.

27. If C&D must go beyond the Facility's boundary to perform work required by this Order, C&D must use its best efforts to obtain the necessary access agreements from the present owner(s) of such property within 30 days after C&D knows of the need for access. Any such access agreement must provide for access by U.S. EPA and its representatives. C&D must submit a copy of any access agreement to U.S. EPA's Project Manager. If it does not obtain agreements for access within 30 days, C&D must notify U.S. EPA in writing within 14 additional days of both the efforts undertaken to obtain access and the failure to obtain access agreements. U.S. EPA may, at its discretion, assist C&D in obtaining access.

28. Nothing in this Section limits or otherwise affects U.S. EPA's right of access and entry under applicable law, including RCRA and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. §§ 9601-9675.

VIII. COST ESTIMATES AND ASSURANCES OF FINANCIAL RESPONSIBILITY FOR COMPLETING THE WORK

29. Respondent shall submit to U.S. EPA detailed written estimates, in current dollars, of the cost of hiring a third party to perform the Work To Be Performed described in Section VI of this Consent Order (hereafter Estimated Cost of the Work). The Estimated Cost of the Work shall account for the total costs of the work activities that they cover, as described in Section VI and/or the Final Remedy Construction Completion Report, including any necessary long term costs, such as operation and maintenance costs and monitoring costs. A third party is a party who (i) is neither a parent nor a subsidiary of C&D and (ii) does not share a common parent or subsidiary with C&D. The cost estimates shall not incorporate any salvage value that may be realized from the sale of wastes, Facility structures or equipment, land or other assets associated with the Facility.

30. Within thirty days after C&D has submitted RFI Work Plan(s) under Section VI, paragraph 14 b., has selected an interim measure to perform under Section VI, paragraphs 15 or 16, or has submitted the CMP or CMS under Section VI paragraph 18, C&D shall submit to U.S. EPA for review and approval an initial Estimated Cost of the Work to be Performed which covers: RCRA Facility Investigation under Section VI, paragraph 14. b., and/or Interim Measures under Section VI, paragraph 15, and/or, and/or CMS or CMP and/or the Final Remedy Construction Completion Report under Section VI, paragraph 18.

31. Concurrent with the submission of additional Work Plan(s) required under Section VI (Work To Be Performed), C&D shall submit a revised Estimated Cost of the Work.

32. C&D shall annually adjust the Estimated Cost of the Work for inflation within sixty (60) days after the close of C&D's fiscal year until the Work required by this Consent Order is completed. In addition, C&D shall adjust the Estimated Cost of the Work if any other condition increases the cost of the Work to be performed under this Consent Order.

33. C&D shall submit each Estimated Cost of the Work to U.S. EPA for review. U.S. EPA will review each cost estimate and notify C&D in writing of U.S. EPA's approval, disapproval, or modification of the cost estimate.

34. In order to secure the full and final completion of the Work in accordance with this Consent Order, C&D shall establish and maintain financial assurance for the benefit of the U.S. EPA in the amount of the most recent Estimated Cost of the Work. C&D may use one or more of the financial assurance forms generally described in paragraphs a - f below. Any and all financial assurance instruments provided pursuant to this Consent Order shall be satisfactory in form and substance as determined by U.S. EPA:

a. A trust fund established for the benefit of U.S. EPA, administered by a trustee who has the authority to act as a trustee under Federal or State law and whose trust operations are regulated and examined by a Federal or State agency, and that is acceptable in all respects to the U.S. EPA. The trust agreement shall provide that the trustee shall make payments from the fund as the U.S. EPA Project Manager shall direct in writing (1) to reimburse C&D from the fund for expenditures made by C&D for Work performed in accordance with this Consent Order, or (2) to pay any other person whom the U.S. EPA Project Manager determines has performed or will perform the Work in accordance with this Consent Order. The trust agreement shall further provide that the trustee shall not refund to the grantor any amounts from the fund unless and until U.S. EPA has advised the trustee that the Work under this Consent Order has been successfully completed.

b. A surety bond unconditionally guaranteeing performance of the Work in accordance with this Consent Order, or guaranteeing payment at the direction of U.S. EPA into a standby trust fund that meets the requirements of the trust fund in paragraph 34. a., above. The surety company issuing the bond shall, at a minimum, be among those listed as acceptable sureties on Federal Bonds as set forth in Circular 570 of U.S. Department of the Treasury.

c. An irrevocable letter of credit, payable at the direction of the U.S. EPA Project Manager, into a standby trust fund that meets the requirements of the trust fund in paragraph 34. a., above. The letter of credit shall be issued by a financial institution (i) that has the authority to issue letters of credit, and (ii) whose letter-of-credit operations are regulated and examined by a Federal or State agency.

d. A policy of insurance that (i) provides U.S. EPA with rights as beneficiaries who are acceptable to U.S. EPA; and (ii) is issued by an insurance carrier that (a) has the authority to issue insurance policies in the applicable jurisdiction(s), and (b) whose insurance operations are regulated and examined by a Federal or State agency. The insurance policy shall be issued for a face amount at least equal to the current Estimated Cost of the Work to be performed under this Consent Order, except where costs not covered by the insurance policy are covered by another financial assurance instrument, as permitted in paragraph 5 of this Section. The

policy shall provide that the insurer shall make payments as the U.S. EPA Project Manager shall direct in writing (i) to reimburse C&D for expenditures made by C&D for Work performed in accordance with this Consent Order, or (ii) to pay any other person whom the U.S. EPA Project Manager determines has performed or will perform the Work in accordance with this Consent Order, up to an amount equal to the face amount of the policy. The policy shall also provide that it may not be canceled, terminated or non-renewed and the policy shall remain in full force and effect in the event that (i) C&D is named as a debtor in a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code; or (ii) U.S. EPA notifies the insurer of C&D's failure to perform, under paragraph 43 of this section.

e. A corporate guarantee, executed in favor of the U.S. EPA by one or more of the following: (i) a direct or indirect parent company, or (ii) a company that has a "substantial business relationship" with C&D (as defined in 40 C.F.R. § 264.141(h)), to perform the Work in accordance with this Consent Order or to establish a trust fund as permitted by paragraph 34. a., above; provided, however, that any company providing such a guarantee shall demonstrate to the satisfaction of the U.S. EPA that it satisfies the financial test requirements of 40 C.F.R. § 264.143(f) with respect to the Estimated Cost of the Work that it proposes to guarantee; or

f. A demonstration by C&D that C&D meets the financial test criteria of 40 C.F.R. § 264.143(f) with respect to the Estimated Cost of the Work, provided that all other requirements of 40 C.F.R. § 264.143(f) are satisfied.

35. Within thirty days after C&D has proposed Interim Measures which C&D shall perform under Section VI, paragraph 14 or has submitted the RFI Work Plan(s) under Section VI, paragraph 13. b. or has submitted the CMP or CMS under Section VI paragraph 18, C&D shall submit draft financial assurance instruments (for initial financial assurance under paragraphs 34. a., 34. b., 34. c., 34. d., or 34. e.) and related documents to U.S. EPA, concurrently with C&D's submission of the initial Estimated Cost of the Work, for U.S. EPA's review and approval. Within ten days after U.S. EPA's approval of both the initial Estimated Cost of the Work, and the draft financial assurance instruments, whichever date is later, C&D shall execute or otherwise finalize all instruments or other documents required in order to make the selected financial assurance legally binding in a form substantially identical to the financial assurance documents reviewed and approved by U.S. EPA. C&D shall submit all executed and/or otherwise finalized instruments or other documents to U.S. EPA within thirty days after U.S. EPA's approval of the initial Estimated Cost of the Work and the draft financial assurance instruments, whichever date is later.

36. Within thirty days after C&D has identified Interim Measures to perform under Section VI, paragraph 15 or has submitted the RFI Work Plan(s) under Section VI, paragraph 14. b. or has submitted the CMP or CMS under Section VI paragraph 18, C&D shall submit to U.S. EPA all documentation necessary to demonstrate that C&D satisfies the financial test criteria pursuant to paragraph 34. f., concurrently with C&D's submission of the initial Estimated Cost

of the Work. C&D's financial assurance shall be effective immediately upon U.S. EPA's approval of the initial Estimated Cost of the Work and C&D's demonstration that C&D satisfies the financial test criteria pursuant to paragraph 34. f., whichever date is later.

37. If C&D seeks to establish financial assurance by using a surety bond, a letter of credit, or a corporate guarantee, C&D shall at the same time establish, and thereafter maintain, a standby trust fund, which meets the requirements of paragraph 34. a. above, into which funds from the other financial assurance instrument can be deposited, if the financial assurance provider is directed to do so by U.S. EPA, pursuant to paragraph 44. b.

38. C&D shall submit all financial assurance instruments and related required documents by certified mail to the U.S. EPA Project Manager.

39. If at any time during the effective period of this Consent Order C&D provides financial assurance for completion of the Work by means of a corporate guarantee or financial test pursuant to paragraphs 34. e. or 34. f. above, C&D shall also comply with the other relevant requirements of 40 C.F.R. § 264.143(f), 40 C.F.R. §264.151(f), and 40 C.F.R. § 264.151(h)(1) relating to these methods, unless otherwise provided in this Consent Order, including but not limited to, (i) initial submission of required financial reports and statements from the guarantors' chief financial officer and independent certified public accountant; (ii) annual re-submission of such reports and statements within ninety days after the close of each of the guarantors' fiscal years; and (iii) notice to U.S. EPA within ninety days after the close of any of the guarantors' fiscal years in which any such guarantor no longer satisfies the financial test requirements set forth at 40 C.F.R. Part 264.143(f)(1). C&D further agrees that if C&D provides financial assurance by means of a corporate guarantee or financial test, U.S. EPA may request additional information (including financial statements and accountant's reports) from C&D or corporate guarantor at any time.

For purposes of the corporate guarantee or the financial test described in paragraphs 34. e. and 34. f. above, references in 40 CFR 264.143(f) to "the sum of current closure and post-closure costs and the current plugging and abandonment cost estimates" shall mean "the sum of all environmental remediation obligations" (including obligations under CERCLA, RCRA, UIC, TSCA and any other state or tribal environmental obligation) guaranteed by such company or for which such company is otherwise financially obligated in addition to the cost of the Work to be performed in accordance with this Consent Order.

40. C&D may combine more than one mechanism to demonstrate financial assurance for the Work to be performed in accordance with this Consent Order, except that mechanisms guaranteeing performance rather than payment may not be combined with other instruments.

41. If at any time U.S. EPA determines that a financial assurance instrument provided pursuant to this Section is inadequate, or no longer satisfies the requirements set forth or incorporated by reference in the Section, whether due to an increase in the estimated cost of completing the Work or for any other reason, U.S. EPA shall so notify C&D in writing. If at any time C&D becomes aware of information indicating that any financial assurance instrument provided pursuant to this Section is inadequate or no longer satisfies the requirements set forth or

incorporated by reference in the Section, whether due to an increase in the estimated cost of completing the Work or for any other reason, then C&D shall notify U.S. EPA in writing of such information within ten days. Within thirty days of receipt of notice of U.S. EPA's determination, or within thirty days of C&D's becoming aware of such information, as the case may be, C&D shall obtain and present to U.S. EPA for approval a proposal for a revised or alternative form of financial assurance listed in paragraph 34. above that satisfies all requirements set forth or incorporated by reference in this Section. In seeking approval for a revised or alternative form of financial assurance, C&D shall follow the procedures set forth in paragraph 46. b. below.

42. C&D's inability or failure to establish or maintain financial assurance for completion of the Work shall in no way excuse performance of any other requirements of this Consent Order, including, without limitation, the obligation of C&D to complete the Work in strict accordance with the terms of this Consent Order.

43. Any and all financial assurance instruments provided pursuant to paragraphs 34. b., 34. c., 34. d. or 34. e. shall be automatically renewed at the time of their expiration unless the financial assurance provider has notified both C&D and the U.S. EPA Project Manager at least one hundred and twenty days prior to expiration, cancellation or termination of the instrument of a decision to cancel, terminate or not renew a financial assurance instrument. Under the terms of the financial assurance instrument, the one hundred and twenty days will begin to run with the date of receipt of the notice by both the U.S. EPA Project Manager and C&D. Furthermore, if C&D has failed to provide alternate financial assurance and obtain written approval for such alternate financial assurance within ninety days following receipt of such notice by both C&D and the U.S. EPA Project Manager, then the U.S. EPA Project Manager will so notify the financial assurance provider in writing prior to the expiration of the instrument, and the financial assurance provider shall immediately deposit into the standby trust fund, or a newly created trust fund approved by EPA, the remaining funds obligated under the financial assurance instrument for the performance of the Work in accordance with this Consent Order.

44. Performance Failure.

a. In the event that U.S. EPA determines that C&D (i) has ceased implementation of any portion of the Work, (ii) is significantly or repeatedly deficient or late in its performance of the Work, or (iii) is implementing the Work in a manner that may cause an endangerment to human health or the environment, U.S. EPA may issue a written notice (Performance Failure Notice) to both C&D and the financial assurance provider of C&D's failure to perform. The notice issued by U.S. EPA will specify the grounds upon which such a notice was issued and will provide C&D with a period of ten days within which to remedy the circumstances giving rise to the issuance of such notice.

b. Failure by C&D to remedy the relevant Performance Failure to U.S. EPA's satisfaction before the expiration of the ten-day notice period specified in paragraph 43. a. shall trigger U.S. EPA's right to have immediate access to and benefit of the financial assurance provided pursuant to paragraphs 34. a., 34. b., 34. c, 34. d, or 34. e. U.S. EPA may at any time thereafter direct the financial

assurance provider to immediately (i) deposit into the standby trust fund, or a newly created trust fund approved by U.S. EPA, the remaining funds obligated under the financial assurance instrument (ii) or arrange for performance of the Work in accordance with this Consent Order.

c. If U.S. EPA has determined that any of the circumstances described in clauses (i), (ii), or (iii) of paragraph 44. a. has occurred, and if U.S. EPA is nevertheless unable after reasonable efforts to secure the payment of funds or performance of the Work in accordance with this Consent Order from the financial assurance provider pursuant to this Consent Order, then, upon receiving written notice from U.S. EPA, C&D shall within ten days thereafter deposit into the standby trust fund, or a newly created trust fund approved by U.S. EPA, in immediately available funds and without setoff, counterclaim, or condition of any kind, a cash amount equal to the estimated cost of the remaining Work to be performed in accordance with this Consent Order as of such date, as determined by U.S. EPA.

d. C&D may invoke the procedures set forth in Section XI (Dispute Resolution), to dispute U.S. EPA's determination that any of the circumstances described in paragraph 44. a., 44. b., or 44. c has occurred. Invoking the dispute resolution provisions shall not excuse, toll or suspend the obligation of the financial assurance provider, under paragraph 44. b. of this section, to fund the trust fund or perform the Work. Furthermore, notwithstanding C&D's invocation of such dispute resolution procedures, and during the pendency of any such dispute, U.S. EPA may in its sole discretion direct the trustee of such trust fund to make payments from the trust fund to any person that has performed the Work in accordance with this Consent Order until the earlier of (i) the date that C&D remedies, to U.S. EPA's satisfaction, the circumstances giving rise to U.S. EPA's issuance of the relevant Performance Failure Notice or (ii) the date that a final decision is rendered in accordance with Section XI (Dispute Resolution), that C&D has not failed to perform the Work in accordance with this Consent Order.

45. Reduction of Amount of Financial Assurance. If C&D believes that the estimated cost to complete the remaining Work has diminished below the amount covered by the existing financial assurance provided under this Consent Order, C&D may, at the same time that C&D submits the annual cost adjustment, pursuant to paragraph 32., or at any other time agreed to by U.S. EPA, submit a written proposal to U.S. EPA to reduce the amount of the financial assurance provided under this Section so that the amount of the financial assurance is equal to the estimated cost of the remaining Work to be performed. The written proposal shall specify, at a minimum, the cost of the remaining Work to be performed and the basis upon which such cost was calculated. In seeking approval of a revised financial assurance amount, C&D shall follow the procedures set forth in paragraph 46.b. of this Section. If U.S. EPA decides to accept such a proposal, U.S. EPA shall notify C&D of its decision in writing. After receiving U.S. EPA's written decision, C&D may reduce the amount of the financial assurance only in accordance with and to the extent permitted by such written decision. In the event of a dispute, C&D may reduce the amount of the financial assurance required hereunder only in accordance with the final U.S. EPA Dispute Decision resolving such dispute. No change to the form or terms of any financial

assurance provided under this Section, other than a reduction in amount, is authorized except as provided in paragraph 46.b., below.

46. Change of Form of Financial Assurance.

a. If C&D desires to change the form or terms of financial assurance, C&D may, at the same time that C&D submits the annual cost adjustment, pursuant to paragraph 31, or at any other time agreed to by U.S. EPA, submit a written proposal to U.S. EPA to change the form of financial assurance. The submission of such proposed revised or alternative form of financial assurance shall be as provided in paragraph b., below.

b. A written proposal for a revised or alternative form of financial assurance shall specify, at a minimum, the cost of the remaining Work to be performed, the basis upon which such cost was calculated, and the proposed revised form of financial assurance, including all proposed instruments or other documents required in order to make the proposed financial assurance legally binding. The proposed revised or alternative form of financial assurance shall satisfy all requirements set forth or incorporated by reference in this Section. U.S. EPA shall notify C&D in writing of its decision to accept or reject a revised or alternative form of financial assurance submitted pursuant to this paragraph. Within ten days after receiving a written decision approving the proposed revised or alternative financial assurance, C&D shall execute and/or otherwise finalize all instruments or other documents required in order to make the selected financial assurance legally binding in a form substantially identical to the documents submitted to U.S. EPA as part of the proposal, and such financial assurance shall be fully effective. C&D shall submit all executed and/or otherwise finalized instruments or other documents required in order to make the selected financial assurance legally binding to the U.S. EPA Project Manager within thirty days of receiving a written decision approving the proposed revised or alternative financial assurance. U.S. EPA shall release, cancel or terminate the prior existing financial assurance instruments only after C&D has submitted all executed and/or otherwise finalized new financial assurance instruments or other required documents to U.S. EPA.

47. Release of Financial Assurance. C&D may submit a written request to the U.S. EPA Project Manager that U.S. EPA release C&D from the requirement to maintain financial assurance under this Section at such time as U.S. EPA and C&D have both executed an Acknowledgment of Termination and Agreement to Record Preservation and Reservation of Rights pursuant to Section XVIII (Termination and Satisfaction) of the Consent Order. The U.S. EPA Project Manager shall notify both C&D and the provider(s) of the financial assurance that C&D is released from all financial assurance obligations under this Consent Order. C&D shall not release, cancel or terminate any financial assurance provided pursuant to this section except as provided in this paragraph or paragraph 46. b. In the event of a dispute, C&D may release, cancel, or terminate the financial assurance required hereunder only in accordance with a final administrative or judicial decision resolving such dispute.

IX. RECORD PRESERVATION

48. C&D must retain, during the pendency of this Order and for at least six years after the Order terminates, all data and all final documents now in its possession or control or which come into its possession or control which relate to this Order. C&D must notify U.S. EPA in writing 90 days before destroying any such records, and give U.S. EPA the opportunity to take possession of any non-privileged documents. C&D's notice will refer to the effective date, caption, and docket number of this Order and will be addressed to:

Director
Waste, Pesticides and Toxics Division
U.S. EPA, Region 5
77 W. Jackson Blvd.
Chicago, IL 60604-3590

C&D will also promptly give U.S. EPA's Project Manager a copy of the notice.

49. Within 30 days of retaining or employing any agent, consultant, or contractor (agents) to carry out the terms of this Order, C&D will enter into an agreement with the agents to give C&D a copy of all data and final non-privileged documents produced under this Order.

50. C&D will not assert any privilege claim concerning any data gathered during any investigations or other actions required by this Order.

X. STIPULATED PENALTIES

51. C&D must pay the following stipulated penalties to the United States for violations of this Order:

a. For failure to submit quarterly progress reports by the dates scheduled in paragraph 23, above: $500 per day for the first 14 days and $1,000 per day thereafter.

b. For failure to adequately demonstrate, as required by paragraph 16 a., that current human exposures are under control by June 1, 2008: $2,500 per day.

c. For failure to adequately demonstrate, as required by paragraph 16 b., that groundwater migration is stabilized by June 1, 2008: $2,500 per day.

d. For failure to submit the CMP or CMS in paragraph 18 by August 1, 2009: $1,000 per day for the first 14 days and $1,500 per day thereafter.

e. For failure to implement according to the approved schedule, the selected final corrective measures as described in paragraphs 21 and 22: $1,500 per day for the first 14 days and $2,000 per day thereafter.

f. For failure to submit the Final Remedy Construction Completion Report as scheduled in paragraph 18: $500 per day for the first 14 days and $1,000 per day thereafter.

g. For failure to submit the Current Conditions Report required in paragraph 14 a. within 60 days after the effective date of the Order: $500 per day for the first 14 days and $1,000 per day thereafter.

If any of the above deadlines is extended by the Project Managers for EPA and C&D, no stipulated penalties shall begin to accrue until the expiration of the extended deadline.

52. Whether or not C&D has received notice of a violation, stipulated penalties will begin to accrue on the day a violation occurs, and will continue to accrue until C&D complies. For items b and c, above, stipulated penalties will not accrue during the period, if any, beginning 31 days after the Environmental Indicators Report required by paragraph 15 is due until the date that U.S. EPA notifies C&D in writing of any deficiency in the required demonstration(s). Separate stipulated penalties for separate violations of this Order will accrue simultaneously.

53. C&D must pay any stipulated penalties owed to the United States under this Section within 30 days of receiving U.S. EPA's written demand to pay the penalties, unless C&D invokes the dispute resolution procedures under Section XI: Dispute Resolution. A written demand for stipulated penalties will describe the violation and will indicate the amount of penalties due.

54. Interest will begin to accrue on any unpaid stipulated penalty balance beginning 31 days after C&D receives U.S. EPA's demand letter. Interest will accrue at the current value of funds rate established by the Secretary of the Treasury. Under 31 U.S.C. § 3717, C&D must pay an additional penalty of six percent per year on any unpaid stipulated penalty balance more than 90 days overdue.

55. C&D must pay all penalties by certified or cashier's check payable to the United States of America, or by wire transfer, and will send the check to:

U.S. Department of the Treasury
Attention: U.S. EPA Region 5, Office of the Comptroller
P.O. Box 70753
Chicago, Illinois 60673.

A transmittal letter stating the name of the Facility, C&D's name and address, and the U.S. EPA docket number of this action must accompany the payment. C&D will simultaneously send a copy of the check and transmittal letters to the U.S. EPA Project Manager.

56. C&D may dispute U.S. EPA's assessment of stipulated penalties by invoking the dispute resolution procedures under Section XI: Dispute Resolution. The stipulated penalties in dispute will continue to accrue, but need not be paid, during the dispute resolution period. C&D must pay stipulated penalties and interest, if any, according to the dispute resolution decision or

agreement. C&D must submit such payment to U.S. EPA within 30 days after receiving the resolution according to the payment instructions of this Section.

57. Neither invoking dispute resolution nor paying penalties will affect C&D's obligation to comply with the terms of this Order not directly in dispute.

58. The stipulated penalties set forth in this Section do not preclude U.S. EPA from pursuing any other remedies or sanctions which may be available to U.S. EPA for C&D's violation of any terms of this Order. However, U.S. EPA will not seek both a stipulated penalty under this Section and a statutory penalty for the same violation.

XI. DISPUTE RESOLUTION

59. The parties will use their best efforts to informally and in good faith resolve all disputes or differences of opinion arising under this Order.

60. If either party disagrees, in whole or in part, with any decision made or action taken under this Order, that party will notify the other party's Project Manager of the dispute. The Project Managers will attempt to resolve the dispute informally.

61. If the Project Managers cannot resolve the dispute informally, either party may pursue the matter formally by placing its objections in writing. A written objection must state the specific points in dispute, the basis for that party's position, and any matters which it considers necessary for determination.

62. U.S. EPA and C&D will in good faith attempt to resolve the dispute through formal negotiations within 21 days, or a longer period if agreed in writing by the parties. During formal negotiations, either party may request a conference with appropriate senior management to discuss the dispute.

63. If the parties are unable to reach an agreement through formal negotiations, within 14 business days after any formal negotiations end, C&D or U.S. EPA's Project Manager may submit additional written information to the Director of the Waste, Pesticides and Toxics Division, U.S. EPA Region 5. U.S. EPA will maintain a record of the dispute, which will contain all statements of position and any other documentation submitted pursuant to this Section. U.S. EPA will allow timely submission of relevant supplemental statements of position by the parties to the dispute. Based on the record, U.S. EPA will respond to C&D's arguments and evidence and provide a detailed written decision on the dispute signed by the Director of the Waste, Pesticides and Toxics Division, U.S. EPA Region 5 (EPA Dispute Decision).

64. If, at the conclusion of the Dispute Resolution process, C&D notifies U.S. EPA that it refuses to implement U.S. EPA's selected final corrective measures, U.S. EPA will endeavor to pursue the action(s) it deems necessary, if any, within a reasonable period of time.

XII. FORCE MAJEURE AND EXCUSABLE DELAY

65. Force majeure, for purposes of this Order, is any event arising from causes not foreseen and beyond C&D's control that delays or prevents the timely performance of any obligation under this Order despite C&D's best efforts.

66. If any event occurs or has occurred that may delay the performance of any obligation under this Order, whether or not caused by a force majeure event, C&D must notify U.S. EPA within two business days after learning that the event may cause a delay. If C&D wishes to claim a force majeure event, within 15 business days thereafter C&D must provide to U.S. EPA in writing all relevant information relating to the claim, including a proposed revised schedule.

67. If U.S. EPA determines that a delay or anticipated delay is attributable to a force majeure event, U.S. EPA will extend in writing the time to perform the obligation affected by the force majeure event for such time as U.S. EPA determines is necessary to complete the obligation or obligations.

XIII. MODIFICATION

68. This Order may be modified only by mutual agreement of U.S. EPA and C&D, except as provided in Section VI - Work to be Performed. Any agreed modifications will be in writing, will be signed by both parties, will be effective on the date of signature by U.S. EPA, and will be incorporated into this Order.

XIV. RESERVATION OF RIGHTS

69. Nothing in this Order restricts U.S. EPA's authority to seek C&D's compliance with the Order and applicable laws and regulations. For violations of this Order, U.S. EPA reserves its rights to bring an action to enforce the Order, to assess penalties under Section 3008(h)(2) of RCRA, 42 U.S.C. § 6928(h)(2), and to issue an administrative order to perform corrective actions or other response measures. In any later proceeding, C&D shall not assert or maintain any defense or claim based upon the principles of waiver, res judicata, collateral estoppel, issue preclusion, claim-splitting, or other defenses based upon a contention that the claims raised by the United States in the later proceeding were or should have been raised here. This Order is not a covenant not to sue, release, waiver, or limitation of any rights, remedies, powers, or authorities of U.S. EPA.

70. U.S. EPA reserves all of its rights to perform any portion of the work consented to here or any additional site characterization, feasibility study, and remedial work as it deems necessary to protect human health or the environment.

71. If U.S. EPA determines that C&D's actions related to this Order have caused or may cause a release of hazardous waste or hazardous constituent(s) which may pose a threat to human health or the environment, or that C&D cannot perform any of the work ordered, U.S.

EPA may order C&D to stop implementing this Order for the time U.S. EPA determines may be needed to abate the release or threat and to take any action that U.S. EPA determines is necessary to abate the release or threat.

72. C&D does not admit any of U.S. EPA's factual or legal determinations. Except for the specific waivers in this Order, C&D reserves all of its rights, remedies and defenses, including all rights and defenses it may have: (a) to challenge U.S. EPA's performance of work; (b) to challenge U.S. EPA's stop work orders; and (c) regarding liability or responsibility for conditions at the Facility, except for its right to contest U.S. EPA's jurisdiction to issue or enforce this Order. C&D has entered into this Order in good faith without trial or adjudication of any issue of fact or law. C&D reserves its right to seek judicial review of U.S. EPA actions taken under this Order, including a proceeding brought by the United States to enforce the Order or to collect penalties for violations of the Order.

XV. OTHER CLAIMS

73. C&D waives any claims or demands for compensation or payment under Section 106(b), 111, and 112 of CERCLA against the United States or the Hazardous Substance Superfund established by 26 U.S.C. § 9507 for, or arising out of, any activity performed or expense incurred under this Order. Additionally, this Order is not a decision on preauthorization of funds under Section 111(a)(2) of CERCLA.

XVI. INDEMNIFICATION OF THE UNITED STATES GOVERNMENT

74. C&D indemnifies, saves and holds harmless the United States, its agencies, departments, agents, and employees, from all claims or causes of action arising from or on account of acts or omissions of C&D or its officers, employees, agents, independent contractors, receivers, trustees, and assigns in carrying out activities required by this Order. This indemnification will not affect or limit the rights or obligations of C&D or the United States under their various contracts. This indemnification will not create any obligation on the part of C&D to indemnify the United States from claims arising from the acts or omissions of the United States.

XVII. SEVERABILITY

75. If any judicial or administrative authority holds any provision of this Order to be invalid, the remaining provisions will remain in force and will not be affected.

XVIII. TERMINATION AND SATISFACTION

76. C&D may request that U.S. EPA issue a determination that C&D has met the requirements of the Order for all or a portion of the Facility. C&D may also request that U.S. EPA issue a "no further interest" or "no further action" determination for all or a portion of the Facility.

77. The provisions of the Order will be satisfied upon C&D's and U.S. EPA's execution of an "Acknowledgment of Termination and Agreement on Record Preservation and Reservation of Rights," consistent with U.S. EPA's Model Scope of Work.

78. C&D's execution of the Acknowledgment will affirm its continuing obligation to preserve all records as required by Section IX, to maintain any necessary institutional controls or other long terms measures, and to recognize U.S. EPA's reservation of rights as required in Section XIV.

XIX. NOTICES

79. Unless otherwise stated, all notices to U.S. EPA required under this Order shall be sent to:

Tammy Moore, Project Manger
Mail Code DE-9J
RCRA Corrective Action Branch
Waste, Pesticides and Toxics Division
U.S. EPA, Region 5
77 W. Jackson Blvd.
Chicago, IL 60604-3590

XX. EFFECTIVE DATE

80. This Order is effective on January 1, 2007.

IT IS SO AGREED:

DATE: 12/21/06

BY: _____
Ian J. Harvie
Vice President and
Chief Financial Officer
C & D Technologies, Inc.

IT IS SO ORDERED:

DATE: 1/16/07

BY: _____ for
Margaret M. Guerriero, Director
Waste, Pesticides and Toxics Division
U.S. Environmental Protection Agency
Region 5

RECEIVED
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US EPA REGION V
2007 JAN 18 AM 11: 27

RCRA-05-2007-0003

CASE NAME: C & D Technologies, Inc.
DOCKET NO: RCRA-05-2007-0003

CERTIFICATE OF SERVICE

I hereby certify that today I filed the original of this **Administrative Order on Consent** and this **Certificate of Service** in the office of the Regional Hearing Clerk (E-13J), United States Environmental Protection Agency, Region V, 77 W. Jackson Boulevard, Chicago, IL 60604-3590.

I further certify that I then caused a true and correct copy of the filed document to be mailed on the date below, via Certified Mail, Return Receipt Requested to:

Mr. John M. Kyle, III
Barnes & Thornburg
11 South Meridian Street
Indianapolis, IN 46204-3535

Certified Mail Receipt # **7001 0320 0006 1448 1768**

Dated: Jan 18th, 2007

Katrina Jones, Administrative Program Asst.
United States Environmental Protection Agency, Region V
Waste, Pesticides and Toxics Division
77 W. Jackson Blvd., DE-9J
Chicago, IL 60604-3590
(312) 353-5882

RECEIVED
REGIONAL HEARING CLERK
US EPA REGION V
2007 JAN 18 AM 11: 28

APPENDIX B

Field Sampling and Analysis Plan

DRAFT

FIELD SAMPLING AND ANALYSIS PLAN

RCRA FACILITY INVESTIGATION
C&D TECHNOLOGIES
200 MAIN STREET
ATTICA, INDIANA

RCRA-05-2007-0003, U.S.EPA ID NO.: IND 000 810 754

Prepared for

C&D Technologies
200 West Main Street
Attica, Idiana

August 2007

URS
1000 Corporate Centre Drive
Suite 250
Franklin, Tennessee 37067
(615) 771-2480

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The RFI Field Sampling and Analysis Plan (FSP) is designed to meet the objectives of the RFI as outlined in Section 1.2 of the RFI Work Plan. Data obtained during the RFI will be used to identify the nature and extent of any releases of hazardous waste and/or hazardous constituents at or from the Facility which may pose an unacceptable risk to human health and the environment. Findings of the RFI will result in one of the following determinations for each solid waste management units and areas of concern (SWMU and AOC) investigated:

- Current human exposures to contamination at or from the Facility are under control;
- Migration of potentially impacted groundwater at or from the Facility is stabilized;
- Additional data collection and /or risk evaluation; or
- Corrective Measures Plan or Corrective Measures Study.

This RFI Sampling Plan presents approaches and rationale for sampling soils and groundwater at the site. The locations and number of soil borings for the RFI were selected:

1) To confirm the presence or absence of a release in SWMUs/AOCs where the possibility of a release exists;
2) To provide sufficient coverage of the areas to delineate the nature and extent of the chemicals of interest (COIs) in surface and subsurface soils where releases are known to have occurred; and
3) To provide a sufficient number of samples for statistical characterization of the exposure point concentration for relevant receptors in the risk evaluation.

Soil sampling depths are identified for each of the SWMUs/AOCs dependent on the COIs present and previous analytical data. Sampling depths during the RFI are defined as follows:

- Surface samples – from 0 to 1 ft bgs
- Mid-depth samples – from 4 to 5 ft bgs
- Subsurface samples – unit specific (20 ft bgs at SWMU 8 and various depths at other SWMUs and AOCs based on subsurface drainage features, not likely to exceed 15 ft bgs)

Soil samples collected at the surface will be used in the risk evaluation for the industrial worker, maintenance/utility worker, construction worker, and trespasser. Samples collected at the mid-depth and subsurface depth intervals will be used along with surface samples to evaluate risks for the maintenance/utility worker and construction worker scenarios. Subsurface samples not associated with subsurface drainage features will be submitted and held for analysis if mid-depth samples are not impacted by the COIs. The intent of the subsurface samples collected at areas where subsurface drainage features are present is to determine if releases have occurred to the subsurface soils and groundwater from these drainage features.

Some of the SWMU and AOC boundaries overlap; therefore, soil borings installed in these areas will be used to evaluate the presence of COIs for multiple units. Since the COIs vary across the different SWMUs and AOCs, analytical parameters will be combined to fulfill the sampling requirements for each unit (i.e., where lead is the primary COI in one area and RCRA metals are the primary constituent in another, all soil samples requiring metals analysis will be analyzed for

RCRA metals since lead is included in that analysis). Sample collection depths may also be affected in areas where overlap occurs. In these instances, the soil boring will be advanced to the terminating depth of the deepest soil boring and soil samples will be collected at the designated depth intervals for each soil boring represented at that location.

The groundwater investigation for the RFI will utilize existing and newly installed monitoring wells. The existing monitoring wells are used to monitor water quality in the deep water bearing zone. New monitoring wells will be installed adjacent to the existing monitoring wells and be used to determine if releases of COIs have impacted the shallow water bearing zone.

RFI activities that will be conducted at each of the SWMUs and AOCs identified in the RFI Work Plan are presented in Tables 4-1 and 4-2 of the RFI Work Plan and discussed in the following sections. A Site Location Map is presented as Figure 2-1, RFI SWMUs/AOCs are presented as Figure 2-2 as included in the RFI Work Plan.

1.1 RFI FIELD SAMPLING AND ANALYSIS PLAN

The FSP was developed in general accordance with the RCRA Facility Investigation (RFI) Guidance, Volumes I through IV, published by the Waste Management Division, Office of Solid Waste, USEPA, dated May 1989. The FSP was developed to identify standard operating procedures and sample collection methodologies for the intended sample media to fulfill data collection objectives identified in the RFI Quality Assurance Project Plan (QAPP) discussed in Section 6 and presented as Appendix B of the RFI Work Plan.

SWMUs and AOCs, soil and groundwater sample collection, monitoring well installation, equipment decontamination, equipment calibration and field documentation, geologic logging, and investigation derived waste disposal procedures are discussed in the following sections.

1.2 SWMUS AND AOCS

According to the Current Conditions Report (CCR) and subsequent discussions with USEPA, 16 areas were identified for additional review and investigation. Each area is summarized and the proposed investigation activities are described below.

1.2.1 Area 1 – Wastewater Treatment Plant

According to the CCR, releases of acids, acid impacted water, and lead impacted liquids have occurred in the WWTP area. This area includes the former exterior wastewater storage silos, concrete walkway, drainage ditch, and ground surface leading to a drainage ditch on the northwest side of site.

URS will install ten soil borings to a terminating depth of 5 ft bgs. Soil samples will be collected at surface and mid-depth intervals. All soil samples will be analyzed for lead.

1.2.2 Area 2 – Current and Former Acid Storage Lofts

Documented operational releases have been attributed to tanker overfills and spill/leak incidents. Area 2 was formerly located in a former alley/former railroad spur area. The alley was enclosed in the early 1990s. Spill of lead oxide documented in Area 3 may have impacted soils in Area 2.

URS will install two soil borings to a terminating depth of 5 ft bgs. Soil samples will be collected at surface and mid-depth intervals. All soil samples will be analyzed for lead.

1.2.3 Area 3 – Lead Oxide Storage Silos

Releases of lead oxide dust from the storage silos during tanker truck loading operations have been documented in Area 3. Areas beneath the storage silos, concrete alley and storm drains in the alley may have been impacted by releases of the lead oxide dust.

URS will install two soil borings to a terminating depth of 5 ft bgs. Soil samples will be collected at surface and mid-depth intervals. All soil samples will be analyzed for lead.

1.2.4 Area 4 – Stormwater Sewers

According to the CCR, releases which occurred at the various SWMUs/AOCs may have impacted the stormwater sewer. Documented releases include acids, lead oxide dust, and contact cooling water.

URS will install ten soil borings to a terminating depths of 5 to 20 ft bgs (assuming subsurface drainage features are present at several boring locations). Soil samples will be collected at surface, mid-depth, and subsurface depth intervals. All soil samples will be analyzed for volatile organic compounds (VOCs) and lead.

1.2.5 Area 5 – Exterior Former Hazardous Waste Materials Storage Area

According to the CCR, no documented releases were identified in the former hazardous waste materials storage area. Therefore, additional investigation is warranted to determine if impact of the potential COIs exist in this area.

URS will install two soil borings to a terminating depth of 5 ft bgs. Soil samples will be collected at surface and mid-depth intervals. All soil samples will be analyzed for VOCs and 8 RCRA metals.

1.2.6 Area 6 – Exterior Former Drum Storage Area and Transfer Pad

Three storage areas have been documented in historical aerial photographs and previous site assessments. No documented releases from staged materials were noted in this area, although, this area is included within previous releases from Area 1.

URS will install two soil borings to a terminating depth of 5 ft bgs. Soil samples will be collected at surface and mid-depth intervals. All soil samples will be analyzed for VOCs and the 8 RCRA metals.

1.2.7 Area 7 – Poly-Mixing Room

This area has been identified as a SWMU based on the historical use of and storage of solvents in this area, including tetrachloroethene, since 1982. The CCR report indicates no documented releases from this area were identified during site research. Additional investigation is necessary to determine if impacted soils in the vicinity of Area 2 exist based on the historical usage of this area.

URS will install a single boring in Area 2 to a terminating depth of 5 ft bgs. Soil samples will be collected at surface and mid-depth intervals. All soil samples will be analyzed for VOCs.

1.2.8 Area 8 – Historical Drive Up Disposal Area

According to the CCR, dumping activities occurred from the early 1900s through the 1960s in this area. The dump area reportedly accepted household trash and materials from drive-up disposal.

URS will install ten soil borings to a terminating depth of 20 ft bgs. Soil samples will be collected at surface, mid-depth, and subsurface depth intervals. All soil samples will be analyzed for VOCs, SVOCs, PAHs, and 8 RCRA metals.

1.2.9 Area 9 – Historical Former Waste and Dust Storage Room

Area 9 was identified as a SWMU based on a 1948 fire insurance map which identified the room as a "waste and dust storage room". The area is currently utilized as a compressor room.

URS will install one soil boring to a terminating depth of 5 ft bgs. Soil samples will be collected at surface and mid-depth intervals. All soil samples will be analyzed for VOCs, SVOCs, PAHs, and 8 RCRA metals.

1.2.10 Area 10 – Southwest Historical Former Container Storage Area

A large container storage area was identified in a 1960s historical aerial photograph where the current Expander Mill and warehouse building is located. What appeared to be drums, ASTs, and other unknown items were staged in this area. This area was identified as a SWMU since the material storage practices are unknown. Additional investigation is necessary to determine if impacted soils in the vicinity of Area 10 exist based on the historical usage of this area.

URS will install two soil borings to a terminating depth of 5 ft bgs. Soil samples will be collected at surface and mid-depth intervals. All soil samples will be analyzed for VOCs, SVOCs, PAHs, and 8 RCRA metals.

1.2.11 Area 11 – Northeastern Historical Former Container Storage Area

A container storage area was observed on the west side near the northeast end of the railroad spur/concrete alley in historical aerial photographs dated 1988 and 1993. The storage area appeared to be concrete. The area has been identified as a SWMU since the historical material storage practices in this area are unknown. The former container storage area is currently located

under a concrete slab in the shipping building which also contains the facility's hazardous waste storage area.

URS will install two soil borings to a terminating depth of 5 ft bgs. Soil samples will be collected at surface and mid-depth intervals and analyzed for VOCs and 8 RCRA metals.

1.2.12 Area 12 – Central Vacuum System / Baghouses

This area consists of four former baghouse locations and has been identified as a SWMU based on the historical operations of the baghouses as the most likely locations for potential lead impacts to the site. The central vacuum system utilizes five internally located baghouses.

URS will install four soil borings (one at each baghouse location) to a terminating depth of 5 ft bgs. Soil samples will be collected at surface and mid-depth intervals and analyzed for total lead.

1.2.13 Area 13 – Former Oxide Mill Area

According to the CCR, historical operational releases to emissions and possible soil impacts were noted in documents reviewed during the CCR in the area around the former oxide mill. Potential lead impacts may exist around the perimeter of the oxide mill building and lead oxide loading area.

URS will install ten soil borings to a terminating depth of 5 ft bgs. Soil samples will be collected at surface, mid-depth, and subsurface depth intervals and analyzed for total lead.

1.2.14 Area 14 – Former Onsite Filling Station

A review of historical Sanborn fire insurance maps and aerial photographs, indicate a gasoline filling station was located on the south side of the site (currently used for employee parking). The property was acquired by C&D in 2000. The previous owner indicated all USTs had been removed. However, during site development as a parking area, five USTs were excavated and removed. Thirty soil samples were collected from soils excavated from the tank pit and analyzed for total petroleum hydrocarbons (TPH). Analytical results indicate TPH was detected at 12 ppm in one soil sample. TPH concentrations in the remaining soil samples were below the laboratory detection limit of 10 ppm. Based on this information, no additional investigation is required for this area. The UST Closure Report is presented as Appendix G in the RFI Work Plan.

1.2.15 Area 15 – West Container Storage Area

Drums, an AST and other debris were observed along the western and northwestern perimeter of the former western employee parking areas during a review of aerial photographs. The parking area did not appear paved in the aerial photographs. Based on site interviews, containers in this area would have been empty.

URS will install four soil borings to a depth of 5 ft bgs. Soil samples will be collected at surface, mid-depth, and subsurface depth intervals and analyzed for VOCs, SVOCs, PAHs, and 8 RCRA metals.

1.2.16 Area 16 – DC Generator Area

C&D indicated that low level PCBs were contained in two former DC Generators used at the site. The generators were taken out of service in 1988. As a result of the DC Generators having contained PCBs, C&D has identified the area where the DC Generators were located as a SWMU/AOC that will be further investigated during the RFI.

URS will install two soil borings to a terminating depth of 5 ft bgs. Soil samples will be collected at surface and mid-depth depth intervals and analyzed for polychlorinated biphenyls.

1.3 SOIL SAMPLES

Soil samples will be collected at various depth intervals as identified in Table 4-1 at locations identified on Figure 4-1. The following equipment may be used for soil sample collection:

- GeoProbe direct push drill rig or similar equipment equipped with a dual tube sample collection system with acetate liners.
- Hollow stem auger (HSA) drill rig equipped with 4 ¼ - inch augers, stainless-steel split spoon, and associated drill tooling.
- Stainless-steel hand auger.
- Stainless-steel spoons and mixing bowls for sample collection, if needed. New, disposable aluminum cooking trays may be used in place of stainless-steel mixing bowls.
- TerraCore disposable soil sample and field preservation kits for VOC analysis (SW-846 Method 5035A) .
- Photoionization detector (PID) and plastic freezer bags for headspace screening.
- Nitrile gloves.

1.3.1 Soil Boring Installation and Sample Collection

Soil borings will be installed using direct push technologies having a two-inch diameter drill casing and one-inch diameter drive rods. Soil samples will be collected continuously from ground surface to terminating depth using a dual-tube sampling system and disposable acetate liners. During soil boring installation, the acetate liner will be attached to the drive rods and secured within the lead drill casing. The acetate liner and lead drill casing will be advanced into undisturbed soil using a hydraulic hammer.

Once the desired depth interval is complete, the acetate liner will be extracted, opened, and soils inspected for soil characteristics and classification. Soil samples collected for analyses will be split with one-half of the interval transferred to the appropriate sample container and the other half placed in a plastic freezer bag for headspace analysis for VOCs. The plastic bag will be labeled according to content and allowed to site for period of 15 minutes. Headspace readings will be obtained using a PID and recorded in the project field book. Additional headspace readings may also be obtained from other depth intervals where visual observations indicate possible impacts are present.

Soil samples collected for VOC analysis will be collected using TerraCore sample collection and field preservation kits. The TerraCore sampler is a single use device designed to collect soil samples from soil cores and transfer them to the appropriate containers for in-field preservation. Three 5-gram samples collected with the TerraCore device will be transferred to one of two pre-weighed vials containing bisulfate preservative for low level analysis and one pre-weighed vial containing methanol for high level analysis, if necessary.

At monitoring well installations using an HSA drill rig, soil samples will be collected from a stainless-steel split spoon. During soil boring installation, the split-spoon is attached to drill rods and threaded through the hollow stem auger. The split-spoon is driven ahead of the auger into undisturbed soil using a hydraulic hammer. Once the desired depth interval is complete, the split spoon will be retracted, opened, and the soils inspected for soil characteristics and classification. Soil sample collection and headspace readings will be conducted consistent with direct push methodologies described above.

All sample collection tooling that contacts subsurface soils will be decontaminated prior to usage and between each soil boring location according to Section 1.7 below.

1.4 GROUNDWATER SAMPLES

Groundwater samples will be collected at monitoring wells identified in Table 4-2. Groundwater samples will also be collected from four monitoring wells to be installed adjacent to the existing onsite monitoring wells (see Figure 4-1). The following equipment may be used for groundwater sample collection and monitoring well installation:

- Hollow stem auger (HSA) drill rig equipped with 4 ¼ - inch augers, stainless-steel split spoon, and associated drill tooling.
- Sonic drilling technology using outer drill casing with a nominal diameter of 6 inches for 2-inch well installation. The sonic rig will utilize a dual line of drill pipe for core sampling equipped with a catch basket for core sample retention.
- Submersible pump (Whaler ® or similar) for monitoring well development.
- Stainless steel bladder pump and associated polyethylene tubing for groundwater sample collection.
- Well construction materials – 2.0-inch diameter, flush-jointed, PVC (NSF Standard 14) well casing and well screen, filter sand, bentonite chips, Portland cement grout mixture, and concrete for well pad.
- Potable water.

1.4.1 Monitoring Well Installation and Development

Upon reaching the terminating depth (to be determined by field observation and onsite geologist), the soil boring will be converted to 2.0-inch monitoring well. The monitoring well will be constructed as follows according to the *RCRA Groundwater Monitoring: Technical Guidance Document:*

- A minimum of 0.5 feet of filter sand will be placed in bottom of borehole for footing of the well casing.
- The screened interval will be placed in the well first. The length of well screen will be long enough to effectively monitor the desired depth interval and will be, at a minimum, 5 feet in length.
- Sufficient well casing will be added to the screened interval to bring the monitoring well to ground surface.
- Filter material will be placed around the well screen up to approximately two feet above the top of screened interval. The filter material will be added either by tremie pipe or poured. During installation, the augers will be slowly retracted to prevent potential bridging problems with the filter material.
- A bentonite pellet seal will be placed over the filter pack to minimum thickness of two feet above the top of filter pack or desired depth. The seal will be hydrated with potable water and allowed to set eight hours or the manufacturer's recommended hydration time, whichever is longer.
- The annular space above the bentonite seal will backfilled from bottom to top using a tremie pipe with cement grout/bentonite slurry to within two feet of ground surface via tremie pipe. The cement grout/bentonite slurry will be allowed to set for 24 hours prior to well completion.
- The surface will be completed with a two-foot by two-foot wide by four-inch thick concrete pad with a secure well vault. The concrete pad will be sloped away from the well vault to avoid water accumulation within the well vault. A locking well cap will be used to seal the well casing.
- The well may also be completed as a stick-up well in which a metal riser encasing the well casing will be extended to two to three feet above ground surface. The metal casing will be locked and four metal protective bumper posts (bollards) will be installed at each corner of the concrete well pad. The base of the bollards will be set at a depth of 2 ft bgs and anchored with concrete. Upon completion, the bollards and metal well casing will be painted with yellow hazard paint.

Each monitoring well will be developed to create an effective filter pack around the well screen using a submersible pump (Whaler, Monsoon, or similar) and proper surging techniques. During development, the submersible pump will be raised and lowered throughout the screened interval to ensure that all sediments and fines have been removed to the extent possible. Development will be considered complete when the desired turbidity level is reach and field parameters (pH, specific conductance, temperature, and dissolved oxygen) have stabilized.

1.4.2 Groundwater Sample Collection

Groundwater samples will be collected using a stainless steel bladder pump equipped with a disposable polyethylene bladder and disposable polyethylene tubing. Prior to sample collection, static groundwater elevations will be recorded at each onsite monitoring wells for potentiometric

purposes using an electronic water level indicator. The water level indicator will be decontaminated between each monitoring well as described in Section 1.7.2.

Groundwater samples will be collected using low-flow (minimum drawdown) sample collection techniques. The bladder pump will be positioned in the middle of the screened interval. Purge rates will be set between 100 and 500 mL/min to minimize drawdown. The water level elevation will be monitored during purging to ensure water table drawdown does not exceed 0.5 ft. Water quality parameters will be monitored during purging using a water quality meter equipped with a flow-through cell. Groundwater samples will be collected once water quality parameters have stabilized (± 0.1 pH, ± 3% for conductivity, ± mV for redox potential, and ± 10% for turbidity and dissolved oxygen).

Upon stabilization, the monitoring well discharge line will be disconnected from the flow-though cell and groundwater samples will be transferred to the appropriate laboratory provided sample container.

The pump will be decontaminated between each monitoring well location and a new bladder and tubing will be used at each sampling location.

1.5 FIELD QUALITY ASSURANCE /QUALITY CONTROL PROCEDURES AND SAMPLES

See Project QAPP presented in Section 6 and Appendix B of the RFI Work Plan.

1.6 SAMPLE IDENTIFICATION, HANDLING, AND DOCUMENTATION

All samples will be given a unique sample identification number in the field. The sample ID for all samples will begin with CD. The sample ID will also consist of a boring number (i.e., SB-1 for soil boring number 1), and a depth code (i.e., (0-1) for a sample collected from the 0 to 1 ft sample interval). A completed sample code for a sample collected from soil boring number 1 from the 0 to 1 ft depth would be CD-SB-1-(0-1).

New monitoring wells installed adjacent to existing monitoring wells will be identified by the adjacent monitoring well and designated with an "S" indicating shallow. For example, a shallow monitoring well installed adjacent to MW-1 would be identified as MW-1S. If a monitoring well is installed in area not adjacent to an existing well, it will be identified in chronological order starting from the last numbered monitoring well at the Site. For example, if MW-5 is the last numbered monitoring well at the site, the new monitoring well would be MW-6. Groundwater samples will be labeled according to the monitoring well identification where the sample was collected.

All samples will be placed on ice in an insulated cooler subsequent to sample collection and labeling. The sample identification, date and time of collection, and analytical parameters will be recorded in the field notebook. Samples will be transported under standard URS chain-of-custody protocol described in the RFI QAPP presented in Section 6 of the RFI Work Plan.

1.7 EQUIPMENT DECONTAMINATION

Equipment used to install soil borings, monitoring wells, and collect soil and groundwater samples will be decontaminated between use and sample locations.

1.7.1 Equipment List

The following is a list of equipment that may be needed to perform decontamination:

- Brushes, scrapers, wash tubs, 5-gallon buckets, or container of suitable size for equipment decontamination.
- High pressure steam cleaner (portable).
- Sponges, paper towels (plain white, no ink prints).
- Potable tap and deionized water.
- Low phosphate laboratory-grade detergent.
- Plastic sheeting.
- Appropriate decontamination solution for the chemical and equipment compatible (ex. 10% or 1% nitric acid, acetone, methanol, isopropyl alcohol, and/or hexane).
- Bung-top and open-top steel drums.
- Gloves, safety glasses, and other protective equipment specified in the health and safety plan.

The water used for decontamination will be of potable quality and from a source that is monitored for the contaminants of concern on a regular basis.

1.7.2 Sampling Equipment

The following steps will be used to decontaminate small sampling equipment:

- Personnel will dress in suitable safety equipment to reduce exposure.
- Gross contamination on equipment will be scraped off at the sampling site.
- Equipment that will not be damaged by water will be placed in a bucket containing detergent along with potable water and scrubbed with a bristle brush. Equipment will be rinsed with tap water in a second bucket. The equipment will be wiped down with the appropriate decontamination solution (such as isopropyl alcohol), followed by a deionized water spray or rinse. Equipment that may be damaged by water will be carefully wiped clean using a sponge and detergent water and rinsed with deionized water.
- Accumulated solids from the bucket will be placed in open-top drums with accumulated soil cuttings.
- Water generated during decontamination will be transferred to bung-top drums using a funnel.

- Rinse and detergent waters will be replaced between sample locations.

Following decontamination, equipment will be placed in a clean area or in/on clean plastic.

1.7.3 Drilling and Heavy Equipment

The need for decontamination of drilling and heavy equipment will be assessed prior to moving onto each sampling location. If decontamination is needed, the equipment will be wiped clean with disposable towels and the appropriate decontamination solution and rinsed. If extensive decontamination is needed, the equipment will be decontaminated using high pressure water and/or steam. The following steps will be used to decontaminate drilling and heavy equipment:

- Personnel will dress in suitable safety equipment to reduce personal exposure.
- Gross contamination or cuttings will be scraped off at the sampling site.

If the equipment if not used immediately, it will be stored in a designated clean area.

The following steps will be used to decontaminate downhole tools:

- Personnel will dress in suitable safety equipment to reduce personal exposure.
- Gross contamination on equipment will be scraped off at the sampling site.
- Equipment that will not be damaged by water will be placed in a bucket containing detergent along with potable water and scrubbed with a bristle brush. Equipment will be rinsed with tap water in a second bucket. The equipment will be wiped down with the appropriate decontamination solution (such as isopropyl alcohol), followed by a deionized water spray or rinse. Equipment that may be damaged by water will be carefully wiped clean using a sponge and detergent water and rinsed with deionized water.
- Accumulated solids from the bucket will be placed in open-top drums with accumulated soil cuttings.
- Water generated during decontamination will be transferred to bung-top drums using a funnel.
- Rinse and detergent waters will be replaced at the end of each work day.

In the event high pressure water and/or steam is used to decontaminate drill tooling, a decontamination pad will be constructed to prevent overspray from the cleaning apparatus as well as potentially impacted soils and debris from contacted the surrounding ground surface. Construction of the decontamination pad may require a wooden or metal frame with a plywood floor draped with heavy mil plastic sheeting. The floor of the decontamination pad will be sloped towards the rear so that water and fines will flow away from the entrance. Decontamination fluids and solids will be transferred to open-top drums upon completion of decontamination.

Drill casings used with the direct push rig may be decontaminated by hand using a bucket wash following steps outlined for sampling equipment in Section 1.7.2.

1.7.4 Equipment Leaving the Site

Vehicles used for nonconstruction activities shall be cleaned on an as-needed basis as determined by the Site Safety Officer or Site Supervisor. Cleaning will be required for very dirty vehicles that will be leaving the area. The cleaning shall take place on site by washing with soap and water on the outside and vacuuming the inside on an as-needed basis as determined by the Site Safety Officer.

1.7.5 Decontamination Wastes

All decontamination fluids will be containerized and stored onsite. Each storage container will be identified with date(s), waste generated, and identification numbers. Following receipt and review of analytical data, decontamination fluids will be disposed according to applicable regulations.

1.8 EQUIPMENT CALIBRATION AND FIELD DOCUMENTATION

All field personnel will carry waterproof, bound notebooks for the keeping of chronological record of project field events. Field logbooks, calibration logs, and laboratory logbooks will be maintained by URS or by a designated contractor. The front cover of each logbook will typically be labeled with the following information:

- Person or organization to whom the book is assigned
- Book number
- Project name, number
- Start date
- End date

All logbook entries will contain accurate and detailed documentation of daily project activities. Because the information contained in these logbooks forms a basis for subsequent reports, the field logbook will typically include the information below:

- Site identification
- Location of sampling points
- Description of sampling points
- References to any photographs
- Sample identification numbers
- Number of samples taken
- Time of sample taken
- Reference to sample location map
- Number of QA samples taken (e.g., duplicates)

- Collector's name
- Field observations
- Sample distribution (e.g., QA laboratory, agency split)
- Detailed lithologic descriptions of each soil sample
- All field measurements

Any changes in weather, accidents or problems with equipment, quantities and manufacturer's of materials used, field measurements, construction logs, samples collected and sample identifications, and break times or down times will be recorded. Visitor names, purpose of visit, and duration at site should also be recorded.

Field personnel may also use field sampling data sheets and boring logs during investigation activities. These forms will be kept in the project file.

1.9 GEOLOGIC LOGGING

A "site geologist" (geologist or geotechnical engineer) or other individual under the direction of a profession geologist experienced in borehole drilling and soil/sediment sampling will be present at each operating drill rig. This site geologist will be responsible for logging samples, preparing samples for shipment, monitoring drilling operations, and preparing logs with boreholes and groundwater data according to United States Geological Survey (USGS).

Boring logs will subscribe to the following requirements:

- Logs will be prepared and signed in the field as borings are drilled.
- Log entries will be printed. Photo reproductions will be clean and legible.
- Borehole depth information will be recorded to the nearest 0.1 foot.
- Relevant information blanks in the log form will be completed. If surveyed horizontal control is not available at the time of drilling, location sketches referenced by measuring distances or prominent surface features shall be shown on, or attached to, the log.
- The drilling equipment used will be described on each log.
- Special problems encountered during drilling and their resolution will be recorded on the log. This would include sudden tool drops, unrecovered tools in the borehole, and lost casings.
- The dates for the start and completion of borings will be recorded on the boring log. Changes in shift, driller, and site geologist will also be noted.
- Stratigraphic/lithologic changes will be identified on the boring log by a solid horizontal line at the appropriate scale depth on the log which corresponds to measured borehole depths at which changes occur, measured and recorded to the nearest 0.1 foot. Gradational transitions and changes identified from cuttings or methods other than direct observation and measurement will be identified by a

horizontal dashed line at the appropriate scale depth based on the best judgment of the logger.

- Logs will clearly show the depth intervals from which all samples are retained. The sampler type, diameter, and length of sampled interval and length (or percent) of sample recovery will be recorded for each driven or cored sample.
- Logs will identify the depth at which water is first encountered, the depth of water at the completion of drilling, and the stabilized depth to water. The absence of water in borings will also be indicated. Stabilized water level data will include time allowed for levels to stabilize.
- Logs will show borehole and sample diameters and depths at which drilling or sampling methods or equipment change.
- Logs will show total depth of penetration and sampling. The bottom of the borehole will be so identified on the log by solid double lines from margin to margin with the notation "end of boring."
- Logs will show blow counts, hammer type and weight, and length of hammer fall for driven samplers. Blow counts will be recorded in half-foot increments when a standard penetration test is performed. For penetration less than a half-foot, the count will be annotated with the distance over which the count was taken. Refusal, if reached, will be noted.
- Logs will include all other information relevant to a particular investigation, but not limited to:
  - Odors.
  - Any observed evidence of contamination in samples, cuttings, or drilling fluid.
- Special abbreviations used on a log will be defined either in the log where used, or in a general legend.

During field activities, borings logs may be recorded in the field book of the onsite geologist and later transferred to a permanent boring log so long as the field is retained in the project file for reference.

1.10 INVESTIGATION DERIVED WASTE DISPOSAL

The following equipment is required for waste disposal:

- 55-gallon steel drums.
- Paint stick or permanent marker.
- Trash bags.
- Hazardous and non-hazardous waste labels.
- Plastic sheeting.

- Nylon reinforced strapping tape.

1.10.1 Types of Wastes

The field Work Planned during this investigation will produce investigation-derived wastes (IDW). These will consist of the soil from the installation of soil borings and monitoring wells, decontamination fluids, and used personnel protective equipment (PPE).

1.10.1.1 Soil Cuttings

The cuttings from soil borings will be drummed in open-top steel drums for disposal as non-hazardous or hazardous waste, dependent upon analytical results.

1.10.1.2 Water

Decontamination, well development and purge water generated by equipment and personnel cleaning and sampling will be containerized in bung-top steel drums pending analytical results.

1.10.1.3 Used Personnel Protective Equipment

Trash and used personnel protective equipment will be placed into plastic garbage bags and disposed in accordance with local refuse disposal regulations. Worn personal protective equipment required by C&D for entrance into production areas (cloth booties, gloves, etc.) will be disposed according to Site requirements.

1.11 IDW CONTAINER LABELING

After the waste materials are place in an appropriate container, the container will be labeled with a description of contents and the accumulation start date. Each waste container will be stored in a designated storage area prior to disposal. An inventory of IDW at the site will be maintained by the site safety officer or his/her designee.

APPENDIX C

RFI Quality Assurance Project Plan

DRAFT

RFI QUALITY ASSURANCE PROJECT PLAN

C&D TECHNOLOGIES
200 MAIN STREET
ATTICA, INDIANA

RCRA-05-2007-0003, U.S.EPA ID NO.: IND 000 810 754

Prepared for

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August 2007

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TITLE/SIGNATURE PAGE

QUALITY ASSURANCE PROJECT PLAN FOR THE RCRA INVESTIGATION AT C&D TECHNOLOGIES, INC U.S. EPA ID NUMBER RCRA-05-2007-0003 REVISION 1.0

August 22, 2007

Prepared by: URS Corporation

Prepared for: C&D Technologies, Inc.

Walt Koslowski – Facility Project Manager	Date
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Appendix A TestAmerica QAPP
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PROJECT DESCRIPTION

1.0 Project Description

This Quality Assurance Project Plan (QAPP) presents the organization, objectives, planned activities, and specific Quality Assurance/Quality Control (QA/QC) procedures associated with the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) for the C&D Technologies, Inc. located at 200 West Main Street, in the City of Attica, Fountain County, Indiana, (the Site or Facility) in response to Administrative Order of Consent Docket No.RCRA-05-2007-0003. Specific protocols for sampling, sample handling and storage, chain-of-custody, and laboratory and field analyses will be described. All QA/QC procedures will be structured in accordance with applicable technical standards, U.S. EPA's requirements, regulations, guidance, and technical standards. This QAPP has been prepared in accordance with the U.S. EPA Region 5 QAPP policy as presented in *U.S. EPA RCRA QAPP Instructions*, and other relevant guidance documents.

1.1 Introduction

URS Corporation (URS) has prepared this QAPP on behalf of C&D Technologies, Inc. This QAPP along with a Field Sampling and Analysis Plan (FSP), Health and Safety Plan (HSP), Community Relations Plan, and RFI schedule have been appended to the RFI Work Plan, dated August 27, 2007. The FSP discussed in Section 5 and presented in Appendix B of the RFI Work Plan has been entirely incorporated into the QAPP through specific reference.

1.1.1 Overall Project Objectives and Decision Statements

The purpose of the RFI is to identify the nature and extent of any releases of hazardous waste and/or hazardous constituents from the Facility which may pose an unacceptable risk to human health and the environment. Data obtained during the RFI will be used to delineate the extent of chemicals of interest (COI) previously detected in environmental media at the Site, conduct a human health risk evaluation of the Site, and to determine whether additional investigation is warranted.

As identified in Section 4.2.3 of the RFI Work Plan, 16 solid waste management units (SWMUs) and areas of concern (AOCs) have been identified at the Site. The RFI identifies COI for each area based on the historical use information. Analytical parameters are specific for each area and may be one or more of the following: eight RCRA metals, lead, volatile organic compounds (VOCs), and/or semi-volatile organic compounds (SVOCs). Soil from these fifteen areas will be the initial focus of this RFI. Three of these areas have previously been identified as areas of known spills or contamination, and the COI have been previously identified. These areas and the anticipated COI are listed below:

- Area 4: Storm water sewers – Lead and VOCs.
- Area 8: Historical drive up disposal area – VOCs, PAHs, RCRA metals.

- Area 13: Former Oxide Mill area – Lead.

The location of the former DC transformer has been identified as an additional AOC. This area will be included in the RFI to determine if PCBs are present, and whether additional information is warranted.

Overall objectives of the data collection will be as follows:

- For Areas 4, 8, and 13, verify and further define the nature and extent of soil contamination for the identified COI. Data quality must be sufficient to allow comparison with established action levels or regulatory standards (screening levels).

- For the remaining 13 areas of concern, the object is to determine the nature and extent of any releases of the suspected COI into the soil for each of those areas. If pollutants of concern are found to be present in sufficient quantity to pose a risk, either human or ecological, additional sampling will be performed to further define the nature and extent of impact.

- Collect sufficient data for the soil in Areas 4, 8, and 13 to support a human health and ecological risk assessment, and corrective measures study (cms), if needed.

- To further investigate the nature, extent, and source of contamination in the groundwater, five existing deep GW monitor wells and four new shallow groundwater monitoring wells will be sampled as identified in the FSP. The groundwater samples will be analyzed for the RCRA metals and VOCs.

Each area is to be analyzed only for COI specific for that area, as determined by the Current Conditions Report and other previous investigations (see Section 1.3.2 of this QAPP).

The Decision Statement for the investigation of Areas 4, 8, and 13, is: "What is the potential nature and extent of contamination in onsite soil and groundwater media that presents unacceptable risks, which would warrant remedial action?"

The Decision Statement for the other SWMU/Areas of Concern is: "Are the COI present in concentrations sufficient to warrant additional sampling and data collection in these areas?"

The Decision Statement for the groundwater monitor well sampling is twofold: "What is the nature and extent of VOC and metals contamination in onsite groundwater media that presents unacceptable risks, which would therefore warrant remedial action, and does the VOC contamination originate from the C&D Site?"

Associated specific objectives for field and laboratory data collection are tabulated in Section 1.4 of this QAPP.

1.1.2 Project Status/Phase

C&D and URS will utilize an integrated and phased approach for the RFI. During the RFI, data collection will be conducted in phases, with the results of the human health risk assessment and ecological risk assessment being determining factors in decisions regarding the necessity for additional phases of investigation.

The RFI field investigation will include the following activities:

- Surface, mid-depth, and subsurface soil samples will be collected from the SWMUs and AOCs for verification and site characterization. Additional soil samples will be collected from seven off-site background locations for background purposes. The borings and sampling will be conducted at the frequency and locations identified in Table 4-1 presented in the RFI.
- Groundwater sampling will be conducted at five existing and four new monitoring wells. All groundwater samples will be analyzed for total and dissolved lead and VOCs. Groundwater samples will be collected as identified in Table 4-2 of the RFI (Appendix B of RFI Work Plan).

Data from the RFI investigation will be qualitatively and statistically evaluated to determine whether additional investigation is necessary. If the initial data suggests that sufficient site characterization information has been collected, C&D and URS will proceed with the human health risk and ecological risk assessments for the Site. A technical memorandum presenting the RFI data and recommendations of the risk assessments will be prepared and submitted to the U.S.EPA. After a review of the technical memorandum the need for implementing additional investigation activities and human and ecological risk assessments will be evaluated in light of the data requirements for the CMS. The rationale and scope of any additional investigations will be discussed with and approved by the U.S.EPA prior to implementation.

1.1.3 QAPP Preparation Guidelines

This QAPP has been prepared in accordance with the *U.S. EPA Region 5 RCRA QAPP Instructions*.

1.2 Site/Facility Description

A brief description of the facility, its geological setting, and associated features is presented in the section below.

1.2.1 Location

The Site is located at 200 West Main Street, Attica, Fountain County, Indiana. The Site is bounded on the southeast by Third Street, to the southwest by Main Street, the Wabash River to the Northwest, and is located in a mixed area of industrial, commercial, and residential use.

1.2.2 Facility/Site Size and Borders

This information is provided in Section 2.1.1 of the RFI Work plan, which has been incorporated into this QAPP by reference. A map of the site and the surrounding area can be found in Figure 2-1 of the RFI Work Plan.

1.2.3 Natural and Manmade Features

This section is addressed in Section 2.1.1 of the RFI Work Plan concerning natural and manmade features present at the Site.

1.2.4 Topography

See Section 2.1.1 and Figure 2-1 of the RFI Work Plan for information concerning the Site's general topography.

1.2.5 Local Geology and Hydrogeology

See Sections 2.1.2, 2.1.3, 2.1.4, and 2.1.5 of the RFI Work plan for information concerning the site's geology and hydrology, water resources, soil, and climate considerations.

1.2.6 Surrounding Land Use

See Section 2.1.1of the RFI Work plan for information concerning the land use of the area immediately surrounding the Site.

1.2.7 Ecological Communities and Habitats

There is no ecological habitat directly on the site, as it is covered nearly in its entirety by buildings, pavement, or gravel. However, relevant ecological habitats are located in the riparian area along the Wabash River adjacent to the site, comprising a terrestrial/wetland habitat. Common vegetation observed during a site visit by a senior URS biologist in July 2007 included box elder, silver maple, cottonwood, mulberry and sycamore, with a sparse understory of herbaceous vegetation. The Wabash River represents a relevant aquatic ecological habitat that may have been influenced by site releases.

Potential transport pathways include windblown dust, groundwater transport and discharge to the river, and surface water runoff from the SWMUs and AOCs to soils of the riparian buffer along the river, and surface water and sediments of the Wabash River. In the riparian buffer, potentially complete exposure pathways exist for soil invertebrates, plants, birds and mammals. In the Wabash River, potentially complete pathways exist for benthic macroinvertebrates, fish and plankton, birds and mammals. An ecological CSM is shown in Figure 3-5 of the RFI Work Plan. It is noted that potentially complete pathways also exist for reptiles and amphibians in both the terrestrial and aquatic environments. These are acknowledged as potentially complete, but are not shown on Table 3-1, or Figure 3-5, as there is generally little or no information with which to evaluate the consequence of such exposures. For the purposes of the ecological CSM, terrestrial birds and mammals are assumed to forage only for terrestrial dietary items within the riparian area. Birds and mammals foraging within the Wabash River are assumed to forage via an aquatic foodweb and are termed semiaquatic.

1.3 Site/Facility History

1.3.1 General History

The general, operational, and RCRA history of the facility is discussed in Sections 2.2 and 2.3 of the RFI Work Plan.

1.3.2 Past Data Collection Activities

The Site has been subject to a number of investigations since 1990, and reports of these investigations have been sent to EPA Region 5. The following summaries are based on a review of reports and supporting documents submitted by consultants and information obtained from the project files of the U.S. EPA and the IDEM. The results obtained under each study have been carefully evaluated using the Region 5 Memorandum Concerning the Use of Historical Data. None of these results will be used to substitute for data needed for the present study. However, the proposed target parameter list, which is based on site operational history and waste management practices, is consistent with the results of the historical data sets.

- 1990 Screening Site Inspection Report—This report was commissioned by EPA, and was conducted by Ecology and Environment, Inc. While the report predates the Region 5 QAPP, the analyses were conducted using CLP protocol, so defensible QA/QC documentation exists. Twelve soil samples were taken on the site, many of which were within Area 8, one of the areas of concern for this report. The samples were analyzed for the CLP target compound and target analyte lists. PAH compounds were detected at relatively low levels (all less than 8 mg/kg) in many of these samples. This report serves as the basis for limiting current SVOC analyses to PAH and related compounds only. Municipal Water Wells were sampled downgradient from the site, and TCE and cis 1-2-DCE were detected in the low ppb range in those wells.
- Soil Investigation for C&D Attica dated May, 2000, performed by Earth Tech—This was a soil investigation limited to the area where the new office was to be constructed. No samples were collected within any of the current areas of concern. Analysis was performed for volatiles and PAH compounds. No target analytes were detected.
- UST Closure Report for C&D Attica Location, October, 2000, prepared by Liesch Companies—This report documents the removal of all underground storage tanks and related materials from Area 14, and contains analyses pertinent to the closure of this underground storage area. The State of Indiana has listed the site as closed. This serves as the basis for no further action for Area 14, as recommended in the RFI.
- April, 2006 VOC Investigation Report by Clayton Group Services—The Work Plan for this report was approved by EPA Region 5. Five monitor wells were installed at the site. Volatiles were analyzed at various depths during the installation of each monitor well, and the monitor wells were analyzed after development was completed. The main conclusions were: 1) The elevated upgradient concentrations and the depth of the TCE detections suggested a distal upgradient source for TCE; 2) The lack of any detection of TCE in groundwater monitor wells installed between the alleged landfill on the C&D

facility, and the City of Attica water supply wells, and the direction of groundwater flow from east-southeast to west-northwest indicate that the C&D facility does not contribute TCE or any other VOCs to the city of Attica well field contamination. The only VOC compounds detected (that were not also detected in the trip and equipment blanks) were TCE and cis-1,2-DCE.

1.3.3 Current Status

A Current Conditions Report (CCR) dated March 1, 2007 by Clayton Group Services which identifies 15 SWMUs or AOCs and assigns the primary COI for each area. URS has reviewed this document, and has added VOCs, PAHs, and the 8 RCRA metals as COI for Area 15, identified another area (Area 16) as the location of an historic DC transformer. PCB analyses will be conducted in this area, to determine the presence/absence of PCBs.

1.4 Project Objectives and Intended Data Usages

For this project, there are several different goals. The SWMUs/AOCs will be evaluated based upon soil sampling, and there are different objectives depending on the specific area. Table 1-1 lists all SWMU/AOC Areas, the current pollutants of concern, and the objectives for each area to be sampled. In areas where SWMU/AOC boundaries overlap or a single soil boring can accomplish the data collection objectives of more than one area reducing the need for multiple borings, a single soil boring will be installed. Where this occurs, soil samples from the common soil boring will be analyzed for the full range of analyses required for each area represented. Please see Table 4-1 in the RFI Work Plan for additional information.

For Areas 1, 4, 8, and 13, known releases have been documented. The following objectives are intended for these three areas:

- It will be necessary to gather sufficient information to evaluate the nature and extent of releases from SWMUs, and also to determine whether unreasonable risks to human are associated with the areas.
- Tier 1 Screening Evaluation: Chemical concentrations detected in soil samples collected during the RFI will be compared to the most current U.S.EPA Region IX Preliminary Remediation Goals (PRGs), which are conservative risk-based criteria developed based on a target cancer risk of 10^{-6} and a target hazard index of one for noncarcinogens (U.S.EPA Region IX, 2000). For the purposes of screening, the PRGs for noncarcinogens will be adjusted to a target hazard index of 0.1. For the C&D site, on-site land use is industrial and will remain so; therefore, the PRGs for industrial soil will be used. The U.S.EPA Region IX PRGs for industrial soil are also appropriate screening criteria for the recreational user exposure scenario as the frequency and duration of exposure for this receptor is much less than the daily exposures assumed for the industrial scenario used to construct the Region IX PRGs for industrial soil.

  Per U.S.EPA guidance, a chemical whose maximum detected concentration exceeds its industrial soil PRG will be considered a COI for that SWMU or AOC and will be carried into the next tier of the process (U.S.EPA, 1999a). Chemicals identified as essential

nutrients (calcium, chloride, iodine, magnesium, phosphorus, potassium, and sodium) will not be included in the risk screening.

In addition, chemical concentrations in soil will be compared to facility-specific natural and anthropogenic background concentrations. Background comparisons will be made following approaches outlined in U.S.EPA guidance (U.S.EPA 2002x). Any chemical that exceeds its respective industrial PRG but is less than background will not be evaluated further. Chemicals retained after this step are identified as COI and are carried forward to the next tier of evaluation.

- Tier 2 – The Tier 2 risk evaluation will consist of a Facility-specific risk evaluation conducted on the COCs identified in Tier 1. The risk evaluation will follow U.S.EPA guidance. The results will be compared to a cumulative target risk level of 10^{-4} for carcinogens and a cumulative target hazard index of one for noncarcinogens, the latter summed based on toxic effects on the same target organs.
- Tier 3 - If COCs are identified following the Tier 2 risk evaluation, further evaluation may be conducted, i.e., a Tier 3 risk evaluation. In a Tier 3 human health risk assessment, exposure assessment and risk characterization may be refined using several techniques. Examples of Tier 3 considerations include the following:
  - Exposure parameters may be estimated as probability density functions, using Monte Carlo analysis, rather than point estimates. The resultant risk characterization would express risks and hazards as a range of probabilities rather than as deterministic point estimates.
  - Site-specific exposure factors may be obtained; i.e., fish ingestion rates, fraction of fish ingested, etc. through local surveys.
  - Collection of fish tissue to provide actual measurements for the fish ingestion pathway.

Area 14 is the site of the former onsite filling station. Five USTs were excavated and removed from this area. Thirty soil samples were collected from soils excavated from the tank pit and analyzed for total petroleum hydrocarbons (TPH). Analytical results indicate TPH was detected at 12 ppm in one soil sample. TPH concentrations in the remaining soil samples were below the laboratory detection limit of 10 ppm. Based on this information, no additional investigation is required for this area.

Soil in all other SWMU/AOCs identified in the RFI will be sampled to determine if there has been a release of any COI in those areas. Per U.S.EPA guidance, analytical results of the COI will be compared to the corresponding Region IX PRG for industrial soil, to determine if further sampling of the area is warranted.

Groundwater samples will be analyzed for the Appendix IX volatiles and total and dissolved lead. Objectives of the analyses are as follows:

- Tier 1 Screening: Chemical concentrations detected in groundwater samples collected during the RFI will be compared to the most current federal drinking water standards or Maximum Contaminant Levels (MCLs). Where MCLs are not available, the U.S.EPA Region IX PRGs for tap water will be used. For the purposes of screening the PRGs will be based on a target cancer risk of 10^{-6} and for noncarcinogens the PRGs will be adjusted to a target hazard index of 0.1. A chemical whose maximum detected concentration exceeds the Tier 1 screening criterion will be considered a COI and will be carried into the next tier of the process (Tier 2). Chemicals identified as essential nutrients (calcium, chloride, iodine, magnesium, phosphorus, potassium, and sodium) will not be included in the risk screening. In addition, chemical concentrations in groundwater will be compared to regional and facility-specific natural and anthropogenic background concentrations, if available, as part of Tier 1 screening. Where facility-specific background data are available from upgradient wells for this screen, the maximum detected concentration of a chemical detected in a facility well will be compared to two times the arithmetic mean concentration detected in the facility-specific background samples. Any chemical that exceeds its respective Tier 1 screening criterion but is less than its background concentration will not be evaluated further. Chemicals retained after this step are identified as COI and are carried forward to the next tier of evaluation.

- Tier 2 Quantitative Risk Evaluation: PCOI identified in groundwater that exceed Tier 1 screening criteria may undergo a Tier 2 quantitative risk evaluation. Data used in Tier 1 will be reviewed to determine if additional data are needed to conduct the Tier 2 evaluation. The Tier 2 risk evaluation will be a facility-specific risk evaluation based on the CSM for groundwater developed using the results from the Phase I and/or Phase II of the RFI. The Tier 2 risk evaluation will focus on complete exposure pathways at identified points of exposure (on-site or off-site). Fate and transport evaluation will be used to consider the potential for transport and attenuation of chemicals in groundwater. In addition, Tier 2 risk options may include the use of facility-specific bioavailability data, facility-specific exposure durations or frequencies and/or stochastic (Monte Carlo) analysis following U.S.EPA guidance (U.S.EPA, 1992a; 1997b,c; 1999b). The results of the Tier 2 risk evaluation will be used to identify if no further action is appropriate and where remedial action is necessary. If groundwater poses a cumulative cancer risk greater than 10^{-4} for a receptor or a hazard index greater than one for chemicals that act on the same organ, then RGs will be calculated for those COI that are responsible for the risk exceedances. If the target risk levels are not exceeded, then a no further action determination will be made. The volatiles results will be used to help confirm previous conclusions that neither the C&D site, nor the historical dumping area located on that site are the source of chlorinated solvent contamination of the City of Attica municipal wells potentially located downgradient from the C&D site.

Parameters listed in Tables 1-2 and 1-3 are the proposed critical measurement parameters for the RFI, for soil and groundwater samples, respectively, along with both the human health and ecological screening factors relevant to this project. These tables also contain the laboratory reporting limits and MDL. Instances are footnoted where the analytical method detection or

reporting limits do not meet one of the screening levels, and where no practical alternative analytical method with sufficient sensitivity is available.

At least seven surface and subsurface background soil samples will be collected, to assess whether the target decision levels which are health based or ecological based are less than the native soil concentrations. If the statistically derived soil background levels are determined to be above the target decision levels, then a statistical comparison shall be made to the investigational areas. Background comparisons will be made in accordance with *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites* (U.S.EPA 2002).

The human health and ecological risk evaluation will be performed using U.S.EPA risk assessment guidance. Key guidance documents that will be used in the risk evaluations include:

Risk Assessment Guidance for Superfund. Volume I. Human Health Evaluation Manual (Part A) (U.S.EPA 1989).

Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors (U.S.EPA 1991)

Guidelines for Exposure Assessment (Final) (U.S.EPA 1992)

Wildlife Exposure Factors Handbook (U.S.EPA 1993)

Exposure Factors Handbook (U.S.EPA 1997a)

Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments (U.S.EPA 1997b)

Guidelines for Ecological Risk Assessment (U.S.EPA 1998)

Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites (U.S.EPA 2002a)

Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites (U.S.EPA 2002b)

Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) (U.S.EPA 2004)

The human and ecological risk evaluations are discussed in detail in Section 3.3 RFI Work Plan.

1.4.1 Project Target Parameters

The complete list of target parameters for this project for soils are indicated in Table 1-2, and for groundwater samples in Table 1-3. The analytical parameters are specific for each investigation area as explained later in this section of the QAPP.

1.4.2 Field Parameters

Water quality measurements for turbidity, specific conductance, temperature, and pH will be recorded in field book or groundwater sample log sheet and included in the final report. The water quality measurements are for field purposes only and are not target parameters for any project objective. They are to be used only for information regarding the sampling of the monitor wells, and for general information about the nature of the groundwater. No field parameters will be recorded during soil sample collection activities.

1.4.3 Laboratory Parameters

The project-specific laboratory parameters for soils and groundwater are included in Tables 1-2 and 1-3, respectively. Analytical parameters for soil samples are specific for each investigation area. Analytical parameters for each area were selected based on information presented in the March 2007 CCR that was submitted to EPA Region 5. Manufacturing activities at the Site are ongoing. Based on site manufacturing operations, lead is the predominant COI. Below is a summary of the Contaminants of Concern identified by area:

- **Area 1** – Waste Water Pretreatment Plant – Wastewater from the plant is treated in this area. The CCR states that the COI in Area 1 is lead, as a result of the information collected and presented in that report on the operations of the WWPTP, the chemicals used there, and the spills and releases there. Soil samples taken from this area will be analyzed for lead.
- **Area 2** – Current and Former Acid Storage Lofts – As a result of the information collected and presented in the CCR on the operation of the current and former acid storage lofts and its proximity to the lead oxide storage silos, the chemicals used there, and the spills and releases there, the COI in Area 2 is lead. Soil samples taken from this area will be analyzed for lead.
- **Area 3** – Lead Oxide Storage Silos – As a result of the information collected and presented in the CCR on the operation of the lead oxide storage silos, the chemicals used there, and the spills and releases there, the COI in Area 3 is lead.
- **Area 4** – Storm Water Sewers – According to the Current Conditions Report, various releases at the site were documented as entering the storm water sewers. The COI identified were lead and VOCs.
- **Area 5** – Exterior Former Hazardous Waste Materials Storage Area – COI are identified as lead and VOCs.
- **Area 6** – Exterior Former Drum Storage Area and Transfer Pad – COI are identified as VOCs and metals.
- **Area 7** – Polymer Mixing Room – The CCR states this room was historically utilized for the storage and use of various solvents to clean buckets used in the polymer mixing process. The COI is identified as VOCs.

- **Area 8** – Historical Drive-up Dumping Area – Dumping activities occurred in this area from the early 1900's up to 1960. The COI for this area are identified as VOCs, PAHs, and metals.
- **Area 9** – Historical Former Waste and Dust Storage Room - Identified as such on a 1948 fire insurance map, this area will be investigated for the presence/absence of metals, VOCs, and PAHs.
- **Area 10** – Southwest Historical Former Container Storage Area. Soil samples will be collected and analyzed for metals, VOCs, and PAHs, since no previous analytical data was available.
- **Area 11** – Northeastern Historical Former Container Storage Area - This area is immediately north of the current hazardous waste area. The CCR identified VOCs and metals as the COI for this area.
- **Area 12** – Central Vacuum System Baghouses – This area consists of four former exterior baghouses, and was identified as a SWMU based on historical operations of the baghouses and one documented release at the former Oxide Mill Baghouse, which is also included in Area 13. The COI for Area 12 is lead.
- **Area 13** – Former Oxide Mill Area – lead has been identified as the COI for this area.
- **Area 14** – Former Onsite Filling Station – This area formerly contained several USTs that have since been removed. The UST Closure Report is attached with the RFI Waste Plan. No further action is recommended for this area.
- **Area 15** – West Container Storage Area – Storage of material in drums was observed in historical aerial photographs. Soil samples will be collected from this area and submitted for metals, VOCs, and PAHs analyses.
- **Area 16** – Location of Historic DC Generator – A former DC transformer was located in this area the reportedly contained PCBs. Soil samples will be collected from this area to determine the presence or absence of PCBs.
- **Ground Water** – Monitor Wells – There are five existing deep monitor wells on the C&D site. Historical analytical data indicate chlorinated solvents are present in groundwater collected from three of five of these monitoring wells. Groundwater samples will be collected from the five existing wells and analyzed for VOCs and total and dissolved lead. In addition, four new monitoring wells will be installed to monitor the shallow groundwater bearing zone. Groundwater samples collected from these new monitoring wells will be analyzed for the same COI.

1.5 Sampling Locations

Proposed soil boring and monitoring well locations are provided on Figure 4-1 presented in Section 4 of the RFI Work Plan. Sampling locations may change based on field conditions, drill rig access, and potential health and safety hazards. The URS Field Manager will consult with both the URS and C&D Project Mangers prior to any changes in locations during the field

investigation. Any major changes to this sampling strategy will only be implemented after receipt of approval from the U.S. EPA RCRA Project Manager.

1.5.1 Rationale for Selected Sampling Locations

The rationale for the selected sampling locations (and depths) at each SWMU and AOC are described in Section 3.2 of the RFI Work Plan. The general sampling approach has been devised on targeting locations that will most likely meet the data collection goals of the RFI. Soil samples will be collected from locations that are representative of each area. The value of the data from each sample will thereby be maximized reducing the need for additional sampling.

The statistical arguments supporting the number of samples to be taken for a given matrix are **also provided in Section X.X of the Field Sampling Plan.**

1.6 Project Schedule

C&D has developed the proposed project schedule presented in Figure 4-2 of the RFI Work Plan. The schedule represents a realistic estimate of the time required to implement the investigations described in the RFI Work Plan. The project schedule assumes no unexpected delays in field activities or laboratory analysis time will be encountered. The schedule for future investigation activities will be determined by the findings from the RFI. The schedule will be implemented upon receipt of U.S.EPA letter approving this RFI Work Plan. C&D and URS will notify U.S.EPA a minimum of 10 days prior to initiation of field efforts.

Table 1-1 – Data Objectives and Proposed Contaminants of Concern, QA Sampling Frequency

SWMU/AOC	Data Objectives	Contaminants of Concern	Proposed Number of Unique Soil Borings	Proposed Number of Samples	Field DUP	MS/ MSD
Soil Sample Areas						
Area 1	Nature and extent of release	lead	10	20	1	1
Area 2	presence/absence of contaminants	lead	2	4	1	
Area 3	presence/absence of contaminants	lead	3	6		
Area 4	nature & extent of release	lead, VOCs	10	20	2	1
Area 5	presence/absence of contaminants	RCRA metals, VOCs	2	4	1	
Area 6	presence/absence of contaminants	RCRA metals, VOCs	3	6		1
Area 7	presence/absence of contaminants	VOCs	2	4		
Area 8	nature & extent of release	RCRA metals, VOCs, PAHs	10	30	3	1
Area 9	presence/absence of contaminants	RCRA metals, VOCs, PAHs	1	2		
Area 10	presence/absence of contaminants	RCRA metals, VOCs, PAHs	2	4	1	1
Area 11	presence/absence of contaminants	RCRA metals, VOCs	2	4	1	
Area 12	presence/absence of contaminants	lead	4	2		
Area 13	nature & extent of release	lead	10	80	2	1
Area 14	none-area closed	none	0	0		
Area 15	presence/absence of contaminants	RCRA metals, VOCs, PAHs	6	12	1	1
Area 16	presence/absence of contaminants	PCBs	2	4	1	1
Background soils	Determine background soil concentrations	RCRA metals	7	14	1	1
GW Monitor Wells						
5 Existing Deep MW	Source of VOC, pres/absen Pb	VOC, total/dis lead	NA	5	1	
4 New Shallow MW	Source of VOC, pres./abs. Pb	VOC, total/dis lead	NA	4		1
Note: Soil sample results must be reported by dry weight, requiring a percent moisture analysis.						
Trip blanks--one per cooler containing VOC samples either soil or water, for VOC analysis.						
Equipment/Field Blanks--Soils-One per sampling day. Waters--one each for total and dis. lead.						

Table 1-2 – Soil Screening Levels, Methods, Reporting Limits, MDLs

Compound	Method	Units	RL	MDL	Human Health RBSL (Region IX Industrial Soil PRG)	Ecological Screening Levels (Region 5)	Comment
RCRA Metals							
Arsenic	6010B	mg/kg	1	0.34	1.6	5.7	
Barium	6010B	mg/kg	20	0.2	6,700	1.04	2
Cadmium	6010B	mg/kg	0.5	0.027	45	0.00222	1
Chromium	6010B	mg/kg	1	0.13	450	0.4	2
Lead	6010B	mg/kg	0.3	0.24	800	0.0537	1
Mercury	7471A	mg/kg	0.1	0.013	31	0.1	
Selenium	6010B	mg/kg	0.5	0.3	510	0.0276	1
Silver	6010B	mg/kg	1	0.29	510	4.04	
Appendix IX Volatiles Method 8260B							
Acetone	8260B/5035	ug/kg	20	2.7	5,400,000	2500	
Acetonitrile	8260B/5035	ug/kg	100	5.6	340,000	1370	
Acrolein	8260B/5035	ug/kg	100	4.8	34	5270	2
Acrylonitrile	8260B/5035	ug/kg	100	2.5	49	23.9	
Benzene	8260B/5035	ug/kg	5	0.23	1400	255	
Bromodichloromethane	8260B/5035	ug/kg	5	0.48	1,800	540	
Bromoform	8260B/5035	ug/kg	5	0.65	220,000	15900	
Bromomethane	8260B/5035	ug/kg	5	0.61	1300	na	
2-Butanone (MEK)	8260B/5035	ug/kg	20	1	11,000,000	89600	
Carbon disulfide	8260B/5035	ug/kg	5	0.2	72,000	94.1	
Carbon tetrachloride	8260B/5035	ug/kg	5	0.45	550	2980	
Chlorobenzene	8260B/5035	ug/kg	5	0.28	53,000	13100	
Chloroprene	8260B/5035	ug/kg	5	0.21	1200	2.9	2
Dibromochloromethane	8260B/5035	ug/kg	5	0.36	2,600	2050	
Chloroethane	8260B/5035	ug/kg	5	0.54	6,500	na	
Chloroform	8260B/5035	ug/kg	5	0.4	470	1190	
Chloromethane	8260B/5035	ug/kg	5	0.25	16,000	na	
Allyl chloride	8260B/5035	ug/kg	10	0.78	18,000	13.4	
1,2-Dibromo-3-chloropropane	8260B/5035	ug/kg	10	1.4	2,000	35.2	
1,2-Dibromoethane (EDB)	8260B/5035	ug/kg	5	0.37	73	1230	
Dibromomethane	8260B/5035	ug/kg	5	0.57	na	na	
trans-1,4-Dichloro-2-butene	8260B/5035	ug/kg	5	0.75	18	na	
Dichlorodifluoromethane	8260B/5035	ug/kg	5	0.4	31,000	39500	
1,1-Dichloroethane	8260B/5035	ug/kg	5	0.32	170,000	20100	
1,2-Dichloroethane	8260B/5035	ug/kg	5	0.48	600	21200	
trans-1,2-Dichloroethene	8260B/5035	ug/kg	5	0.55	23,000	784	
cis-1,2-Dichloroethene	8260B/5035	ug/kg			15,000	na	
1,1-Dichloroethene	8260B/5035	ug/kg	5	0.6	41,000	8280	
1,2-Dichloropropane	8260B/5035	ug/kg	5	0.35	740	32700	
cis-1,3-Dichloropropene	8260B/5035	ug/kg	5	0.35	1,800	398	

trans-1,3-Dichloropropene	8260B/5035	ug/kg	5	0.35	1,800	398	
1,4-Dioxane	8260B/5035	ug/kg	500	29	160,000	2050	
Ethylbenzene	8260B/5035	ug/kg	5	0.53	40,000	5160	
Ethyl methacrylate	8260B/5035	ug/kg	5	0.45	14,000	30000	
2-Hexanone	8260B/5035	ug/kg	20	0.84	na	12600	
Iodomethane	8260B/5035	ug/kg	5	0.44	na	na	
Isobutyl alcohol	8260B/5035	ug/kg	200	16	400,000	20800	
Methacrylonitrile	8260B/5035	ug/kg	5	0.76	840	57	
Methylene chloride	8260B/5035	ug/kg	5	1.3	21,000	10400	
Methyl methacrylate	8260B/5035	ug/kg	5	0.54	270,000	984000	
4-Methyl-2-pentanone (MIBK)	8260B/5035	ug/kg	20	0.54	4,700,000	443000	
Propionitrile	8260B/5035	ug/kg	20	1.8	na	49.8	
Styrene	8260B/5035	ug/kg	5	0.2	170,000	4690	
1,1,1,2-Tetrachloroethane	8260B/5035	ug/kg	5	0.42	7,300	225000	
1,1,2,2-Tetrachloroethane	8260B/5035	ug/kg	5	0.46	930	127	
Tetrachloroethene	8260B/5035	ug/kg	5	0.83	1,300	9920	
Toluene	8260B/5035	ug/kg	5	0.29	52,000	5450	
1,1,1-Trichloroethane	8260B/5035	ug/kg	5	0.76	120,000	29800	
1,1,2-Trichloroethane	8260B/5035	ug/kg	5	0.41	1,600	28600	
Trichloroethene	8260B/5035	ug/kg	5	0.41	110	12400	
Trichlorofluoromethane	8260B/5035	ug/kg	5	0.41	200,000	16400	
1,2,3-Trichloropropane	8260B/5035	ug/kg	5	0.82	76	3360	
Vinyl acetate	8260B/5035	ug/kg	10	0.28	140,000	12700	
Vinyl chloride	8260B/5035	ug/kg	5	0.44	750	646	
Xylenes (total)	8260B/5035	ug/kg	10	0.76	42,000	10000	
PAH Semi Volatiles – Method 8270C							
Acenaphthene	8270C	ug/kg	6.67	1.3	2,900,000	682000	
Acenaphthylene	8270C	ug/kg	6.67	1.2	na	682000	
Anthracene	8270C	ug/kg	6.67	1.3	10,000,000	1480000	
Benzo(a)anthracene	8270C	ug/kg	6.67	0.95	2,100	5210	
Benzo(b)fluoranthene	8270C	ug/kg	6.67	1.2	2,100	59800	
Benzo(k)fluoranthene	8270C	ug/kg	6.67	1.7	21,000	148000	
Benzo(ghi)perylene	8270C	ug/kg	6.67	1.3	na	119000	
Benzo(a)pyrene	8270C	ug/kg	6.67	1.3	210	1520	
Chrysene	8270C	ug/kg	6.67	0.9	210,000	4730	
Dibenz(a,h)anthracene	8270C	ug/kg	6.67	1.3	210	18400	
Fluoranthene	8270C	ug/kg	6.67	1.2	2,200,000	122,000	
Fluorene	8270C	ug/kg	6.67	1.2	2,600,000	122,000	
Indeno(1,2,3-cd)pyrene	8270C	ug/kg	6.67	1.5	2,100	109,000	
2-Methylnaphthalene	8270C	ug/kg	6.67	1.5	na	3240	
Naphthalene	8270C	ug/kg	6.67	1.6	19,000	99.4	
Phenanthrene	8270C	ug/kg	6.67	2.0	na	45,700	
Pyrene	8270C	ug/kg	6.67	1.1	2,900,000	78,500	
PCBs							
Aroclor 1016	8082	ug/kg	33	11	740	0.332	1
Aroclor 1221	8082	ug/kg	33	13	740	0.332	1
Aroclor 1232	8082	ug/kg	33	12	740	0.332	1
Aroclor 1242	8082	ug/kg	33	14	740	0.332	1

Aroclor 1248	8082	ug/kg	33	15	740	0.332	1
Aroclor 1254	8082	ug/kg	33	8.8	740	0.332	1
Aroclor 1260	8082	ug/kg	33	9.8	740	0.332	1
Percent Moisture	EPA 160.3	%	1	0.1	NA	NA	
Comment 1: ESL is below best MDL. Non-detected Data will be evaluated at half the MDL for risk assessment.							
Comment 2: ESL is below reporting limit, but above MDL. "J" flagged data will be used, ND data evaluated at MDL.							
Comment 3: RBSL is below reporting limit, but above MDL. "J" flagged data will be used, ND data evaluated at MDL.							
Comment 4: RBSL is below best MDL. Non-detected Data will be evaluated at half the MDL for risk assessment.							

Notes: RL=Reporting Limit
MDL=Method Detection Limit
RBSL=Risk Based Screening Level
PRG=Preliminary Remediation Goals

Table 1-3 – Water Screening Levels, Methods, Reporting Limits, MDLs

Compound	Method	Units	RL	MDL	Human Health RBSL (Region IX GW PRG or DW Based)	Source of non-PRG levels	Ecological Screening Levels GW (Region 5)	Comment
Metals								
Lead (total)	6020	ug/L	1	0.11	15	DW ACT	1.17	
Lead (dissolved)	6020	ug/L	1	0.11	15	DW ACT	1.17	
Acetone	8260B	ug/L	10	1.1	550		1700	
Acetonitrile	8260B	ug/L	20	3.5	10		12,000	3
Acrolein	8260B	ug/L	20	2.2	0.00422		0.19	1,4
Acrylonitrile	8260B	ug/L	20	2	0.0039		1.2	1,4
Benzene	8260B	ug/L	1	0.13	5	MCL	114	
Bromodichloromethane	8260B	ug/L	1	0.15	0.018		na	1,4
Bromoform	8260B	ug/L	1	0.64	8.5		230	
Bromomethane	8260B	ug/L	1	0.41	.87		16	3
2-Butanone (MEK)	8260B	ug/L	10	0.57	700		2200	
Carbon disulfide	8260B	ug/L	1	0.13	100		15	
Carbon tetrachloride	8260B	ug/L	1	0.13	0.171		240	3
Chlorobenzene	8260B	ug/L	1	0.15	100	MCL	47	
Chloroprene	8260B	ug/L	2	0.29	1.4		na	3
Dibromochloromethane	8260B	ug/L	1	0.18	0.13		na	4
Chloroethane	8260B	ug/L	1	0.29	4.6		na	
Chloroform	8260B	ug/L	1	0.16	80	THM-MCL	140	3
Chloromethane	8260B	ug/L	1	0.3	16		na	
Allyl chloride	8260B	ug/L	2	0.35	1		na	4
1,2-Dibromo-3-chloropropane	8260B	ug/L	2	0.67	0.2	MCL	na	4
1,2-Dibromoethane (EDB)	8260B	ug/L	1	0.24	0.05	MCL	na	4
Dibromomethane	8260B	ug/L	1	0.28	6.1		na	
1,2-Dichlorobenzene	8260B	ug/L			600	MCL		
1,3-Dichlorobenzene	8260B	ug/L			18			
1,4-Dichlorobenzene	8260B	ug/L			75	MCL		
trans-1,4-Dichloro-2-butene	8260B	ug/L	1	0.15	0.0012		na	4
Dichlorodifluoromethane	8260B	ug/L	1	0.31	39		na	
1,1-Dichloroethane	8260B	ug/L	1	0.15	81		47	
1,2-Dichloroethane	8260B	ug/L	1	0.22	5	MCL	910	
cis-1,2-Dichloroethene	8260B	ug/L			70	MCL	na	
trans-1,2-Dichloroethene	8260B	ug/L	1	0.19	100	MCL	970	
1,1-Dichloroethene	8260B	ug/L	1	0.19	7	MCL	65	
1,2-Dichloropropane	8260B	ug/L	1	0.18	5	MCL	360	
cis-1,3-Dichloropropene	8260B	ug/L	1	0.14	0.4		na	3
trans-1,3-Dichloropropene	8260B	ug/L	1	0.19	0.4		na	3
1,4-Dioxane	8260B	ug/L	200	19	6.1		22,000	4
Ethylbenzene	8260B	ug/L	1	0.17	700	MCL	14	

Ethyl methacrylate	8260B	ug/L	1	0.14	55		na	
2-Hexanone	8260B	ug/L	10	0.41	na		99	
Iodomethane	8260B	ug/L	1	0.18	na		na	
Isobutyl alcohol	8260B	ug/L	50	8.2	180		na	
Methacrylonitrile	8260B	ug/L	2	0.51	1		na	3
Methylene chloride	8260B	ug/L	1	0.33	4.3		940	
Methyl methacrylate	8260B	ug/L	2	0.49	140		2800	
4-Methyl-2-pentanone (MIBK)	8260B	ug/L	10	0.32	20		170	
Propionitrile	8260B	ug/L	4	1-2	na		na	
Styrene	8260B	ug/L	1	0.11	100	MCL	32	
1,1,1,2-Tetrachloroethane	8260B	ug/L	1	0.23	0.43		na	3
1,1,2,2-Tetrachloroethane	8260B	ug/L	1	0.18	0.055		380	4
Tetrachloroethene	8260B	ug/L	1	0.29	5	MCL	45	
Toluene	8260B	ug/L	1	0.13	1000	MCL	253	
1,1,1-Trichloroethane	8260B	ug/L	1	0.22	200	MCL	76	
1,1,2-Trichloroethane	8260B	ug/L	1	0.27	5	MCL	500	
Trichloroethene	8260B	ug/L	1	0.17	5	MCL	47	
Trichlorofluoromethane	8260B	ug/L	1	0.21	130		na	
1,2,3-Trichloropropane	8260B	ug/L	1	0.43	0.0056		na	4
Vinyl acetate	8260B	ug/L	2	0.19	41		248	
Vinyl chloride	8260B	ug/L	1	0.22	2	MCL	930	
Xylenes (total)	8260B	ug/L	2	0.28	21		65.7	

Comment 1: ESL is below best MDL. Non-detected Data will be evaluated at half the MDL for risk assessment.

Comment 2: ESL is below reporting limit, but above MDL. "J" flagged data will be used, ND data evaluated at MDL.

Comment 3: RBSL is below reporting limit, but above MDL. "J" flagged data will be used, ND data evaluated at MDL.

Comment 4: RBSL is below best MDL. Non-detected Data will be evaluated at half the MDL for risk assessment.

Notes: GW=Ground water
PRG=Preliminary Remediation Goals
DW=Drinking Water
MCL=Maximum Concentration Level
THM=Trihalomethanes

PROJECT ORGANIZATION AND RESPONSIBILITY

2.0 Project Organization and Responsibility

At the direction of the U.S. EPA RCRA PROJECT MANAGER (RPM) [NAME], URS has responsibility for all phases of the investigation. Personnel from the URS Franklin, TN office will perform the field investigation, prepare the Report, and perform any subsequent studies. Project management will also be provided by URS. The various quality assurance, field, laboratory and management responsibilities of key project personnel are defined below.

2.1 Project Organization Chart

The lines of authority specific to this investigation are presented in Figure 2.1. This chart includes all individuals discussed below.

2.2 Management Responsibilities

RCRA Project Manager

The RCRA Project Manager, [NAME], has the overall responsibility for all phases of the investigation.

C&D Facility Project Manager

The C&D Attica Project Manager, Mr. Walt Koslowski, is responsible for implementing the project, and has the authority to commit the resources necessary to meet project objectives and requirements. The Facility Project Manager's primary function is to ensure that technical, financial, and scheduling objectives are achieved successfully. The C&D Project Manager will report directly to the U.S.EPA Region 5 RCRA Project Manager and will provide the major point of contact and control for matters concerning the project. The C&D Project Manager will:

- Define project objectives and develop a detailed work plan schedule;
- Establish project policy and procedures to address the specific needs of the project as a whole, as well as the objectives of each task;
- Acquire and apply technical and corporate resources as needed to ensure performance within budget and schedule constraints;
- Orient all field leaders and support staff concerning the project's special considerations;
- Monitor and direct the field leaders;
- Develop and meet ongoing project and/or task staffing requirements, including mechanisms to review and evaluate each task product;
- Review the work performed on each task to ensure its quality, responsiveness, and timeliness;

- Review and analyze overall task performance with respect to planned requirements and authorizations;
- Approve all reports (deliverables) before their submission to U.S. EPA Region 5;
- Ultimately be responsible for the preparation and quality of interim and final reports; and
- Represent the project team at meetings and public hearings.

URS Project Manager

The URS Project Manager, Jack Waggener, has responsibility for ensuring that the project meets U.S.EPA's objectives and URS quality standards. The URS Project Manager will provide assistance to C&D in terms of writing and distributing the QAPP to all those parties connected with the project (including the laboratory). The URS Project Manager will report directly to the C&D Project Manager and is responsible for technical QC and project oversight.

2.3 Quality Assurance Responsibilities

C&D Facility QA Manager

Due to the limited scope of this project, there will be no Facility QA Manager. The URS QA Manager will assume the duties normally associated with the facility QA manager, through contact with the URS Field Manager.

URS QA Manager

The URS QA Manager, Peter Ciarleglio reports directly to the URS Project Manager and will be responsible for ensuring that all URS procedures for this project are being followed. In addition, the URS QA Manager will be responsible for the data validation of all sample results from the analytical laboratory. In addition, due to the limited size of this project, the URS QA Manager will also perform on site QA functions normally designated for the Facility QA Manager. These duties will include:

- Performing QA audits on various phases of the field operations;
- Reviewing and approving QA plans and procedures;
- Providing QA technical assistance to project staff;
- Reporting on the adequacy, status, and effectiveness of the QA program on a regular basis to the program manager and executive vice president for technical operations.

U.S.EPA RCRA Quality Assurance Coordinator (RQAC)

The U.S.EPA RQAC, not yet assigned, has the responsibility to review and approve all QAPPs. Additional U.S.EPA responsibilities for the project include:

- Conducting external Performance and System Audits of Test America, North Canton Analytical Laboratory.
- Evaluating results of performance evaluation sample data.
- Reviewing and evaluating analytical field and laboratory procedures.

2.4 Laboratory Responsibilities

The laboratory tasked with responsibility for analytical work is:

Test America North Canton (formerly STL-North Canton)
4101 Shuffel Drive NW
North Canton, Ohio, 44720
(330) 497-9396

Test America, North Canton Project Manager

The laboratory staff, through the laboratory project manager will be responsible for maintaining all aspects of the laboratory to meet the requirements outlined in this QAPP. They will also be responsible for notifying the field team leader when non-conformances are noted, particularly when there is a problem with the receipt of the samples, and in any other instance where corrective action may be warranted.

The Test America, North Canton Project Manager, Frank Calovini, will report directly to the URS QA Manager and will be responsible for the following:

- Ensuring all resources of the laboratory are available on an as-required basis.
- Overseeing production and final review of analytical reports.

The Test America, North Canton Operations Manager

The Test America Operations Manager, Ray Risden, will report to the Test America Project Manager and will be responsible for:

- Coordinating laboratory analyses.
- Supervising in-house chain-of-custody.
- Scheduling sample analyses.
- Overseeing data review.
- Overseeing preparation of analytical reports.
- Approving final analytical reports prior to submission to URS/C&D.

Test America, North Canton Quality Assurance Officer

The Test America, North Canton QA officer, Dorothy Leeson, has the overall responsibility for data after it leaves the laboratory. The Test America, North Canton QA officer will be independent of the laboratory but will communicate data issues through the Test America, North Canton Project Manager. In addition, the Test America, North Canton QA Officer will:

- Oversee laboratory QA.
- Oversee QA/QC documentation.
- Conduct detailed data review.
- Determine whether to implement laboratory corrective actions, if required.
- Define appropriate laboratory QA procedures.
- Prepare laboratory SOPs.
- Sign the title page of the QAPP.

Final responsibility for project quality rests with the URS Project Manager. Independent QA will be provided by the Test America North Canton Project Manager and QA Officer prior to release of all data to URS/C&D.

Test America, North Canton Sample Custodian

The Test America, North Canton Sample Custodian, John McFadden, will report to the Test America, North Canton Operations Manager. Responsibilities of the Test America, North Canton Sample Custodian will include:

- Receiving and inspecting the incoming sample containers.
- Recording the condition of the incoming sample containers.
- Signing appropriate documents.
- Verifying chain-of-custody.
- Notifying laboratory manager and laboratory supervisor of sample receipt and inspection.
- Assigning a unique identification number and customer number, and entering each into the sample receiving log.
- With the help of the laboratory manager, initiating transfer of the samples to appropriate lab sections.
- Controlling and monitoring access/storage of samples and extracts.

Test America, North Canton Technical Staff

The Test America, North Canton technical staff will be responsible for sample analysis and identification of corrective actions. The staff will report directly to the Test America, North Canton Operations Manager.

Laboratory Documents Incorporated into this QAPP

The Test America, North Canton QA Manual is attached as an Electronic Appendix to this QAPP, and has been incorporated into this QAPP. The above explanation briefly and generally summarizes the internal responsibilities of the laboratory. Details concerning internal laboratory responsibilities, sample chains of custody, handling corrective actions or non-conformance with accepted procedures, specific responsibilities of individuals, etc. are to be found in this manual.

The Test America, North Canton Laboratory SOPs are also attached as an Electronic Appendix to this QAPP. The SOP's applicable to the individual analyses are listed in Table 4.1 of this QAPP.

2.5 Field Responsibilities

URS Site Manager

The C&D Project Manager will be supported by the URS Site Manager, Dylan Crouch. He is responsible for leading and coordinating the day-to-day activities of the various resource specialists under his/her supervision. The URS Site Manager is a highly experienced environmental professional and will report directly to the C&D Project Manager. Specific field team leader responsibilities include:

- Provision of day-to-day coordination with the C&D Project Manager on technical issues in specific areas of expertise;
- Developing and implementing of field-related work plans, assurance of schedule compliance, and adherence to management-developed study requirements;
- Coordinating and managing field staff including sampling and drilling, and supervising field laboratory staff;
- Implementing QC for technical data provided by the field staff including field measurement data;
- Adhering to work schedules provided by the project manager;
- Authoring, writing, and approving of text and graphics required for field team efforts;
- Coordinating and overseeing technical efforts of subcontractors assisting the field team;

- Identifying problems at the field team level, resolving difficulties in consultation with the C&D Project Manager, implementing and documenting corrective action procedures, and provision of communication between team and upper management; and
- Participating in preparation of the final report.

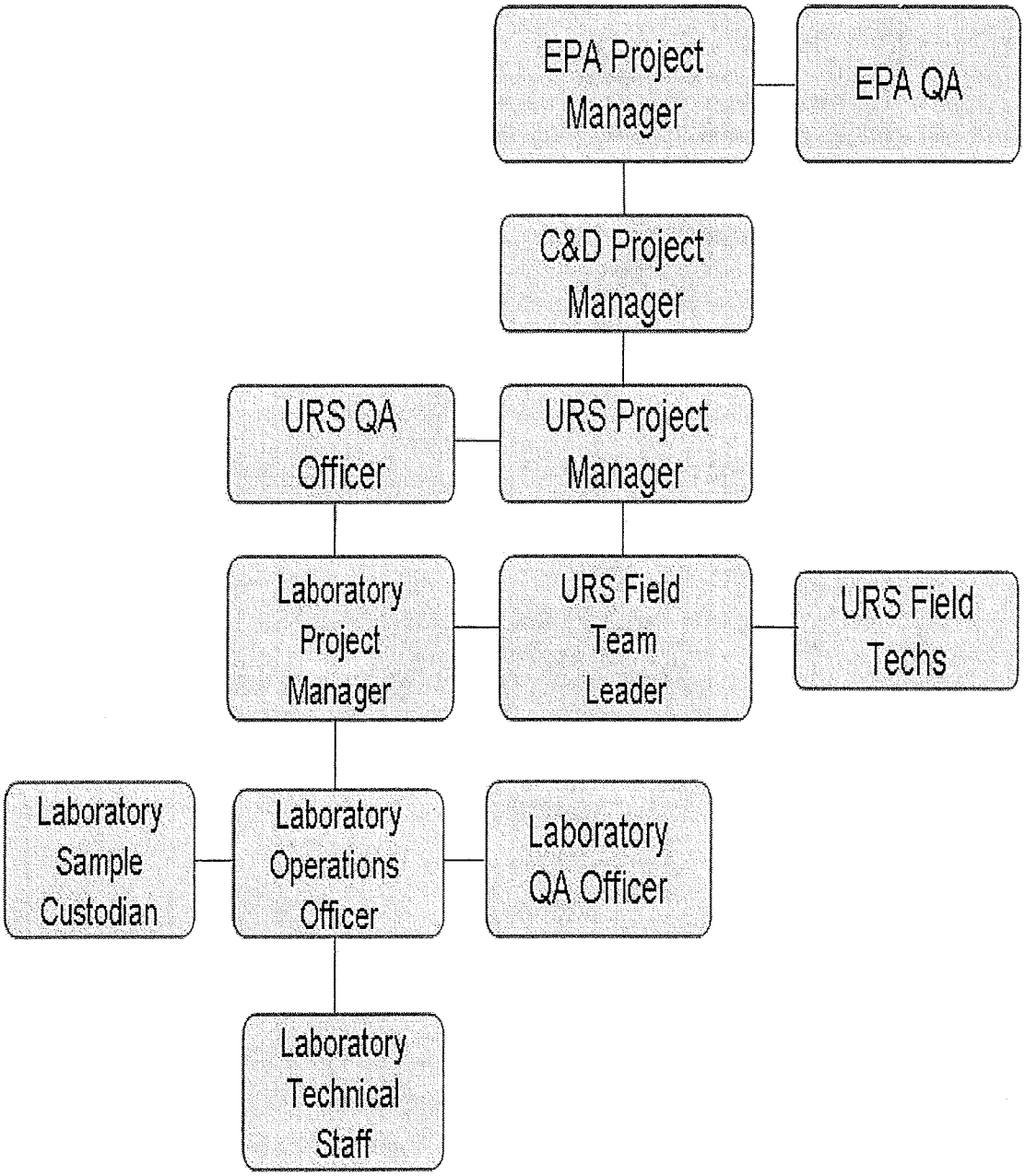
URS Field Technical Staff

The technical staff for this project will be drawn from URS's pool of corporate resources. The technical staff will be utilized to gather and analyze data, and to prepare various task reports and support materials. All of the designated technical team members are experienced professionals who possess the degree of specialization and technical competence required to effectively and efficiently perform the required work.

2.6 Special Training Requirements and Certifications

Based on the project sampling events proposed in this QAPP, no specialized training or certification is required for contractor personnel. All contractors and their employees must have current 40 hour HAZWOPER training according to 40 CFR 1910.120.

Figure 2.1
Project Organizational Chart



QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA

3.0 Quality Assurance Objectives

The overall QA objective for this project is to develop and implement procedures for laboratory analysis, chain-of-custody, and reporting that will provide results which are legally defensible in a court of law. This section will provide in greater detail specific project objectives and intended data usages mentioned in Section 1 of this QAPP. Specific procedures for sampling, chain-of-custody, laboratory instrument calibration, laboratory analysis, reporting of data, internal QC, audits, preventive maintenance of field equipment, and corrective action are described in other sections of this QAPP.

3.1 Precision

3.1.1 Definition

Precision is a measure of the degree to which two or more measurements are in agreement.

3.1.2 Field Duplicate Collection

Combined field sampling and lab precision is assessed through the collection and measurement of field duplicates at a rate of at least 1 duplicate for every 10 analytical samples for each analytical group. To accomplish this, field personnel should collect field duplicates according to the schedule specified in Table 1-1, since different analyses are required for soils in different areas, and some of the soil borings are within two different areas.

Each field duplicate collected should be regarded as a separate sample, so that each field duplicate will require its own separate set of sample containers.

Field duplicate objectives for groundwater are to achieve less than 30% RPD and for soils, less than 50% RPD on all target compounds detected at levels above the laboratory reporting/estimated quantitation limit.

3.1.3 Laboratory Precision Objectives

Precision in the laboratory is assessed through the calculation of relative percent differences (RPD) on duplicate samples, or on the MS/MSD samples, as per the requirements of the SOP for that analytical group. The equations to be used for precision in this project can be found in Section 12 of this QAPP.

Laboratory precision control limits are provided in Tables 3.1 and 3.2 for the soil and water matrix samples, respectively. These are also in the applicable SOPs as referenced in Section 7 of this QAPP.

For inorganic analyses, laboratory precision shall be assessed through the analysis of a sample/sample duplicate pair, or by the analysis of MS/MSD samples, and also through the analysis of field duplicate samples collected in accordance to Section 3.1-2 of this QAPP. For

organic analyses, laboratory precision shall be assessed through the analysis of matrix spike/matrix spike duplicate (MS/MSD), and also through the analysis of field duplicates collected as per Section 3.12 of this QAPP.

3.2 Accuracy

3.2.1 Definition

Accuracy is the degree of agreement between an observed value and an accepted reference or true value.

3.2.2 Field Accuracy Objectives

Accuracy in the field is assessed through the use of field (equipment) and trip blanks and through the adherence to all sample handling, preservation and holding times.

Field sampling personnel will also designate which project specific field samples will be analyzed as an MS/MSD by the laboratory, and insure that sufficient sample is collected to accomplish this. Overall, MS/MSD frequency should be at least five percent of all samples analyzed for each matrix. Field sampling personnel are cautioned that the analytical schedule is different for each soil area sampled. Table 1-1 designates the areas where an MS/MSD soil sample should be collected, so that enough MS/MSD analyses are performed for each analytical group.

3.2.3 Laboratory Accuracy Objectives

Laboratory accuracy is assessed through the analysis of MS/MSD, standard reference materials (SRM), laboratory control samples (LCS) and surrogate compounds, and the determination of percent recoveries. The equation to be used for accuracy in this project can be found in Section 12 of this QAPP. Information on compounds to be included in the LCS and MSDS spiking solutions, along with accuracy control limits are given in Tables 3.1 and 3.2 for the soil and water samples, respectively, and also in the applicable SOPs as referenced in Section 7 of this QAPP. Also, in the case of sampling for VOCs in soil, use of the Encore sampler will ensure data tint is both accurate and representative of on-site conditions.

3.3 Completeness

3.3.1 Definition

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under normal conditions.

3.3.2 Field Completeness Objectives

Field completeness is a measure of the amount of valid measurements obtained from all the measurements taken in the project. The equation for completeness is presented in Section 12 of this QAPP. The field completeness objective for this project will be greater than 90 percent.

3.3.3 Laboratory Completeness Objectives

Laboratory completeness is a measure of the amount of valid measurements obtained from all the measurements taken in the project. The equation for completeness is presented in Section 12 of this QAPP. The laboratory completeness objective for this project, with respect to critical measurement parameters identified in Tables 1-2 and 1-3 of this QAPP, will be greater than 90 percent based on all valid field samples successfully submitted to the lab.

3.4 Representativeness

3.4.1 Definition

Representativeness expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition within a defined spatial and/or temporal boundary.

3.4.2 Measures to Ensure Representativeness of Field Data

No field analyses for target pollutants are scheduled for this phase of the project.

3.4.3 Measures to Ensure Representativeness of Laboratory Data

Representativeness in the laboratory is ensured by using the proper analytical procedures, appropriate methods, meeting sample holding times and analyzing and assessing field duplicate samples.

Representativeness of sampling is dependent upon the proper design of the sampling program and will be satisfied by ensuring that the RFI Work Plan is followed and that proper sampling techniques are used. The sampling network was designed to provide data representative of facility conditions. During development of this network, consideration was given to past waste disposal practices, existing analytical data, physical setting and processes, and constraints inherent to the RCRA program. The rationale of the sampling network is discussed in the RFI Work Plan.

3.5 Decision Rules

3.5.1 Definition

A Decision Rule is a statement which allows for a course of action or non-action to be taken, based on assumptions made to draw out and test its logical or empirical consequences.

3.5.2 Decision Rule Objectives

The decision rule objectives address the following.

- Define statistical parameter(s) characterizing the population (e.g., mean, maximum, percentile) and incorporate the scale of decision-making (e.g., residential lot size). For this project, samples shall be collected discretely without compositing to provide greater indication of locally contaminated zones and hot spots. Given the limited number of

samples to be collected in this preliminary phase, this will provide adequate characterization of the site for present project purposes.

- Identify action level(s) (e.g., Soil Screening Level; Maximum Contaminant Level for drinking water; Ecological Data Quality Levels (EDQL) or a reference-based standard).
- Develop "if/then" statements defining conditions that would cause the decision maker to choose among alternative actions (e.g., remediation or no remediation).

Decision levels, expressed as human health or ecological target decision levels, for each critical measurement parameter are specified in the Tables 1-2 and 1-3 of this QAPP.

- For Areas 1, 4, 8, and 13, it will be to evaluate the nature and extent of releases from solid waste management units, and also to determine whether unreasonable risks to humans are associated with the areas.
- If any soil samples from Areas 1, 4, 8, and 13 exceed the Industrial Soil RBSL in **Table 1-2,** then a human health risk assessment will be initiated as described in Section 3.3.1 of the RFI Work Plan for that Area.
- If it is determined in the preliminary ecological assessment that the soil pollutants are confined to the site, and there are no significant enviroreceptors on the property, the soil from Areas 1, 4, 8, and 13 may not be evaluated for ecological risk. However, the analytical protocol discussed in this QAPP also compares the laboratory reporting and detection limits to the Region 5 Ecological Screening Levels (dated 8/22/03), and assesses data usefulness for this purpose. Therefore, the data could be used for an ecological risk assessment (within limitations **footnoted in Table 1-2**) if this proves necessary.
- If any contaminants of concern exceed the Region 5 ecological screening levels in Areas 1, 4, 8, and 13, and an ecological risk assessment is deemed necessary, it will be conducted.
- For all other areas where soil samples are collected, if any sample exceeds the RBSL for industrial soil, then further investigation as to the nature and extent of the contamination will be undertaken in a future sampling event.
- If any groundwater samples exceed the RBSL from Table 1-3, then the human health risk will be assessed; if any groundwater exceeds the ESL listed in Table 1-3, then ecological risk will be assessed.

As more information from the investigation is gathered, the planning team will use the decision rule(s) for this facility to statistically set the acceptable level of confidence in the data or the amount of uncertainty needed to optimize the design of the data collection.

3.6 Comparability

3.6.1 Definition

Comparability is an expression of the confidence with which one data set can be compared to another.

3.6.2 Measures to Ensure Comparability of Field Data

Comparability to previous data obtained from the site is dependent upon the proper design of the sampling program and will be satisfied by ensuring that the Field Sampling Plan is followed and that proper sampling techniques are used.

Field data collected for this project will not be critical in evaluating the site as to risk or extent of contamination. Any data obtained will not be compared to historical field data.

3.6.3 Measures to Ensure Comparability of Laboratory Data

Planned analytical data will be comparable when similar sampling and analytical methods are used and documented in the QAPP. Comparability is also dependent on similar QA objectives.

The methods proposed in this RFI are all the same SW846 methods performed in the past. The reporting limits are also similar, and the QC requirements should be similar to the data supplied in the past. If necessary, the data should be comparable. However, at the present time, URS does not intend to incorporate any of the previous data into the current investigation and risk assessment proposed for this project. The previous data will only be used for historical information as to what parameters have been detected at the site.

3.7 Level of Quality Control Effort

Field blank, trip blank, method blank, field duplicate, laboratory duplicate, laboratory control, standard reference materials (SRM) and matrix spike samples will be analyzed to assess the quality of the data resulting from the field sampling and analytical programs. Table 1-1 contains a summary of the number of all field blanks, trip blanks, MS/MSD samples, Field duplicates, and background samples to be collected and submitted to the analytical laboratory. These QC measures are listed below along with other QC measures required by this QAPP that are also compatible with the Test America analytical SOPs.

- Field and trip blanks consisting of distilled water will be submitted to the analytical laboratories to provide the means to assess the quality of the data resulting from the field sampling program.
- Field/equipment blank samples are analyzed to check for procedural contamination at the facility which may cause sample contamination. However, the concentrations of contaminants found in equipment blanks for soil samples, being collected in the aqueous phase, are not directly comparable to mg/kg values reported in a soil matrix. For this project, one water field blank will be submitted, consisting of laboratory reagent water

that has been exposed to all sampling equipment. The water field blank will be analyzed for VOCs, total metals, and any dissolved metals that are also analyzed on any water sample. The dissolved metals field blank water must be passed through the same in-line filter used for the samples. To represent soil field blanks for this phase of the project, five equipment rinsates collected at approximately equal intervals throughout the sampling period will be analyzed for PAHs, Appendix IX VOCs, and RCRA metals.

- Trip blanks are used to assess the potential for contamination of samples due to contaminant migration during sample shipment and storage. For this project, one trip blank will be submitted with each cooler containing either aqueous or soil samples for volatiles analyses, and will be analyzed for VOC only.
- Method or process blank samples are generated within the laboratory and used to assess contamination resulting from laboratory procedures. This QAPP requires that the lab analyze one method or process blank with each analytical batch of 20 samples (or less). This is consistent with the lab SOP and standard practice.
- Field Duplicate samples are analyzed to check for sampling and analytical reproducibility. The filed duplicate should be treated as a separate sample, and a complete set of sample bottles required for the analyses of that sample should be submitted, and recorded on the Chain of Custody (ChOC). One field duplicate will be collected for every ten samples of the same sample type/matrix. At least one soil field duplicate will be collected from each sampled SWMU/AOC.
- MS/MSDs provide information about the effect of the sample matrix on the digestion and measurement methodology. Depending on site specific circumstances, one MS/MSD should be collected for every 20 or fewer investigative samples of a given matrix for all analyses. MS/MSD samples are designated/collected by the sampling personnel. Although they are not logged as a separate sample, the MS/MSD, and the extra sample containers, if required, should be clearly designated on the Chain of Custody.
- Laboratory Control Samples (LCS) are matrix specific known control samples analyzed by the lab, to demonstrate that the analytical system is in control. This QAPP requires that the lab analyze one LCS with each analytical batch of 20 samples (or less) of the same matrix. This is consistent with the lab SOP and standard practice.
- The laboratory is required to provide a "CLP-like" Level 4 data package which will contain all summary data and also all raw data directly from each instrument. The Level 4 package must provide sample prep logs, instrument run logs, and all analytical batch and QC batch identification data, so that all samples can be traced back to the appropriate instrument, calibration, and QC data, and so that the calculations to generate the final result can be reproduced during data validation.

Table 3.1 – Soil QC Sample Limits (Test America, North Canton)

Method: 6010B RCRA Metals										
	Check (LCS)					**Sample Spike**				
Compound	**Spike Amnt**	**Units**	**LCL**	**UCL**	**RPD**	**Spike Amnt**	**Units**	**LCL**	**UCL**	**RPD**
Arsenic	200	mg/kg	80	120	20	200	mg/kg	75	125	20
Lead	50	mg/kg	80	120	20	50	mg/kg	75	125	20
Selenium	200	mg/kg	80	120	20	200	mg/kg	75	125	20
Barium	200	mg/kg	80	120	20	200	mg/kg	75	125	20
Cadmium	5	mg/kg	80	120	20	5	mg/kg	75	125	20
Chromium	20	mg/kg	80	120	20	20	mg/kg	75	125	20
Silver	5	mg/kg	80	120	20	5	mg/kg	75	125	20
Method: 7471A										
	Check (LCS)					**Sample Spike**				
Compound	**Spike Amnt**	**Units**	**LCL**	**UCL**	**RPD**	**Spike Amnt**	**Units**	**LCL**	**UCL**	**RPD**
Mercury	0.8333	mg/kg	73	123	20	0.1667	mg/kg	10	199	50
Method: 8260B/5035A, Appendix 9 List										
	Check (LCS)					**MS/MSD Spike**				
Compound	**Spike Amnt**	**Units**	**LCL**	**UCL**	**RPD**	**Spike Amnt**	**Units**	**LCL**	**UCL**	**RPD**
Acetone	20	ug/kg	58	130	30	50	ug/kg	10	200	66
Acetonitrile			50	130	30			50	130	30
Acrolein			50	130	30			50	130	30
Acrylonitrile			50	130	30			50	130	30
Benzene	20	ug/kg	75	129	20	50	ug/kg	55	138	20
Bromodichloromethane	20	ug/kg	72	125	30	50	ug/kg	47	131	51
Bromoform	20	ug/kg	43	149	30	50	ug/kg	26	141	64
Bromomethane	20	ug/kg	24	152	30	50	ug/kg	15	152	72
2-Butanone (MEK)			0	0	0			0	0	0

Table 3.1 – Soil QC Sample Limits (Test America, North Canton)

Carbon disulfide	20	ug/kg	50	137	30	50	ug/kg	27	149	73
Carbon tetrachloride	20	ug/kg	57	137	30	50	ug/kg	32	143	68
Chlorobenzene	20	ug/kg	75	127	22	50	ug/kg	49	139	22
Chloroprene			0	0	0			0	0	0
Dibromochloromethane	20	ug/kg	49	135	30	50	ug/kg	44	135	61
Chloroethane	20	ug/kg	31	144	30	50	ug/kg	32	140	66
Chloroform	40	ug/kg	73	115	30	50	ug/kg	59	128	46
Chloromethane	20	ug/kg	15	136	30	50	ug/kg	28	130	81
Allyl chloride			0	0	0			0	0	0
1,2-Dibromo-3-chloropropane			50	150	30			50	150	20
1,2-Dibromoethane (EDB)			0	0	0			0	0	0
Dibromomethane			70	130	30			70	130	30
trans-1,4-Dichloro-2-butene			0	0	0			0	0	0
Dichlorodifluoromethane			50	150	20			50	150	20
1,1-Dichloroethane	20	ug/kg	77	119	30	50	ug/kg	56	130	54
1,2-Dichloroethane	20	ug/kg	78	121	30	50	ug/kg	56	126	38
trans-1,2-Dichloroethene	20	ug/kg	68	117	30	50	ug/kg	47	127	58
1,1-Dichloroethene	20	ug/kg	55	142	27	50	ug/kg	43	147	27
1,2-Dichloropropane	20	ug/kg	78	116	30	50	ug/kg	54	125	43
cis-1,3-Dichloropropene	20	ug/kg	71	125	30	50	ug/kg	30	138	49
trans-1,3-Dichloropropene	20	ug/kg	67	125	30	50	ug/kg	34	134	57
1,4-Dioxane			0	0	0			0	0	0
Ethylbenzene	20	ug/kg	79	114	30	50	ug/kg	36	133	72
Ethyl methacrylate			0	0	0			0	0	0
2-Hexanone	20	ug/kg	29	200	41	50	ug/kg	20	190	70
Iodomethane			70	130	30			70	130	30
Isobutyl alcohol			0	0	0			0	0	0
Methacrylonitrile			0	0	0			0	0	0
Methylene chloride	20	ug/kg	58	130	30	50	ug/kg	45	129	49
Methyl methacrylate			0	0	0			0	0	0
4-Methyl-2-pentanone (MIBK)			0	0	0			0	0	0
Propionitrile			0	0	0			0	0	0

Table 3.1 – Soil QC Sample Limits (Test America, North Canton)

Styrene	20	ug/kg	80	114	30	50	ug/kg	23	136	65
1,1,1,2-Tetrachloroethane			70	130	30			70	130	30
1,1,2,2-Tetrachloroethane	20	ug/kg	70	133	30	50	ug/kg	33	162	90
Tetrachloroethene	20	ug/kg	72	120	30	50	ug/kg	31	137	81
Toluene	20	ug/kg	71	130	24	50	ug/kg	46	147	24
1,1,1-Trichloroethane	20	ug/kg	67	123	30	50	ug/kg	48	132	57
1,1,2-Trichloroethane	20	ug/kg	82	116	30	50	ug/kg	58	128	52
Trichloroethene	20	ug/kg	70	131	23	50	ug/kg	46	143	23
Trichlorofluoromethane			50	150	20			50	150	20
1,2,3-Trichloropropane			70	130	30			70	130	30
Vinyl acetate			0	0	0			0	0	0
Vinyl chloride	20	ug/kg	24	152	30	50	ug/kg	30	136	80
Xylenes (total)	60	ug/kg	80	114	30	150	ug/kg	33	135	78
4-Bromofluorobenzene	50	ug/kg	47	158	0	50	ug/kg	47	158	0
1,2-Dichloroethane-d4	50	ug/kg	61	130	0	50	ug/kg	61	130	0
Toluene-d8	50	ug/kg	60	143	0	50	ug/kg	60	143	0
Dibromofluoromethane	50	ug/kg	59	138	0	50	ug/kg	59	138	0
Method: 8270C – PAH Compounds										
	Check (LCS)					**MS/MSD Spike**				
Compound	**Spike Amnt**	**Units**	**LCL**	**UCL**	**RPD**	**Spike Amnt**	**Units**	**LCL**	**UCL**	**RPD**
Acenaphthene	1700	ug/kg	46	110	30	1700	ug/kg	10	200	30
Acenaphthylene	1700	ug/kg	47	110	30	1700	ug/kg	10	200	30
Anthracene	1700	ug/kg	56	111	30	1700	ug/kg	10	200	30
Benzo(a)anthracene	1700	ug/kg	58	111	30	1700	ug/kg	10	200	30
Benzo(b)fluoranthene	1700	ug/kg	43	124	30	1700	ug/kg	10	200	30
Benzo(k)fluoranthene	1700	ug/kg	38	122	30	1700	ug/kg	10	200	30
Benzo(ghi)perylene	1700	ug/kg	44	120	30	1700	ug/kg	10	200	30
Benzo(a)pyrene	1700	ug/kg	44	115	30	1700	ug/kg	10	200	30
Chryene			0	0	0			0	0	0
Dibenz(a,h)anthracene	1700	ug/kg	45	122	30	1700	ug/kg	10	200	30
Fluoranthene	1700	ug/kg	55	118	30	1700	ug/kg	10	200	30

Table 3.1 – Soil QC Sample Limits (Test America, North Canton)

Fluorene	1700	ug/kg	51	110	30	1700	ug/kg	10	187	30
Indeno(1,2,3-cd)pyrene	1700	ug/kg	45	121	30	1700	ug/kg	10	200	30
2-Methylnaphthalene	1700	ug/kg	46	110	30	1700	ug/kg	10	200	30
Naphthalene	1700	ug/kg	42	110	30	1700	ug/kg	10	200	30
Phenanthrene	1700	ug/kg	54	110	30	1700	ug/kg	10	200	30
Pyrene	1700	ug/kg	58	113	30	1700	ug/kg	10	200	30
Method: 8082 - PCBs										
	Check					**Spike**				
Compound	**Spike Amnt**	**Units**	**LCL**	**UCL**	**RPD**	**Spike Amnt**	**Units**	**LCL**	**UCL**	**RPD**
Aroclor 1016	333	ug/kg	41	130	30	333	ug/kg	10	200	30
Aroclor 1221			0	0	0			0	0	0
Aroclor 1232			0	0	0			0	0	0
Aroclor 1242			0	0	0			0	0	0
Aroclor 1248			0	0	0			0	0	0
Aroclor 1254			0	0	0			0	0	0
Aroclor 1260	333	ug/kg	42	130	30	333	ug/kg	10	200	30
Decachlorobiphenyl	6.67	ug/kg	40	138	0	6.67	ug/kg	40	138	0
Tetrachloro-m-xylene	6.67	ug/kg	10	127	0	6.67	ug/kg	10	127	0

Table 3.2 – Water QC Sample Limits (Test America, North Canton)

Target Analyte List:										
Matrix: Water										
Method: 6020 Total and Dissolved Lead										
	Check (LCS)					**Sample Spike**				
Compound	**Spike Amnt**	**Units**	**LCL**	**UCL**	**RPD**	**Spike Amnt**	**Units**	**LCL**	**UCL**	**RPD**
Lead, Total	100	ug/L	69	110	20	100	ug/L	70	130	20
Lead, Filtered	100	ug/L	69	110	20	100	ug/L	70	130	20
Method: 8260B Appendix 9 List										
	Check					**MS/MSD Spike**				
Compound	**Spike Amnt**	**Units**	**LCL**	**UCL**	**RPD**	**Spike Amnt**	**Units**	**LCL**	**UCL**	**RPD**
Acetone	20	ug/L	22	200	95	10	ug/L	45	128	30
Acetonitrile			50	130	30			50	130	30
Acrolein			50	130	30			50	130	30
Acrylonitrile			50	130	30			50	130	30
Benzene	20	ug/L	80	116	20	10	ug/L	78	118	20
Bromodichloromethane	20	ug/L	87	130	30	10	ug/L	80	146	30
Bromoform	20	ug/L	76	150	30	10	ug/L	58	176	30
Bromomethane	20	ug/L	64	129	30	10	ug/L	55	145	30
2-Butanone (MEK)			0	0	0			0	0	0
Carbon disulfide	20	ug/L	73	139	30	10	ug/L	69	138	41
Carbon tetrachloride	20	ug/L	75	149	30	10	ug/L	63	176	30
Chlorobenzene	20	ug/L	76	117	20	10	ug/L	76	117	20
Chloroprene			0	0	0			0	0	0
Dibromochloromethane	20	ug/L	81	138	30	10	ug/L	71	158	30
Chloroethane	20	ug/L	66	126	30	10	ug/L	59	142	30
Chloroform	20	ug/L	84	128	30	10	ug/L	83	141	30
Chloromethane	20	ug/L	48	123	30	10	ug/L	40	137	39
Allyl chloride			0	0	0			0	0	0

Table 3.2 – Water QC Sample Limits (Test America, North Canton)

Target Analyte List:										
Matrix: Water										
1,2-Dibromo-3-chloropropane			70	130	30			70	130	30
1,2-Dibromoethane (EDB)			0	0	0			0	0	0
Dibromomethane			70	130	30			70	130	30
trans-1,4-Dichloro-2-butene			0	0	0			0	0	0
Dichlorodifluoromethane			70	130	30			70	130	30
1,1-Dichloroethane	20	ug/L	86	123	30	10	ug/L	88	127	30
1,2-Dichloroethane	20	ug/L	79	136	30	10	ug/L	71	160	30
trans-1,2-Dichloroethene	20	ug/L	80	120	30	10	ug/L	85	116	30
1,1-Dichloroethene	20	ug/L	63	130	20	10	ug/L	62	130	20
1,2-Dichloropropane	20	ug/L	82	115	30	10	ug/L	87	114	30
cis-1,3-Dichloropropene	20	ug/L	84	130	30	10	ug/L	82	130	30
trans-1,3-Dichloropropene	20	ug/L	84	130	30	10	ug/L	73	147	30
1,4-Dioxane			0	0	0			0	0	0
Ethylbenzene	20	ug/L	86	116	30	10	ug/L	86	132	30
Ethyl methacrylate			0	0	0			0	0	0
2-Hexanone	20	ug/L	35	200	52	10	ug/L	81	128	30
Iodomethane			70	130	30			70	130	30
Isobutyl alcohol			0	0	0			0	0	0
Methacrylonitrile			0	0	0			0	0	0
Methylene chloride	20	ug/L	78	118	30	10	ug/L	82	115	30
Methyl methacrylate			0	0	0			0	0	0
4-Methyl-2-pentanone (MIBK)			0	0	0			0	0	0
Propionitrile			0	0	0			0	0	0
Styrene	20	ug/L	85	117	30	10	ug/L	83	120	30
1,1,1,2-Tetrachloroethane			70	130	30			70	130	30
1,1,2,2-Tetrachloroethane	20	ug/L	85	118	30	10	ug/L	88	116	30
Tetrachloroethene	20	ug/L	88	113	30	10	ug/L	85	121	30
Toluene	20	ug/L	74	119	20	10	ug/L	70	119	20
1,1,1-Trichloroethane	20	ug/L	78	140	30	10	ug/L	71	162	30
1,1,2-Trichloroethane	20	ug/L	83	122	30	10	ug/L	86	129	30

Table 3.2 – Water QC Sample Limits (Test America, North Canton)

Target Analyte List:										
Matrix: Water										
Trichloroethene	20	ug/L	75	122	20	10	ug/L	62	130	20
Trichlorofluoromethane			70	130	30			70	130	30
1,2,3-Trichloropropane			70	130	30			70	130	30
Vinyl acetate			70	130	30			70	130	30
Vinyl chloride	20	ug/L	61	120	30	10	ug/L	88	126	30
Xylenes (total)	60	ug/L	87	116	30	30	ug/L	89	121	30
4-Bromofluorobenzene	10	ug/L	74	116	0	10	ug/L	74	116	0
1,2-Dichloroethane-d4	10	ug/L	61	128	0	10	ug/L	61	128	0
Toluene-d8	10	ug/L	76	110	0	10	ug/L	76	110	0
Dibromofluoromethane	10	ug/L	73	122	0	10	ug/L	73	122	0

SAMPLING PROCEDURES

4.0 Sampling Procedures

4.1 Sampling Procedures for Field Activities

The FSP was developed in general accordance with the RCRA Facility Investigation (RFI) Guidance, Volumes I through IV, published by the Waste Management Division, Office of Solid Waste, U.S.EPA, dated May 1989. The FSP was developed to identify standard operating procedures and sample collection methodologies for the intended sample media to fulfill data collection objectives identified in this QAPP.

A formal Field Investigation Plan has not been developed, as this project is a short term sampling effort that is limited in scope. This is consistent with the Administrative Order, which does not require a formal Field Investigation Plan, and states that the level of detail required can be adjusted to match the project complexity.

4.1.1 Soil Sample Collection

Soil borings will be installed using direct push technologies having a two-inch diameter drill casing and one-inch diameter drive rods. Soil samples will be collected continuously from ground surface to terminating depth using a dual-tube sampling system and disposable acetate liners. During soil boring installation, the acetate liner will be attached to the drive rods and secured within the lead drill casing. The acetate liner and lead drill casing will be advanced into undisturbed soil using a hydraulic hammer.

Once the desire depth interval is complete, the acetate liner will be extracted, opened, and soils inspected for soil characteristics and classification. Soil samples collected for analyses will be split with one-half of the interval transferred to the appropriate sample container and the other half placed in a plastic freezer bag for headspace analysis for VOCs. The plastic bag will be labeled according to content and allowed to site for period of 15 minutes. Headspace readings will be obtained using a PID and recorded in the project field book. Additional headspace readings may also be obtained from other depth intervals where visual observations indicate possible impacts are present.

Soil samples collected for VOC analysis will be collected using TerraCore sample collection and field preservation kits. The TerraCore sampler is a single use device designed to collect soil samples from soil cores and transfer them to the appropriate containers for in-field preservation. Three 5-gram samples collected with the TerraCore device will be transferred to one of two pre-weighed vials containing bisulfate preservative for low level analysis and one pre-weighed vial containing methanol for high level analysis, if necessary.

4.1.2 Monitoring Well Installation and Development

Upon reaching the terminating depth (to be determined by field observation and onsite geologist), the soil boring will be converted to 2.0-inch monitoring well. The monitoring well will be constructed as follows according to the *RCRA Groundwater Monitoring: Technical Guidance Document:*

- A minimum of 0.5 feet of filter sand will be placed in bottom of borehole for footing of the well casing.
- The screened interval will be placed in the well first. The length of well screen will be long enough to effectively monitor the desired depth interval and will be, at a minimum, 5 feet in length.
- Sufficient well casing will be added to the screened interval to bring the monitoring well to ground surface.
- Filter material will be placed around the well screen up to approximately two feet above the top of screened interval. The filter material will be added either by tremie pipe or poured. During installation, the augers will be slowly retracted to prevent potential bridging problems with the filter material.
- A bentonite pellet seal will be placed over the filter pack to minimum thickness of two feet above the top of filter pack or desired depth. The seal will be hydrated with potable water and allowed to set eight hours or the manufacturer's recommended hydration time, whichever is longer.
- The annular space above the bentonite seal will backfilled from bottom to top using a tremie pipe with cement grout/bentonite slurry to within two feet of ground surface via tremie pipe. The cement grout/bentonite slurry will be allowed to set for 24 hours prior to well completion.
- The surface will be completed with a two-foot by two-foot wide by four-inch thick concrete pad with a secure well vault. The concrete pad will be sloped away from the well vault to avoid water accumulation within the well vault. A locking well cap will be used to seal the well casing.
- The well may also be completed as a stick-up well in which a metal riser encasing the well casing will be extended to two to three feet above ground surface. The metal casing will be locked and four metal protective bumper posts (bollards) will be installed at each corner of the concrete well pad. The base of the bollards will be set at a depth of 2 ft bgs and anchored with concrete. Upon completion, the bollards and metal well casing will be painted with yellow hazard paint.

Each monitoring well will be developed to create an effective filter pack around the well screen using a submersible pump (Whaler, Monsoon, or similar) and proper surging techniques. During development, the submersible pump will be raised and lowered throughout the screened interval to ensure that all sediments and fines have been removed to the extent possible. Development

will be considered complete when the desired turbidity level is reach and field parameters (pH, specific conductance, temperature, and dissolved oxygen) have stabilized.

4.1.3 Groundwater Sample Collection

Groundwater samples will be collected using a stainless steel bladder pump equipped with a disposable polyethylene bladder and disposable polyethylene tubing. Prior to sample collection, static groundwater elevations will be recorded at each onsite monitoring wells for potentiometric purposes using an electronic water level indicator.

Groundwater samples will be collected using low-flow (minimum drawdown) sample collection techniques. The bladder pump will be positioned in the middle of the screened interval. Purge rates will be set between 100 and 500 mL/min to minimize drawdown. The water level elevation will be monitored during purging to ensure water table drawdown does not exceed 0.5 ft. Water quality parameters will be monitored during purging using a water quality meter equipped with a flow-through cell. Groundwater samples will be collected once water quality parameters have stabilized (± 0.1 pH, ± 3% for conductivity, ± mV for redox potential, and ± 10% for turbidity and dissolved oxygen).

Upon stabilization, the monitoring well discharge line will be disconnected from the flow-though cell and groundwater samples will be transferred to the appropriate laboratory provided sample container.

4.2 Sample Preservation, Holding Times, Number of Containers

All sample containers will be provided pre-cleaned by the laboratory, each containing the appropriate preservative, if necessary. In addition to chemical preservative, all samples must be shipped in coolers under ice (4 deg. C). All information regarding analytical methods, the corresponding laboratory SOP number, sample preservation, holding times, and number of containers to collect are summarized in Table 4.1. More detailed information on these topics is presented below.

4.2.1 Water Sample Preservation

Water samples will be preserved as follows:

- VOC analyses will be collected in three VOA vials without headspace, preserved with HCl, and shipped cooled under ice to 4.0 +/-2.0 deg. C.
- Samples for Total Metals will be collected in 500 ml. plastic bottles preserved with HNO3 to pH <2.0.
- Samples for dissolved metals will be pumped through an in-line 0.8 um filter (not supplied by the lab) and the filtrate will be collected in a 500 ml. plastic bottle and preserved with HNO3.

4.2.2 Soil Sample Preservation

All soil samples will be collected in the appropriate containers, and placed in coolers with ice, as per Table 4.1. For the VOC analysis, all soil samples must be collected and preserved in conformance with Method 5035. This will require three Terracore samples be collected, sealed, and then deposited into each of three special tared vials containing preservative. Terracore sample kits will be provided by the laboratory. Each kit consists of one pre-sized soil boring device, two tared vials containing bisulfate preservative for low level analysis, and one tared vial containing methanol for high level analysis, if necessary.

4.3 Additional Containers Required for MS/MSD and Field Duplicates

All field duplicates should be treated as a separate sample, and should be shipped to the lab in all the containers required for the analysis separate from the parent sample.

For MS/MSD samples, some analyses require additional sample containers, others do not. Consult Table 4.1 for a list of additional containers required for MS/MSD samples.

4.4 Sample Identification

All samples will be given a unique sample identification number in the field. The sample ID for all samples will begin with CD. The sample ID will also consist of a boring number (i.e., SB-1 for soil boring number 1), and a depth code (i.e., (0-1) for a sample collected from the 0 to 1 ft sample interval). A completed sample code for a sample collected from soil boring number 1 from the 0 to 1 ft depth would be CD-SB-1-(0-1).

New monitoring wells installed adjacent to existing monitoring wells will be identified by the adjacent monitoring well and designated with an "S" indicating shallow. For example, a shallow monitoring well installed adjacent to MW-1 would be identified as MW-1S. If a monitoring well is installed in area not adjacent to an existing well, it will be identified in chronological order starting from the last numbered monitoring well at the Site. For example, if MW-5 is the last numbered monitoring well at the site, the new monitoring well would be MW-6. Groundwater samples will be labeled according to the monitoring well identification where the sample was collected.

Table 4.1 – Analytical Methods, Lab SOPs, Sample Containers, Preservations, and Holding Times

Analytical Procedures	SW846 Method Number	Laboratory SOP Number	Sample Containers (See Note 1)	Additional Containers Required for MS/MSD Samples	Preservative	Holding Times
Total Lead in Groundwater	6020		1 250 ml. PPE	1 250 ml PPE	HNO3, Ice	6 months
Dissolved Lead in Groundwater	6020		1 250 ml. PPE, sample filtered with in-line filter	1 additional 250 ml. PPE, sample filtered with in-line filter	HNO3, Ice	6 months
VOC Analysis in Groundwater	5030/8260B	CORP-MS-0002NC	3 VOA vials, no headspace	3 additional VOA vials, no headspace	HCl, Ice	14 days
Metals Analysis in Soil Samples	3050/6010	CORP-IP-0002NC/CORP-MT-0001NC	1 full 8 oz. Container, Glass	no additional	Ice	6 months
Mercury in Soil Samples	7471A	CORP-MT-0007NC	1 full 8 oz. Container, Glass	no additional	Ice	28 days
VOC Analysis in Soil Samples	5035/8260B	CORP-MS-0002NC	3 Encore or Equiv. Containers (see note 2)	6 additional Encore or Equiv. Containers	Terracore Kit, Ice	48 hrs. until lab preservation, then up to 14 days
PAH Analysis in Soil Samples	8270C	CORP-MS-0001NC	1 full 8 oz. Container, Glass, not needed if 8 oz. metals container already collected	no additional	Ice	Extraction--14 days, Analysis 40 days
PCB Analysis in Soil Samples	8082	CORP-GC-0001NC	1 full 8 oz. Container, Glass, not needed if 8 oz. metals container already collected	no additional	Ice	Extraction--14 days, Analysis 40 days

Note 1: Field Duplicates will be submitted as separate samples, with their own containers.

Note 2: Soil VOCs for Area 7 require an additional 2 oz. container for percent solids, since VOCs are the only analysis for that area, and no other containers will be submitted.

CUSTODY PROCEDURES

5.0 Custody Procedures

Proper sample custody is one of several factors which are necessary for the admissibility of environmental data as evidence in a court of law. Custody procedures help to satisfy the two major requirements for admissibility: relevance and authenticity. Sample custody is addressed in three parts: field sample collection, laboratory analysis, and final evidence files. Final evidence files, including originals of all laboratory reports and purge files, are maintained under document control in a secure area. A sample or evidence file is under your custody if:

- The item is in actual possession of a person.
- The item is in the view of the person after being in actual possession of the person.
- The item was in actual physical possession but is locked up to prevent tampering.
- The item is in a designated and identified secure area.

5.1 Field Custody Procedures

Field logbooks will provide the means of recording data collecting activities performed during the investigation. As such, entries will be described in as much detail as possible so that persons going to the facility could reconstruct a particular situation without reliance on memory. Field log books will be bound field survey books or notebooks. Logbooks will be assigned to field personnel, but will be stored in the document control center when not in use. Each logbook will be identified by the project-specific document number. The title page of each logbook will contain the following:

- Person to whom the logbook is assigned.
- Logbook number.
- Project name.
- Project start date.
- End date.

Entries into the logbook will contain a variety of information. At the beginning of each entry, the date, start time, weather, names of all sampling team members present, level of personal protection equipment being used, and the signature of the person making the entry will be entered.

The names of visitors to the site, field sampling or investigation team personnel and the purpose of their visit will also be recorded in the field logbook.

Measurements made and samples collected will be recorded. All entries will be made in permanent ink, signed, and dated and no erasures will be made. If an incorrect entry is made, the

information will be crossed out with a single strike mark which is signed and dated by the sampler.

Whenever a sample is collected, or a measurement is made, a detailed description of the location of the station, which includes compass and distance measurements, or, latitude and longitude information (e.g., obtained by using a global positioning system) shall be recorded. The number of the photographs taken of the station, if any, will also be noted. All equipment used to make measurements will be identified, along with the date of calibration.

Samples will be collected following the sampling procedures documented in Section 4.0 of this QAPP. The equipment used to collect samples will be noted, along with the time of sampling, sample description, depth at which the sample was collected, volume and number of containers. Sample identification numbers will be assigned prior to sample collection. Field duplicate samples, which will receive an entirely separate sample identification number, will be noted under sample description.

The sample packaging and shipment procedures summarized below will ensure that the samples will arrive at the laboratory with the chain-of-custody intact. The protocol for specific sample numbering and other sample designations are included in Section 4.4 of this QAPP. **Examples of field custody documents and instructions for completion are presented in the Laboratory QA Manual, incorporated into this QAPP as an Electronic Appendix.**

- The field sampler is personally responsible for the care and custody of the samples until they are transferred or properly dispatched. Field procedures have been designed such that as few people as possible will handle the samples. Sample tags or labels MUST be used for all samples for which chain-of-custody is to be maintained.
- All bottles will be identified by the use of sample tags or waterproof sample labels with the field sample ID number, the sampling location, sample depth (for soils), date/time of collection, type of analysis, the sample collection person's initials, and preservative (if applicable). The sample numbering system is presented in Section 4.4 of this QAPP.
- Sample tags/labels will be completed for each sample using waterproof ink unless prohibited by weather conditions. For example, a logbook notation would explain that a pencil was used to fill out the sample tag because the ballpoint pen would not function in freezing weather.
- Samples will be accompanied by a properly completed chain-of-custody form, which will be provided by the laboratory. The sample numbers and locations will be listed on the chain-of-custody form. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents transfer of custody of samples from the sampler to another person, to a mobile laboratory, to the permanent laboratory, or to/from a secure storage area.
- Samples will be properly packaged on ice at 4 deg. C for shipment and dispatched to the appropriate laboratory for analysis, with a separate signed custody record enclosed in and secured to the inside top of each sample box or cooler. Shipping containers will be locked

and secured with strapping tape and custody seals for shipment to the laboratory. The custody seals will be attached to the front right and back left of the cooler and covered with clear plastic tape after being signed by the field team leader. The cooler will be strapped shut with strapping tape in at least two locations.

Whenever split samples are collocated with a government agency, a separate sample receipt will be prepared for those samples and marked to indicate with whom the samples are being collocated. The person relinquishing the samples to the facility or agency should request the following:

- The representative's signature acknowledging sample receipt. If the representative is unavailable or refuses to sign, this is noted in the "Received By" space.
- All shipments will be accompanied by the chain-of-custody record identifying the contents. The original record will accompany the shipment, and the pink and yellow copies will be retained by the sampler for returning to the sampling office.
- If the samples are sent by common carrier, a bill of lading will be used. Receipts of bills of lading will be retained as part of the permanent documentation. If sent by mail, the package will be registered with return receipt requested. Commercial carriers are not required to sign off on the custody form since the custody forms will be sealed inside the sample cooler and the custody seals will remain intact.
- Samples will be transported to the laboratory the same day the samples are collected in the field by overnight carrier.

5.2 Laboratory Custody Procedures

Laboratory custody procedures for sample receiving and log-in; sample storage and numbering; tracking during sample preparation and analysis; and storage of data are described in Section 8.5.3 of the Laboratory QA Manual, provided as an Electronic Appendix to this QAPP. Figure 8.5-1 of that document is an example of the laboratory chain-of-custody form.

5.3 Final Evidence Files

The final evidence file will be the central repository for all documents which constitute evidence relevant to sampling and analysis activities as described in this QAPP. URS is the custodian of the evidence files and maintains the contents of evidence files for the investigation, including all relevant records, reports, logs, field notebooks, pictures, subcontractor reports and data reviews in a secured, limited access area and under custody of the URS Facility Manager.

The final evidence file will include at a minimum:

- Field logbooks and field data sheets.
- Field data and data deliverables.
- Photographs.
- Drawings.

- Soil boring logs.
- Laboratory data deliverables.
- Data validation reports.
- Data assessment reports.
- Progress reports, QA reports, interim project reports, etc.
- All custody documentation (tags, forms, air bills, etc.)

CALIBRATION PROCEDURES AND FREQUENCY

6.0 Calibration Procedures and Frequency

This section describes the calibration procedures and the frequency at which these procedures will be performed for both field and laboratory instruments.

6.1 Field Instrument Calibration

For this phase of the project, the planned field measurements will not be critical to the evaluation of the site, and no target pollutants are being measured in the field. If instruments are used for non-target measurements, calibration will be conducted according to the manufacturer's suggested protocol.

6.2 Laboratory Instrument Calibration

Laboratory calibration procedures are described in general in Section 8.5.4 of the Laboratory QA Plan (See Electronic Appendix). Each laboratory Analytical SOP also has a method specific section on calibration procedures, along with charts and ranges, where applicable (See Electronic Appendix).

The laboratory maintains records for each instrument which will contain the following information: instrument identification, serial number, date of calibration, analyst, calibration solutions run and the samples associated with these calibrations. The "Level 4" data package will contain sufficient information to trace each analysis back to the appropriate instrument and calibration curve used to generate the analytical results for that sample.

ANALYTICAL PROCEDURES

7.0 Analytical Procedures

All samples (groundwater and soil) collected during field sampling activities for the C&D RFI will be analyzed by the Test America North Canton Laboratory (formerly STL). The address and phone number are:

Test America North Canton
4101 Shuffel Drive, NW
North Canton, Ohio 44720
(330) 497-9396

7.1 Field Analytical Procedures

No field measurements of the target pollutants will be measured in the field during this phase of the RFI. Field staff may monitor groundwater quality for pH, temperature, turbidity, and conductivity during groundwater sample collection activities.

7.2 Laboratory Analytical Procedures

The laboratory named above will implement the project required SOPs. These laboratory SOPs for sample preparation, cleanup and analysis are based on SW-846 Update III. Appropriate analyte groups of interest, SW 846 Method numbers, and the corresponding laboratory SOP number are all summarized in Table 4.1. These SOPs provide sufficient details and are suitable for this investigation. The Laboratory SOPs to be used in this investigation are included an Electronic Appendix to this QAPP.

7.2.1 List of Project Target Compounds and Laboratory Detection Limits

A complete listing of project target compounds, project quantitation limits, and current laboratory determined detection limits for each analyte group listed in Table 4.1 can be found in Tables 1-2 and 1-3 of this QAPP. Laboratory Reporting Limits are in compliance with method procedures, and Method detection limits (MDLs) shown have been experimentally determined using the method found in 40 CFR Part 136, Appendix B.

7.2.2 List of Associated Quality Control Samples

The laboratory SOPs listed in Table 4.1 above include a QC section which addresses the minimum QC requirements for the analysis of specific analyte groups. Previous investigations have detected PAH compounds, naphthalene and methyl-naphthalene in the SVOC analyses, and common chlorinated solvents, and common aromatic solvents in the VOC analyses of soil samples, and common chlorinated solvents and aromatic solvents in the VOC analysis of the groundwater. It is anticipated that most metals will be detected in the soil samples. Based on these detections, the laboratory will spike all of compounds listed under the LCS and MSDS columns in Tables 3.1 and 3.2 of this QAPP.

INTERNAL QUALITY CONTROL CHECKS

8.0 Internal Quality Control Checks

8.1 Field Quality Control Checks

As stated previously, the field analytical determinations are not going to be used to determine the presence/absence or the extent of any COI, and will not be used in assessing risk from contamination at the site. Therefore, no formal field analytical audits are planned. However, a checklist of field activity questions will be provided, and the field leader will go over this checklist with all field personnel prior to commencing sampling activities.

8.2 Laboratory Quality Control Checks

The laboratory identified in Section 7 of this QAPP has a QC program in place to ensure the reliability and validity of the analysis performed at the laboratory. All analytical procedures are documented in writing as SOPs and each SOP includes a QC section which addresses the minimum QC requirements for the procedure. In addition, specific analytical QC samples and control limits are summarized in Tables 3.2 and 3.3. The internal QC checks differ slightly for each individual procedure but in general the QC requirements include the following:

- Method blanks
- Reagent/preparation blanks (applicable to inorganic analysis)
- Instrument blanks
- MS/MSDs
- Surrogate spikes
- Analytical spikes (Graphite furnace)
- Laboratory duplicates
- Laboratory control standards
- Internal standard areas for GC/MS analysis
- Mass tuning for GC/MS analysis
- Endrin/DDT degradation checks for GC/EC analysis
- Second, dissimilar column confirmation for GC/EC analysis (Note: not required if distinct Aroclor pattern is observed on primary column, since only PCBs are analyzed)

All data obtained will be properly recorded. The data package will include a full Level IV deliverable package capable of allowing the recipient to reconstruct QC information and compare it to QC criteria. Any samples analyzed in nonconformance with the QC criteria will be reanalyzed by the laboratory if such action is required by the method and/or SOP, if sufficient

volume is available. It is expected that sufficient volumes/weights of samples will be collected to allow for reanalysis when necessary.

DATA REDUCTION, VALIDATION AND REPORTING

9.0 Data Reduction, Validation and Reporting

All data generated through field activities, or by the laboratory operation shall be reduced and validated prior to reporting. No data shall be disseminated by the laboratory until it has been subjected to these procedures which are summarized in subsections below.

9.1 Data Reduction

9.1.1 Field Data Reduction Procedures

All field data will be written into field log books immediately after measurements are taken. If errors are made, results will be legibly crossed out, initialed and dated by the field member, and corrected in a space adjacent to the original (erroneous) entry. Later, when the results calculation forms required for this study are being filled out, the Field Manager, identified in Section 2 of this QAPP, will review the forms to determine whether any errors have been made by the field crew.

Note: for this phase of the project, no data critical to the project objectives will be measured in the field.

9.1.2 Laboratory Data Reduction Procedures

The details of the laboratory data reduction are presented in **Section 8.8 of the Laboratory QA Manual.**

Laboratory data reduction procedures will be performed according to the following protocol. All raw analytical data will be recorded in numerically identified laboratory notebooks. These notebooks will be issued only by the Laboratory QA Manager. Data are recorded in this notebook along with other pertinent information, such as the sample identification number and the sample tag number. Other details will also be recorded in the lab notebook, such as the analytical method used (SOP#), name of analyst, the date of analysis, matrix sampled, reagent concentrations, instrument settings, and the raw data. Each page of the notebook shall be signed and dated by the analyst. Copies of any strip chart printouts (such as gas chromatograms) will be maintained on file. Periodic review of these notebooks by the Lab QA Manager takes place prior to final data reporting. (Records of notebook entry inspections are maintained by the Lab QA Manager.)

For this project, the equations that will be employed in reducing data are presented in **the associated SOPs identified in Table 4.1 of this QAPP.** The formulae included in the SOPs make pertinent allowances for matrix type. All calculations are checked by the Laboratory QA Manager at the conclusion of each operating day. Errors are noted, corrections are made, but the original notations are crossed out legibly. Analytical results for soil samples shall be calculated and reported on a dry weight basis.

QC data (e.g. laboratory duplicates, surrogates, MS/MSDs) will be compared to the method acceptance criteria. Data considered to be acceptable will be entered into the laboratory computer system. Data summaries will be sent to the Laboratory QA Manager for review. If approved, data are logged into the project database format. Unacceptable data shall be appropriately qualified in the project report. Case narratives will be prepared which will include information concerning data that fell outside acceptance limits, and any other anomalous conditions encountered during sample analysis. After the Laboratory QA Manager approves these data, they are considered ready for third party data validation.

9.2 Data Validation

Data validation procedures shall be performed for both field and laboratory operations as described below.

9.2.1 Procedures Used to Validate Field Data

The field data for this phase of the project is not critical to the project objectives, so full validation is not warranted. The procedures to evaluate field data for this investigation include checking for transcription errors and review of field log books, on the part of field crew members. This task will be the responsibility of the Field Manager, who will otherwise not participate in making any of the field measurements, or in adding notes, data or other information to the log book.

9.2.2 Procedures Used to Validate Laboratory Data

The CLP National Functional Guidelines directly apply only to analyses performed according to the CLP SOWs. For all other analyses, project-specific data validation protocols should be developed based on project-specific QC objectives presented in Element 5 and using the Functional Guidelines as a framework when appropriate. See Instructions Section 11-2.2.

Procedures to validate laboratory data will be derived from the U.S. EPA's *Contract Laboratory Program, National Functional Guidelines For Organic Data Review*, and *Contract Laboratory Program, National Functional Guidelines for Inorganic Data Review* (collectively referred to as NFG in the following). However, since SW 846 Methods will be used, the functional guidelines will be adjusted in the following ways:

- Project specific quantitation, reporting limit, and detection limit parameters outlined in this QAPP will be used in place of the CLP "Contract Required Detection Limits".
- The laboratory may use calibration standard concentrations, check standards, surrogate concentrations, etc. appropriate for the data quality objectives outlined in this QAPP, rather than those specified in the CLP SOW.
- QC limits for surrogates, spikes, MS/MSD, duplicates, and others will be in accordance with those outlined in this QAPP, and not those specified in the CLP SOW.

- Other specific QA/QC requirements not discussed here that are only applicable to CLP will not apply.
- However, conceptually, for all QC applicable to both SW 846 and the CLP, validation qualifiers will be assigned accordingly. Example: affected SVOC results (Method 8270C) from undiluted samples where two or more surrogates have less than 10% recovery (on reanalysis) will be rejected (R qualified) as specified in the NFG, regardless of the laboratory surrogate control limits used for this project. Recoveries of two surrogates with low recovery outside the control limits due to matrix interference, but greater than 10% recovery, would be qualified J (estimated) or UJ (not detected, detection limit estimated).

Essentially, all technical holding times shall be reviewed, instrument performance check sample results shall be evaluated, results of initial and continuing calibration will be reviewed and evaluated by trained reviewers independent of the laboratory.
Also, results of all blanks, surrogate spikes, MS/MSDs, laboratory control samples, and target compound identification and quantitation will be reviewed/evaluated by the Data Validator. Calculation checks and dilutions will be checked on selected data points for each method and matrix. One hundred percent of the analytical data shall be validated. The data will be assessed based on the following project specific validation qualifier definitions:

U - The analyte should be considered not detected at the reported value for the reasons explained in the data validation report. This is distinct from the laboratory U or BQL qualifiers, which mean that the analyte was simply not detected.

J - For the GCMS data the identification of the analyte is acceptable, but quality assurance criteria indicate that the quantitative values may be outside the normal expected range of precision or accuracy, i.e., the quantitative value is considered estimated. These reasons will be explained in the data validation report. For non-GCMS data, both the presence and quantitation of the compound is uncertain.

N - There is presumptive evidence that the analyte is present, but it has not been confirmed. The analyte is "tentatively identified". There is an indication that the reported analyte is present, however, all quality control requirements necessary for confirmation were not met. Most often used for pesticides.

R - Data is considered to be rejected and shall not be used. This flag denotes the failure of quality control criteria such that it cannot be determined if the analyte is present or absent from the sample. Resampling and analysis are necessary to confirm or deny the presence of the analyte. Results qualified "R" by the validator will be considered as "incomplete" when determining completeness.

C - This flag is most often used in conjunction with pesticides/PCB data. The analyte is determined to be present and the presence has been confirmed by GC/MS.

UJ - This is a combination of the U and J flags. The analyte is not considered to be present. The reported value is considered to be an estimated limit of detection.

JN - A combination of the J and N flags. The analyte is tentatively identified and the value preceding the JN is estimated.

DUP- This flag will mean that a field duplicate did not meet the precision criteria for this project. Laboratory precision may or may not have been adequate.

Additionally, a method detection limit study will be performed, if required by the U.S. EPA, per the provisions of Federal Register, Vol. 49, no. 209, October 26, 1984, pp.198-199. The results shall also be validated. Alternatively, the laboratory, if required by EPA, can submit the results of their most recent MDL Study with the data package, provided the test was performed within the past year.

The overall completeness of the data package will also be evaluated by the Data Validator. Completeness checks will be administered on all data to determine whether deliverables specified in the QAPP are present. At a minimum, deliverables will include sample chain-of custody forms, analytical results, QC summaries, and supporting raw data from instrument printouts. The reviewer will determine whether all required items are present and request copies of missing deliverables.

9.3 Data Reporting

At least one complete hard copy of each analytical data package must be obtained by the facility from the laboratory. This data package must be sufficiently detailed to allow for full validation of the data. This has commonly been termed "Level IV Deliverables" as described below, and it shall include all QC summary forms also raw data as required by the CLP deliverables. The laboratory shall also provide a CD pdf style version all of the above data package(s). In addition, the laboratory shall provide, in spreadsheet (Excel) format, summaries of all analytical results, including:

- Laboratory Sample Group Number
- Laboratory Sample ID
- URS Field Sample ID
- Date Sampled
- Time Sampled
- Sample Matrix
- Date Received
- Time Received
- Test Method Used

- Parameter (analyte) Description
- Sample Result
- Units
- Lab Qualifier (example: B, J, U, E, D, etc.)
- A column for any additional QC flags used by the lab (Spike recovery low, etc.)
- Sample Adjusted MDL
- Sample Adjusted Reporting Limit
- Dilution
- QC Batch Number
- Surrogate Compounds and recoveries, if applicable
- Date of Sample Prep (if sensitive to holding time)
- Analysis Date
- Analysis time
- Analyst initials
- Analytical Order or Autosampler Number if applicable

Data reporting procedures shall be carried out for field and laboratory operations as indicated In the following sections.

9.3.1 Field Data Reporting

Field data reporting shall be conducted principally through the transmission of report sheets containing tabulated results of all measurements made in the field, and documentation of all field calibration activities.

9.3.2 Laboratory Data Reporting

The task of reporting laboratory data (to the U.S. EPA) begins after the independent validation activity has been concluded. The URS QA Manager must perform a final review of the report summaries and case narratives to determine whether the report meets project requirements. In addition to the record of chain-of-custody, the report format shall consist of the following:

1. **Case Narrative:**
   i. Date of issuance
   ii. Laboratory analysis performed
   iii. Any deviations from intended analytical strategy
   iv. Laboratory batch number
   v. Numbers of samples and respective matrices

vi. QC procedures utilized and also references to the acceptance criteria
vii. Laboratory report contents
viii. Project name and number
ix. Condition of samples 'as-received'
x. Discussion of whether or not sample holding times were met
xi. Discussion of technical problems or other observations which may have created analytical difficulties
xii. Discussion of any laboratory QC checks which failed to meet project or laboratory criteria
xiii. Signature of the Laboratory QA Manager

2. **Chemistry Data Package**
   i. Case narrative for each analyzed batch of samples
   ii. Summary page indicating dates of analyses for samples and laboratory QC checks
   iii. Cross referencing of laboratory sample to project sample identification numbers
   iv. Description of data qualifiers to be used
   v. Sample preparation and analyses for samples
   vi. Sample results
   vii. Raw data for sample results and laboratory QC samples
   viii. Results of (dated) initial and continuing calibration checks, and GC/MS tuning results
   ix. MS/MSD recoveries, laboratory control samples, method blank results, calibration check compounds, and system performance check compound results
   x. Labeled (and dated) chromatograms/spectra of sample results and laboratory QC checks

The data package submitted will be a "CLP-like" Level 4 data package consisting of all the information normally presented in a CLP data package. However, specific CLP requirements as to calibration levels, spiking levels, reporting levels, etc. will be waived, and the lab may replace these with levels more appropriate for meeting the data quality objectives outlined in this QAPP.

9.4 Data Acquisition Requirements and Data Quality Management

Data from previous projects is not intended to be used in this project, except as a guide for further investigation parameters. Therefore issues of bias or non-representativeness in the acquisition of data previously collected are not germane.

The data management at the laboratory is discussed in Sections 8.6 through 8.10 of the **laboratory QA Manual** (See Electronic Appendix to this QAPP).

The .pdf format data package from the laboratory, both the signed hardcopy and .pdf files on CD, will be secured in the project files of the URS Franklin, Tennessee Office after these files have been examined for data review. They will be stored on that site for at least 10 years. In addition, the laboratory will also keep a copy of their data package in their computer archive system for 10 years.

The Excel spreadsheet submittal will first be verified for accuracy during data validation. Once verified, a copy of the original data will be stored in a limited access drive on the URS Franklin computer system, with only administrator access. A second Excel copy will be placed on the office network for further data reduction and assessment for the purposes of the objectives of the project. Access to that copy will be limited to personnel directly involved with the C&D project. If any discrepancy arises in the data, the original hardcopy/pdf version will be the considered the correct value.

PERFORMANCE AND SYSTEM AUDITS AND FREQUENCY

10.0 Performance and System Audits and Frequency

Performance and system audits of both field and laboratory activities will be conducted to verify that sampling and analysis are performed in accordance with the procedures established in the FSP and QAPP. The audits of field and laboratory activities include two independent parts: internal and external audits.

10.1 Field Performance and System Audits

10.1.1 Internal Field Audits

For this project of short duration, and where the field data is not critical to the project objectives, the field audit will consist of a review of the field checklist with all sampling personnel prior to the beginning of the site sample collection activities.

10.1.1.1 Internal Field Audit Responsibilities

Internal audits of field activities including sampling, and field measurements will be conducted by the **[CONTRACTOR]** QA Officer. These audits will verify that all established procedures are being followed.

10.1.1.2 Internal Field Audit Frequency

Since this phase of the project is anticipated to be of short duration, internal field audits will be conducted at least once at the beginning of the site sample collection activities. If additional sampling is required in the future, internal audits will be conducted at least once at the commencement of another round of sampling, and monthly if extended duration field work later becomes necessary.

10.1.1.3 Internal Field Audit Procedures

The audits will include examination of field sampling records, field screening analytical results, field instrument operating records, sample collection, handling and packaging in compliance with the established procedures, maintenance of QA procedures, chain-of-custody, etc. Follow-up audits will be conducted to correct deficiencies, and to verify that QA procedures are maintained throughout the investigation. The audits will involve review of field measurement records, instrumentation calibration records, and sample documentation. The field audit checklist to be used for this project is provided as **Figure 10.X** of this QAPP.

10.1.2 External Field Audits

10.1.2.1 External Field Audit Responsibilities

External field audits may be conducted by the U.S. EPA RCRA Permit Writer/Project Manager.

10.1.2.2 External Field Audit Frequency

External field audits may be conducted any time during the field operations. These audits may or may not be announced and are at the discretion of U.S. EPA.

10.1.2.3 External Field Audit Process

External field audits will be conducted according to the field activity information presented in the QAPP. The external field audit process can include (but not be limited to): sampling equipment decontamination procedures, sample bottle preparation procedures, sampling procedures, examination of field sampling and safety plans, sample vessel cleanliness and QA procedures, procedures for verification of field duplicates, sample preservation and preparation for shipment, as well as field screening practices.

10.2 Laboratory Performance and Systems Audits

10.2.1 Internal Laboratory Audits

Laboratory initiated internal audits are conducted according to the schedule outlined in **Section 9.4 of the laboratory QA Manual.** (See Electronic Appendix to this QAPP.)

A laboratory audit conducted by URS is not contemplated at this time unless required by the EPA Project Manager. The sampling and analytical work currently proposed in this QAPP is a one time sampling event of relatively short duration. The Test America North Canton (formerly STL Canton) laboratory was selected in part due to their being located in Region 5, and having had past experience in performing work under Region 5 QAPP protocols. The laboratory is likely known to some Region 5 personnel, and may have been audited by EPA Region 5 in the past. If the project requires extended analytical work not anticipated at this time, then an audit will be conducted as described below.

10.2.1.1 Internal Laboratory Audit Responsibilities

If an internal laboratory audit other than those initiated by the laboratory itself is required by EPA Region 5, it will be conducted by the **URS** QA Officer.

10.2.1.2 Internal Laboratory Audit Frequency

The internal system audits will be done on an annual basis if the project analytical work expands into another phase (see above).

10.2.1.3 Internal Laboratory Audit Procedures

The internal system audits **may** include an examination of laboratory documentation on sample receiving, sample log-in, sample storage, chain-of-custody procedures, sample preparation and analysis, instrument operating records, etc.

The performance audits **may** involve preparing blind QC samples and submitting them along with project samples to the laboratory for analysis throughout the project. The URS QA Officer

will evaluate the analytical results of these blind performance samples to ensure the laboratory maintains acceptable QC performance. The laboratory audit checklist is included in this QAPP as Figure 10.X.

10.2.2 External Laboratory Audits

10.2.2.1 External Laboratory Audit Responsibilities

An external audit will be conducted as required, by appropriate QA staff of the Waste, Pesticides and Toxics Division, U.S. EPA Region 5. The laboratory also participates in a number of certification programs, most of which require external performance audit samples to be submitted on a regular basis.

10.2.2.2 External Laboratory Audit Frequency

If the laboratory selected has not been previously audited by EPA Region 5, an external audit will be conducted at least once prior to the initiation of the sampling and analysis activities. These audits may or may not be announced and are at the discretion of the U.S. EPA.

10.2.2.3 Overview of the External Laboratory Audit Process

External audits may include any or all of: review of laboratory analytical procedures, laboratory on-site visits, and/or submission of performance evaluation samples to the laboratory for analysis. Failure of any or all audit procedures chosen can lead to laboratory disqualification, and the requirement that another suitable laboratory be chosen.

An external on-site review can consist of: sample receipt procedures, custody and sample security and log in procedures, sample through put tracking procedure, review of instrument calibration records, instrument logs and statistics (number and type), review of QA procedures, log books, sample prep procedures, sample analytical SOP review, instrument (normal or extends quantitation report) reviews, personnel interviews, review of deadlines and glassware prep, and a close out to offer potential corrective action.

It is common practice when conducting an external laboratory audit to review one or more data packages from sample lots recently analyzed by the laboratory. This review will most likely include but not be limited to;

- Comparison of resulting data to the SOP or method, including coding for deviations.
- Verification of initial and continuing calibrations within control limits.
- Verification of surrogate recoveries and instrument timing results where applicable.
- Review of extended quantitation reports for comparisons of library spectra to instrument spectra, where applicable.
- Recoveries on control standard runs.

- Review of run logs with run times, ensuring proper order of runs.
- Review of spike recoveries/QC sample data.
- Review of suspected manually integrated GC data and its cause (where applicable).
- Review of GC peak resolution for isolated compounds as compared to reference spectra (where applicable).
- Assurance that samples are run within holding times.

Ideally, the data should be reviewed while on the premises, so that any data called into question can be discussed with the staff.

PREVENTATIVE MAINTENANCE

11.0 Preventative Maintenance

11.1 Field Instrument Preventative Maintenance

Note: As stated elsewhere in this QAPP, it is anticipated there will be no field analyses critical to the project objectives performed during this phase of the project.

Specific preventative maintenance procedures to be followed for field equipment are based on those recommended by the manufacturer. Field instruments will be checked and calibrated daily before use. Calibration checks will be documented on the Field Calibration log sheets. Critical spare parts such as tape and batteries will be kept on-site to reduce potential downtime. Backup instruments and equipment will be available on-site or within 1-day shipment to avoid delays in the field schedule.

11.2 Laboratory Instrument Preventative Maintenance

As part of the QA Program Plan, a routine preventative maintenance program is conducted by **Test America North Canton** to minimize the occurrence of instrument failure and other system malfunctions. Designated laboratory employees regularly perform routine scheduled maintenance and repair of [or coordinate with the vendor for the repair of] all instruments. **Details of laboratory preventative maintenance program can be found in Section 8.11 of the Laboratory QA Manual.** (See the Electronic Appendix to this QAPP.)

11.3 Inspection/Acceptance Requirements for Supplies and Consumables

For this project, critical supplies will be tracked through the URS management system in the following manner.

Labels indicating the following information on receipt and testing are to be used for critical supplies and consumables.

- Unique identification number (if not clearly shown).
- Date received.
- Date opened.
- Date tested (if performed).
- Date to be retested (if applicable).
- Expiration date.

SPECIFIC ROUTINE PROCEDURES USED TO EVALUATE DATA PRECISION, ACCURACY AND COMPLETENESS

12.0 Specific Routine Procedures Used to Evaluate Data Precision, Accuracy and Completeness

The purpose of this section is to indicate the methods by which it will be ensured that the data collected for this investigation falls in line with the data quality objectives (DQOs) for the site.

Factors considered in this assessment include, but are not limited to:

- The risk assessment parameters chosen based on conditions and possible receptors involved in a project (i.e. ecological data quality levels, human health data quality levels, soil screening guidance, and the like).
- The contaminants known and/or suspected to be of concern on a project, as they relate to the data quality level parameters chosen.
- The choice of analytical and sample preparation methods for contaminants of concern, whose method detection limits will meet or exceed the data quality level concentrations for those contaminants.

Once these goals and objectives are evaluated and chosen, analytical data quality will be assessed to determine if the objectives have been met. In addition, the data will be reviewed for indications of interferences to results caused by sample matrices, cross contamination during sampling, cross contamination in the laboratory, and sample preservation and storage anomalies (i.e. samples holding time or analytical instrument problems).

12.1 Accuracy Assessment

In order to assure the accuracy of the analytical procedures, an environmental sample shall be spiked with a known amount of the so indicated analytes included in Tables 3.1 and 3.2. At a minimum, one sample spike should be included in every set of 20 samples tested on each instrument, for each sample matrix to be tested (i.e., soil, sediment, groundwater and surface water). The increase in concentration of the analyte observed in the spiked sample, due to the addition of a known quantity of the analyte, compared to the reported value of the same analyte in the unspiked sample determines the percent recovery.

Accuracy is similarly assessed by determining percent recoveries for surrogate compounds added to each field and QC sample to be analyzed for the organic target pollutants. Accuracy for all analyses will also be further assessed through determination of percent recoveries for laboratory control samples (LCS), (as well as MS or MS/MSD samples).

Percent recovery for MS or MS/MSD results is determined according to the following equation:

$$\% R = \frac{(\text{Amount in Spiked Sample} - \text{Amount in Sample})}{} \times (100)$$

Known amount added

Percent recovery for LCS and surrogate compound results is determined according to the following equation:

$$\% R = \frac{\text{(Experimental Concentration)}}{\text{Known amount added}} \times (100)$$

12.2 Precision Assessment

The relative percent difference (RPD) between the spike and matrix spike, or matrix spike and sample duplicate in the case of metals, and field duplicate pair or laboratory duplicate pair is calculated to compare to precision DQOs and plotted. The RPD is calculated according to the following formula:

$$RPD = \frac{\text{(Amount in Sample 1 - Amount in Sample 2)}}{0.5\text{(Amount is Sample 1 + Amount in Sample 2)}} \times (100)/$$

12.3 Completeness Assessment

Completeness is the ratio of the number of valid sample results to the total number of samples analyzed with a specific matrix and/or analysis. Following completion of the analytical testing, the percent completeness will be calculated by the following equation:

$$\text{Completeness} = \frac{\text{(number of valid measurements)}}{\text{(number of measurements planned)}} \times (100)$$

12.4 Assessment of Data

The field and laboratory data collected during this investigation will be used to evaluate the nature and extent of contamination at the site. The QC results associated with each analytical parameter for each matrix will be compared to the objectives presented in Section 3 and Tables 3.1, 3.2, and 3.3 of this QAPP. Only data validated in accordance with these QC parameters will be considered useable for decision making purposes.

In addition, the data obtained will be both qualitatively and quantitatively assessed on a projectwide, matrix-specific, parameter-specific and unit-specific basis. This assessment will be performed by the URS QA Manager and the results presented and discussed in detail in the final investigation report. Factors to be considered in this assessment of field and laboratory data will include, but not necessarily be limited to, the following:

- Were all samples obtained using the methodologies and SOPs proposed in the QAPP?
- Were all proposed analyses performed according to the SOPs provided in the QAPP?
- Were samples obtained from all proposed sampling locations and depths?

- Do any analytical results exhibit elevated detection limits due to matrix interferences or contaminants present at high concentrations?
- Were any analytes not expected to be present at the facility, or a given unit, identified as either target parameters or Tentatively Identified Compounds (TICs)?
- Were all field and laboratory data validated according to the validation protocols, including project-specific QC objectives, proposed in the QAPP?
- Which data sets were found to be unusable (qualified as "R") based on the data validation results?
- Which data sets were found to be usable for limited purposes (qualified as "J") based on the data validation results?
- What affect do qualifiers applied as a result of data validation have on the ability to implement the project decision rules?
- Has sufficient data of appropriate quality been generated to support a human health and/or ecological screening risk assessment?
- Were the human health and/or ecological screening risk assessments conducted properly?
- Can valid conclusions be drawn for all matrices at each unit and/or area under investigation?
- Were all issues requiring corrective action, as presented in the monthly QA Reports to management fully resolved?
- Were the project-specific decision rules used as proposed during the actual investigation?
- For any cases where the proposed procedures and/or requirements have not been met, has the affect of these issues on the project objectives been evaluated?
- Have any remaining data gaps been identified and summarized in the final investigation report?
- Based on the overall findings of the investigation and this assessment, were the original project objectives appropriately defined? If not, have revised project objectives been developed?

The planned number of background samples, by media, are listed in **Table 1-1** and were determined using the guidance document *Soil Sampling Quality Assurance User's Guide* (EPA 600/8-89/046, March 1989).

CORRECTIVE ACTION

13.0 Corrective Action

Corrective action is the process of identifying, recommending, approving and implementing measures to counter unacceptable procedures or out of QC performance which can affect data quality. Corrective action can occur during field activities, laboratory analyses, data validation and data assessment. All corrective action proposed and implemented should be documented in the regular QA reports to management. Corrective action should only be implemented after approval by the C&D Project Manager, or his designee. If immediate corrective action is required, approvals secured by telephone from the C&D Project Manager should be documented in an additional memorandum.

For noncompliance problems, a formal corrective action program will be determined and implemented at the time the problem is identified. The person who identifies the problem is responsible for notifying the C&D Project Manager, who in turn will notify the U.S. EPA RCRA Permit Writer/Project Manager. If the problem is analytical in nature, information on these problems will be promptly communicated to the U.S.EPA RCRA Project Manager, Tammy Moore. Implementation of corrective action will be confirmed in writing through the same channels.

Any nonconformance with the established QC procedures in the QAPP or Field Sampling Plan will be identified and corrected in accordance with the QAPP. The C&D Project Manager, or his designee, will issue a nonconformance report for each nonconformance condition. This sampling project is being conducted in compliance with an administrative order, as identified in the RFI Work Plan. This QAPP is intended and expected to be fully compliant with that administrative order. In the event a conflict is discovered between this QAPP and the administrative order, the AO will take precedence.

13.1 Field Corrective Action

Corrective action in the field may be needed when the sample network is changed (i.e. more/less samples, sampling locations other than those specified in the QAPP, etc.), sampling procedures and/or field analytical procedures require modification, etc. due to unexpected conditions. In general, the field team (the Field Team Leader, technicians, the Facility Project Manager, and the Facility QA Officer) may identify the need for corrective action. The field staff in consultation with the field team leader will recommend a corrective action. The Facility project manager will approve the corrective measure which will be implemented by the field team. It will be the responsibility of the Facility Project Manager to ensure the corrective action has been implemented.

If the corrective action will supplement the existing sampling plan (i.e., additional soil borings) using existing and approved procedures in the QAPP, corrective action approved by the Facility

Project Manager will be documented. If corrective actions result in less samples (or analytical fractions), alternate locations, etc., which may cause project QA objectives not to be achieved, it will be necessary that all levels of project management, including the U.S. EPA RCRA Project Manager, concur with the proposed action.

Corrective action resulting from internal field audits will be implemented immediately if data may be adversely affected due to unapproved or improper use of approved methods. The Facility QA Officer will identify deficiencies and recommend corrective action to the Facility Project Manager. Implementation of corrective actions will be performed by the URS Field Manager and field team. Corrective action will be documented in QA reports to the entire project management.

Corrective actions will be implemented and documented in the field record book. No staff member will initiate corrective action without prior communication of findings through the proper channels. If corrective actions are insufficient, work may be stopped by the U.S. EPA RCRA Permit Writer/Project Manager.

If at any time a corrective action issue is identified which directly impacts project DQOs, the U.S. EPA RCRA Permit Writer/Project Manager and/or the U.S. EPA RCRA Enforcement/Permitting QA Coordinator will be notified immediately.

13.2 Laboratory Corrective Action

Corrective action in the laboratory may occur prior to, during and after initial analyses. A number of conditions such as broken sample containers, multiple phases, low/high pH readings, potentially high concentration samples may be identified during sample log-in or just prior to analysis.

Following consultation with lab analysts and section leaders, it may be necessary for the **laboratory** QC manager to approve the implementation of corrective action. **The SOPs included in the Electronic Appendix to this QAPP** discuss method specific conditions during or after analysis that may automatically trigger a corrective action.

Other more general situations are described throughout the **Laboratory QA Manual** that may trigger corrective actions. The laboratory process for finding and documenting non-conformances, and implementing corrective actions are described in **Section 9** of that manual (See Electronic Appendix to this QAPP.

The laboratory QA manager will ensure implementation and documentation of the corrective action. If the nonconformance causes project objectives not to be achieved, it will be necessary to inform all levels of project management, including the U.S. EPA RCRA Permit Writer/Project Manager, to concur with the corrective action.

These corrective actions are performed prior to release of the data from the laboratory. The corrective action will be documented in both the **laboratory**'s corrective action log (signed by analyst, section leader and QC coordinator), and the narrative data report sent from the

laboratory to the **URS** data validator. If corrective action does not rectify the situation, the laboratory will contact the **C&D Attica** project manager.

13.3 Corrective Action During Data Validation and Data Assessment

The facility may identify the need for corrective action during either the data validation or data assessment. Potential types of corrective action may include resampling by the field team or reinjection/reanalysis of samples by the laboratory.

These actions are dependent upon the ability to mobilize the field team, whether the data to be collected is necessary to meet the required QA objectives (e.g., the holding time for samples is not exceeded, etc.). If the URS data assessor/validator identifies a corrective action situation, it is the URS project manager who will be responsible for approving the implementation of corrective action, including resampling, during data assessment. All corrective actions of this type will be documented by the URS QA Manager and approved by C&D.

QUALITY ASSURANCE REPORTS TO MANAGEMENT

14.0 Quality Assurance Reports to Management

The deliverables associated with the tasks identified in the Work Plan and monthly progress reports will contain separate QA sections in which data quality information collected during the task is summarized. Those reports will be the responsibility of the **C&D Attica** project manager and will include the **C&D Attica** QA officer report on the accuracy, precision, and completeness of the data, as well as the results of the performance and system audits, and any corrective action needed or taken during the project.

14.1 Contents of Project QA Reports

The QA reports will contain all results of field and laboratory audits, all information generated reflecting on the achievement of specific DQOs, and a summary of corrective action that was implemented, and its immediate results on the project. The status of the project with respect to the Project Schedule included in the QAPP will be determined if the project is incomplete. Whenever necessary, updates on training provided, changes in key personnel, anticipated problems in the field or laboratory for the coming month that could bear on data quality along with proposed solutions, will be reported. Detailed references to QAPP modifications will also be highlighted. All QA reports will be prepared in written, final format by the C&D Project Manager or his designee. To the extent possible, assessment of the project should also be performed on the basis of available QC data and overall results in relation to originally targeted objectives.

In the event of an emergency, or in case it is essential to implement corrective action immediately, QA reports can be made by telephone to the appropriate individuals, as identified in the Project Organization and Corrective Action sections of this QAPP. However, these events, and their resolution will be addressed thoroughly in the next issue of the monthly QA report.

14.2 Frequency of QA Reports

The Region 5 QAPP requires monthly QA Reports to management. However, this particular project is, at this time, a one time sampling event. Therefore, the QA report, which will incorporate the data validation report along with an assessment as to impact to the site, will be submitted once, with the final report for this phase of the project. If the initial report results in the generation of ongoing work at the site, then monthly QA reports will be established.

14.3 Individuals Receiving/Reviewing QA Reports

All individuals identified in the Project Organization chart will receive copies of the monthly QA Report.

APPENDIX D

Site Specific Health and Safety Plan

DRAFT

HEALTH AND SAFETY PLAN

RCRA FACILITY INVESTIGATION

C&D TECHNOLOGIES
200 MAIN STREET
ATTICA, INDIANA

RCRA-05-2007-0003, U.S.EPA ID NO.: IND 000 810 754

Prepared for
C&D Technologies, Inc.
200 West Main Street
Attica, Indiana 47918

September 2007

URS

URS Corporation
1000 Corporate Centre Drive
Ste. 250
Franklin, TN 37179
Project #20500205.00001

HEALTH AND SAFETY PLAN

RCRA FACILITY INVESTIGATION
C&D TECHNOLOGIES, INC.
200 WEST MAIN STREET
ATTICA, INDIANA

Disclaimer:

This Health and Safety Plan, and each of its provisions, is applicable only to, and for use only by, URS Corporation, its affiliates, and its subcontractors. Any use of this Plan by other parties, including, without limitation, third party contractors on projects where URS is providing engineering, construction management or similar services, without the express written permission of URS, will be at that party's sole risk, and URS Corporation shall have no responsibility therefore. The existence and use of this Plan by URS shall not be deemed an admission or evidence of any acceptance of any safety responsibility by URS for other parties unless such responsibility is expressly assumed in writing by URS in a specific project contract.

This HSP was developed to support field investigation activities described in the RCRA Facility Work Plan, C&D Technologies dated September 05, 2007. The RFI Work Plan is incorporated into this HSP by reference.

REVISION CHECKLIST

HASP Section	PM Initials	RHSM Initials	SSO Initials	Date	Comments

HEALTH AND SAFETY PLAN

	PHONE
Project Number:	20500205.00001
Project Manager: Jack Waggener	(615) 771-2480
Assistant Project Manger: Phil Rector	(615) 771-2480
Site Manager: Craig Bernhoft / Dylan Crouch	(615) 771-2480
Site Safety Officer: Dylan Crouch / TBD	(615) 771-2480

Plan Preparer: Dylan Crouch

Preparation Date: September 5, 2007

HSP Expiration Date: December 31, 2008

APPROVALS

Plan Preparer:

_____

Dylan Crouch, CHMM (DATE)

Regional Health, Safety, and Environment Manager:

_____

Millard P. Griffin, CIP, CSP (DATE)

Project Manager:

_____

Jack Waggener, PE (DATE)

This Health and Safety Plan is valid only for this specific project as described in Section 3.0. It is not to be used for other projects or subsequent phases of this project without the written approval of the Regional HSE Manager. **A copy of this plan is to be maintained at the Site at all times.**

HEALTH AND SAFETY PLAN

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1.0 PLAN-AT-A-GLANCE

HSP SUMMARY SHEET

THIS SUMMARY SHEET IS PROVIDED AS A QUICK-REFERENCE/OVERVIEW ONLY. THE REMAINDER OF THIS SITE-SPECIFIC HSP IS INTEGRAL TO THE SAFE CONDUCT OF SITE OPERATIONS AND MUST BE APPLIED IN ITS ENTIRETY.

EMERGENCY INFORMATION

Ambulance -	911
Fire -	911
Police -	911
Hospital -	765-762-2461

URS Project Manager: Jack Waggener	(615) 771-2480
URS HSP Preparer: Dylan Crouch	(615) 771-2480
URS RHSEM: Millard P. Griffin	(770) 345-9760
National Response Center	(800) 424-8802

HOSPITAL DIRECTIONS: St. Vincent Hospital - Williamsport

Depart Site, take left onto South Market Street and turn right onto West Jackson Street (U.S. Hwy 41). Travel approximately 2.2 miles (across Wabash River) and turn left onto IN-28. Bear right onto East 4th Street and turn right on North Monroe Street. Arrive at 412 North Monroe Street.

Urgent Care operations: 8:00 a.m. until 8:00 p.m. Monday through Friday
8:00 a.m. until 4:00 p.m. Saturday and Sunday

Additional information concerning emergency procedures is located in Section 11.0 and the hospital route map is located in Appendix A. A copy of the hospital route map must be readily available in each Site vehicle that may be used to transport accident victims to the hospital.

CHEMICALS OF CONCERN (COCs)

1. Heavy metals, specifically lead
2. Volatile organic compounds, specifically trichloroethene (TCE)
3. Polyaromatic hydrocarbons (PAHs)

Additional information regarding Site history, constituents of concern, and scope of work activities is located in sections 2.0 and 5.0.

PROJECT HAZARD ANALYSIS

TASK	Chem. Hzds.	Heat Stress	Noise	Slip/Trip/ Fall	Lifting Hzds.	Mech'l. Hzds.	Electro-cution	Explosion	Excav-ation
1. Soil Boring Installation	Low	Med	High	Med	Med	High	n/a	n/a	n/a
2. Monitoring Well Installation	Low	Med	High	Med	Med	High	n/a	n/a	n/a
3. Soil Sample Collection	Med	Med	Low	Low	Med	Low	n/a	n/a	n/a
4.Groundwater Sample Collection	Med	Med	Low	Low	Med	Low	n/a	n/a	n/a

High - Exposure likely more than 50% of the time
Low - Exposure likely less than 10% of the time
Med - Exposure likely 10-50% of the time
n/a – Exposure not anticipated

Additional information concerning Project Hazards and their control can be found in Sections 5.0 and 6.0.

TASK	MINIMUM PROTECTIVE CLOTHING/EQUIPMENT REQUIREMENTS
1	Steel-toed boots, hard hat, safety glasses, with high visibility vest when working near heavy equipment (i.e., drill rigs).
2	Leather gloves (as appropriate) for lifting and handling sampling equipment.
3	Nitrile gloves when handling potentially contaminated materials and sample collection for both soil and groundwater.

PERSONAL PROTECTIVE EQUIPMENT (First Action Level Clothing)

Chemical Protective Clothing
Outer Coveralls: Tyvek®‡
Outer Gloves: Nitrile
Inner Gloves: Nitriles
Chemical protective steel-toed boots or chemical-resistant boot covers over steel-toed boots

‡ Substitute poly-Coated Tyvek® if there is a potential for contact with liquids (groundwater, mud, etc.)

The HSP Preparer has conducted a Hazard Assessment for this project based upon information provided by the Project Manager, in accordance with 29 CFR 1910.132(d).

For more information on personal protective equipment (PPE) and respiratory protection requirements, see the Action Levels table presented in Section 6.3.

C&D SITE SPECIFIC PPE REQUIREMENTS

In additional to the PPE identified above, URS and their subcontractors will adhere to all C&D Site specific health and safety requirements. URS personnel and subcontractor

staff will be required to where cloth booties and additional nitrile gloves (if not worn) while inside applicable areas of the C&D facility. Any equipment brought into these areas will also be subject to similar modifications, if possible. It may be necessary to perform additional decontamination of equipment once outside the C&D facility.

ENGINEERING CONTROLS TO BE USED (as applicable)

- Natural wind forces to reduce exposure to airborne contaminants
- Forced air ventilation (fans) to reduce potential airborne exposures
- Light colored PPE to reduce solar load for heat stress control
- Dining canopy to provide shaded work/rest area for heat stress control

MONITORING EQUIPMENT

__ HNu PID w/ __ eV probe
__ OVM PID w/__ eV lamp
__ Photovac Microtip PID w/ eV lamp or equivalent instrument
X MiniRAE PID w/ 10.6 eV lamp
__ Combustible Gas/O_2 Indicator
__ Foxboro OVA (FID)
__ Miniram Real-time Dust Monitor
__ Other _____

For more information, see Section 6.2.

PERSONAL EXPOSURE SAMPLING

X Will be conducted
__ Will be conducted if PID readings require the use of respiratory protection as described in the Action Level Table presented in Section 6.3.
__ Is not anticipated

For more information on personal exposure sampling and PPE upgrade action levels, see Section 6.3.

HAZ-COM MATERIALS INVENTORY

- TSP or Alconox (decontamination)
- Isobutylene (calibration gas)
- Isopropanol (10% solution for decontamination)
- Hydrochloric Acid (sample preservation)
- Nitric Acid (sample preservation and 10% solution for decontamination (if necessary))

HEALTH AND SAFETY EQUIPMENT LIST

REQ	OPT	
√		URS Safety Management Standards (relevant to project - see next page)
	√	OSHA "Safety on the Job" Posters
√		Hardhats
√		Safety glasses
√		Ear plugs or muffs
	√	Cotton coveralls
	√	Traffic safety vest
	√	Tyvek® coveralls
	√	Polycoated Tyvek® Q-23 Coveralls
√		Steel-toed boots
√		Chemical-resistant steel-toed boots or chemical-resistant boot covers
√		Work gloves
√		Nitrile outer gloves
√		Surgical nitrile inner gloves
√		Plastic sheeting (visqueen)
√		55 gallon 17-H drums (for contaminated solids)
√		55 gallon 17-E drums (for liquids)
	√	Drum liners (for general trash and housekeeping)
√		Barricade tape and barricades
√		Wash tubs and scrub brushes
√		Decon solution
	√	Folding chairs
	√	5 or 10 gallon portable eyewash
	√	Respirator sanitizing equipment
√		First Aid kit
	√	Infection control kit
√		Drinking water
√		Gatorade or similar drink
√		Type ABC fire extinguishers
	√	Half-face respirators (NIOSH approved)
	√	Full-face respirators (NIOSH approved)
	√	Respirator cartridges (organic vapor or organic vapor/P100)
√		Photoionization Detector (PID) w/10.6 eV lamp and calibration kit
	√	Combustible Gas Indicator and calibration kit
	√	Garden sprayer
	√	Compressed gas horn
√		Duct tape
√		Paper towels and hand soap
	√	Spill sorbent
√		Plastic garbage bags
	√	Broom and/or shovel

SAFETY MANAGEMENT STANDARDS REFERENCED BY THIS HSP

SMS	TOPIC	HSP SECTION
02	Worker Right to Know	5.1
22	Lead in Construction	5.1
34	Utility Clearances	5.2
56	Drill Rig Safety	5.2
26	Noise and Hearing Conservation	5.2
21	Housekeeping	5.2
69	Back Injury Prevention	5.2
64	Hand Safety	5.2
18	Heat Stress	5.2
59	Cold Stress	5.2
16	Hand Tools and Portable Equipment	5.2
14	Fire Prevention	5.2
15	Flammable and Combustible Liquids and Gases	5.2
32	Traffic Control	5.2
49	Incident/Near Miss Reporting	5.2, 11.2, 13
65	Injury Management	5.2, 11.1
29	Personal Protective Equipment	7.0
42	Respiratory Protection	8.0
30	Sanitation	9.4
03	Emergency Action Plans	11.0

Copies of Safety Management Standards (SMS) are available at the Health, Safety, and Environment webSite on the SoURSe. Use the "Print This SMS" function on the "Safety Management Standards" page to print the complete SMS.

Copies of the SMSs referenced by this HSP are to be maintained on Site and are included as Appendix E. Project Managers are responsible to see that other SMSs relevant to field activities but not directly referenced by this HSP are also available on Site.

2.0 FACILITY BACKGROUND/WORK PLAN

2.1 SITE HISTORY

The C&D facility is located at 200 West Main Street, Attica, Fountain County, Indiana C&D (the Site or facility) and manufactures large motive and standby power lead acid batteries for commercial, industrial, and military applications. Manufacturing processes include casting/ curing lead battery parts, pasting battery grids, plate processing, battery assembling, charging and finishing. Supporting operations conducted at the Site include shipping and receiving, quality control, equipment maintenance, wastewater pretreatment, waste management, and general administration. The Site is located in a mixed use industrial, commercial, and residential area.

The Site was developed for industrial and commercial purposes prior to 1886 when the Site is identified in a fire insurance map as the Jas Martin & Company Grain Elevator, residential properties, a vacant foundry, and lumber yard. Current Site operations began at the Site in 1955. Multiple tenants operated at the Site prior to 1955 that performed a variety of industrial and commercial services. According to historical aerial photographs, previous reports, and interviews, a portion of the Site was used as a drive up disposal area for household trash and materials. A gasoline filling station also operated at the Site.

2.2 PURPOSE AND SCOPE OF WORK

On January 18th, 2007, the Administrator of the U.S.EPA issued an Administrative Order of Consent to C&D under the Section 3008(h) of the Solid Waste Disposal Act, commonly referred to as RCRA, as amended by the Hazardous and Solid Waste Amendments of 1984 (the Order). The Order states that C&D must identify and define the nature and extent of releases of hazardous constituents at or from the Facility, beginning with a Current Conditions Report (CCR). C&D submitted to U.S. EPA on March 1, 2007 the CCR that identified 15 solid waste management units (SWMUs) and areas of concern (AOCs) to be further evaluated as part of the RFI. U.S. EPA's April 20th , 2007 letter to C&D concerning the CCR, questioned the location of PCB containing capacitors that were mentioned in the *Screening Site Inspection Report for Eltra Corporation C&D Batteries Division Attica IN facility* (SSI Report) by Ecology and Environmental, Inc. submitted to U.S.EPA on October 12, 1990. C&D responded in a June 7, 2007 letter to the U.S. EPA that low level PCBs were contained in two former DC Generators that were taken out of service in 1988. As a result of the DC Generators having contained PCBs, C&D has identified the area where the DC Generators were located as an AOC/SWMU that will be further investigated in the RFI.

The intent of the RFI field activities is to identify the nature and extent of releases of hazardous constituents at or from the Facility which may pose an unacceptable risk to human health and environment. During the RFI, URS will complete approximately sixty (60) exploratory soil borings within the SWMUs and AOCs identified in the March 2007

Clayton Group Services, Inc. (Clayton), Current Conditions Report (CCR) and shown on Figure 4-1 of the RFI Work Plan. Additionally, URS will install four groundwater monitoring wells adjacent to existing monitoring wells MW-1, MW-2, MW-3, and MW-4 to monitor groundwater quality in the shallow water bearing zone.

Soil borings will be installed using traditional direct push technologies or other acceptable means to a maximum depth of 20 feet below ground surface (bgs), first encountered bedrock, or refusal (apparent bedrock), which ever comes first. Soil samples will be collected continuously from the entire depth of the boring using an acetate liner or split spoon sampler in general accordance with ASTM D-1586 and lithology will be characterized in accordance with the USGS soil classification system and recorded on a boring log.

Groundwater monitoring wells will be installed in the shallow water bearing zone using a Hollow Stem Auger or Sonic Drill rig. Upon reaching the terminating depth (to be determined by field observation and onSite geologist), the soil boring will be converted to 2.0-inch monitoring well. The monitoring well will be constructed according to guidance published in the *RCRA Groundwater Monitoring: Technical Guidance Document* and described in the RFI Work Plan.

3.0 APPLICABILITY

The purpose of this plan, which was developed specifically for operations at the C&D Site is to assign responsibilities, establish personal protection standards and mandatory safety procedures, and provide for contingencies that may arise while operations are being conducted at the Site. This HSP complies with, but does not replace, Federal Health and Safety Regulations as set forth in 29 CFR 1910 and 1926. This plan is to be used by personnel as a supplement to such rules, regulations, and guidance. This HSP is to be augmented by the URS Health and Safety Program and Management System, relevant standards from which are required to be available on Site during all activities.

The provisions of the HSP are mandatory for all onSite employees engaged in hazardous material management activities associated with this project which may involve health and safety hazards.

Changing and/or unanticipated Site conditions may require modification of this HSP in order to maintain a safe and healthful work environment. Any proposed changes to this plan should be reviewed with the URS Regional Health, Safety, and Environment Manager (RHSEM) prior to implementation. If this is not feasible, the Site/Project Manager may modify the plan and record all changes in the field log book; under no circumstances will modifications to this plan conflict with Federal, state, or other governmental health and safety regulations.

4.0 RESPONSIBILITIES

URS will have Site health and safety oversight and coordination responsibilities for URS personnel. URS subcontractors will be held accountable for the safe and healthful performance of work by each of their employees, subcontractors, or support personnel who may enter the Site. Each URS subcontractor must prepare and submit a HSP that meets or exceeds the URS safety requirements identified in this HSP.

URS will strictly adhere to the provisions of this HSP, along with the applicable regulations issued by governmental entities.

4.1 URS PROJECT MANAGER

Responsibilities include overall coordination of Site activities. The Project Manager (PM) has overall responsibility for the safety of operations and the health and safety of all personnel. The PM is responsible for ensuring that the project is audited to verify compliance with the project health and safety program.

4.2 URS REGIONAL HEALTH, SAFETY, AND ENVIRONMENT MANAGER

The Regional Health, Safety, and Environment Manager (RHSEM) is responsible for:

- Determining the need for periodic audits of the operation to evaluate compliance with this plan.

- Providing health and safety support as requested by the Site Safety Officer (SSO) and PM.

4.3 URS FIELD MANAGER

The Field Manager is responsible for field-related activities under the direction of the Project Manager and for maintaining field operations in accordance with project requirements. He is responsible for enforcing daily implementation of the HSP and resolving health and safety issues with the SSO. The Field Manager will also assist in conducting Site Safety Briefing and Compliance as well as daily Tailgate Safety Meetings Site briefings (see Appendices B and C). The Field Manager will substitute for the SSO as required by project activities.

4.4 URS SITE SAFETY OFFICER

Responsibilities of SSO include daily implementation of this HSP. The SSO is responsible for implementing and enforcing the HSP, overseeing the safety of daily operations and coordinating safety with subcontractors. In particular, the SSO will:

- Ensure that personnel are aware of the provisions of this HSP and are instructed in work practices, safety, waste management, and emergency procedures.
- Establish and ensure maintenance of Site work zones.
- Monitor the work area and personal breathing zone and ensure compliance of workers relative to pre-established personal protection levels.
- Evaluate Site conditions (i.e., weather, chemical, physical) and recommend any modifications to existing levels of protection.
- Ensure that daily safety briefings are conducted with assistance from the Field Manager.
- Initiate emergency response procedures with immediate communication to the PM.
- Exercise stop-work authority in the event of imminent danger to project personnel.
- Resolve any noncompliance issues with the Field Manager.
- Conduct regular inspections to determine effectiveness of the HSP.
- Maintain the SSO logbook.
- Maintain copies of documents (e.g., training, medical, fit test).

4.5 URS PROJECT PERSONNEL

Project personnel involved in onSite investigations and operations are responsible for:

- Taking all reasonable precautions to prevent injury to themselves and to their fellow employees.
- Performing only those tasks that they believe they can do safely, and immediately reporting any accidents and/or unsafe conditions to the SSO or PM.
- Implementing the procedures set forth in the HSP, and reporting any deviations from the procedures described in the HSP to the SSO or PM for action.
- Notifying the PM and SSO of any special medical problems (i.e., allergies) and seeing that all onSite personnel are aware of such problems.
- Reviewing project health and safety plan and signing Safety Plan Compliance Agreement.

4.6 SUBCONTRACTOR'S SAFETY REPRESENTATIVE

Each subcontractor is requested to designate a Subcontractor's Safety Representative (SSR) who is the subcontractor supervisor. The SSR is responsible for the safe and

healthful performance of work by his work force and subcontractors. During the subcontractor's activities onSite, the SSR will perform continuing work area inspections, participate in Site safety meetings, and conduct safety meetings/safety orientations for all new employees. The SSR will attend safety meetings with the SSO. The SSR will also investigate accidents and overexposures involving subcontractor personnel.

5.0 HAZARD EVALUATION

5.1 CHEMICAL HAZARDS

Below is a summary of the maximum detected concentrations for the primary COCs known to be present at the Site. Based on this data and the toxicity of these compounds, TCE, lead, and PAHs are the primary constituents of concern for this project. TCE and PAHs are potential carcinogens. Symptoms of acute exposure to TCE may include irritation to the eyes, skin, and mucous membranes, headache, nausea, vomiting, and weakness. TCE may also cause arrhythmia and liver damage. Symptoms of acute exposure to PAHs may include headache and skin irritation. Lead exposure symptoms may include weakness, insomnia, abdominal pain, and irritated eyes. The primary routes of exposure for these COCs are via inhalation, ingestion, and skin absorption. The Primary Site COCs are presented below with known contaminant concentrations.

PRIMARY COCs		
COC	**Soil**	**Groundwater**
TCE	<1.0 µg/kg**	20 µg/L**
PAH	7.7 µg/kg *	NA
Lead	3,660 mg/kg *	NA

* = Analytical data for soil presented in E&E SSI Report
** = Analytical data for groundwater presented in Clayton VOC Investigation Report
NA = Not analyzed

URS's written Hazard Communication program is located in URS SMS 02. Relevant MSDS sheets are presented in Appendix D. PPE criteria based on this previous information is provided in Section 6.0.

The primary raw material used at the Site during production is lead. Therefore, the potential exposure to lead and lead compounds is present. URS SMS 022 addresses precautions associated with potential lead exposures.

The RHSME must approve the use of any hazardous materials that will be brought on Site to facilitate this project (e.g., decontamination solutions, fuel for equipment operation) prior to bringing such materials on Site. In addition, plant-specific approval requirements may apply. A material safety data sheet (MSDS) must be provided to the SSO. MSDSs must be available on Site and maintained by the SSO. All labeling and storage of hazardous materials must be in accordance with regulatory requirements.

5.2 PHYSICAL HAZARDS

Physical hazards are inherently present during subsurface drilling activities. Common physical hazards include mechanical hazards; noise exposure associated with the operation of sampling equipment; slip-trip-fall hazards associated with the field environment; hazards associated with weather conditions; musculoskeletal injury

resulting from lifting tasks; and explosion hazards from underground pipes or lines that may be encountered during the drilling process. The typical physical hazards anticipated to be present on the Site and the methods for preventing injury due to these hazards are described below.

- **Buried utilities:** Underground utilities must be located before intrusive activities begin. Plant construction drawings are available that indicate the approximate locations of fire water lines and storm sewers. In addition, the Field Manager or SSO must obtain the appropriate permit from the plant prior to initiating intrusive activities. See SMS 034 for additional information regarding utility clearance and isolation.
- **Overhead lines:** Heavy equipment (e.g., drilling rig, excavator) will remain a safe distance (minimum 20 feet) from overhead power lines. See SMS 034 for additional information regarding utility clearance and isolation. Equipment, or any part of the equipment, cannot come within the following minimum clearance from energized overhead lines:

Power Lines Nominal System (kv)	Minimum Required Clearance
600v-50	10 feet
50- 75	11 feet
75-125	13 feet
125-175	15 feet
175-250	17 feet
250-370	21 feet
370-550	27 feet
550-1000	42 feet

- **Drilling rig:** The drill rig will be inspected prior to on-Site use and daily throughout the project. See SMS 056 for additional information regarding Drilling Safety Guidelines.
- **Pressure Washing/Decontamination:** Washer must be rated less than 3000 psi. A minimum of a 42" wand requiring two-handed operation is required. Proper PPE including slicker or polycoated Tyvek suit, rubber boots, thick-mil Nitrile gloves, face shield, and safety glasses is required.
- **Noise:** Workers must wear approved hearing protection when working around equipment that produces sound levels in excess of 85 decibels, whenever signs indicate that hearing protection is required, and whenever voices must be raised to be heard at a distance of three feet or less. See SMS 026 for more information regarding hearing conservation.
- **Terrain:** Adequate Site clearing and leveling should be conducted to accommodate the drilling rig and supplies and provide a safe working area.

- **Slip/trip/fall:** Good housekeeping practices should be employed to prevent slip/trip/fall hazards. Caution must be employed when walking to prevent slip/trip/fall hazards caused by terrain. See SMS 021 regarding proper housekeeping practices
- **Drum handling:** Do not manhandle full drums. Partially fill drums to reduce weight when possible. Get help when moving drums. Use a drum cart or fork lift with a drum grappler or other mechanical lifting device if possible. Wear gloves and pay close attention to the positions of hands and feet. See SMS 069 for additional information regarding manual lifting or material handling as well as SMS 064 for hand safety.
- **Materials handling:** Use proper lifting techniques. Use the buddy system or mechanical lifting aids when moving heavy or bulky items. See SMS 069 for additional information regarding manual lifting or material handling as well as SMS 064 for hand safety.
- **Heat/cold:** Ample breaks will be taken during hot or cold ambient conditions. See SMS 018 for additional information regarding heat stress and SMS 059 for information related to cold stress.
- **Pinch points:** Personnel must always be aware of limb or body position in close proximity to moving equipment to reduce pinch point hazards. Wear appropriate hand protection to protect hands. See SMS 064 for additional information regarding a hand safety.
- **Electrical:** Power tools must be in good working order and used with ground fault circuit interrupt (GFCI) protection. All electrical cords and extension cords must be inspected prior to use. Do not overload plugs.
- **Fire/explosion:** Fueling of any gas- or diesel-powered equipment shall be performed only after the equipment is cooled. Grounding techniques will be used during transfer of fuel and/or other flammable liquids. Please see SMS 014 and 015 for additional information.
- **Vehicle traffic:** Use barricades, traffic cones or other appropriate measures to control vehicle traffic through the work area. SMS 032 addresses vehicle safety.
- **Incident Reporting and Investigation:** Although this HSP was created to prevent injuries from occurring during this project, injuries are possible based on the hazardous nature of the project tasks. URS policies and procedures in place for the timely reporting of work related injuries, illness, and incidents. Please see SMS 049 and 065 for additional information.

6.0 WORKER PROTECTION

The minimum level of protection required on the Site include safety boots, safety glasses, and a hard hat. Shirts must have sleeves. No rings or linkless wrist-watches are permitted. The levels of personal protection are selected by evaluating the performance characteristics of the clothing against the requirements and limitations of the Site- and task-specific conditions.

6.1 LEVEL OF PROTECTION

The specific PPE listed for each level of protection was selected based on potential respiratory and dermal hazards. The levels of protection to be used during project-related activities are as follows:

- Level D
  - Uniform/standard work clothes
  - Gloves (leather or other) as needed based on task
  - Steel-toe work boots
  - Safety glasses with side shields
  - Hard hat
  - Hearing protection as required

- Modified Level D
  - Tyvek® coveralls
  - Polycoated Tyvek when performing hollow stem auger drilling
  - Nitrile disposable gloves with latex undergloves
  - Steel-toe rubber work boots
  - Safety glasses with side shields
  - Hard hat
  - Hearing protection as required

- Level C *
  - Tyvek® coveralls
  - Polycoated Tyvek when performing hollow stem auger drilling
  - Nitrile disposable gloves with latex undergloves
  - Steel-toe rubber work boots
  - Hard hat
  - Hearing protection as required
  - Full-face air purifying respirator with organic vapor cartridges

**** Respirator cartridge change out schedule is as follows:***
If respirators are worn, cartridges should be changed out at least once every eight hours of accumulated use and/or at end of week.

6.2 MONITORING EQUIPMENT

The monitoring equipment specified in Section 1.0 (MiniRAE PID w/ 10.6 eV lamp) will be used on a regular basis to evaluate the potential for exposure to airborne contaminants, typically every five to ten minutes. Air monitoring will be conducted in the immediate vicinity of the contaminant source point or work area (e.g., at the borehole and cuttings adjacent to the borehole). If readings exceed the first Action Level (5 ppm > one minute), monitoring in the operator's breathing zone (OBZ) of the person working nearest the point of operations/contaminant source will start immediately, and Site personnel will upgrade PPE if necessary.

6.3 ACTION LEVELS

Action levels and response criteria based on the PID readings are presented in the table below.

Analyzer Reading (above background)	Location	Duration	Action	Personal Protective Equipment
<25 ppm	Point of Operations/Release Source point	-----	Continued periodic monitoring.	Minimum Site ensemble
>25 ppm (1st Action Level)	Point of Operations/Release Source point	> 1 minute	Monitor OBZ; establish work zones as described in Section 6.5.	Minimum Site Ensemble,
<25 ppm	OBZ	----	No respirators required.	Minimum site ensemble
>25 ppm (2nd Action Level)	OBZ	> 1 minute	Provide respiratory protection; establish decon area as described in 10.0.	Minimum Site Ensemble, PLUS: Tyvek® coveralls*, Nitrile Outer Gloves, Nitrile Inner (surgical) gloves, and full-face respirators with organic vapor cartridges.
>125 ppm (3rd Action Level)	OBZ	>1 minute	Stop work; move upwind while vapors dissipate. If elevated levels remain, evacuate upwind, and notify RHSEM or PM.	As specified by RHSEM

Lead concentrations in associated soils are insufficient to cause significant employee exposure during drilling and sampling operations provided proper PPE is used (e.g., nitrile gloves are worn during handling of soils), proper decontamination procedures are followed (particularly prior to eating or drinking), and airborne particulate levels are kept low (i.e., no visible dust emissions during drilling/sampling activities).

6.4 BACKGROUND READINGS

All direct-reading instrument readings will be evaluated relative to background reading, not "meter zero". Prior to the start of work at each shift, and whenever there is a significant shift in wind direction, instrument readings will be obtained upwind of the Site work zone in order to determine the level of "background" readings from local vehicle traffic, emissions from nearby operations unrelated to the Site, etc. Site readings will be evaluated against these background readings (i.e., if an action level is listed as 25 ppm, it is evaluated as 25 ppm above background).

6.5 SITE CONTROL

Work area barricades will be used to prevent access by unauthorized persons. Yellow caution tape, sawhorse-type barricades or other appropriate barriers can be used for this purpose. Formal work zones will be implemented if the analyzer reading exceeds 25 ppm in the work area. Work zone designations will be as follow:

- Exclusion Zone (EZ) – The EZ is where potentially hazardous contaminants and physical hazards to the workers will be contained. The location of the EZ will change as the location of work moves. A 25-foot circle (as practical) around the work area will be defined before work starts. The EZ boundary will be marked using caution tape or other effective barricade. The size of the EZ may vary as necessary to accommodate Site conditions and to ensure contaminant containment. Appropriate personal protection will be required in this area.
- Contaminant Reduction Zone (CRZ) – A corridor leading from the EZ will be defined; it will lead from the work area to a break area. All decontamination activities will occur in the CRZ. A waste container will be placed at the end of the corridor so that contaminated disposable equipment can be placed inside and covered. No one will be permitted into the CRZ or EZ unless he/she is in full compliance with the requirements of this HSP.
- Support Zone – A Support Zone, the outermost part of the Site, must be defined for each field activity. Support equipment is located in this uncontaminated or clean area. Normal work clothes are appropriate within this zone. The location of the support zone will be selected based on accessibility, wind direction (upwind of work area), and resources (i.e., roads, shelter, utilities).
- Site Illumination – Work will be conducted during daylight hours only.

6.6 DATA LOGGING

All monitoring data, including background readings and instrument calibration, will be logged in the field log book. All monitoring instruments will be calibrated in accordance with the manufacturer's instructions prior to the start of each shift. Calibration should also be performed when inconsistent or erratic readings are obtained. If an instrument cannot be calibrated to specification, or becomes otherwise inoperable, all invasive Site

work (i.e., drilling, excavating) will cease until the instrument is appropriately repaired or replaced; the PM or HSP Preparer should be contacted for further guidance.

7.0 PERSONAL PROTECTIVE EQUIPMENT

The minimum PPE for Site personnel includes:

- Hardhat
- Safety glasses with side shields (or impact resistant goggles)
- Steel-toed boots or Chemical-resistant steel-toed boots
- Ear protection in vicinity of noisy equipment
- Work gloves and/or chemical-resistant gloves
- Traffic safety vest in the vicinity of heavy equipment

As the various monitoring Action Levels are reached, additional PPE is required. Section 6.0 provides the description of the incremental PPE requirements relative to specific Action Levels, as well as the specific kinds of PPE to be used. URS' procedures for use and selection of personal protective equipment are located in SMS 29, a copy of which is to be maintained on Site.

7.1 DURATION OF WORK TASKS

The duration of work tasks in which personnel use PPE ensembles that include chemical protective clothing (including uncoated Tyvek®) will be established by the SSO. Variables to be considered include ambient temperature and other weather conditions, the capacity of individual personnel to work in the required level of PPE in heat and cold, and the limitations of specific PPE ensembles. The recommended rest breaks are as follows:

- Fifteen minutes midway between shift startup and lunch
- Lunch break (30-60 minutes)
- Fifteen minutes midway between lunch and shift end

Rest breaks are to be taken in the support zone or other clean area after personnel have completed the decontamination process, including soap and water wash of hands and face.

8.0 RESPIRATORY PROTECTION

Based on the concentrations of the COCs known to be present at the Site, the use of respiratory protection is not anticipated. However, respirators will be required depending on PPE upgrades determined by air monitoring data and the action levels presented in Section 6.3.

Respirators will only be worn by those URS employees that are enrolled in the URS Medical Surveillance Program and are medically evaluated in compliance with the requirements of the HAZWOPER standard. Employees not physically or psychologically capable of wearing respirators are not assigned to this project.

A person wearing a respirator must be clean-shaven in the area of the face piece seal. Long hair, sideburns, and skullcaps that extend under the seal are not allowed. Glasses with temple pieces extending under the seal are not allowed for full-face respirators. Persons with facial conditions that prevent a proper seal are not allowed to wear a respirator until the condition is corrected. Facial conditions that may cause a seal problem include missing dentures, scars, severe acne, etc. Contact lenses can be used with air purifying, but not supplied air respirators.

No individual will enter an area where the use of respiratory protective equipment is required unless the person has been fit tested within the last year. Fit testing will be performed in accordance with accepted fit test procedures defined in SMS 042.

8.1 RESPIRATOR SELECTION

Once the need for respirators has been established, the respirators will be selected on the basis of the hazards to which the worker is exposed. Only NIOSH-approved respirators will be issued.

The form of the airborne contaminants has been evaluated based upon the suspected contaminants of concern. Evaluation of the concentration of the airborne chemical hazard will be performed using direct reading instruments to determine what type respirator will be used. Airborne readings will be compared to Action Levels presented in Section 6.3.

8.2 CLEANING OF RESPIRATORS

Respirators assigned and worn by one individual must be dismantled and thoroughly cleaned and disinfected after each day's use. Visitors or multi-assigned respirators must be cleaned and disinfected after each use. A disinfectant spray or wipe is approved as a disinfectant between uses during the day but not for cleaning and sanitizing after each day's use. Care must be taken to prevent damage from rough handling during the cleaning procedure. After cleaning, respirators must be reassembled.

During respirator cleaning, the respirator will also be inspected for damaged parts. If damaged parts are identified, the respirator will not be used again until repaired. Damaged parts must be replaced by a URS trained respirator user or a manufacturers representative. Only approved parts will be used for repair purposes.

8.3 STORAGE OF RESPIRATORS

When not in use, respirators must be stored to protect them from dust, sunlight, heat, extreme cold, excessive moisture, damaging chemicals, and physical damage. Respirators must be stored in sealable (e.g. Ziploc® or twist-tie) reusable plastic bags between shifts.

The respirator storage environment must be clean, dry, and away from direct sunlight. OnSite cabinets or cases are suggested. Storing bagged respirators in vehicles is discouraged due to the potential for damage from other material or equipment.

9.0 DECONTAMINATION PROCEDURES

9.1 PERSONNEL DECONTAMINATION PROCEDURES

Personnel decontamination procedures are as follows:

1. Equipment drop
2. Outer glove removal
3. Suit removal
4. Respirator removal
5. Inner glove removal

When project requirements necessitate deviations from the listed steps, deviations will be noted in the field logbook.

In the event of physical injury or other serious medical concerns, immediate first aid is to be administered in lieu of further decontamination efforts.

9.2 SAMPLE EQUIPMENT DECONTAMINATION PROCEDURES

Equipment decontamination procedures are as follows:

1. Alconox and water rise
2. Potable water rinse
3. Deionized water rinse

Sample equipment decontamination may be completed in a bucket wash / rinse or using pressure wash or steam clean.

9.3 HEAVY EQUIPMENT DECONTAMINATION PROCEDURES

Heavy equipment decontamination procedures are as follows:

1. Pressure wash or steam clean

All decontamination of heavy equipment will be conducted within a decontamination pad to contain any potentially impacted decontamination fluids and residual drill fines.

All equipment will be visually inspected prior to departure from Site.

9.4 SANITATION

Potable water will be made available at the Site, either from a pressurized source or commercially available bottled water. Drinking cups will be supplied so personnel will neither drink directly from the source of water nor have to share drinking cups. Sources of non-potable water shall be clearly labeled as such.

Unless toilet facilities are available on Site or transportation is readily available to transport personnel to nearby (within five minutes) toilet facilities, portable toilet facilities, such as chemical toilets, will be provided on Site.

Washing facilities will be provided on Site, and will be located in the decontamination area or the support area. Soap, clean water, wash basins and single-use towels will be available for personnel use.

URS' procedures for Site sanitation are located in SMS 030.

10.0 SAFE WORK PRACTICES

10.1 GENERAL

1. Eating, drinking, chewing gum or tobacco, and smoking are prohibited in the contaminated or potentially contaminated area or where the possibility for the transfer of contamination exists.

2. All personnel will enter designated work areas only through the contamination reduction zone (CRZ). All personnel leaving an exclusion/work zone must exit through the CRZ and pass through the decontamination station as described in Section 9.0.

3. Personnel will wash their hands and face thoroughly with soap and water prior to eating, drinking or smoking.

4. Avoid contact with potentially contaminated substances. Do not walk through puddles, pools, mud, etc. Avoid, whenever possible, kneeling, leaning or sitting on contaminated surfaces. Do not place monitoring equipment on potentially contaminated surfaces (i.e., ground, etc.)

5. All field crew members should make use of their senses to alert them to potentially dangerous situations in which they should not become involved (i.e., presence of strong, irritating or nauseating odors).

6. Only those vehicles and equipment required to complete work tasks should be permitted within the exclusion/work zone (drill rigs, excavators, and similar items). All non-essential vehicles should remain within the support zone.

7. Containers, such as drums, will be moved only with the proper equipment and will be secured to prevent dropping or loss of control during transport.

8. Field survey instruments, such as PIDs, should be covered with plastic or similar covering to minimize the potential for contamination.

9. No matches or lighters will be permitted in the work area/exclusion zone or contamination reduction zone.

10. Contaminated protective equipment, such as respirators, hoses, boots, and disposable protective clothing, will not be removed from the work area/exclusion zone or decontamination area until it has been cleaned, or properly packaged and labeled.

11. Prevent, to the extent possible, spills. In the event that a spill occurs, contain liquid if possible.

12. Prevent splashing of the contaminated materials.

13. Field crewmembers shall be familiar with the physical characteristics of the Site operations including:

    - Wind direction in relation to the contaminated area;
    - Accessibility to equipment and vehicles;
    - Areas of known or suspected contamination;
    - Site access; and
    - Nearest water sources.

14. The number of personnel and equipment in the exclusion zone should be minimized but only to the extent consistent with workforce requirements of safe Site operations.

15. All wastes generated during URS and/or subcontractor activities at the Site will be disposed of as directed by the PM and in conformance with applicable regulations.

16. All personal protective equipment will be used as specified and required.

17. The buddy system will be used at all times when performing sampling for hazardous material when the first action level criteria has been exceeded or when working in remote areas.

18. Personnel are to immediately notify the SSO or Field Manager if any indications of potential explosions or unusual conditions are observed.

10.2 SAMPLING PRACTICES

For all sampling activities, the following standard safety procedures shall be employed:

1. All sampling equipment should be cleaned before proceeding to the Site.

2. At the sampling Site, sampling equipment should be cleaned after each use.

3. Work in "cleaner" areas should be conducted first where practical.

4. All unauthorized personnel will remain outside exclusion zones at all times.

10.3 SAMPLE SHIPMENT/HAZARDOUS MATERIALS SHIPMENT

If samples to be collected during the course of this project fall under the criteria that defines them as hazardous materials under DOT regulations 49 CFR Parts 171-177 (see URS guidelines for determination), then they must be shipped in accordance with those regulations by an individual who is certified as having been Function-Specific trained as required under the DOT regulations.

11.0 EMERGENCY CONTINGENCY

It is URS' policy to evacuate personnel from areas involved in hazardous material emergencies and to summon outside assistance from agencies with personnel trained to respond to the specific emergency. In the event of a fire or medical emergency, the emergency numbers identified in Section 1.0 (page 1) can be called for assistance. URS will follow the steps outlined in the Emergency Response Checklist. In the event of a facility emergency, URS will follow facility policy in the event. See SMS 003 for additional information.

EMERGENCY RESPONSE CHECKLIST

In an Emergency	Yes	No
Confirm the reported incident	_____	_____
Evacuate and secure the area	_____	_____
Render first aid/emergency medical care	_____	_____
Notify promptly:		
Project Manager	_____	_____
Fire Department	_____	_____
Police Department	_____	_____
Nearest Hospital or Medical Care Facility	_____	_____
Start Documentation	_____	_____
If spill or leak occurs:		
Don the proper PPE	_____	_____
Stop the source	_____	_____
Contain the spill	_____	_____
Clean up the spill	_____	_____
Upon evacuating, take attendance at the assembly area	_____	_____
Authority given:		
Leave the Site	_____	_____
Restart the operations	_____	_____
Debrief and document the incident	_____	_____
A copy of the document submitted to the RHSEM	_____	_____

11.1 MEDICAL EMERGENCY RESPONSE PLAN

At least one URS employee on Site will hold a current certificate in American Red Cross Standard First Aid or equivalent. This training provides six and one-half hours of Adult CPR and Basic First Aid. If an injury occurs, but it is not particularly serious or life threatening, the person should be escorted to the nearest occupational health clinic or urgent care facility. See SMS 65 for additional information concerning injury management. If a medical emergency exists, consult the emergency phone number list and request an ambulance immediately. Perform First Aid/CPR as necessary, stabilize the injured, decontaminate if necessary, and extricate only if the environment they are in is dangerous or unsafe and ONLY if the rescuers are appropriately protected for potential hazards they may encounter during the rescue. When emergency services personnel arrive, communicate all first aid activities that have occurred. Transfer responsibility for care of the injured/ill to the emergency services personnel.

The following items and emergency response equipment will be located within easy access at all times:

- First Aid Kit and Infection Control Kit;
- Eyewash – A 15 minute eyewash (required if corrosives are present) or an appropriate amount of portable sterile eyewash bottles will be available on Site for flushing foreign particles or contaminants out of eyes. The SSO will demonstrate the proper operation of the unit(s) prior to the start of work;
- Emergency Phone Numbers List; and
- Portable radios for emergency communications in remote areas.

Drugs, inhalants, or medications shall not be included in the First Aid Kit.

11.2 INCIDENT/NEAR MISS REPORTING

Site injuries and illnesses must be reported to the SSO and PM immediately following first-aid treatment. Work is to be stopped until the PM or SSO and RHSEM have determined the cause of the incident and have taken the appropriate action to prevent a reoccurrence. Any injury or illness, regardless of severity, is to be reported on the accident report form (see SMS 49).

"Near Miss" reports are to be submitted on Form 49-2. Near misses are unplanned events that could have resulted in injury, property, or equipment damage if there was a change in time or space.

12.0 TRAINING, MEDICAL SURVEILLANCE, SITE INSPECTIONS

12.1 TRAINING AND MEDICAL SURVEILLANCE

All Site personnel will have met the requirements of 29 CFR 1910.120(e), including:

- Forty hours of initial off-Site training or its recognized equivalent
- Eight hours of annual refresher training for all personnel (as required);
- Eight hours of supervisor training for personnel serving as site superintendents or Site Safety Officers
- Three days of work activity under the supervision of a trained and experienced supervisor

In addition, all Site personnel will review this HSP and sign a copy of the Safety Plan Compliance Agreement, which is found in Attachment B. The PM will maintain these agreements at the Site, and place them in the project file at the conclusion of the operation.

Prior to the start of operations at the Site, the SSO will conduct a Site safety briefing, which will include all personnel involved in Site operations. At this meeting, the SSO will discuss:

- Contents of this HSP
- Types of hazards at the Site, including heat stress, and means for minimizing exposure to them
- The type of monitoring that will be performed
- Action levels for upgrade and downgrade of personal protective equipment
- Personal protective equipment that will be used
- Site-specific respiratory protection requirements
- Decontamination protocol
- Site control measures, including safe operating practices and communication
- Location and use of emergency equipment
- Evacuation signals and procedures

All Site personnel, including subcontractor personnel, are to attend the briefings and sign the Site Plan Compliance Agreement Form (see Appendix B). Additional Site Safety Briefings will be conducted whenever new personnel report to the Site.

Subsequent Site Safety Briefings will be conducted if there is a change in task or significant change in task location.

12.2 C&D SITE SPECIFIC REQUIREMENTS

URS and their subcontractors will adhere to all C&D Site specific training and Site safety requirements. Since a portion of the field activities will be conducted inside the C&D facility, all PPE requirements and necessary upgrades (i.e, additional cloth booties and gloves) will be completed. This is most likely to occur in production areas where lead and lead compounds are present.

12.3 SITE INSPECTIONS

The URS Field Manager or Site Safety Officer is to conduct a tailgate safety meeting prior to the start of each shift and document on the form found in Appendix C. The purpose of the daily tailgate meeting is to identify potential job hazards for the day's activities and methods to eliminate or control the hazards. The tailgate meeting will be updated during the shift if new or different tasks or unanticipated hazards are encountered, or if the control measures are inadequate. The completed forms are to be maintained on Site until the completion of the project, at which time they are to be placed in the project files.

13.0 RECORDKEEPING

The PM and SSO are responsible for Site recordkeeping. Prior to the start of work, they will review the HSP; if there are changes to be made, the change will be noted in the Revision Checklist.

All personnel will review the HSP and sign the Safety Plan Compliance Agreement in Attachment B; copies of these forms will be maintained in the project file as noted in Section 12.

The SSO will conduct tailgate safety meetings in accordance with Section 12 and have all attendees sign the form in Attachment C; copies will be maintained in the project file.

Any incident or exposure incident will be investigated (see SMS 49) will be completed and forwarded to the Office Administrative Manager and Health and Safety Representative.

All instrument readings and calibrations, PPE use and changes, health and safety-related issues, and deviations from or problems with this HSP will be recorded in the field log.

APPENDIX A

HOSPITAL ROUTE MAP

Directions to WILLIAMSPORT, IN

YAHOO! LOCAL Maps

Summary and Notes

START **C & D Technologies Incorporated**
(765) 762-2461 ★★★★★
200 W Main St, ATTICA, IN

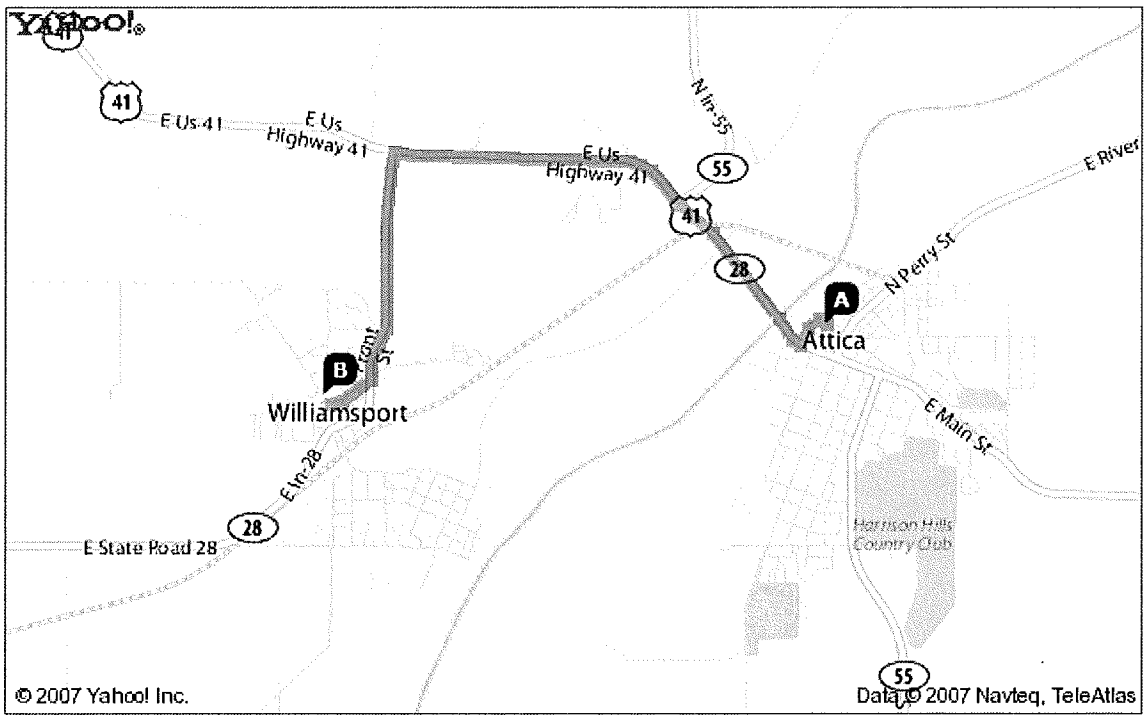
FINISH **412 N Monroe St, WILLIAMSPORT, IN**

Total Distance: 3.9 miles, Total Time: 7 mins (approx.)

Add your notes here...

	Distance
200 W MAIN ST, ATTICA, IN	
1. Start at **200 W MAIN ST, ATTICA**	go < **0.1** mi
2. Bear **L** on **S MARKET ST**	go **0.2** mi
3. Turn **R** on **W JACKSON ST(US-41)**	go **0.2** mi
4. Continue to follow **US-41**	go **2.2** mi
5. Turn **L** on **IN-28**	go **1.1** mi
6. Bear **R** on **E 4TH ST**	go **0.2** mi
7. Turn **R** on **N MONROE ST**	go < **0.1** mi
8. Arrive at **412 N MONROE ST, WILLIAMSPORT**	
412 N MONROE ST, WILLIAMSPORT, IN	

Distance: 3.9 miles, Time: 7 mins



When using any driving directions or map, it's a good idea to do a reality check and make sure the road still exists, watch out for construction, and follow all traffic safety precautions. This is only to be used as an aid in planning.

APPENDIX B

SAFETY PLAN COMPLIANCE AGREEMENT

SAFETY COMPLIANCE AGREEMENT, BRIEFING FORM,
AIR MONITORING LOG, AND CALIBRATION CHECK SHEET
FOR SUBSURFACE SOIL INVESTIGATION

I have read the Health and Safety Plan for the project and I understand it, and agree to comply with all of its provisions. I understand that I could be prohibited from working on the project for violating any of the health and safety requirements specified in the Plan.

	Name	Signature
URS Site Manager		
URS Site Safety Officer		
URS Site Personnel		

SAFETY ISSUES

	DISCUSSED Yes	No
Protective Clothing/Equipment	___	
Chemical and Physical Hazards	___	
Control Methods	___	
Air Monitoring Action Levels and Requirements	___	
Nearest Phone	___	
Hospital Name/Address/Directions	___	

Meeting conducted by: _____ Date: _____

Attendees' Names (print) **Signatures**

_____

_____

_____

_____

DAILY INSTRUMENT CALIBRATION CHECK SHEET

DATE	INSTRUMENT	BATTERY CHECK OK?	ZERO ADJUST OK?	CALIBRATION GAS (PPM)	READING (PPM)	CALIBRATED BY

FIELD MONITORING ACTIVITY LOG

DATE	ACTIVITY MONITORED	TIME	LOCATION	READING	ACTION	READING BY

HEALTH AND SAFETY COMPLIANCE AGREEMENT

I have read, understood, and agree with the health and safety protocols in the HSP and the information discussed in the health and safety meeting briefing. I also understand that noncompliance with the HSP may result in dismissal from the Site.

Printed Name	Organization	Signature	Date

Personnel health and safety briefing conducted by

Name	**Signature**	**Date**

APPENDIX C

TAILGATE MEETING FORM

TAILGATE MEETING FORM

Date and Time of Meeting _____

Prepared By: _____

CHECK TOPIC(S) DISCUSSED

First Aid
- ☐ Facilities
- ☐ Reporting and Records
- ☐ Treatment of _____

Personal Protective Equipment
- ☐ Glasses, Goggles, and Shields
- ☐ Hard Hats
- ☐ Respirators
- ☐ Gloves
- ☐ Other _____

Emergency Procedures
- ☐ Glasses, Goggles, and Shields
- ☐ Hard Hats
- ☐ Respirators
- ☐ Gloves
- ☐ Rally/Headcount Area
- ☐ Other _____

Special Tools / Equipment
- ☐ Chain saws / Chop saws
- ☐
- ☐

Industrial Sanitation and Hygiene
- ☐ Drinking water
- ☐ Restrooms/Porta toilets
- ☐ Personal Cleanliness

Housekeeping
- ☐ Waste Containers
- ☐ Waste Materials

Fire Prevention
- ☐ Extinguishers
- ☐ Smoking
- ☐ Hot Work
- ☐ Explosives and Flammable Liquids
- ☐ Other _____

Vehicles/Heavy Equipment
- ☐ Transportation of Employees
- ☐ Operation and Inspection
- ☐ Preventative Maintenance
- ☐ Other _____

Discussion _____

_____

_____

_____

ATTENDEES

Name (Printed)	Signature

APPENDIX D

MATERIAL SAFETY DATA SHEETS

APPENDIX E

URS SAFETY MANAGEMENT STANDARDS

APPENDIX E

Community Involvement Plan

DRAFT

COMMUNITY INVOLVEMENT PLAN

C&D TECHNOLOGIES
200 MAIN STREET
ATTICA, INDIANA

RCRA-05-2007-0003, U.S.EPA ID NO.: IND 000 810 754

Prepared for

C&D Technologies
200 West Main Street
Attica, Indiana

August 2007

URS
1000 Corporate Centre Drive
Suite 250
Franklin, Tennessee 37067
(615) 771-2480

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1.1 Background

On January 18, 2007, the United States Environmental Protection Agency (EPA) Region V issued an Administrative Order on Consent to the C&D Technologies battery manufacturing facility in Attica, Illinois. The Order specifies that C&D Technologies will: "Perform an investigation [*otherwise referred to as the RCRA Facility Investigation or RFI*] to identify the nature and extent of any release of hazardous wastes and/or hazardous constituents at or from the facility which may pose an unacceptable risk to human health and the environment" and provide specified reports within a specific schedule, to U.S. EPA (U.S. EPA 2007a). The Order has been entirely incorporated into the Community Involvement Plan through specific reference and is included as Appendix A of the RFI Work Plan.

Further, the Order states that C&D Technologies will (1) "establish a public repository in the City of Attica for information regarding [the aforementioned] site activities and [(2)] conduct timely public outreach and involvement activities" (U.S. EPA 2007a).

C&D Technologies has funded this Community Involvement Plan to document planned efforts to meet and/or exceed EPA requirements.

1.2 Purpose of the Plan

The purpose of this Community Involvement Plan is to outline potential steps, options and means by which relevant information concerning the aforementioned environmental investigation activities and public involvement will be expedited.

This plan will attempt to address historic and emerging environmental issues and answer basic questions. It will define mechanisms to create greater public access to information relevant to the Order and corresponding actions that may arise from current environmental site investigations. This plan also seeks to contribute to better decision outcomes that benefit the affected community.

Since this document was written in the early stages of the facility investigation process, this plan will further outline actions and procedures to anticipate and expedite information when analysis is completed and after results have been verified to the satisfaction of U.S. EPA.

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A community involvement plan is essentially "a document that serves as the basic foundation for any good public involvement program." This Plan utilizes U.S. EPA guidance concerning key elements of an effective public involvement plan and other elements tailored to this stage of the RCRA Facility Investigation (RFI) implemented by C&D Technologies.

This Community Involvement Plan will describe and document:

1) The site history and activities concerning potential risks to human health and the environment;

2) The characteristics of the surrounding community in relation to demographics, history of events and background;

3) A process by which community concerns will be identified;

4) A detailed plan of action to address community concerns;

5) A contingency plan for unexpected events;

6) A process by which community involvement may be sought (public meetings, schedules of activity, interpretive assistance, etc.);

7) A contact list of officials with phone numbers and email addresses;

8) Appropriate local media contacts;

9) Location of the information repository for documents pertaining to the RCRA Facility Investigation and its findings; and

10) Details of future processes to amend or update this Community Involvement Plan if necessary when relevant investigations are completed and final conclusions are reached.

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The purpose for this section is to inform the community of Attica about the characteristics of the current and historic facility/site, land uses, types of industrial manufacturing activities and the types of manufacturing operational controls used by the C&D Technologies' facility. This information establishes a foundation for and will guide the current RCRA Facility Investigation (RFI) to "identify the nature and extent of any release of hazardous wastes and/or hazardous constituents at or from the facility which may pose an unacceptable risk to human health and the environment."

Information provided in this section is summarized from previous contractor, state and federal reports and their research. Some of the research drew from deed information, analysis of current and historic aerial photographs and community records, information collected from the Fountain County Assessor's Office and other information supplied by C&D Technologies.

3.1 Facility Description

The C&D Technologies' Attica facility and site can be characterized as follows:

1) It is an active battery manufacturing facility.

2) It is situated on approximately 12.5 acres of land, located adjacent to the east bank of the Wabash River [see Figure 1 (Clayton Group Services, Inc., 2007)].

3) The Facility terrain slopes northwest, toward the river.

4) The Facility is located at 200 West Main Street in Attica, Fountain County, Indiana.

5) There are approximately 295,000 square feet of interconnected buildings existing on the site.

6) Facility building functions include manufacturing, production, office space, storage, material receiving, product shipment, quality control, laboratory analysis, equipment maintenance, wastewater pretreatment, waste management and temporary storage, and administration.

7) The Site is bounded on the southeast by Third Street; to the southwest by Main Street; and the Wabash River to the northwest.

8) Surrounding land uses include industrial, commercial, and residential properties at or near the same elevation of the facility. Other surrounding development exists at higher elevations.

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9) A former "landfill" is located between the Wabash River and the Facility buildings.

10) The city of Attica's municipal drinking water well field is located approximately 0.25 miles south of the Facility.

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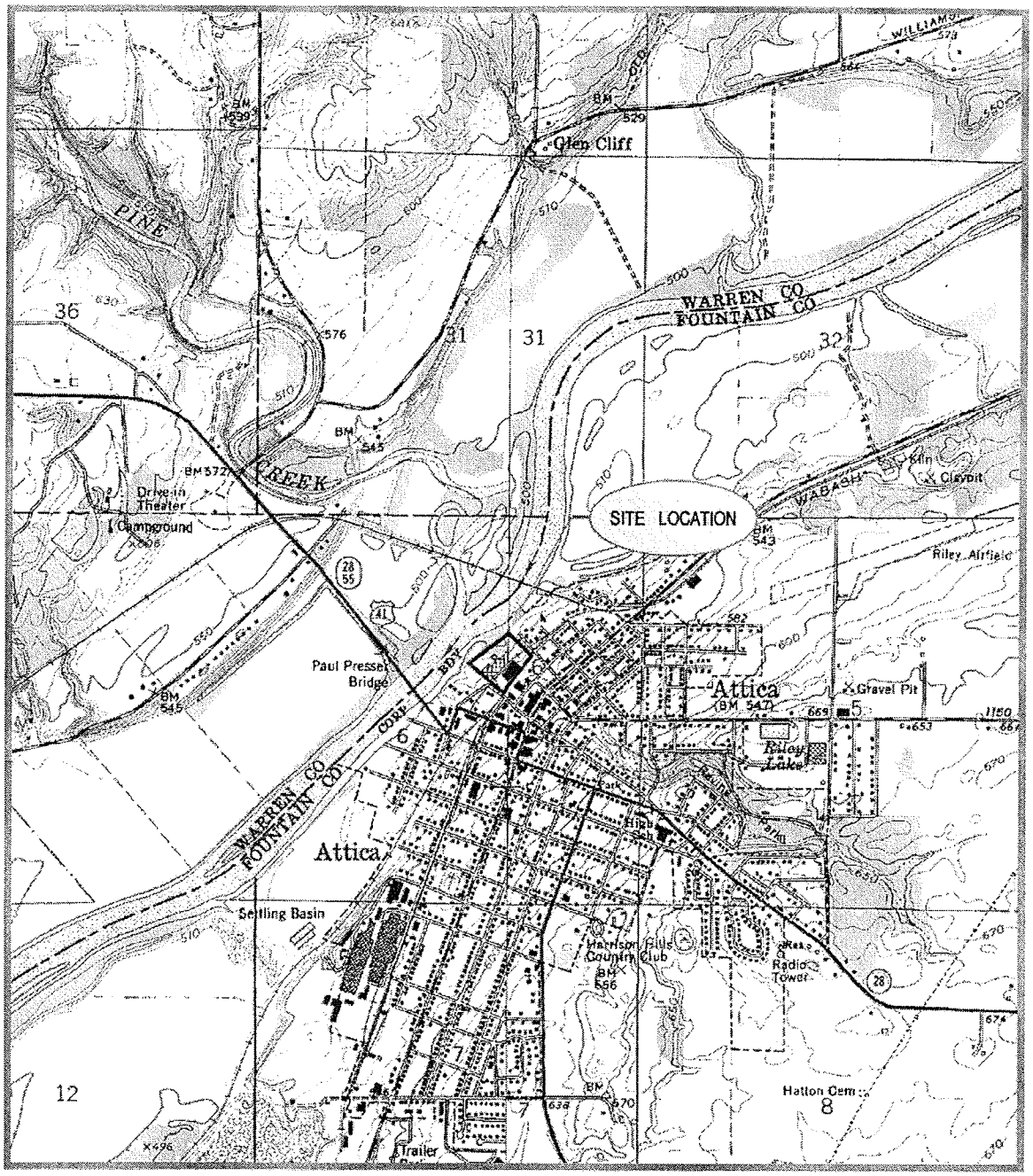

Scale 1:24000

0 1/2 1 MILE

1000 0 1000 2000 3000 FEET

QUADRANGLE LOCATION

FIGURE 1

SITE LOCATION MAP

C & D TECHNOLOGIES, INC.
200 WEST MAIN STREET
ATTICA, INDIANA

(SOURCE OF MAP IS USGS 7.5 MINUTE QUADRANGLE MAP, WILLIAMSPORT, ATTICA, INDIANA)

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3.1.1 Manufacturing Activities

The Attica C&D Technologies plant manufactures large motive (vehicle) batteries and standby power lead acid batteries for use in commercial, industrial, and military applications. The manufacturing process in the plant ranges from casting and curing of lead battery parts, pasting battery grids, processing plates and assembling, and charging and finishing production batteries.

A summary of potential manufacturing sources and operational controls for specific environmental concerns follows (air emissions, wastewater discharges, storm sewers and storm water, and hazardous waste management). Each description is intended to generally familiarize the reader with the relationship between current manufacturing processes and issues of interest to this investigation. More detailed and technical information about each one of these manufacturing processes can be reviewed in cited reports below. Section 4 of this plan will outline environmental concerns, regulatory compliance issues, and investigation focus areas and potential responses to these findings.

3.1.1.1 Emissions Controls

Regulated emissions result from 18 melting pot operations, sulfuric acid treatment of assembled battery elements, drying ovens, acid filling of battery cases and oxide removal from production materials. These emission sources are managed by a variety of control methods and technologies. These include OSI filter systems, shed industrial baghouses and wet scrubbers. These systems are designed and managed to independently or in tandem, capture and/or treat specific components of hazardous airborne contaminants. Air monitoring samples air discharges to detect the effectiveness and need for adjustments to these treatment systems.

3.1.1.2 Wastewater Controls

Battery manufacturing processes and air emissions controls such as wet scrubbers and floor washing create wastewater that is pre-treated before it enters the city wastewater treatment system for final treatment and release back into the environment.

C&D Technologies installed a new wastewater pretreatment plant (WWPTP) and retention tank farm in 2004. The Facilities' production wastewater is first collected in a concrete sump. Then it is pumped through equalization, pH adjustment, and sludge thickening tanks and micro-filtration units for treatment. The first cycle of pre-treated wastewater is sampled and held in one of six 15,000-gallon fiberglass above ground effluent storage tanks. Then it is sampled again prior to discharge to the Attica Publicly Owned Treatment Works (POTW). If test results are not acceptable, it is returned to the

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WWPTP for re-treatment. The WWPTP pre-treats approximately 65,000-gallons of production wastewater each week.

3.1.1.3 Storm Sewers and Controls

In recent history, the Attica C&D Technologies facility maintains five storm water outlets or outfalls. They vary in type (PVC and concrete tile) and in size (from six to 48 inches in diameter). These facility storm water outlets eventually discharge to a City owned 96 inch tile and a drainage ditch, both of which lead to the Wabash River. Recently installed flow monitoring devices collect storm water samples for testing and analysis for storm water compliance. As a result of recent evaluations and testing of the systems, some of the storm water conveyances have been upgraded, closed or re-routed (See Figure 2)

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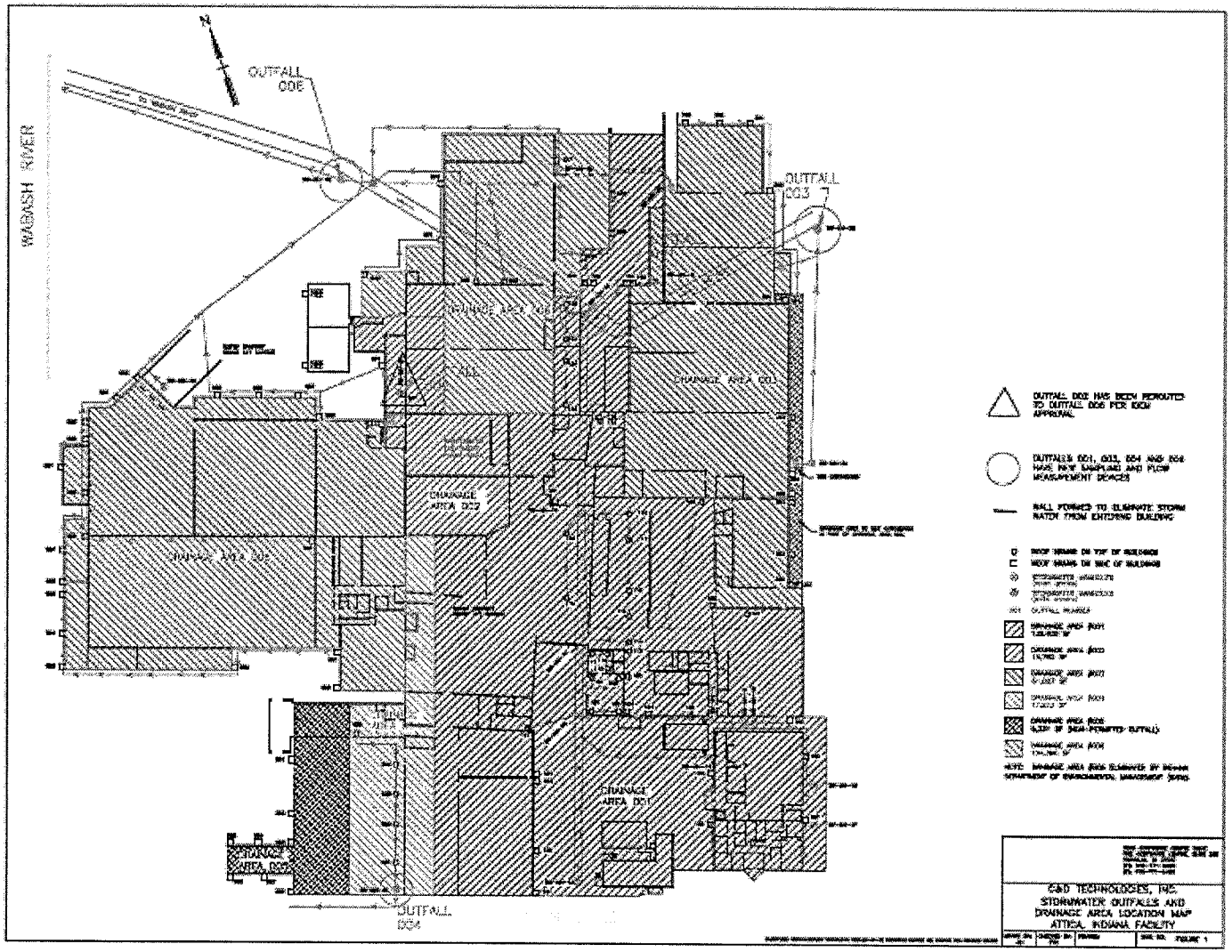
FIGURE 2



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3.1.1.4 Waste Management

Since 1996, the Attica C&D Technologies Facility is currently regulated as a "Large Quantity Generator" (LQG) of hazardous waste. Frequently generated waste steams and their sources are provided in Table 1 (Clayton Group Services, Inc., 2007).

The Facility manages two types of waste storage areas: (1) collection or accumulation areas, and (2) storage areas. Fifteen regulated Satellite Accumulation Areas (SAAs) collect and assemble hazardous wastes for removal, treatment or temporary storage of waste. Facility hazardous waste "Current Container Management Areas" (CCMAs) are established to temporarily store wastes in 55 gallon drums. These wastes are grouped into four classifications. Used oil is also stored in drums. Drums containing wastes that are accumulated in the SAAs are transported to the CCMAs for storage until disposal.

Due to the long history of industrial activity on the site, the site also includes a variety of former regulated and formerly unregulated hazardous material storage areas. Investigations identify these sites for management or future action by reviewing historic written records and by interpreting historical aerial and site photographs.

3.2 Site History (Current Conditions Report, C & D Technologies)

The following summarizes the history of the Facility site. It is intended to aid in public awareness of how the site came to be used for industrial activities and their current operations. This information is also pertinent to facilitating additional awareness of environmental factors associated with the site and to stimulate knowledge and input from the community concerning unrecorded activities which may aid in current investigations.

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TABLE 1
C & D Technologies Attica Plant
Waste Summary Table

Scrap Lead Material		
Scrap lead	Remelt lead ingots & small lead castings (i.e., connectors); non-lead materials to be less than 1%.	3,930,000 lbs Annually to Doe Run Company, Resource Recycling Division for beneficial reclamation
Lead dross	Lead dross generated by the skimming of casting pots & grid casting machines to include solid lead "splatters."	
Plates	To include grids, oxide, and separators.	
Elements (or groups)	Assembled plates with separators (no jars).	
Batteries (or cells) Wet	Assembled batteries with electrolyte	
Batteries (or cells) Dry	Assembled batteries without electrolyte	
Covers	Battery covers with or without lead inserts	
Lead dust	Generated from air pollution control dust baghouses, dust collectors, central vacuum system	
Lead shavings	Lead shavings from the slitter saw contain only lead alloy with no other contamination.	
Wet Paste	Scrap paste & paste collected from the area around the machine; to contain less than 2 inches of free water on the top of each container.	
Slump Paste, Wet	Paste collected from the sump in the plate processing area & the drop out tank, to contain less than 2 inches of free water on the top of each container.	
Filter Cake Paste	Paste collected and dewatered through filter press; to contain no standing water.	
Filter Cake Wastewater Treatment	Dewatered sludge (through filter press) from wastewater treatment system; to contain no standing water	
Steel Scrap	Lead-contaminated steel scrap; to include obsolete equipment and/or parts, ductwork, racks, etc.	
Baghouse Bags / Dust Collector Filters	Cloth-type baghouse bags/dust collector filters from air pollution control devices: baghouses, dust collectors, central vacuum systems.	

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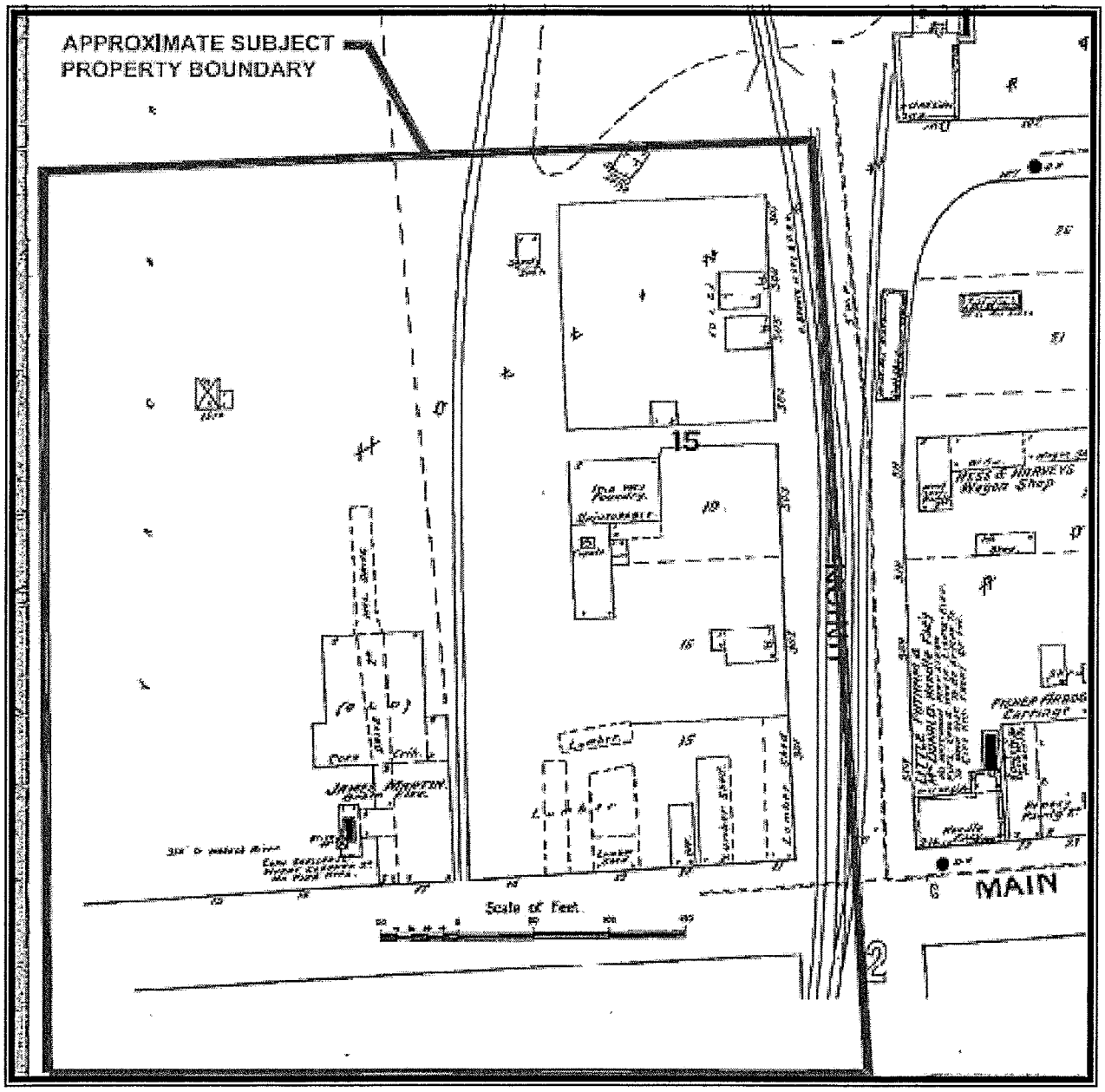
3.2.1 Late 1800's - Early Industrial Use Documented

The current C&D Technologies site has been the location of varying degrees of industrial activity since the late 1800s. An 1886 fire insurance map identified the Jas Martin & Company Grain Elevator, residential properties, a vacant foundry and a lumber yard [See Figure 3 (Clayton Group Services, Inc., 2007)].

Figure 3

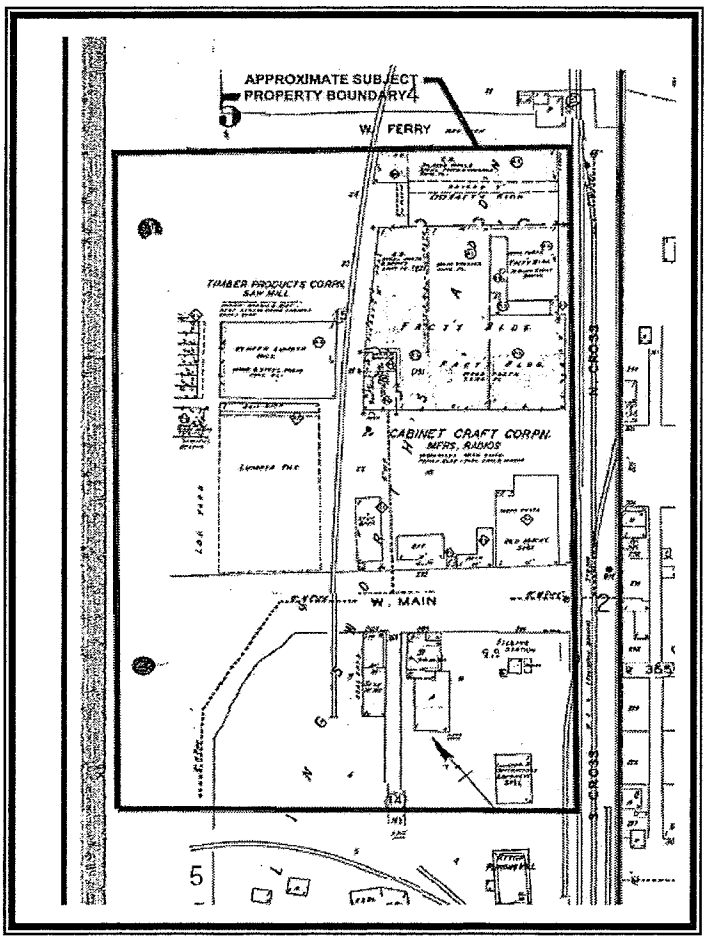


3.2.2 1900 to 1955 – Early Industries and Current Buildings Erected

Prior to 1955, Sanborn fire maps showed that a variety of businesses operated on or were associated with the site. These include the Attica Bridge and Machine Works, H.C. Martin & Company Lumber Yard, Attica Saw Mill, Wabash Valley Canning Company, Timber Products Corporation Saw Mill, Cabinet Craft Corporation (casket and radio cabinet manufacturer), Howard Radio Company (HRC), which became Radio Materials Corporation (RMC), and a gasoline filling station.

Many of the current on-site buildings (main plant buildings) were constructed in the 1940s and 1950s as indicated by Figure 4 (Clayton Group Services, Inc., 2007) below. Portions of the site were used for drive up disposal (the Attica dump area).

Figure 4



3.2.3 1955 to 1980's – Battery Operations Begin and Grow

In 1955, Electric Auto-Lite Company (EA-L) purchased a portion of the east building from RMC and began on-site battery manufacturing operations. In 1960, EA-L acquired the remainder of the east building and west building. In 1963, Eltra Corporation (EC) made EA-L one of its manufacturing divisions. Over time, EC expanded the current acquisitions to include the Attica dump area, the FPI property and land extending to the Wabash River. EC constructed a parking lot over as a portion of the dump in 1978. In 1979, EC was acquired as a division under Allied Chemical Corporation and the facility became known as C&D Batteries. Additional parcels were added in the 1980's, including two parcels on Main Street.

3.2.4 1980's to Present – Federal Agencies Become Involved

Since the late 80's, the C&D Attica site has been the focus of a variety of federal environmental site investigations. Allied Chemical Corporation officials initiated one of the first site investigations by approaching U.S. EPA to assess the site pursuant to section 103(c) of the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or "Superfund"). Allied Corporation submitted the notification listing acids and heavy metals as waste types and the source as a lead-acid battery plant.

Subsequently, the site was evaluated in a Preliminary Assessment (PA) and which was later partially amended by the Indiana Department of Environmental Management (IDEM) in 1987. A Screening Site Inspection (SSI) work plan for the C&D site under Technical Directive Document (TDD) F05-8710-075 was issued in 1987. The work plan for the C&D site was approved in 1988 and The SSI was conducted in 1989.

Figure 5 (Clayton Group Services, Inc., 2007) on the following page shows the current layout of facilities owned and operated by C&D Technologies and many of the immediately surrounding land uses.

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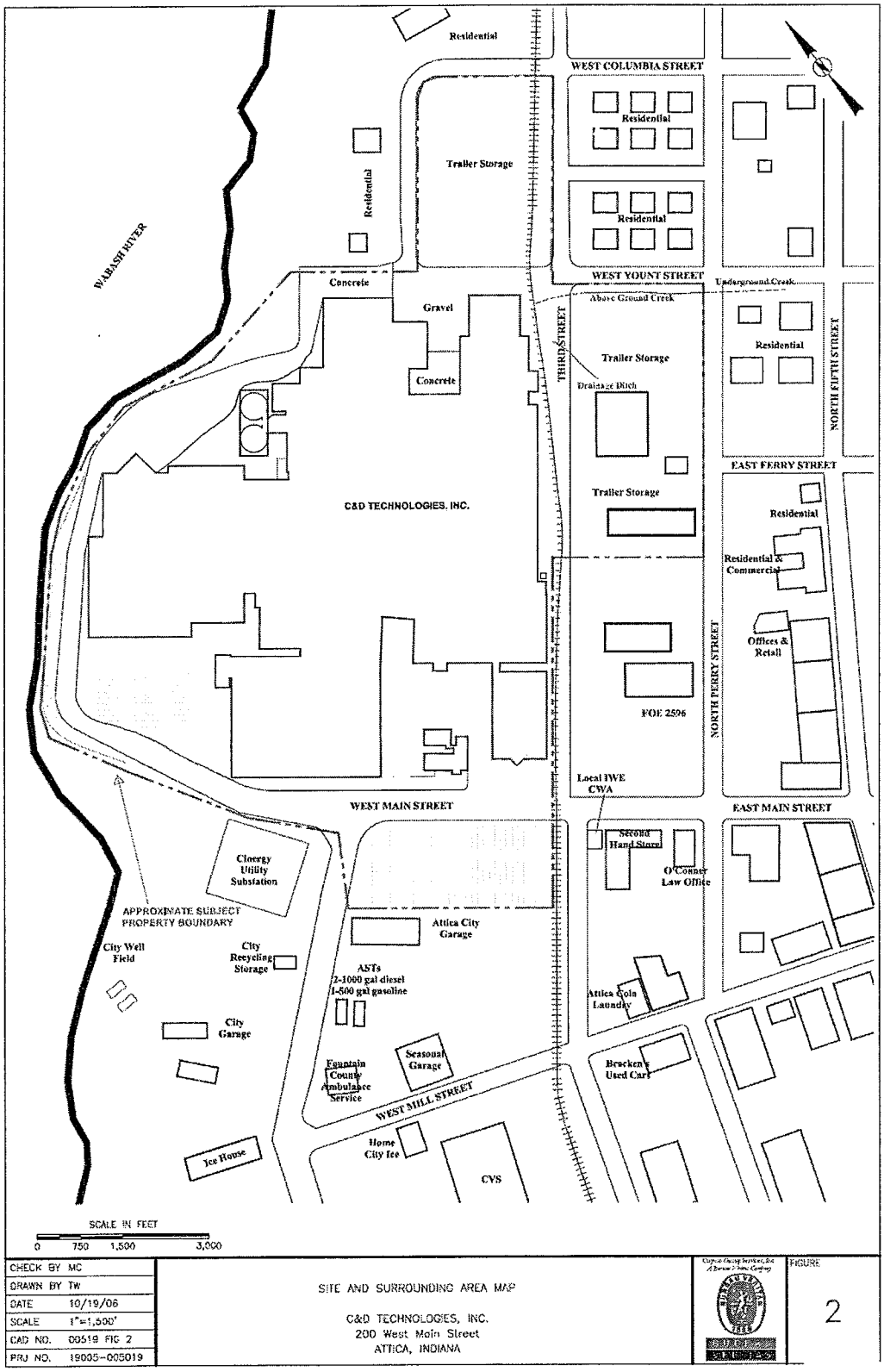
Figure 5



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3.2.4 1980's to Present – Federal Agencies Become Involved (continued)

The following is a summary of the results of past investigations and are quoted from recent site conditions reports (Clayton Group Services, Inc. (2007). It should be noted that none of the results of previous studies will be used as a substitute for information that is required for this investigation.

- 1990 Screening Site Inspection Report—This report was commissioned by EPA and conducted by Ecology & Environment, Inc. (E&E). Twelve soil samples were taken on the site, many of which were within a location known as Area 8, one of the areas of current concern. The samples were analyzed for the CLP target compound and target analyte lists. Polyaromatic Hydrocarbon (PAH) compounds were detected at relatively low levels (all less than 8 milligram per kilogram (mg/kg) or part per million, ppm) in many of these samples. Municipal water wells were sampled down gradient from the site, and TCE and cis-1,2-DCE were detected in the low part per billion (ppb) range in those wells.

- Soil Investigation for C&D Attica in 2000 – These tests were performed by Earth Tech and were limited to the area for a new office building. No samples were collected within any of the current areas of concern. Analysis was performed for volatiles and PAH compounds. No target analytes were detected.

- UST Closure Report for C&D Attica Location, October, 2000 - Liesch Companies' report documented the removal of all underground storage tanks and related materials from an area known as Area 14 – former gasoline filling station. The State of Indiana has listed the site as closed. This serves as the basis for no further action for Area 14, as recommended in the RFI Work Plan.

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3.2.5 1980's to Present – Federal Agencies Become Involved at the Site

(*Summary of the results of past investigations - Continued*)

- April, 2006 VOC Investigation Report by Clayton Group Services—The Work Plan for this report was approved by EPA Region V. Five monitor wells were installed at the site. Volatile organic compounds (VOCs) were analyzed in groundwater samples collected at various depths during the installation of each monitor well, and the monitor wells were sampled and analyzed after well development was completed. The main conclusions were:

    1) Elevated concentrations and the depth of the TCE detected could be interpreted as originating from an up-gradient source (a site with a higher groundwater elevation).

    2) No detection of TCE was observed in groundwater monitoring wells installed between the "landfill" on the C&D facility site and the City of Attica water supply wells.

    3) The direction of groundwater flow from east-southeast to west-northwest indicate that the C&D facility does not contribute TCE or any other VOCs to the City of Attica well field contamination.

- Appendix A contains two exhibits of previous spill events: Exhibit 1, Map of Spill Locations and Exhibit 2, Past Spill Event Summary and responses taken from 1981 through 1999.

- A USEPA Consent Decree (1:03-dv-413-DFH-TAB) dated November 20, 2006 required that the storm water system be inspected and upgraded. Flow monitoring devices and automated sampling devices were also installed in compliance with the Consent Decree. An aging outfall was relined, other infrastructure was repaired and additional testing and analysis was completed.

- A U.S. EPA Administrative Order on Consent, dated January 2007 to C&D Technologies, required new and extensive RCRA environmental investigations.

Figure 6 on the following page illustrates the location of previous areas of interest for environmental investigation in relation to current facilities and infrastructure.

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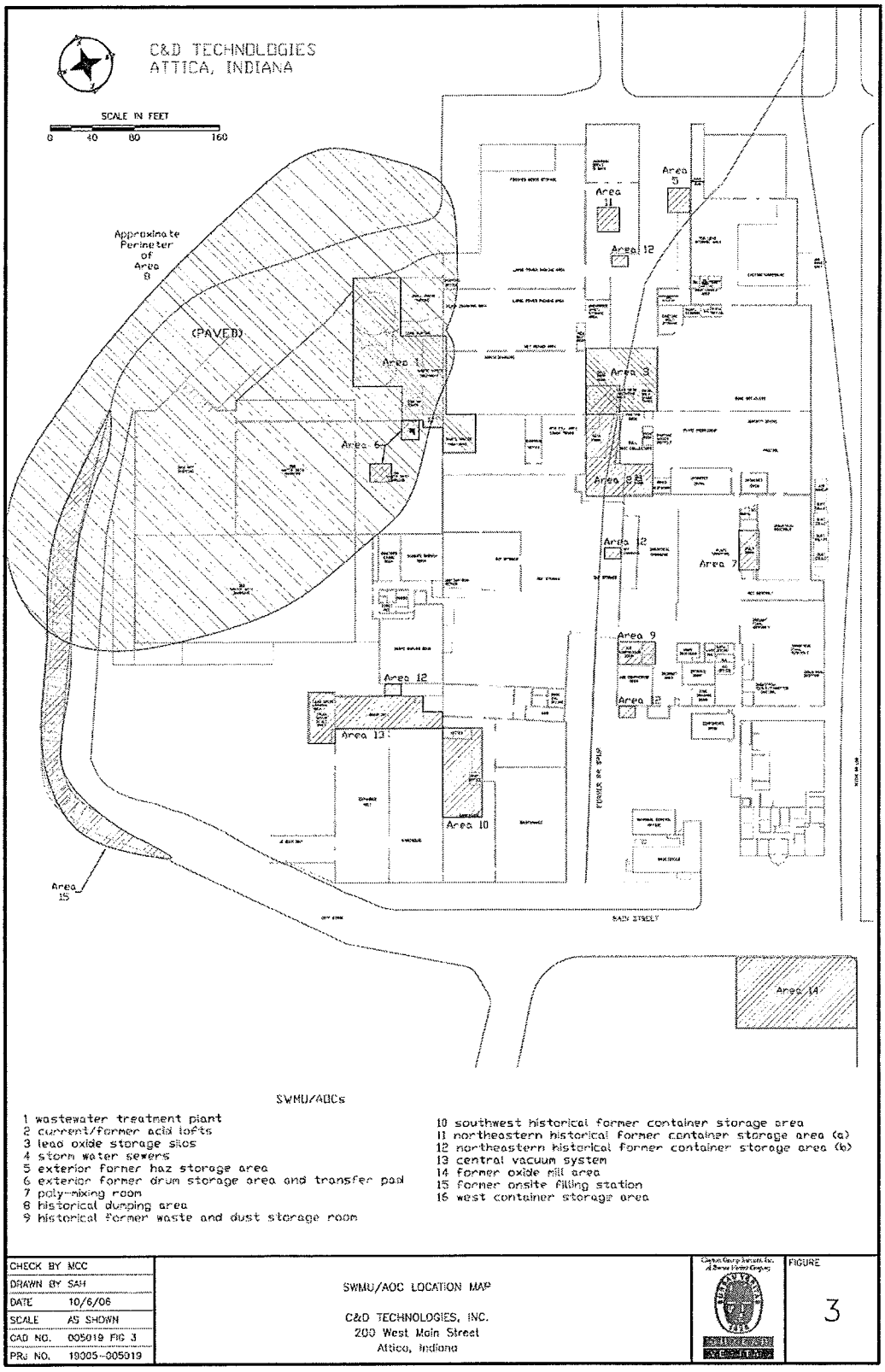
Figure 6


C&D TECHNOLOGIES
ATTICA, INDIANA
SCALE IN FEET
0 40 80 160
Approximate Perimeter of Area 8
(PAVED)
Area 1
Area 2
Area 3
Area 4
Area 5
Area 6
Area 7
Area 8
Area 9
Area 10
Area 11
Area 12
Area 13
Area 14
Area 15
MAIN STREET
SWMU/AOCs
1 wastewater treatment plant
2 current/former acid lofts
3 lead oxide storage silos
4 storm water sewers
5 exterior former haz storage area
6 exterior former drum storage area and transfer pad
7 poly-mixing room
8 historical dumping area
9 historical former waste and dust storage room
10 southwest historical former container storage area
11 northeastern historical former container storage area (a)
12 northeastern historical former container storage area (b)
13 central vacuum system
14 former oxide mill area
15 former onsite filling station
16 west container storage area
CHECK BY MCC
DRAWN BY SAH
DATE 10/6/06
SCALE AS SHOWN
CAD NO. 005019 FIG 3
PRJ NO. 19005-005019
SWMU/AOC LOCATION MAP
C&D TECHNOLOGIES, INC.
200 West Main Street
Attica, Indiana
FIGURE
3

The purpose of the next section is to transition from a summary of historical events and issues to a summary of current issues and activities. The following information will summarize the status of environmental investigation activities that are currently planned or are on-going and their relationship to various community, site and facility issues.

4.1 Community Issues

4.1.1 Community Profile

The C&D facility is bordered to the north and northeast by residential properties. The facility is bordered to the east by North Perry Street followed by residential and retail commercial properties. The southeastern side of the facility is bordered by a social lodge (FOE 2596). The southern side of the facility is bordered by West Main Street followed by a law office, commercial retail, coin laundry facility, Attica City Garage and storage yard Synesael Garage, ambulance service, ice house warehouse and a Cinergy utility substation. The C&D facility is bordered to the west by the Wabash River.

Table 2 (U.S. EPA 2007b) summarizes the demographic profile based on 2000 census data for the community within a 3 mile radius of the facility. Some of the more notable statistics include the following. Within 3 miles radius of the C&D facility, the US Census reports that in 2000:

- 98 percent of the population was white
- 74 percent of the population was over 18 years of age
- 18 percent are over 65 years of age
- 26 percent are 18 years and younger
- 69 percent of families in this radius made less than $50,000 per year
- Over 50 percent of the population had a high school degree and 35 percent had some college education or a four year degree

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Table 2

Demographic Profile of Surrounding Area (3 Miles) Data Dictionary

This section provides demographic information regarding the community surrounding the facility. ECHO compliance data alone are not sufficient to determine whether violations at a particular facility had negative impacts on public health or the environment. Statistics are based upon the 2000 US Census data. The latitude and longitude are obtained from the EPA Locational Reference Table (LRT) when available.

Radius of Area:	**3 Miles**	**Land Area:**	**98.48%**	**Households in area:**	**2,195**
Center Latitude:	**40.295272**	**Water Area:**	**1.52%**	**Housing units in area:**	**2,407**
Center Longitude:	**-87.250395**	**Population Density:**	**198.89/sq. mi.**	**Households On Public Assistance:**	**35**
Total Persons:	**5,539**	**Percent Minority:**	**1.46%**	**Persons Below Poverty Level:**	**485**

Race Breakdown	**Persons (%)**	**Age Breakdown:**	**Persons (%)**
White:	5,474 (98.83%)	**Child 5 years and less:**	427 (7.71%)
African-American:	(0.00%)	**Minors 17 years and younger:**	1,432 (25.85%)
Hispanic-Origin:	21 (0.38%)	**Adults 18 years and older:**	4,107 (74.15%)
Asian/Pacific Islander:	23 (0.42%)	**Seniors 65 years and older:**	984 (17.76%)
American Indian:	19 (0.34%)		
Other/Multiracial:	1 (0.02%)		

Education Level (Persons 25 & older)	**Persons (%)**	**Income Breakdown:**	**Households (%)**
Less than 9th grade:	244 (7.02%)	**Less than $15,000:**	363 (16.54%)
9th-12th grades:	602 (17.32%)	**$15,000-$25,000:**	395 (18.00%)
High School Diploma:	1,754 (50.46%)	**$25,000-$50,000:**	782 (35.63%)
Some College/2-yr:	589 (16.94%)	**$50,000-$75,000:**	446 (20.32%)
B.S./B.A. or more:	287 (8.26%)	**Greater than $75,000:**	247 (11.25%)

Note: Please note: Entries in gray denote records that are not federally required to be reported to EPA. These data may not be reliable.

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4.1.2 Chronology of Community Involvement

To date, there has been no organized community involvement plan to systematically inform the community about environmental activities at the plant.

The following summarizes anticipated community involvement as a result of this community involvement plan.

July 2007	Develop Community Involvement Plan
September 2007	EPA Reviews Involvement Plan Establish Information Repository Public review of Public Involvement Plan
Winter 2007	Monitor Progress of Investigations
Spring 2008	Announce Investigation Findings
To Be Determined	Public review and comment on proposed final corrective measures
To Be Determined	Public review of U.S. EPA "Final Decision and Response to Comments" (Final Decision).

4.2 Site Issues

4.2.1 Current Investigations

On January 18, 2007, the United States Environmental Protection Agency Region V issued an administrative order on consent to the C&D Technologies battery manufacturing facility in Attica, Illinois (U.S. EPA 2007a). The following summarizes the requirements of the Order. The complete order is located in Appendix B.

4.2.2 Chronology of Summarized Requirements and Status:

C&D must identify and define the nature and extent of releases of hazardous waste and hazardous constituents at or from the Facility which may pose an unacceptable risk to human health and the environment. The following actions are referenced in the

4.2.2.1 Current Conditions Report:

Provide to U.S. EPA a brief report covering all areas of the Facility, including areas leased to other parties or operators and the former landfill.

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4.2.2.2 RCRA Facility Investigation (RFI) Work Plan:

Provide to U.S. EPA a detailed strategy for conducting the environmental investigation addressing EPA specified criteria and deliverables.

1) *RFI scope* (which issues and areas will be studies)
2) *Potential Receptor Identification* Plan submitted separately or no later than the RFI work plan. It must include a *Conceptual Site Model* (CSM) that will identify primary and secondary contaminant fate and transport (migration) to all media, including chemical transformation and ecological, human and groundwater conceptual site receptors. It shall be updated every 90 days if new data alters the prior model or indicates that the prior model was incomplete.
3) *RFI Work Plan Objectives*
4) *Environmental Setting and Characterization Plan*
5) *RFI Project Management Plan*
6) *RFI Sampling and Analysis Plan*
7) *RFI Quality Assurance Project Plan*
8) *Data Management Plan*
9) *Health and Safety Plan*
10) *Community Relations Plan*
11) Schedule for Implementation of the Work Plan

4.2.2.3 RCRA Facility Investigation (RFI) Report:

This report must describe the nature and extent of any; releases of hazardous waste and hazardous constituents at or from the Facility which do not pose an unacceptable risk to human health and the environment, and provide the basis for those conclusions, including an evaluation of the risks. The RFI Report may be submitted in two phases to provide timely support for the following demonstrations and determinations.

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4.2.2.4 Environmental Indicators Report:

This report should document that all current human exposures to contamination at or from the Facility are under control (i.e., significant or unacceptable exposures do not exist for all media known or reasonably suspected to be contaminated with hazardous wastes or hazardous constituents above risk-based levels, for which there are complete pathways between contamination and human receptors.)

It should document that the migration of all groundwater known or reasonably suspected to be contaminated with hazardous wastes or hazardous constituents above acceptable levels is stabilized to remain within any existing areas of contamination as defined by monitoring locations designated at the time of the demonstration.

To prepare for the Environmental Indicators report, C&D will:

1) Determine appropriate risk screening criteria under current use scenarios and provide the basis and justification for the use of these criteria. Determine any current unacceptable risks to human health and the environment and describe why other identified risks are acceptable.

2) Control any unacceptable current human exposures that C&D identifies. This includes performing any corrective actions or other response measures (corrective measures) necessary to control current human exposures to contamination to within acceptable risk levels.

3) C&D must stabilize the migration of contaminated groundwater. This includes implementing any corrective measures necessary to stabilize the migration of contaminated groundwater.

4) C&D will conduct groundwater monitoring to confirm that any contaminated groundwater remains within the original area of contamination.

5) C&D will prepare a report, either prior to or as part of the Environmental Indicators Report that describes and justifies any interim actions performed to meet the requirements of this Section, including sampling documentation, construction completion documentation and/or confirmatory sampling results.

4.2.2.5 Analytical Procedures:

The following are intended to assure the community in the quality of the testing procedures used conducted by C&D Technologies during the environmental investigation.

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1) All sampling and analysis conducted under this Order must be performed in accordance with the Region 5 RCRA Quality Assurance Project Plan Policy (April 1998) as appropriate for the site, and be sufficient to identify and characterize the nature and extent of all releases as required by this Order. U.S. EPA may audit laboratories C&D selects or require C&D to purchase and have analyzed any performance evaluation samples selected by U.S. EPA which are compounds of concern. C&D must notify U.S. EPA in writing at least 14 days before beginning each separate phase of field work performed under this Order. At the request of U.S. EPA, C&D will provide or allow U.S. EPA or its authorized representative to take split or duplicate samples of all samples C&D collects under this Order.

2) Any risk assessments C&D conducts must estimate human health and ecological risk under reasonable maximum exposure for both current and reasonably expected future land use scenarios. In conducting the risk assessments, C&D will follow the RAGS, ERAGS or other appropriate U.S. EPA guidance. C&D will use appropriate, conservative screening values when screening to determine whether further investigation is required. Appropriate screening values include those derived from Federal Maximum Contaminant Levels, RAGS, ERAGS, U.S. EPA Region 9 Preliminary Remediation Goals, U.S. EPA Region 5 Ecological Screening Levels, and U.S. EPA Region 5 Risk Based Screening Levels.

4.2.2.6 Final Corrective Measures:

C&D must propose to U.S. EPA the final corrective measures necessary to protect human health and the environment from all current and reasonably expected future unacceptable risks due to releases of hazardous waste or hazardous constituents at/or from the Facility. Depending upon the extent and complexity of environmental issues that may be identified at the Facility, C&D will submit either a CMP or CMS described below:

1) *A Corrective Measures Proposal* (CMP) will be completed if the Facility has limited or simple environmental issues.

2) *A Corrective Measures Study* (CMS) will be completed if the Facility has extensive or complex environmental issues. The CMS will identify and evaluate potential remedial alternatives for releases that pose an unacceptable risk to human health or the environment and contain supporting documentation for the corrective measures that C&D proposes .to remediate such releases at the Facility.

3) The data and information gathered during the Current Conditions Report, the RFI, and any interim measure will determine whether a CMP or CMS is appropriate and the scope of the CMP or CMS.

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4) The CMP or CMS containing the final proposed corrective measures must also include a detailed schedule to construct and implement the final corrective measures, and to submit a Final Remedy Construction Completion Report. C&D must complete as much of the initial construction work as practicable within one year after U.S. EPA selects the final corrective measures. C&D must complete all final corrective measures within a reasonable period of time to protect human health and the environment.

5) As part of developing its CMP or CMS, C&D must propose appropriate risk screening criteria, cleanup objectives, and points of compliance under current and reasonably expected future land use scenarios and provide their basis and justification.

6) U.S. EPA may request supplemental information from C&D if U.S. EPA determines that the CMP or CMS and supporting information do not provide an adequate basis to select final corrective measures that will protect human health and the environment from the release of hazardous waste and hazardous constituents at or from the Facility. C&D must timely provide to U.S. EPA any supplemental information that U.S. EPA requests in writing.

7) U.S. EPA will provide the public with an opportunity to review and comment on its proposed final corrective measures, including a detailed description and justification for the proposal (the Statement of Basis). Following the public comment period, U.S. EPA will select the final corrective measures, and will notify the public of the decision and rationale in a "Final Decision and Response to Comments" (Final Decision).

4.2.2.7 C&D Implements Corrective Measures:

C&D will implement the Final Corrective Measures selected in U.S. EPA's Final Decision According to the Schedule in the Final Decision.

1) C&D must provide quarterly progress reports to U.S. EPA by the fifteenth day of the month after the end of each quarter. The report must list work performed to date, data collected, problems encountered, project schedule, and percent project completed.

2) The parties will communicate frequently and in good faith to assure successful completion of the requirements of this Order, and will meet via teleconference or in person on at least a semi-annual basis to discuss the work proposed and performed.

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4.2.2.8 Final Remedy Construction Completion Report:

C&D must document all work that it has performed pursuant to the schedule in U.S. EPA's Final Decision.

1) *Operations and Maintenance Plan*: If ongoing monitoring or operation and maintenance are required after construction of the final corrective measures, C&D must include an operations and maintenance plan in the Final Remedy Construction Completion Report. C&D must revise and resubmit the report in response to U.S. EPA's written comments, if any, by the dates U.S. EPA specifies. Upon U.S. EPA's written approval, C&D must implement the approved operation and maintenance plan according to the schedule and terms of the plan.

4.2.2.9 Other Factors:

The following are key components in which the community should be aware.

1) The Project Managers for C&D and U.S. EPA can agree in writing to extend any deadline. The Division Director; Waste, Pesticides and Toxics Division must approve extensions over three months.

2) C&D is required to identify and define the nature and extent, and remediate as necessary, releases of:

    a Hazardous waste and hazardous waste constituents originating at the Facility (includes the former landfill), and

    b Hazardous waste and hazardous waste constituents both originating at and migrating from the Facility (per Order).

    c Note: The complete Order is in Appendix B.

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Representatives of the EPA Region 5 RCRA staff and C&D Technologies have been designated to respond directly to media and public inquiries regarding investigation activities. These representatives will coordinate public information releases, creation of frequently requested questions and answers, and status reports and findings of various stages of the investigation process. The following sections outline other activities and resources prepared for the community involvement plan process.

5.1 Local Officials and Leaders

Involve local officials and community leaders: The City of Attica has duly elected officials who are very experienced and routinely involved in providing the community with direct communications about issues of concern to the community. This plan acknowledges the critical role these leaders can play to convey information regarding the environmental investigation of the C&D Technologies site. Lists of identified officials and community leaders that will receive regular updates of the progress of the investigation are listed in Appendix C.

5.2 Residents

Keep residents informed through traditional and effective community communication channels: Community residents have a right to timely, accurate and complete information regarding the nature of any environmental findings that may lead to a finding of unacceptable risks to human health and the environment. Community news publications such as newspapers, church newsletters and bulletin boards, and public meeting, local radio coverage and other common venues will be used to keep the community informed and up-to-date.

5.3 Technical Activities

Continue to provide follow-up information after current environmental investigations are complete as emerging technical issues, risks and future actions materialize, if any: The community has a right to timely, accurate and complete information as new issues or activities emerge. Special concerns and amendments to the Community Involvement Plan will be necessary if unacceptable risks to human health and the environment are identified. Until new legal agreements are reached or environmental findings dictate otherwise, all current or future actions will be governed by the current Administrative Order.

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5.4 Contingency Community Involvement Activities

Initiate other contingency community involvement activities as the environmental investigation evolves and as findings warrant: The following activities will be initiated per EPA Region V input, community interest and as circumstances warrant.

Activity	Time Frame
1. Maintain a site mailing list	As Needed
2. Provide site information on the Internet	As Needed
3. Write and distribute news releases	As needed
4. Prepare and distribute fact sheets and update reports	Reports - On-going Fact Sheets - As Needed
5. Hold public meetings	As needed
6. Publish newspaper advertisements	As needed
7. Program Evaluation	As needed

5.5 Information Repository

The Administrative Order requires the establishment of an information repository. The information repository will be a designated location that will maintain public access to site-specific documents and general information about the environmental investigation. The information repository for the C&D Technologies Facility RCRA environmental investigation will be at:

Attica Public Library
305 South Perry St.
Attica, IN 47918
Telephone 765-764-4194
Fax 765-764-0906
http://www.attica.lib.in.us

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U.S. Environmental Protection Agency. (2007a). *Administrative Order on Consent to C&D Technologies,* U.S. EPA Docket Number RCRA-05-2007-0003. Chicago, IL. U.S. EPA Region 5.

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Clayton Group Services, Inc. (2007). *Current Conditions Report, C&D Technologies, Inc., Attica Indiana Facility, Fountain County – IND000810754, Clayton Project No. 19005-005019.01-001.*

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APPENDIX A

Exhibit 1: Map of Spill Event Sites (Clayton Group Services, Inc. (2007)

Exhibit 2: Past Spill Release Summary (Clayton Group Services, Inc. (2007)

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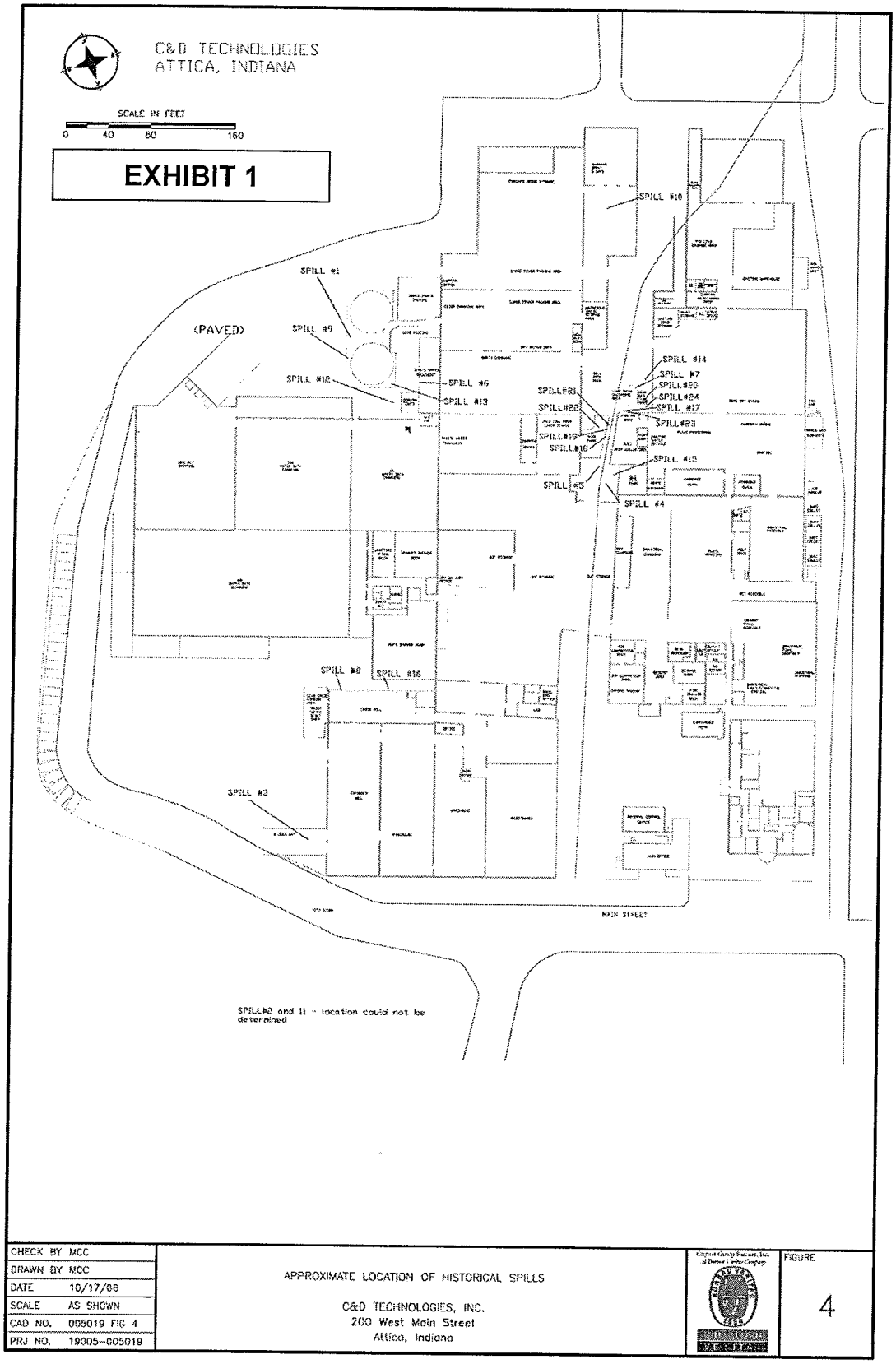

CHECK BY MCC	APPROXIMATE LOCATION OF HISTORICAL SPILLS	FIGURE
DRAWN BY MCC	C&D TECHNOLOGIES, INC.	4
DATE 10/17/06	200 West Main Street	
SCALE AS SHOWN	Attica, Indiana	
CAD NO. 005019 FIG 4		
PRJ NO. 19005-005019		

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EXHIBIT 2

TABLE 2
Past Spill Release Summary

C&D Technologies, Inc., Attica, Indiana Facility

Clayton #	Source of Information	Spill Date	Material	Quantity	Location	Current Conditions Report Area	Response
1	Indiana State Board of Health	02/18/81	Concentrated Sulfuric Acid	95 gallons	Slow leak in a 7,500-gallon storage tank in the wastewater treatment plant	AREA 1	Spilled acid drained into a storm sewer leading to the Wabash River. The sewer was flushed with water. pH of water entering Wabash River was one. C&D confident given the high water level in the River that the dilution would quickly neutralize the issue.
2	Indiana State Board of Health	02/25/81	Dilute Acid	50 gallons	Storm sewer leading to the Wabash River.	UNKNOWN LOCATION	unknown
3	C&D Inter-Office Environmental Incident Log	03/03/83	Diesel Fuel	10 to 20 gallons	Fuel spill occurred in the truck dock area.	*Spill occurred in truck docks which is not in an identified SWMU or AOC Area. However, fuel entered facility storm drains and therefor is included in AREA 4*	Spill impacted the truck dock area, facility storm drain system and the Wabash River. A temporary wire and straw dam was erected across the storm drainage ditch. A small amount of the fuel was observed on the Wabash River.
4	C&D Inter-Office Environmental Incident Log	05/24/83	Used Acid	Unknown Quantity	Overfill of outside storage tank in the diked concrete alley	AREA 2	Reportedly all spilled material was contained
5	C&D Inter-Office Environmental Incident Log	05/31/83	Acid Tainted Water	Approximately 80 gallons	Underground process drain clogged resulted in overflow from cleanout ports in alley and into storm drains	AREA 2 & 4	Approximately 5 to 20 gallons escaped into the storm drain, 50 to 60 gallons were contained by sand bags and sealed manhole lids. pH of water was three.
6	C&D Letter to the Indiana State Board of Health	06/16/83	Lead Impacted Neutralization Liquid	2,000 gallons	Pipe burst on pretreatment system neutralization tank. Liquid poured onto the floor, out the back door of the pretreatment system across the ground over a hill and into a city storm ditch	AREA 1 & 4	Liquid traveled approximately 20 yards. 500-gallons contained within pretreatment building, 500-gallons recovered from pools on the ground, and 1,000-gallons escaped to storm ditch. Liquid had a pH of 8 and lead concentration estimated at 100ppm. Shoveled wet and contaminated areas of soil into drums which was processed in the wastewater treatment system.
7	C&D Memorandum	02/02/84	Lead Oxide	Unknown Quantity	Unknown - probable lead oxide silos	AREA 3	memo addressed spill prevention methods and referenced two lead oxide spills that had occurred in past two months, no other documentation regarding any known spills matched this information
8	C&D Inter-Office Communication	02/17/84	Lead Oxide	Unknown Quantity	Ground around oxide mill	AREA 14	Air emissions noted from the central vacuum system for the oxide mill. Reportedly emissions had been noted for past two years. Corrective measures for future emissions recommended, no information for any cleanup was noted.
9	C&D Inter-Office Communication & Indiana State Board of Health Letter	05/27/84	Lead Impacted Neutralization Liquid	500 gallons	Overflow from the number one settling tank in wastewater treatment	AREA 1	Maximum lead concentration noted at 50 ppm. Corrective action recommended was to "clean up contaminated soil".
10	C&D Inter-Office Environmental Incident Log	06/01/84	Acid	1 gallon	Storage area in the alley and storm sewer which led to Wabash River	AREA 12	No information
11	C&D Letter to the Indiana State Board of Health	12/05/84	Lead contaminated debris and Lead Oxide		Unknown	UNKNOWN LOCATION	Soil samples were collected and eight 55-gallon drums of lead impacted soil was removed. Impacted area included 88 cubic feet. Soil with concentrations in excess of 1,300 ppm lead may remain.
12	C&D Letter to the Indiana State Board of Health	10/23/85	Contact Cooling Water	3,000 gallons	Storm sewer leading to outfall 001	AREA 1 & 4	Discharge occurred three times within previous 6 months, Lead and pH concentrations reportedly within guidelines at outfall 001.
13	C&D Inter-Office Communication	08/22/87	Acid	3,000 gallons	diked area around acid tank in wastewater treatment plant and on cement walkway outside plant	AREA 1	Acid inside the diked area and on the concrete outside was neutralized.
14	IDEM Incident Report, Indiana State Board of Health, Environmental Emergency Response Team, Incident Reporting Log and C&D Letter	02/26/88	Lead Oxide Dust	261 lbs	Sifted from semi-truck during loading process, release covered a 1,000 sq. ft. area beneath the bulk storage tanks, aluminum siding and concrete block wall.	AREA 3	100% of the lead oxide was reclaimed through the facility's vacuum system.
15	Pinkerton Incident Report	06/15/88	Acid	Unknown Quantity	Tanker unloading, exact location not noted	AREA 2	Noted as "acid cleaned up"
16	C&D Inter-Office Communication	11/22/88	Lead Oxide Dust	Unknown Quantity	Central vacuum exhaust emissions	AREA 13	Area noted as thoroughly cleaned
17	IDEM Emergency Response, Incident Repots	12/12/89	Lead Oxide Dust	50 lbs	Beneathe the lead oxide storage tanks, near the old railroad spur - approximately 2,400 sq. ft.	AREA 3	Entire spilled amount was reportedly recovered. Batteries dusted with lead oxide were cleaned. Building walls, tank support beams and concrete beneath the tank were vacuumed.

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EXHIBIT 2

TABLE 2
Past Spill Release Summary

C&D Technologies, Inc., Attica, Indiana Facility

Clayton #	Source of Information	Spill Date	Material	Quantity	Location	Current Conditions Report Area	Response
18	C&D Inter-Office Communication	08/01/90	Acid	Unknown Quantity	West side acid loft into the alley	AREA 2	Approximately 5,000 lbs of soda ash was used to neutralize the acid. Acid loft was washed down and wash water was neutralized.
19	C&D Inter-Office Communication	05/09/91	Acid	75 gallons	East side charging roof onto the Trident charging scrubber building roof and into an alley near a storm drain.	AREA 2	Manhole cover placed over storm drain. pH at discharge point for storm drain was neutral. Roofs were washed down, water neutralized and pumped to waste water treatment system.
20	C&D Memorandum, IDEM Letter, and C&D Summary Report	09/10/93	Lead Oxide Dust	50 to 75 lbs	Lead oxide was emitted into the air from the positive oxide bulk storage silo entrance hatch. An approximately 22,140 sq. ft. area in the alley between the two buildings near the storage silos was affected.	AREA 3	Area was diked off due to incoming rain, wash water and rain water was collected and pumped to the waste water treatment system. 100% of the lead oxide dust was reportedly recovered.
21	C&D Letter to IDEM	07/13/94	Sulfuric Acid	50 to 100 gallons	Off roof into alley and storm drain	AREA 2 & 4	Storm drain was plugged and captured acid was neutralized. pH of 2 inside storm drain, 6 to 7 pH down stream in Wabash River. pH returned to neutral values inside the storm drain within 15 minutes.
22	C&D Memorandum	09/07/94	Acid	2,500 gallons	West acid tank farm, no information as to if the acid was contained in the tank farm was noted.	AREA 2	Accident with fork truck released acid. No notation regarding recovered acid was in memo. Cost breakdown noted 18,000-lbs of soda ash and seven 55-gallon drums of caustic liquid.
23	C&D Memorandum	07/18/95	Pasting Wet Scrubber Water & Lead Oxide	< 300 gallons	Exact location not noted. Holding tanks near pasting wet scrubber and storm drain.	AREA 3 & 4	Storm drain was cleaned and hole in sump repaired. No information as to quantity noted.
24	C&D Hand Written Memorandum	08/12/99	Lead Oxide Dust	100 lbs	Overfill of lead oxide tanks due to overfilling – exact location not provided	AREA 3	Unknown

Table based on review of available information found in C&D, IDEM and Fountain County Health Department files

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APPENDIX B

ADMINISTRATIVE ORDER ON CONSENT

Note: The Order has been entirely incorporated into this Community Involvement Plan through specific reference and is included as Appendix A in the RFI Work Plan.

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APPENDIX C

LOCAL OFFICIALS AND LEADERS

City Mayor: Mr. Dion "Butch" Swift, II
City Council Representative: Mr. Bill Craft
State Senator: Mr. Phil Boots (Dist. 23)
State Representatives: Mr. F. Dale Grubb (Dist. 42)
U.S. House: Mr. Brad Ellsworth (Dist. 8)
U.S. Senate: Mr. Richard Lugar (R)
Mr. Evan Bayh (D)

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APPENDIX F

Clayton VOC Investigation Report

VOC Investigation Report
C&D Technologies, Inc.
1515 West Main Street
Attica, Indiana

Prepared for:

US EPA, Region 5

Chicago, Illinois

Clayton Project No. 25-05019
April 12, 2006

CLAYTON GROUP SERVICES, INC.
9376 Castlegate Drive
Indianapolis, Indiana 46256
317.570.4582

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1.0 INTRODUCTION

The U.S. Environmental Protection Agency, Region V (EPA) requested that C&D Technologies, Inc. (C&D) perform an environmental investigation into whether an alleged old municipal landfill ("landfill") located on C&D property is the source of trichloroethylene (TCE) being detected in the Town of Attica, Indiana's well field. C&D retained Clayton Group Services, Inc. (Clayton) to conduct this investigation. The C&D facility is located adjacent to the well field.

An investigation was conducted to accomplish the following objectives:

1. To determine if VOCs were present in groundwater on the C&D facility between the landfill and the City of Attica well field, and if groundwater flow supported migration of those VOCs toward the City well field.
2. The lithologic sequence associated with the Wabash River valley alluvium in the vicinity of the C&D facility.
3. The occurrence and flow direction of groundwater in the alluvial sediments in the vicinity of the C&D facility.
4. The occurrence of VOCs in groundwater that is attributable to migration from upgradient locations in the vicinity of the C&D facility.

A VOC Investigation Work Plan was prepared and submitted to USEPA for approval. The Work Plan, provided as **Appendix A**, presents steps used to investigate groundwater -- south of the alleged landfill and west of the C&D facility. The Work Plan incorporated the following step-by-step process to accomplishing the objectives. These steps were discussed and agreed upon during discussions with EPA personnel prior to implementation, and after some of the field data acquisition prior to performing the next step.

1. Location and procedures used to perform the hydrostratigraphic soil borings and monitoring wells.
2. The emplacement of four hydrostratigraphic soil borings for lithologic characterization and vertical aquifer profiling of VOCs to identify screen placement for permanent monitoring wells across the C&D facility.
3. The installation of five groundwater monitoring wells for groundwater sampling across the C&D facility.
4. The acquisition of static water level measurements to allow the determination of groundwater flow direction.

The above-noted work was performed between January 6 and February 28, 2006. Groundwater information was collected and interpreted to determine if the C&D facility is a

source of VOCs in the groundwater and if VOC groundwater contamination from upgradient sources is impacting the C&D facility.

1.1 BACKGROUND

C&D operates a manufacturing site in Attica, Indiana (the "Site"). A portion of this Site allegedly includes an old municipal landfill. This landfill allegedly operated for several decades, and was supposedly closed and stopped accepting waste in 1958. The alleged landfill has never been formally closed under any known environmental program. A parking lot and part of the C&D building have been built over a portion of the alleged former landfill (see **Figure 1**).

The C&D property is located immediately adjacent to the Wabash River (see **Figure 2**). Immediately adjacent to the Site, and downstream of the C&D facility is the Town's municipal water supply well field with three groundwater withdrawal wells. One of the wells is inactive.

In early 2005, EPA held a meeting with C&D, Attica town representatives, IDEM and Radio Materials Company (RMC), an Attica company that has a known and widespread TCE groundwater problem. The RMC facility is located approximately ¾ mile away from the Attica well field (see **Figure 3**). At the meeting, EPA requested that C&D perform an environmental investigation on its facility to determine if it was the source or a contributing source of the TCE in the town's well field. As a result of this meeting C&D prepared a VOC Investigation Work Plan dated August 25, 2005 that was approved for implementation by U.S.EPA. After approval of this work plan, C&D approached Attica officials about installing a treatment system on the well field, and additionally, learned significantly more about the nature of the RMC site TCE problem through a review of their Phase IIB RCRA Facility Investigation Report. On December 1, 2005, C&D representatives and U.S. EPA officials met again, and it was agreed that C&D would go forward with the original scope of work approved by U.S. EPA with the addition of monitoring wells to be installed in presumed upgradient locations. The final work plan approved by EPA was submitted on January 6, 2006. The nature and location of all work related to the hydrostratigraphic borings and monitoring well installations was discussed and agreed to prior to submittal of the final work plan during conversations between Mr. Ron St. John of Clayton Group Services, and Ms. Tami Moore and Mr. Gary Cygan of U.S. EPA.

2.0 SITE DESCRIPTION

The Site is located at 200 West Main Street in Attica, Fountain County, Indiana (**Figure 2**). The Site is bounded on the southeast by Third Street; to the southwest by Main Street; the Wabash River to the northwest; and is located in a mixed area of industrial, commercial, and residential use. Located between the Wabash River and the Site buildings is the former alleged landfill.

2.1 GEOLOGY AND HYDROGELOGY

The Site is located within the Middle Wabash River Basin which is predominately overlain by Wisconsinan Age Tipton Till Plain deposits. The Tipton Till plain is generally featureless, flat to gently-rolling plain, which is interrupted in places by very low-relief end moraines. The elevation of the site is approximately 520 feet above mean sea level.

Based on the Well Head Protection Phase I for Attica Water Works, the Site is underlain by approximately 140 feet of unconsolidated, valley-train glaciofluvial deposits consisting of sand and gravel. Generally speaking, these unconsolidated deposits occur in a narrow band that parallels the Wabash River. These sand and gravel deposits can produce upwards of 1,600 gallons per minute (gpm), and have been test pumped at up to 2,500 plus gpm.

The Attica city wells are completed in the Wabash River alluvial sand and gravel at a depth of approximately 110 to 120 feet below ground surface (well bottom elevation of 480 to 490 feet amsl). The Wabash River alluvium is a valley train sand and gravel deposit that has very steep sidewalls in connection with the bedrock valley walls. Groundwater entering the bedrock in the upland areas east of Attica needs to flow west-northwest to its discharge point, the Wabash River alluvium. Once in the Wabash River alluvium, the groundwater flows and discharges to the river. Located below the unconsolidated deposits is Paleozoic Pennsylvanian age sandstones of the Raccoon Creek Group and Mississippian age limestones and shales of the Borden Group.

3.0 SCOPE OF WORK

3.1 BORINGS

The scope of work associated with this investigation included the emplacement of four borings that incorporated continuous soil sampling and vertical aquifer profiling for VOCs at 10-foot intervals. The locations for these borings are shown on **Figure 4**. The borings are summarized below.

Boring #	Location	Depth, feet bgs	GW Sample Designation
SB-1	Between the city wells and the portion of the C&D plant that had historically been used by RMC	145	GW-1
SB-2	Southeast upgradient position at the southeast corner of the C&D facility	120	GW-2
SB-3	Northeast upgradient position at the C&D facility	120	GW-3
SB-4	South of the plant buildings that are situated on the alleged landfill; this area is between the alleged landfill and the city well	120	GW-4

The primary purpose of the four borings was to identify, using vertical groundwater profiling, the vertical interval for the screen placement during the installation of five 2-inch monitoring wells located in the vicinity of the four borings. SB-1 was extended to 145 feet to confirm the depth to bedrock.

Details of soil and groundwater grab sampling procedures are provided in the Work Plan provided as **Appendix A**. Soil sample descriptions and the field screening results were recorded on boring logs, which are provided in **Appendix B**.

3.1.1 Soil Sampling

As noted in the Work Plan the primary purpose of this investigation was groundwater characterization, however each boring was continuously sampled and the extracted soil core inspected and field-screened with a photoionization detector. Based on this screening only one soil sample was submitted for VOCs analysis -- 10 to 12.5 feet bgs sample from SB-4. VOC analytical results of soil samples are provided in **Table 1** provided at the end of the report. Analytical reports are provided in **Appendix C**.

The unconsolidated materials encountered during the installation of the four borings consisted of the following: The initial 10 to 15 feet is comprised of topsoil, fill sand and silty or sandy clay. This sequence of materials overlie 35 to 40 feet of poorly sorted, light yellow to brown sand and gravel comprised of angular to well rounded rock fragments ranging in size from 2 to 25 mm in diameter. This upper sand and gravel deposit is separated from the underlying deposit by approximately 5 feet of a dense gray till. Below the till is approximately 30 to 40 feet of a brown/reddish brown, well sorted, fine- to coarse-grained sand. Underlying this sand is approximately 20 feet of a brown/reddish brown, well sorted fine- to coarse-grained sand and gravel; the thickness of this unit may extend another 30 feet, however, no samples were recovered.

3.1.2 Vertical Groundwater Profiling

In each boring vertical aquifer profiling was conducted. Although the procedures for this effort are provided in the Work Plan provided in **Appendix A**, those procedures are more clearly described below.

- PowerPunch™ Method – a borehole pumping and groundwater sampling system designed to recover a discrete water sample from undisturbed aquifer material. The PowerPunch is a direct push system that utilizes a 5 foot by 1-inch diameter retractable screen. This method allows the retractable screen to be pushed into and exposed to undisturbed materials ahead of the roto-sonic outer casing. An integral nitrile annular seal between the PowerPunch inner rod and roto-sonic outer casing effectively isolates the sampling screen. Groundwater samples are collected through a pump system, in this case a Grundfos RediFlo. The pump is lowered to the top of the PowerPunch screen and water is purged from the isolated zone. Purging is considered complete and the water sample is collected when the field stabilization parameters remain stable, since theoretically, the water entering the screen is from undisturbed aquifer material (i.e. water added during advancement of the roto-sonic outer casing is not able to the enter the screen). The entire sampling device is retrieved by a wire line and overshot coupler or with the roto-sonic inner rods.

- Isolated Screen Method – Upon collection of a soil sample from a particular interval, a stainless steel screen is then set at the bottom of the borehole with the lead rod and an inflatable K-packer. The K-packer is attached to the upper end of the lead rod and prevents aquifer material from coming in between the screen and roto-sonic outer casing. The outer casing is then vibrated back 5 feet exposing the screen to the formation. The purpose of the lead rod, which is approximately five feet long by 3.5-inches in diameter, is to keep the screen from becoming lost in the aquifer material when the outer casing is pulled back. Groundwater samples are collected through a pump system that has an inflatable packer located above the pump to effectively seal off the pump from water present in the outer casing above the pump. The pump is lowered to the top of the lead rod

and the packer is inflated. Once the submersible pump and inflatable packer are installed, water is purged from the isolated zone. Purging is considered complete and the water sample is collected when the volume of water added during advancement of the roto-sonic outer casing plus 5 volumes of the isolated sampling zone are removed and the field stabilization parameters remain stable. The entire sampling device is retrieved by a wire line and overshot coupler or with the roto-sonic inner rods.

The PowerPunch method was used initially on SB-1 to collect groundwater samples. This method proved to be ineffective as the screen did not provide an adequate flow of water to monitor stabilization parameters until stability was achieved prior to sample collection. Based on the sample results obtained using the PowerPunch method, it appears that water added during the advancement of the roto-sonic outer casing was present in the samples. The isolated screen method was then utilized to collect groundwater samples during the remainder of SB-1 and completely in borings SB-2, SB-3 and SB-4. This method proved to be effective in the ability to purge added water and monitoring of stabilization parameters so that a representative groundwater sample could be collected from a discrete vertical profile of the aquifer. The amount of clean water used by the driller to advance to the desired depth where the screen/packer assembly was set was closely monitored; this facilitated the calculation of the necessary purge water volume needed to be pumped from the formation prior to the collection of the VOC sample. **Table 2** provides descriptive information for the four borings and notes the volumes purged for each profile interval.

3.2 MONITORING WELLS

Details of monitoring well installation, development and sampling procedures are provided in the Work Plan provided as **Appendix A**. The locations for these monitoring wells are shown on **Figure 4**. Five monitoring wells were installed, the depths of the wells determined by the groundwater profiling performed for borings SB-1, SB-2, SB-3 and SB-4.

MW #	Location
MW-1	At SB-1 -- Between the city wells and the portion of the C&D plant that had historically been used by RMC.
MW-2	At SB-2 -- Southeast upgradient position
MW-3	At SB-3.-- Northeast upgradient position
MW-4	West of SB-4 -- South of plant buildings that are situated on the alleged landfill; this area is between the alleged landfill and the city well field
MW-5	East of SB-4 -- South of plant buildings that are situated on the alleged landfill; this area is between the alleged landfill and the city well field

Groundwater samples were analyzed for the presence of VOCs by USEPA Method 8260b. VOCs that have Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (MCLs) are listed below with their corresponding IDEM RISC residential groundwater cleanup goals, Minimum Detection Limit (MDL) and Reporting Limit (RL).

4.0 RESULTS

Four hydrostratigraphic borings were emplaced at the site between January 6 and 27, 2006. A narrative summary of each boring location is provided below:

SB-1 The soil boring closest to the city wells on the grassy area on the southwest side of the facility. The installation of this boring was intended to be an indicator of anything potentially coming from the old RMC portion of the C&D facility.

SB-2 The soil boring is just east of the southwest portion of C&D administrative office building. This is one of the two upgradient locations, and was installed to determine the upgradient groundwater quality coming toward the city well field.

SB-3 This soil boring is in the back parking lot on the northeast side of the facility. This location was installed to determine the upgradient groundwater quality coming toward the alleged landfill on the C&D facility.

SB-4 This soil boring is on the southwest side of the C&D loading docks, and was intended to determine the groundwater quality between the alleged landfill and the city well field.

VOC analytical results of vertical groundwater profiling for the four borings are provided in **Table 3** provided at the end of the report. **Table 3** summarizes those VOC compounds that were detected in at least one sample. Analytical reports are provided in **Appendix D**. Below is a brief summary of the profile results, in ug/L, related to identified concentrations of TCE and its breakdown product cis-1,2-DCE.

Sample Interval Feet bgs	**TCE**	**cis-1,2-DCE**
	SB-1	
35-40	**0.63 J**	nd
45-50	**1.6**	nd
55-60	**0.98 J**	nd
65-70	**2.2**	nd
75-80	**2.4**	nd
85-90	**3.6**	nd
95-100	**5.6**	**0.31 J**
105-110	**5.7**	**0.36 J**
115-120	**1.7**	nd

Sample Interval Feet bgs	**TCE**	**cis-1,2-DCE**
	SB-2	
35-40	**No sample**	
45-50	**0.83 J**	nd
55-60	**0.83 J**	nd
65-70	**0.63 J**	nd
75-80	**5.0**	nd
85-90	**19**	**2.3**
95-100	**12**	**0.67 J**
105-110	**7.8**	**0.60 J**
115-120	**8.4**	**0.51 J**

All of the borings had detectable concentrations of TCE, however in borings SB-1 and SB-2 detected concentrations were higher and present in all of sample intervals. Sample intervals between 95 and 110 feet bgs for SB-1 had concentrations of just over 5 ug/L. Sample

intervals between 85 and 100 feet bgs for SB-2 had concentrations of 12 to 19 ug/L. The data suggests that at SB-1 and SB-2 very low concentrations of TCE occur at the water table (somewhere between 35 to 45 feet in depth depending on the location), and increase in concentration to a depth of approximately 85 to 95 feet in depth.

Sample Interval Feet bgs	TCE	cis-1,2-DCE
SB-3		
35-40	nd	nd
45-50	nd	nd
55-60	nd	nd
65-70	nd	nd
75-80	nd	nd
85-90	nd	nd
95-100	nd	nd
105-110	**1.8**	nd
115-120	**0.74 J**	nd

Sample Interval Feet bgs	TCE	cis-1,2-DCE
SB-4		
35-40	nd	nd
45-50	nd	nd
55-60	**0.87 J**	nd
65-70	**0.33 J**	nd
75-80	nd	nd
85-90	nd	nd
95-100	nd	nd
105-110	nd	nd
115-120	nd	nd

Detectable concentrations of TCE in borings SB-3 and SB-4 were no greater than 1.8 ug/L. It was identified at 105 to 120 feet bgs in SB-3 and 55 to 70 feet bgs in SB-4.

A review of the data in **Table 3** is straight-forward, particularly when incorporating the following information.

(1) Sampling commenced with SB-1 with the utilization of the PowerPunch sampling technique that ultimately didn't work very well. The Power Punch method produced a low yield that severely hindered low-flow parameter monitoring and was ultimately responsible for detectable concentrations of trihalomethanes in sample results from the first four sample intervals at GW-1. The presence of these compounds indicates that the majority of water obtained from the sampling interval originated from water introduced during the sonic drilling process. The water used by Boart for drilling purposes was obtained from a nearby small town (not Attica). An analysis of this water is noted in **Table 3** and indicates the suite of trihalomethanes that are typically found in municipal water supplies that have been chlorinated prior to distribution. These trihalomethane compounds were also found in the 35-40, 45-50, 55-60 and 65-70 depth intervals of SB-1. The drilling groundwater collection method was changed to the use of a temporary well screen isolated by a K-packer when collecting the 75 to 80 ft depth interval. This would also suggest that the other compounds determine in SB-1 (i.e., TCE and cis-1,2-DCE) are likely to have been diluted as well and probably occur at higher concentration in the formation.

(2) Initial samples from SB-1 indicated the presence of perchloroethylene. Clayton queried Boart about where the sampling pump had last been used. Confirmation by Boart personnel that it had been used at a dry cleaner site and the presence of

perchloroethylene in a subsequent equipment blank (**Table 3**) for the Grundfos pump confirmed that cross-contamination from the pump was responsible for the perc detections. The groundwater pumping method was changed to the use of a new 4-inch Grundfos pump and reel when collecting the 85 to 90 ft depth interval.

As the work plan identified, the vertical VOC groundwater profiling data was used to select the completion depth of the screen intervals for the five groundwater monitoring wells. Prior to installing the five groundwater monitoring wells, the vertical VOC groundwater profiling data was shared with EPA representatives to obtain their concurrence regarding the completion depth of the monitoring wells. As a result, five, 2-inch ID PVC monitoring wells were emplaced at the site between January 30 and February 1, 2006. Development of the wells occurred February 7 – 11. **Table 4** provides descriptive information for the five wells and notes the development volumes for each well. The wells were allowed to stabilize for two weeks prior to their sampling on February 28.

VOC analytical results are provided in **Table 5** provided at the end of the report. Analytical reports are provided in **Appendix F**. Below is a brief summary of the profile results, in ug/L, related to identified concentrations of TCE and its breakdown product cis-1,2-DCE. These results are also provided in **Figure 5**. The results of the monitoring well samples are consistent with the results of the profile sampling.

MW	TCE	cis-1,2-DCE
MW-1	**5.7**	nd
MW-2	**20**	**2.2**
MW-3	**3.0**	nd
MW-4	nd	nd
MW-5	nd	nd

Figure 5 illustrates the potentiometric contours for groundwater contained in the river alluvium in the vicinity of the C&D facility as determined from static water levels obtained from the monitoring wells on February 28, 2006. A review of these potentiometric contours indicates that groundwater within the river alluvium flows from east-southeast to west-northwest to discharge to the Wabash River. The hydraulic gradient appears to be on the order of 0.0007 on this measurement date. MW-2, the primary upgradient well, has the highest concentration of TCE. **Figure 5** indicates that MW-1 is essentially downgradient of MW-2 and indicates an expected lower concentration of TCE. Note that the vertical screen

interval for these wells is about the same, MW-1 is downgradient and slightly deeper (105 – 115 bgs) compared to MW-2 (95 – 105 bgs). MW-3 is also upgradient, and is located at the northeast corner of the C&D facility. Nevertheless, TCE was identified in this well at 3.0 ug/L, and at a vertical interval similar to MW-1 and MW-2. The significant depth of TCE detection in these three wells strongly suggests a distal upgradient source.

MW-3 and MW-4, the wells between the alleged former landfill and the Attica city well field did not have detectable concentrations of TCE. This groundwater VOC data in conjunction with the groundwater flow data indicates that the C&D facility has not contributed any TCE contamination to the Attica water supply wells.

4.0 CONCLUSIONS

The results of the groundwater investigations summarized in this report provide the following conclusions:

1. The Wabash River alluvial sequence in the vicinity of the C&D facility is approximately 145 feet thick.

2. Groundwater within the river alluvium in the vicinity of the C&D facility flows from east-southeast to west-northwest to discharge to the Wabash River at an approximate hydraulic gradient of 0.0007.

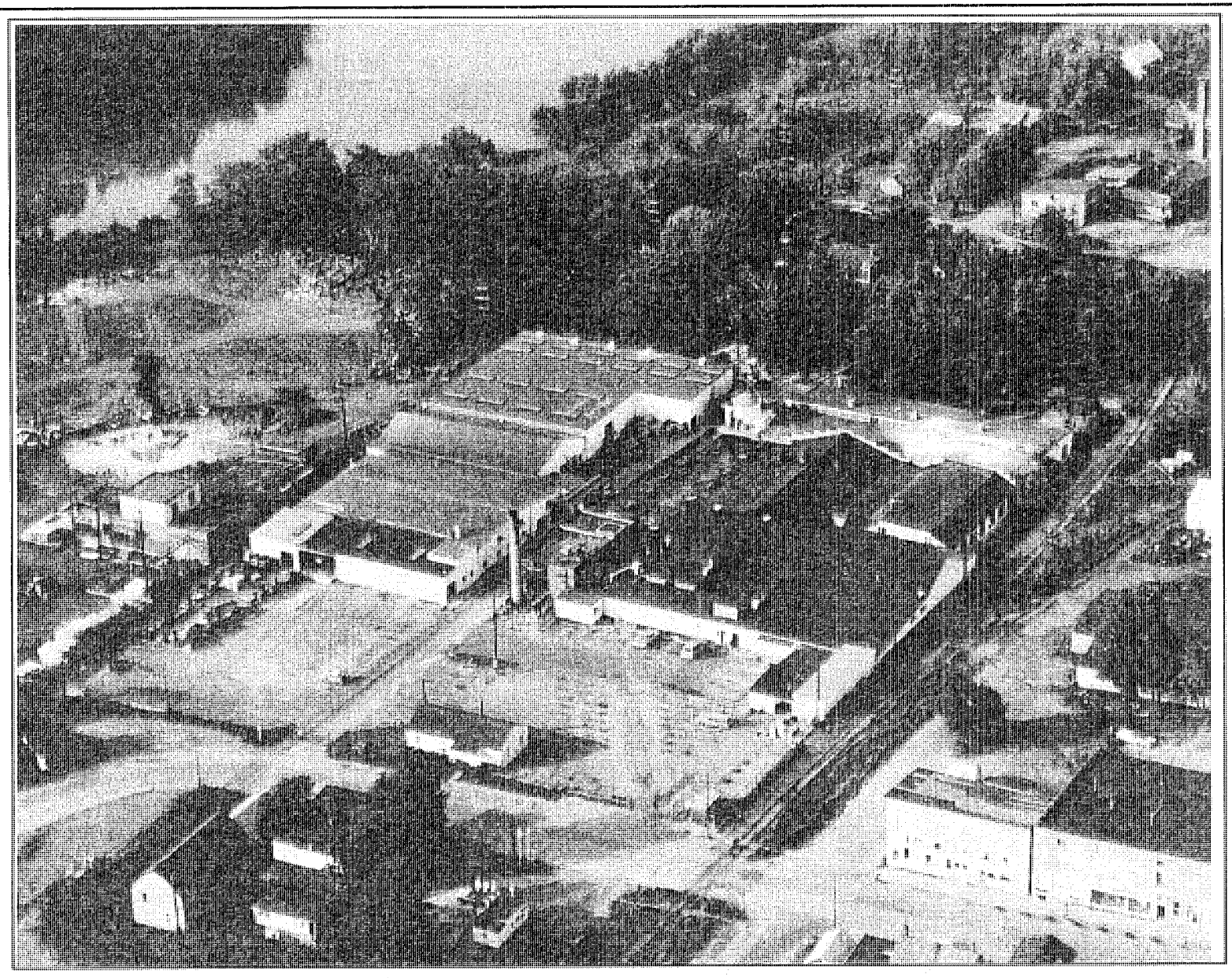
3. The results from collecting VOC groundwater grab samples during vertical profiling of the alluvial aquifer while performing hydrostratigraphic control borings agreed well with the groundwater sampling results from monitoring wells installed afterward.

4. The elevated TCE concentration in upgradient groundwater monitoring wells, and the depth interval at which this TCE occurs within the river alluvium suggests a distal upgradient source of the TCE.

5. The lack of any detection of TCE in groundwater in monitoring wells installed between the alleged landfill on the C&D facility and the City of Attica water supply wells, and the direction of groundwater flow from east-southeast to west-northwest indicate that the C&D facility does not contribute TCE or any other VOCs to the City of Attica well field contamination.

6. A till layer with a thickness of about 4 to 6 feet is present at a depth of about 47 - 55 feet bgs (elevation range of ~445 – 433 feet NGVD). This till separates the alluvium into two distinct water-bearing zones. Identified TCE contamination in MW-1, MW-2 and MW-3 occurs at depths below this till indicating a distal contaminant source rather than a local source in the vicinity of the C&D facility.

Figures



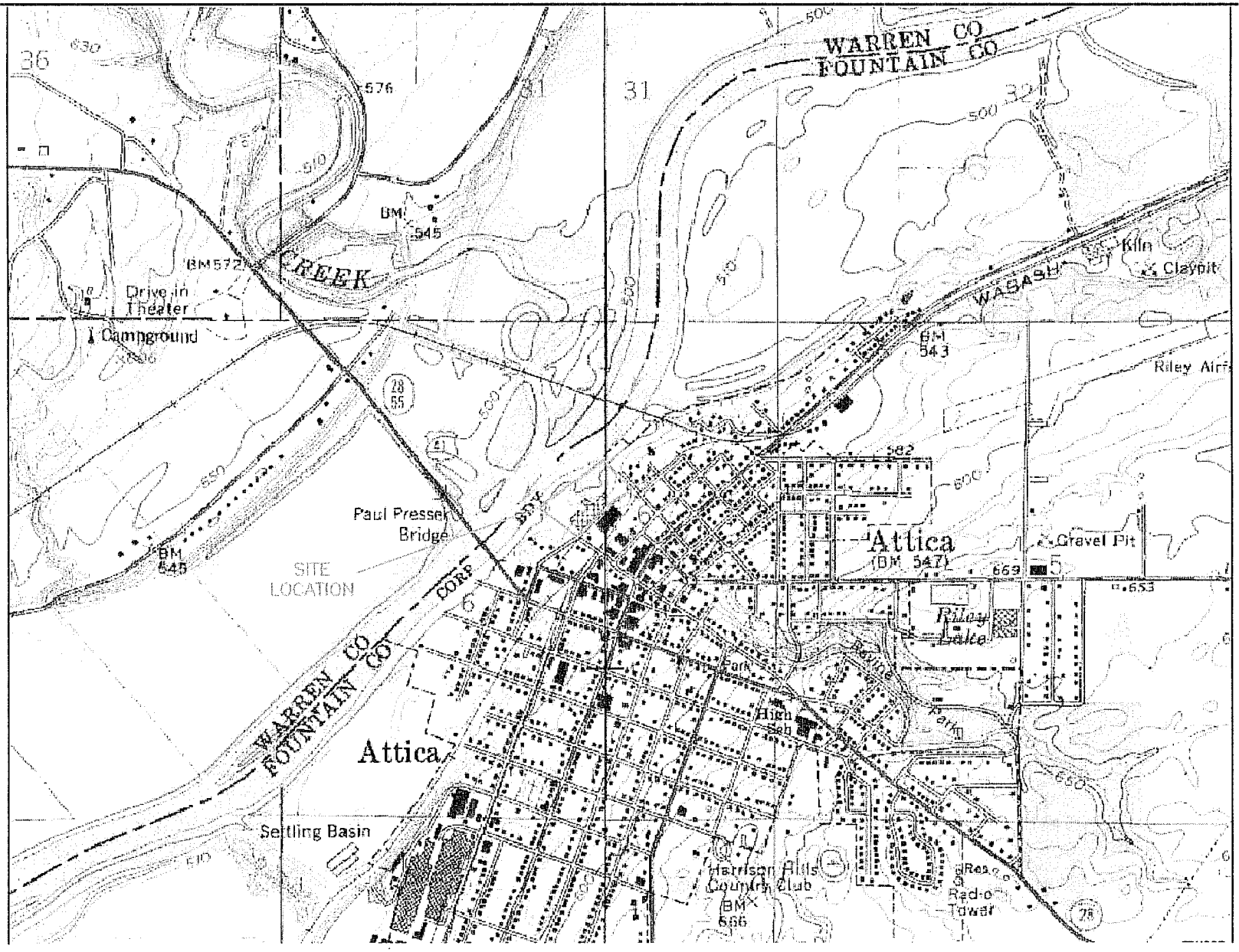
CHECK BY	MGD
DRAWN BY	SAH
DATE	6/1/05
SCALE	unknown
CAD NO.	fig 1 work plan
PRJ NO.	25-05019

HISTORICAL AERIAL PHOTO OF LANDFILL

C & D TECHNOLOGIES, INC.
ATTICA, INDIANA

Clayton
GROUP SERVICES

FIGURE
1



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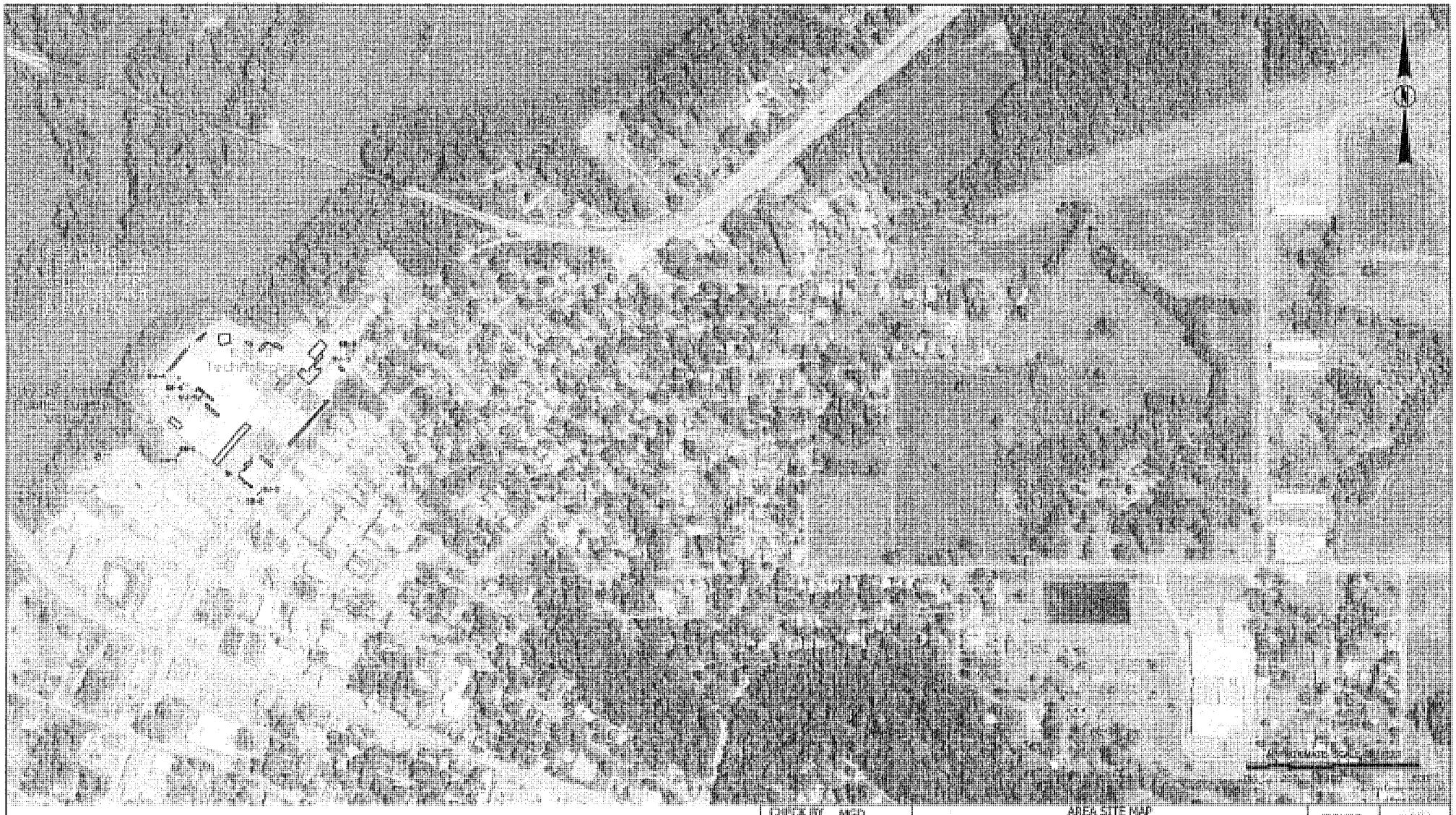
DRAWN BY	SAH
DATE	6/1/05
SCALE	Not to Scale
CAD NO.	fig 2 Work Plan
PRJ NO.	25-05019

SITE LOCATION MAP

C & D TECHNOLOGIES, INC.
ATTICA, INDIANA

Clayton
GROUP SERVICES

FIGURE
2



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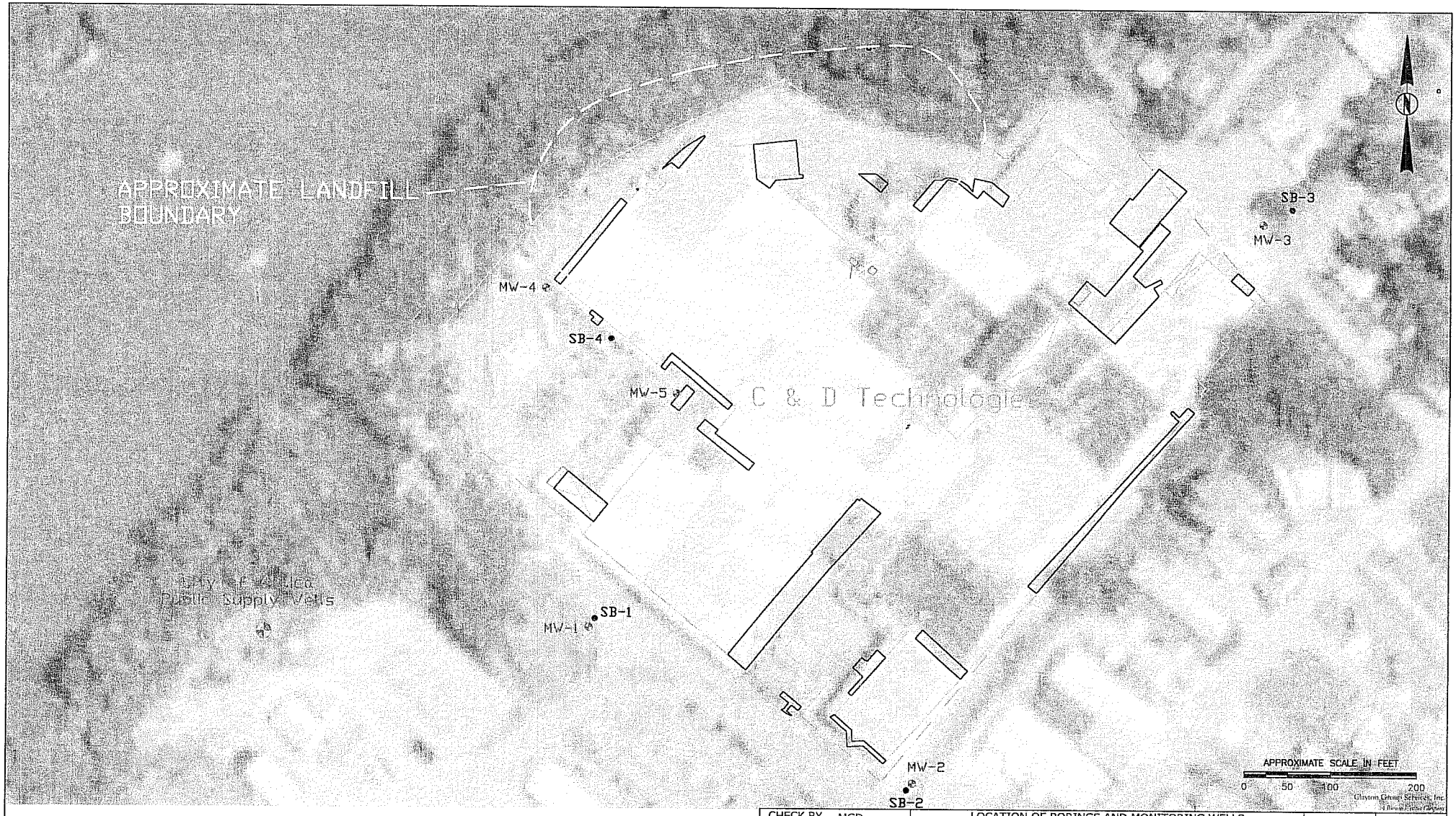
DRAWN BY	CCS
DATE	3/5/06
SCALE	1" = 400'
CAD NO.	area site map
PRJ NO.	25-05019

AREA SITE MAP
C & D TECHNOLOGIES
200 WEST MAIN STREET
ATTICA, INDIANA
2003 AERIAL PHOTO: http://www.indiana.edu/~ts/?gisdata/ortho.html
SURVEY DATA: JOHN E. FISHER & ASSOCIATES, P.C.

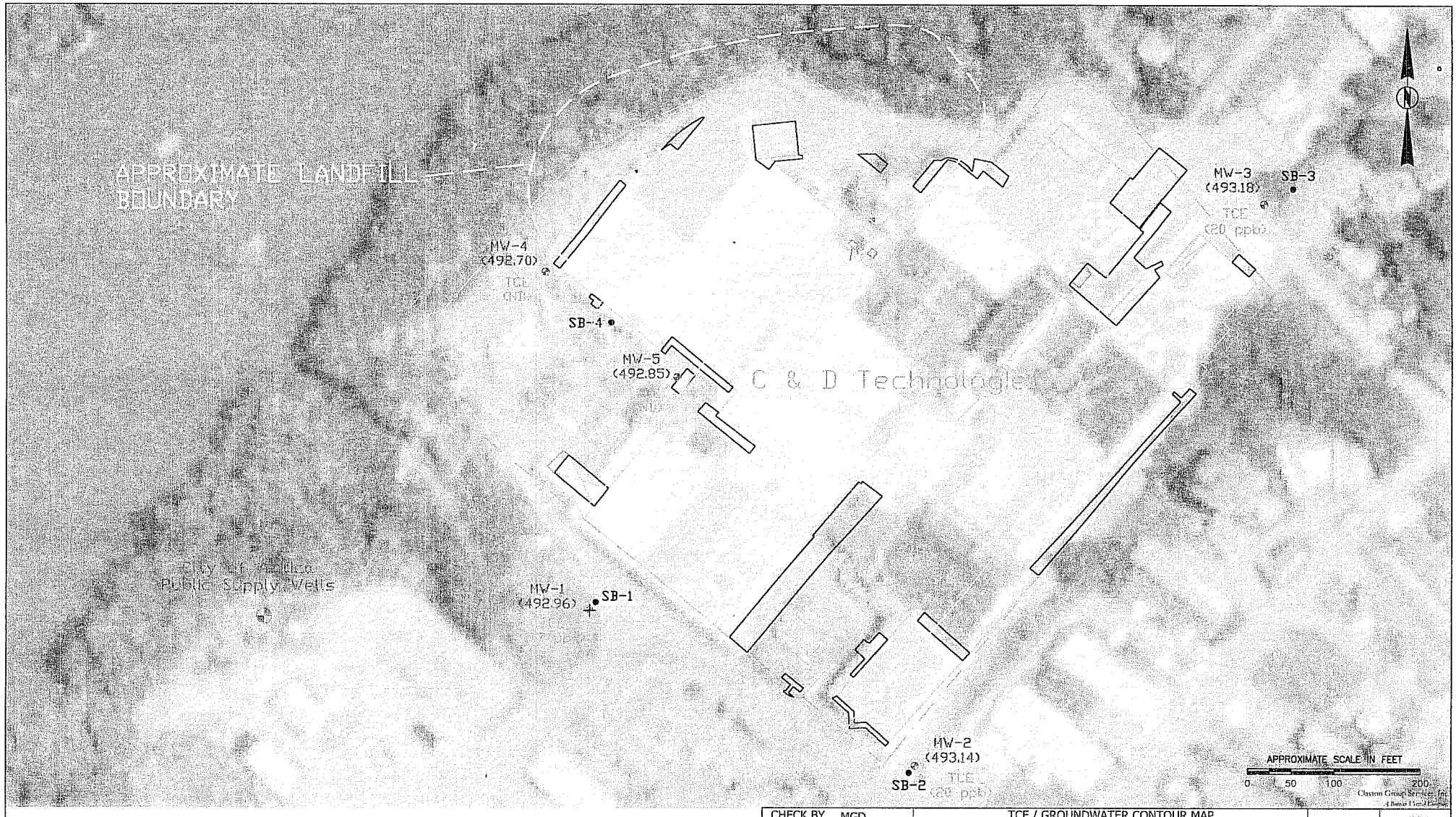
FIGURE
3



CHECK BY	MGD
DRAWN BY	CCS
DATE	3/6/06
SCALE	1" = 100'
CAD NO.	boring map
PRJ NO.	25-05019

LOCATION OF BORINGS AND MONITORING WELLS
C & D TECHNOLOGIES
200 WEST MAIN STREET
ATTICA, INDIANA
2003 AERIAL PHOTO: http://www.indiana.edu/%7Egisdata/orthos.html
SURVEY DATA: JOHN E. FISHER & ASSOCIATES, P.C.

FIGURE 4



CHECK BY	MGD
DRAWN BY	CCS
DATE	3/6/06
SCALE	1" = 100'
CAD NO.	gw contour
PRJ NO.	25-05019

TCE / GROUNDWATER CONTOUR MAP
C & D TECHNOLOGIES
200 WEST MAIN STREET
ATTICA, INDIANA
2003 AERIAL PHOTO: http://www.indiana.edu/%7Egisdata/orthos.html
SURVEY DATA: JOHN E. FISHER & ASSOCIATES, P.C.

FIGURE
5

Tables

Table 1
VOC Results -- Soil Samples

LabID	ClientID	Collection Date	TetraCE (perc)	TCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	Vinyl Chloride	Toluene	Carbon Disulfide	Benzene	Acetone
SOIL	µg/kg											
06010792-001A	SB-4 10-12.5	25-Jan-06	<1	<1	<1	<1	<1	<1	<1	**1.4 J**	**0.67 J**	**2.9**

Table 2
Boring/Profile Information

Boring #	Northing	Easting	GS Elevation	Total Depth	Total Depth
			feet NGVD	feet BGS	feet NGVD
SB-1	1838465	2905862	521.6	145.0	376.6

Profile Interval	Purge Volume
feet bgs	gallons
GW-1 35-40	--
GW-1 45-50	10
GW-1 55-60	4
GW-1 65-70	13
GW-1 75-80	250
GW-1 85-90	250
GW-1 95-100	330
GW-1 105-110	350
GW-1 115-120	380

Boring #	Northing	Easting	GS Elevation	Total Depth	Total Depth
			feet NGVD	feet BGS	feet NGVD
SB-3	1838948	2906657	524.3	120.0	404.3

Profile Interval	Purge Volume
feet bgs	gallons
GW-3 35-40	216
GW-3 45-50	200
GW-3 55-60	168
GW-3 65-70	330
GW-3 75-80	220
GW-3 85-90	210
GW-3 95-100	290
GW-3 105-110	370
GW-3 115-120	340

Boring #	Northing	Easting	GS Elevation	Total Depth	Total Depth
			feet NGVD	feet BGS	feet NGVD
SB-2	1838273	2906224	529.8	120.0	409.8

Profile Interval	Purge Volume
feet bgs	gallons
GW-2 45-50	530
GW-2 55-60	210
GW-2 65-70	280
GW-2 75-80	380
GW-2 85-90	290
GW-2 95-100	370
GW-2 105-110	490
GW-2 115-120	270

Boring #	Northing	Easting	GS Elevation	Total Depth	Total Depth
			feet NGVD	feet BGS	feet NGVD
SB-4	1838788	2905876	518.7	120.0	398.7

Profile Interval	Purge Volume
feet bgs	gallons
GW-4 35-40	225
GW-4 45-50	381
GW-4 55-60	216
GW-4 65-70	261
GW-4 75-80	315
GW-4 85-90	265
GW-4 95-100	325
GW-4 105-110	330
GW-4 115-120	265

NGVD --- 1929 GS -- ground surface BGS -- below ground surface

Table 3
VOC Results -- Groundwater Profile Samples

LabID	ClientID	Collection Date	TetraCE (perc)	TCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	Vinyl Chloride	Toluene	2-Butanone	Carbon Disulfide	Bromo-dichloro-methane	Dibromo-chloro-methane	Bromoform	Chloroform
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Minimum Detection Level			**0.30**	**0.28**	**0.30**	**0.42**	**0.83**	**0.28**	**0.17**	**1.9**	**0.15**	**0.22**	**0.24**	**0.34**	**0.35**
SB-1	**95-105**	**Screen Interval**		**for**	**MW-1**										
06010278-003A	GW-1 35-40	10-Jan-06	<1	**0.63 J**	<1	<1	<1	<1	**0.35 J**	<1	<1	<1	<5	<1	<1
06010278-004A	GW-1 45-50	10-Jan-06	**39**	**1.6**	<1	<1	<1	<1	**0.32 J**	<1	<1	**0.32 J**	**0.41 J**	<1	**1.0**
06010278-005A	GW-1 55-60	11-Jan-06	**37**	**0.98 J**	<1	<1	<1	<1	**0.41 J**	<1	<1	**0.60 J**	**0.40 J**	<1	**2.3**
06010278-008A	GW-1 55-60 DUP#1	11-Jan-06	**36**	**1.1**	<1	<1	<1	<1	**0.48 J**	<1	**0.20 J**	**0.38 J**	**0.33 J**	<1	**2.4**
06010278-006A	GW-1 65-70	11-Jan-06	**26**	**2.2**	<1	<1	<1	<1	**0.37 J**	<1	<1	**0.53 J**	**0.60 J**	**0.64 J**	**0.86 J**
06010278-007A	GW-1 75-80	11-Jan-06	**5.9**	**2.4**	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010427-002A	GW-1 85-90	12-Jan-06	<1	**3.6**	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010427-003A	GW-1 95-100	13-Jan-06	<1	**5.6**	**0.31 J**	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010427-004A	GW-1 105-110	13-Jan-06	<1	**5.7**	**0.36 J**	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010427-005A	GW-1 115-120	13-Jan-06	<1	**1.7**	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010333-001A	Water Source	9-Jan-06	**0.91 J**	<1	<1	<1	<1	<1	<1	<1	<1	**1.9 J**	**2.8 J**	**1.5 J**	**0.84 J**
06010278-001A	TRIP BLANK	9-Jan-06	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010427-001A	TRIP BLANK	12-Jan-06	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010641-001A	EQ Blank (2-inch) pump	23-Jan-06	**7.0**	<1	<1	<1	<1	<1	**0.36 J**	<1	<1	**1.7**	**1.4 J**	<1	**1.2**
SB-2	**85-95**	**Screen Interval**		**for**	**MW-2**										
06010532-002A	GW-2 45-50	16-Jan-06	<1	**0.83 J**	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010532-003A	GW-2 55-60	16-Jan-06	<1	**0.83 J**	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010532-004A	GW-2 65-70	16-Jan-06	<1	**0.63 J**	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010532-005A	GW-2 75-80	17-Jan-06	<1	**5.0**	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010532-006A	GW-2 85-90	17-Jan-06	<1	**19**	**2.3**	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010532-007A	GW-2 95-100	17-Jan-06	<1	**12**	**0.67 J**	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010532-008A	GW-2 105-110	18-Jan-06	<1	**7.8**	**0.60 J**	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010532-010A	GW-2 105-110 DUP#2	18-Jan-06	<1	**7.5**	**0.40 J**	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010532-009A	GW-2 115-120	18-Jan-06	<1	**8.4**	**0.51 J**	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010532-001A	TRIP BLANK	16-Jan-06	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1

Table 3
VOC Results -- Groundwater Profile Samples

LabID	ClientID	Collection Date	TetraCE (perc)	TCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	Vinyl Chloride	Toluene	2-Butanone	Carbon Disulfide	Bromo-dichloro-methane	Dibromo-chloro-methane	Bromoform	Chloroform
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Minimum Detection Level			**0.30**	**0.28**	**0.30**	**0.42**	**0.83**	**0.28**	**0.17**	**1.9**	**0.15**	**0.22**	**0.24**	**0.34**	**0.35**
SB-3	**105-115**	**Screen Interval**		**for**	**MW-3**										
06010642-003A	GW-3 35-40	19-Jan-06	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010642-004A	GW-3 45-50	19-Jan-06	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010642-005A	GW-3 55-60	20-Jan-06	<1	<1	<1	<1	<1	<1	**0.19 J**	<1	<1	<1	<5	<1	<1
06010642-006A	GW-3 65-70	20-Jan-06	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010642-007A	GW-3 75-80	20-Jan-06	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010642-002A	GW-3 75-80 DUP#3		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010642-008A	GW-3 85-90	23-Jan-06	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010642-009A	GW-3 95-100	23-Jan-06	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010642-010A	GW-3 105-110	23-Jan-06	<1	**1.8**	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010642-011A	GW-3 115-120	23-Jan-06	<1	**0.74 J**	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010642-001A	TRIP BLANK	19-Jan-06	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
SB-4	**55-65**	**Screen Interval**		**for**	**MW-4 & MW-5**										
06010794-002A	GW-4 35-40	25-Jan-06	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010794-003A	GW-4 45-50	25-Jan-06	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010794-004A	GW-4 55-60	25-Jan-06	<1	**0.87 J**	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010831-002A	GW-4 65-70	26-Jan-06	<1	**0.33 J**	<1	<1	<1	<1	<1	<1	<1	**0.29 J**	<5	<1	<1
06010831-006A	GW-4 65-70 DUP#4	26-Jan-06	<1	<1	<1	<1	<1	<1	<1	<1	<1	**0.20 J**	<5	<1	<1
06010831-003A	GW-4 75-80	26-Jan-06	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010831-004A	GW-4 85-90	26-Jan-06	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010831-005A	GW-4 95-100	26-Jan-06	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010920-002A	GW-4 105-110	27-Jan-06	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010920-003A	GW-4 115-120	27-Jan-06	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06010794-001A	TRIP BLANK	25-Jan-06	<1	<1	<1	<1	<1	<1	<1	<1	<1	**4.4**	**0.91 J**	<1	**7.8**
06010791-001A	Water Source	25-Jan-06	<1	<1	<1	<1	<1	<1	<1	<1	<1	**4.9**	**3.8 J**	**1.1**	**3.4**
06010791-002A	EQ Blank (4-inch) pump	25-Jan-06	<1	<1	<1	<1	<1	<1	**1.8 J**	<1	<1	**1.2**	**0.83 J**	<1	**1.5**
06010831-001A	TRIP BLANK	26-Jan-06	<1	<1	<1	<1	<1	<1	**0.20 J**	<1	**0.19 J**	**4.8**	**1.2 J**	<1	**8.3**
06010920-001A	TRIP BLANK	27-Jan-06	<1	<1	<1	<1	<1	<1	<1	**2.1 J**	<1	**4.1**	**0.84 J**	<1	**6.7**

Table 4
Monitoring Well Information

Location	Northing	Easting	GS Elevation	Total Depth	Total Depth	Top of Screen	Bottom of Screen	Top of Screen	Bottom of Screen	TOC (MP)	Static WL	WL Elevation
			feet NGVD	feet BGS	feet NGVD	feet BGS	feet BGS	feet NGVD	feet NGVD	feet NGVD	feet BGS	feet NGVD
MW-1	1838455	2905855	522.56	104.85	417.71	114.85	104.85	407.71	417.71	522.38	29.42	492.96
MW-2	1838281	2906230	529.59	94.60	434.99	104.60	94.60	424.99	434.99	529.37	36.23	493.14
MW-3	1838931	2906623	523.47	114.45	409.02	124.45	114.45	399.02	409.02	523.37	30.19	493.18
MW-4	1838846	2905800	518.72	64.64	454.08	74.64	64.64	444.08	454.08	518.48	25.78	492.70
MW-5	1838726	2905952	520.70	64.64	456.06	74.64	64.64	446.06	456.06	520.42	27.57	492.85

GS -- ground surface

WL -- Water Level

NGVD --- 1929

BGS -- below ground surface

TOC (MP) -- Top of Casing (Measuring Point)

MW	Development Volume
	gallons
MW-1	745
MW-2	596
MW-3	1039
MW-4	317
MW-5	413

Table 5
VOC Results -- Monitoring Wells

LabID	ClientID	Collection Date	TetraCE (perc)	TCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	Vinyl Chloride	Toluene	2-Butanone	Carbon Disulfide	Bromo-dichloro-methane	Dibromo-chloro-methane	Bromoform	Chloroform
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Minimum Detection Level			**0.30**	**0.28**	**0.30**	**0.42**	**0.83**	**0.28**	**0.17**	**1.9**	**0.15**	**0.22**	**0.24**	**0.34**	**0.35**
06030059-003A	MW-1	28-Feb-06	<1	**5.7**	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06030059-002A	MW-1 Duplicate	"	<1	**6.0**	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06030059-004A	MW-2	"	<1	**20**	**2.2**	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06030059-005A	MW-3	"	<1	**3.0**	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06030059-006A	MW-4	"	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06030059-007A	MW-5	"	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06030059-008A	Equip Blank (Pump)	"	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1
06030059-001A	Trip Blank	"	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<5	<1	<1

Appendix A

VOC Work Plan
(Jan 6, 2006)

VOC
Investigation Work Plan

C&D Technologies, Inc.
Attica, IN

Clayton Project No. 25-05019
January 5, 2006

Prepared For:

US EPA, Region 5

Prepared by:

CLAYTON GROUP SERVICES, INC.
3140 Finley Road
Downers Grove, Illinois 60515
630.795.3200

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1.0 INTRODUCTION

The U.S. Environmental Protection Agency, Region V (EPA) has demanded that C&D Technologies, Inc. (C&D) perform an environmental investigation into whether an allegedly old municipal landfill ("landfill") located on C&D property is the source of trichloroethylene (TCE) being detected in the Town of Attica, Indiana's well field. C&D retained Clayton Group Services, Inc. (Clayton) to conduct this investigation. The C&D facility is located upgradient of the well field. The alleged landfill located on the northwest side of the C&D property may be a potential source of historical TCE releases to the subsurface. The purpose of this Volatile Organic Compound (VOC) Investigation Work Plan (Work Plan) is to determine if VOCs attributable to the C&D facility are present in groundwater south of the facility and to determine if a known VOC groundwater contamination plume upgradient of the C&D facility is impacting the C&D facility

This Work Plan presents the initial steps proposed to investigate groundwater south of the alleged landfill. The Work Plan includes three objectives that include:

1. The emplacement of four soil borings for lithologic characterization and vertical aquifer profiling of VOCs to identify screen placement for permanent monitoring wells downgradient and upgradient of the C&D facility.
2. The installation five groundwater monitoring wells for groundwater sampling downgradient and upgradient of the C&D facility.
3. The acquisition of static water level measurements to allow the determination of groundwater flow direction.

Groundwater information will be collected and interpreted to determine if the C&D facility is a source of VOCs in the groundwater and if VOC groundwater contamination from upgradient sources is impacting the C&D facility.

1.1 BACKGROUND

C&D operates a manufacturing site in Attica, Indiana (the "Site"). A portion of this Site allegedly includes an old municipal landfill. This landfill allegedly operated for several decades, and was supposedly closed and stopped accepting waste in 1958. The alleged landfill has never been formally closed under any known environmental program. A

parking lot has been built over a portion of the alleged former landfill (see **Figure 1**).

The C&D property is located immediately adjacent to the Wabash River (see **Figure 2**). Immediately adjacent to the Site, and downstream of the C&D facility is the Town's municipal water supply well field with three groundwater withdrawal wells. One of the wells is in inactive.

TCE has been detected in the well field since at least 1983. According to the Town's data, TCE has been detected in a range of 1 to 9 parts per billion (ppb). A copy of the city data is attached. A review of the TCE concentration occurring in the Town's groundwater wells indicates that the concentration of TCE has been decreasing over time. It is believed that no action has ever been taken by the town to address or treat the water being delivered to town residents. This well field provides 100% of the town's water supply.

The Site apparently had interim status to store 26,000 gallons (roughly 475 55-gallon drums) of hazardous waste in a container storage area. This TSD interim status unit is documented to have been clean-closed in the mid 1980s. The site is listed on EPA's RCRA Corrective Action list. IDEM has indicated that the current GPRA rating for this site is low.

Clayton personnel have reviewed the Indiana Department of Environmental Management (IDEM) files for the C&D facility to ascertain other information. This review determined that C&D's predecessors may have used small quantities of tetrachloroethene (PCE) and trichloroethene (TCE) in the early 1980's. Based on a review of Sanborn maps from 1896 to 1948 the area west of Cross Street (Union St.) and north of Main Street, the area that is now occupied by C&D, was used as a lumberyard, a foundry, a grain elevator, and a machine works. Through the mid 1950's, RMC and its predecessor, Edwin L. Guthman & Co., may have operated within the older portion of the C&D facility as a manufacturer of radio components and cabinets.

In early 2005, EPA held a meeting with C&D, Attica town representatives, IDEM and Radio Materials Company (RMC), an Attica company that has a known and widespread TCE groundwater problem. The RMC facility is located approximately ¾ mile away from the Attica wells field. At the meeting, EPA requested that C&D perform an environmental investigation into the source of the TCE being found in the town's well field. As a result of this meeting C&D prepared a *VOC Investigation Work Plan* dated August 25, 2005 that was approved for implementation by U.S.EPA. After approval this work plan, C&D approached Attica officials about installing a treatment system on the well field, and additionally, learned significantly more about the nature of the RMC site TCE problem through a review of their *Phase IIB RCRA Facility Investigation Report*. On December 1, 2005, C&D representatives and U.S. EPA officials met again, and it was agreed that C&D would go forward with the original scope of work approved by U.S. EPA in the C&D August 25, 2005 work plan. Additionally, C&D informed U.S. EPA that it would install two groundwater monitoring wells in upgradient locations to determine upgradient occurrence of TCE. The nature and location of upgradient monitoring well installations was discussed and agreed to in a subsequent conversation between Mr. Ron St. John of Clayton Group Services, and Ms. Tami Moore and Mr. Gary Cygan of U.S. EPA. This updated work plan reflects those changes.

2.0 SITE DESCRIPTION

The Site is located at 200 West Main Street in Attica, Fountain County, Indiana (**Figure 2**). The Site is bounded on the southeast by Third Street; to the southwest by Main Street; the Wabash River to the northwest; and is located in a mixed area of industrial, commercial, and residential use. Located between the Wabash River and the Site buildings is the former alleged landfill.

2.1 GEOLOGY AND HYDROGELOGY

The Site is located within the Middle Wabash River Basin which is predominately overlain by Wisconsinan Age Tipton Till Plain deposits. The Tipton Till plain is generally featureless, flat to gently-rolling plain, which is interrupted in places by very low-relief end moraines. The elevation of the site is approximately 520 feet above mean sea level.

Based on the *Well Head Protection Phase I* for Attica Water Works, the Site is underlain by approximately 140 feet of unconsolidated, valley-train glaciofluvial deposits consisting of sand and gravel. Generally speaking, these unconsolidated deposits occur in a narrow band that parallels the Wabash River. These sand and gravel deposits can produce upwards of 1,600 gallons per minute (gpm), and have been test pumped at up to 2,500 plus gpm.

The Attica city wells are completed in the Wabash River alluvial sand and gravel at a depth of approximately 110 to 120 feet below ground surface (well bottom elevation of 480 to 490 feet amsl). The Wabash River alluvium is a valley train sand and gravel deposit that has very steep sidewalls in connection with the bedrock valley walls. Groundwater entering the bedrock in the upper till plain, like the Bodine report indicates, needs to flow west-northwest to its discharge point, the Wabash River alluvium. Once in the Wabash River alluvium, the groundwater flows and discharges to the river. Located

below the unconsolidated deposits is Paleozoic Pennsylvanian age sandstones of the Raccoon Creek Group and Mississippian age limestones and shales of the Borden Group.

2.2 PREVIOUS SUBSURFACE SITE INVESTIGATIONS

There have been no previous investigations of the C&D Technologies facility or that portion of their facility that was previously used as the alleged landfill.

3.0 SCOPE OF WORK

The scope of work associated with this Work Plan includes the following:

1. Emplacement of four borings to 120 feet below ground surface (bgs) that includes continuous soil sampling and vertical aquifer profiling for VOCs at 10-foot intervals. The locations for these borings are shown on **Figure 3**. Each boring is described below:

    - A boring will be located just south of plant buildings that are situated on the alleged landfill; this area is between the alleged landfill and the city wells.

    - A boring will be located between the portion of the C&D plant that had historically been used by RMC and the city wells.

    - Two borings will be located in the anticipated upgradient position west of plant buildings, and city well field.

The primary purpose of these borings is to identify the vertical interval for the screen placement during the permanent installation of monitoring wells identified below.

- Installation of five 2-inch groundwater monitoring wells south, west, and east of the C&D property as shown on **Figure 3**. Clayton will develop and survey the wells prior to sampling for VOCs.

3.1 BORINGS

Soil borings will be emplaced for lithologic characterization and vertical aquifer profiling for VOCs. Although sampling of groundwater is the primary purpose of this task, soil screening using a photoionization detector (PID) will be performed on soil samples to identify any potential VOCs' contamination for the entire boring sequence from surface to the bottom and includes both unsaturated and saturated samples.

3.1.1 Soil Sampling Procedures

Borings will be emplaced with Roto-Sonic Methods that include the utilization of the isolated stainless steel screen method. The isolated stainless steel screen method allows for collection of groundwater samples and continuous core soil samples as the boring is advanced using a 10-foot long, 4-inch or 6-inch I.D. core barrel using no water or air to

collect the core sample. This method is summarized more completely in Section 1.1.2 -- Vertical Aquifer Profiling Procedures.

A Clayton geologist will describe and classify the retrieved soil cores using the Unified Soil Classification System. Soil sample descriptions and the field screening results will be recorded on boring logs and noted in a field logbook.

For soil screening the retrieved 5-foot sample (vertical measurement) will be divided in two 2.5-foot sampling intervals; each interval collected will be split into two portions; one will be screened using a PID and the other portion will be placed into clean laboratory-provided containers for potential laboratory analysis. No more than one 5-foot interval will be pulled ahead of the interval currently being examined by the geologist. This is done to reduce the opportunity for bias from chemical volatilization while the sample awaits examination.

Clayton does not anticipate that field screening will identify soils that potentially contain laboratory quantifiable VOCs, however appropriate field procedures will utilized to identify any such contamination. Selection of soil samples for laboratory analysis will be based on location, lithology and field-screening results. Soil samples will be collected utilizing USEPA field method 5035. Samples exhibiting detectable headspace reading (> 5.0 ppm) are probable candidates for laboratory analysis. Headspace readings are recorded on the soil boring log beside the sample depth interval. Field assessment and headspace screening will determine which soil samples receive laboratory analysis. Additional soil samples will be submitted if soil conditions warrant. All samples will be handled under chain-of-custody requirements.

3.1.2 Vertical Aquifer Profiling Procedures

Vertical aquifer profiling will performed by utilizing the Boart Longyear roto-sonic borehole pumping and groundwater sampling system, more specifically the roto-sonic stainless steel sampling screen method. This procedure allows for the collection of isolated groundwater samples through a 5-foot long x 2-inch I.D. stainless steel screen

that allows for the development of a real time vertical contaminant profile during drilling in granular materials, such as the sand and gravel aquifers underlying the site. The Boart procedure is described below and shown on **Figure 4**.

The isolated stainless steel screen method allows for collection of groundwater samples and continuous core soil samples as the boring is advanced using a 4-inch or 6-inch I.D. core barrel using no water or air to collect the core sample. The core barrel is advanced 10 feet at a time followed by the outer drill casing using water for lubrication and to prevent heaving. The amount of water added for each interval is monitored. The inner core barrel would then be pulled and soil sample extracted and placed in 5-foot long sample sleeves. The stainless steel screen is then set at the bottom of the borehole with the lead rod and K-packer. The outer casing is then vibrated back 5 feet exposing the screen to the formation. The submersible pump and inflatable packer is installed and the volume of water is purged from the isolated zone. The volume of water added during advancement of the drill casing plus 5 volumes of the isolated sampling zone is removed and the water sample is collected.

Upon reaching the water table, and at 10-foot intervals thereafter, water and soil samples will be collected for measurement of field parameters, PID headspace, and potentially for off-site laboratory analysis.

Groundwater samples are collected through a pump system that has an inflatable packer located above the pump to effectively seal off the upper casing. The pump is lowered to the top of the lead rod, which is attached to the top of the screen, and the packer is inflated. The lead rod is approximately five feet long by 3.5-inch diameter. The purpose of the lead rod is to keep the screen from becoming lost in the sand when the casing is pulled back. The entire sampling device is retrieved by a wire line and overshot coupler. The K-packer is attached to the upper end of the lead rod and prevents the sand from coming in between the screen and drill casing. The interval below the inflatable packer is developed and purged, and a sample of groundwater is collected.

DEFINITIONS

1. Roto-Sonic Method: A drilling technique in which the drill string is advanced using vibrations at a frequency of 50 to 150 hertz or cycles per second.
2. Purging: Activity in which water below the inflated packer and within the interval of the stainless steel sampling screen is removed to allow replacement by fresh representative formation water for sampling.
3. Packer: A compressible cylinder of rubber and metal that is place inside the drill casing just above the lead rod and screen interval then inflated to seal off the upper casing column during groundwater purging and sampling in the screen interval below the packer.
4. K-Packer: 4.85 diameter rubber seal attached to the top of the lead rod to prevent sand from entering the bottom of the drill casing.
5. Stainless Steel Screen: a 5-foot long, 2-inch I.D. Stainless steel screen with machined slots over the entire surface area. The bottom of the screen has a 5-inch long drive point.

3.2 MONITORING WELLS

3.2.1 Installation Procedures

Well installation activities will be performed using hollow stem auger (HSA) drilling technique. These wells will be blank drilled (plug placed in drilling bit to prevent materials from entering the HSA), no soil or groundwater sampling will be conducted. Upon reaching the final completion depth, the plug will be knocked out and a monitoring well installed inside the HSA. Monitoring wells will be constructed using flush threaded Schedule 40, 2-inch ID PVC, 0.010-inch machine-slotted screen and 2-inch ID PVC riser. No adhesives, solvents, or grease will be used. The top of the riser for monitoring wells will be situated in flush-mounted protective covers and will be secured with an expandable locking cap with a hole drilled through its center.

A sand filter pack will be installed adjacent to the screen via tremie line and will extend to a height of approximately 2 feet above the upper screen interval. A minimum 2-foot bentonite pellet seal will be placed over the sand filter pack, and the annular seal will be hydrated with tap water. A bentonite/grout mix will be placed above the bentonite pellets to within 5 feet bgs. The auger string will be raised incrementally during placement of the sand pack, annular seal, and grout. A locking protective casing will be installed over the monitoring wells and set in concrete. The remaining annular space will be filled with concrete to secure the protective locking cover and form a concrete pad at grade. . All

work will be performed in accordance with Indiana State Well Drillers Regulations – 312 IAC.

3.2.2 Well Development Procedures

After a minimum of 48 hours following installation, the monitoring wells will be developed using a new disposable bailer and/or electrical submersible pump. Prior to development, the static water level and the total depth at each well will be measured using an electronic water level indicator. The measurements will be referenced to a marked survey location on the rim of the well riser. The two measurements will be used to calculate the volume of standing water in each well (well volume). Monitoring well development will be performed by surging and purging using a bailer and/or electrical submersible pump. Surging of the monitoring wells will be accomplished by dropping a solid slug into the well and then moving the slug up and down through the screen interval. A minimum of ten well volumes of water from each well will be removed or, if there is insufficient water, the well(s) will be bailed/pumped dry at least five times. Turbidity of the development water will be monitored throughout the development process. Development will be complete upon removal of the 10 well volumes (or bailed dry five times).

3.3 GROUNDWATER SAMPLING PROCEDURES

When possible low-flow sampling will be used for the collection of groundwater samples. USEPA 542-S-02-001 (May 2002) "Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers" will be utilized in the collection of groundwater samples.

As described in Section 3.2.1 vertical aquifer profiling will performed by utilizing the Boart Longyear roto-sonic borehole pumping and groundwater sampling system. This system will utilize a Grundfos RediFlo2 submersible pump that has an adjustable pumping rate from 100 ml/min to 9 GPM at depths up to 250 feet. This groundwater pump will be used for all groundwater sampling. An *In-Situ Inc.* MPT9K XP Profiler will be used to monitor the stabilization of water-quality-indicator parameters when

collecting samples from borings and monitoring wells. The multi-parameter probe will be utilized downhole for sampling of monitoring wells and with a flow through cell for the vertical aquifer profiling.

Prior to water sample collection, a static water level measurement in each boring or well will be acquired. Each boring or well will be purged prior to sample collection at a rate not to exceed 1.0 liter/minute. Drawdown in any well will not exceed 25% of the distance from the top of the well screen to the pump intake. Prior to sample collection, ground water quality stabilization will be demonstrated; stabilization is reached when three consecutive readings meet the stabilization criterion listed below. To ensure that formation water is being monitored the determination of stabilization will not occur until the third sample has been removed from each well. The water quality indicator parameters are as follows:

pH	± 0.2 pH units		Oxidation Reduction Potential	± 10 mV
Turbidity	± 10% of reading		Specific Conductance	± 3% of reading
Temperature			Dissolved Oxygen	± 0.3 mg/L

Groundwater samples for laboratory analyses will be collected in laboratory-supplied containers, labeled, and properly sealed. The sample labels will include sample number, place of collection, date and time of collection, and analyses to be performed. The samples will be delivered under proper chain of custody protocol to a laboratory for analyses.

3.3.1 QA/QC Samples

QA/QC samples will be collected and analyzed in conjunction with the investigative samples. The types of QA/QC samples and their frequencies are described below.

A trip blank is a water sample prepared by the laboratory that is transported to the sampling Site and is handled in the same manner as other samples, except that it remains unopened, and then is returned to the laboratory for analysis to determine QA/QC of

sample handling procedures. One trip blank is included in each cooler containing groundwater samples for VOC analysis.

A field duplicate is a blind duplicate sample taken in the field and sent to the laboratory for analysis. The results will provide some indication of the homogeneity of the sample medium and the precision of the laboratory and its equipment. A minimum of one field duplicate will be collected for each ten or fewer organic samples of groundwater.

A MS/MSD is a separate sample or additional sample volume (the samples will be split at the laboratory to provide the MS duplicate) collected in the field and sent to the laboratory for analysis. The results provide information about the effect of sample matrix on the digestion and measurement methodology. MS/MSDs will be collected for each 20 or fewer organic groundwater samples. MS/MSDs will not be obtained at the same locations as duplicates.

3.4 GROUNDWATER ANALYSIS

Groundwater samples will be analyzed for the presence of VOCs by USEPA Method 8260b. VOCs that have SDWA MCLs are listed below with their corresponding detection limits (DL) and IDEM RISC residential groundwater cleanup goals.

Chemical Name	MCL	RISC 2001	RISC 2004	DL	Chemical Name	MCL	RISC 2001	RISC 2004	DL
Tetrachloroethene	5	14	8.8	1.0	1,1,1-Trichloroethane	200	880	3,800	1.0
Trichloroethene	5	25	**0.45**	0.5	1,1,2-Trichloroethane	5	**3.2**	**3.2**	0.5
cis-1,2-Dichloroethene	70	77	77	1.0	1,2-Dichloroethane	5	**2.0**	**2.0**	0.5
trans-1,2-Dichloroethene	100	150	150	1.0	Benzene	5	6.2	5.2	1.0
1,1-Dichloroethene	7	**0.67**	4.8	0.5	Ethyl-benzene	700	1,600	1,600	1.0
Vinyl chloride	2	**1.5**	**1.9**	0.5	Toluene	1,000	930	930	1.0
Carbon tetrachloride	5	**2.6**	**2.6**	0.5	*m&p*-Xylene	10K	1,900	270	1.0
Chlorobenzene	100	130	130	1.0	*o*-Xylene	10K	1,900	270	1.0
o-Dichlorobenzene (1,2)	600	480	480	1.0	Dichloromethane	5	--	--	1.0
p-Dichlorobenzene (1,4)	75	8.0	8.0	1.0	1,2-Dichloropropane	5	**2.6**	**2.6**	1.0
1,2,4-Trichlorobenzene	70	220	220	1.0	Styrene	100	2,000	2,000	1.0

3.5 MONITORING WELL SURVEY

After installation, monitoring wells will be surveyed by a licensed surveyor for both horizontal and vertical control. Survey points for each well will include a predetermined location on the rim of the well riser and a reference ground elevation immediately adjacent to the well.

3.6 MANAGEMENT OF INVESTIGATION-DERIVED MATERIALS

Investigation-derived materials will be generated during multiple phases of the groundwater investigation activities including: equipment decontamination, monitoring well installation, well developing/purging, and groundwater sampling. The management of such materials is discussed in the Sections 3.6.2 and 3.6.3.

3.6.1 Equipment Decontamination

The decontamination area for drilling/well installation equipment will be established at the Site. The area will be constructed in a manner that will allow the collection of all decontamination materials. A high-pressure power washer supplied with potable water will be used for decontamination of truck-mounted drilling equipment. Prior to entering the Site, all appropriate parts of truck-mounted drilling equipment will be thoroughly washed with a standard commercial soap and clean water to remove soil, oil, and grease. Before initiating drilling activities and between each location, the appropriate parts of the equipment (including split spoons, augers, drill bits, drill rods, core barrels, casings, and any associated tools that enter boreholes) will be high-pressure washed at the decontamination station.

Sampling equipment such as downhole pumps, split spoons, bailers, and scoops that will be reused during sampling will be decontaminated between each sampling location or interval (if applicable). This decontamination protocol consists of scrubbing the equipment with an Alconox or comparable solution and tap water wash followed by a distilled water rinse.

Mud and surficial soils removed during the equipment decontamination process will be managed with investigation-derived soils as described in Section 3.6.2. Decontamination water will be managed as outlined in Section 3.6.3.

3.6.2 Management of Investigation-Derived Soils

Soil cuttings brought to the surface during drilling activities will be containerized and staged on-Site. All containers will be labeled as to their contents and date of origin, pending management off-Site.

3.6.3 Management of Investigation-Derived Liquids

Decontamination water and groundwater generated during development or purging of monitoring wells will be containerized and staged on-Site. All containers will be labeled as to their contents and date of origin, pending management off-Site.

4.0 TIMELINE

The emplacement of the borings is scheduled to begin on January 9, 2006 and should take about 6 to 9 working days to complete (depending on the weather). Allowing for receipt and assessment of the analytical data from the laboratory (three weeks), the installation of the monitoring wells should commence the week of February 6 and take 5 to 8 working days to complete (including well development). The wells will be allowed to stabilize for two weeks after installation/development. Static water level measurement and well sampling will then take place some time in early March. Analytical results from the monitoring well sampling should be available by late March.

A report discussing the results of the investigation efforts described by this Work Plan will be submitted to C&D Technologies, Inc. within 2 weeks of receiving the analytical data from the sampling of the monitoring wells. The results of the three investigative objectives described in this Work Plan will be used to make interpretations and will be incorporated into figures, tables, and appendices for the report. A report to EPA will be submitted within 4 weeks of the receipt of analytical results for samples collected from the monitoring wells.

C&D Technologies, Inc. recognizes that additional work may be required beyond the scope described by this work plan, and will revise the work plan and field efforts appropriately in conjunction with discussions regarding potential additional work with U.S. EPA.

FIGURES

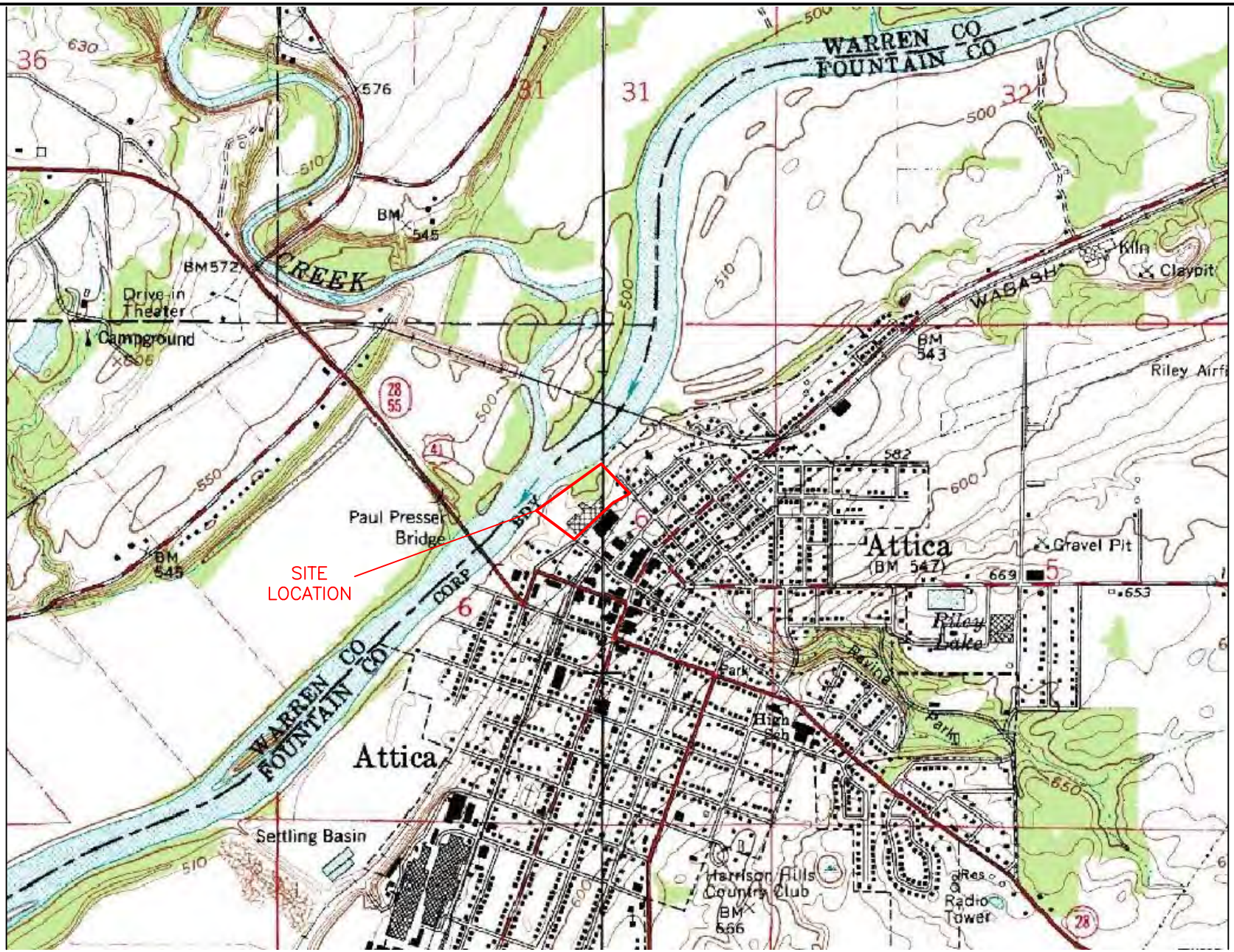
CHECK BY	MGD
DRAWN BY	SAH
DATE	6/1/05
SCALE	unknown
CAD NO.	fig 1 work plan
PRJ NO.	25-05019

HISTORICAL AERIAL PHOTO OF LANDFILL

C & D TECHNOLOGIES, INC.
ATTICA, INDIANA

Clayton
GROUP SERVICES

FIGURE
1



CHECK BY	MGD
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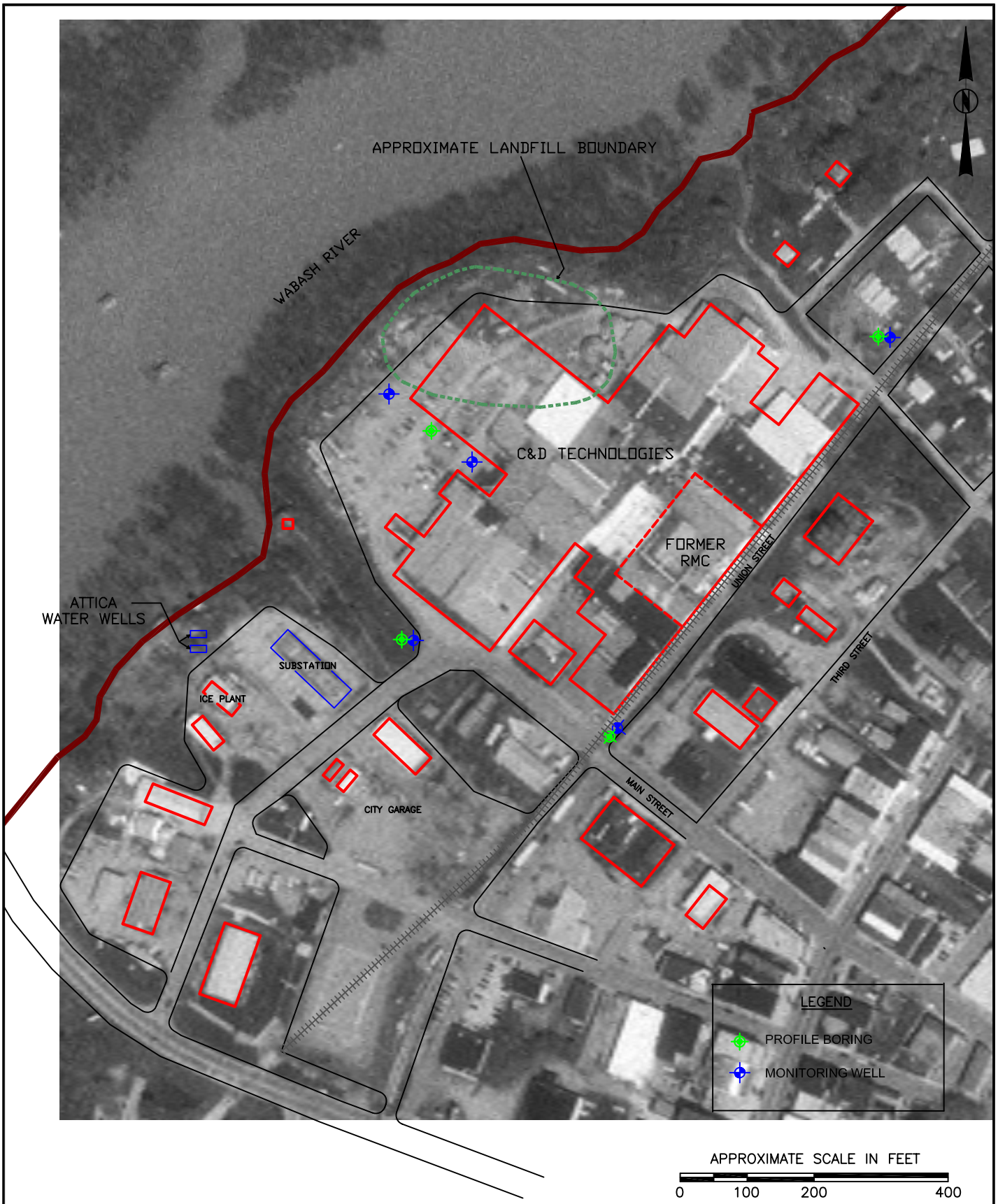
DATE	6/1/05
SCALE	Not to Scale
CAD NO.	fig 2 Work Plan
PRJ NO.	25–05019

SITE LOCATION MAP

C & D TECHNOLOGIES, INC.
ATTICA, INDIANA

Clayton GROUP SERVICES

FIGURE
2



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DRAWN BY	TW
DATE	04-29-05
SCALE	1" = 200'
CAD NO.	Attica, IN
PRJ NO.	

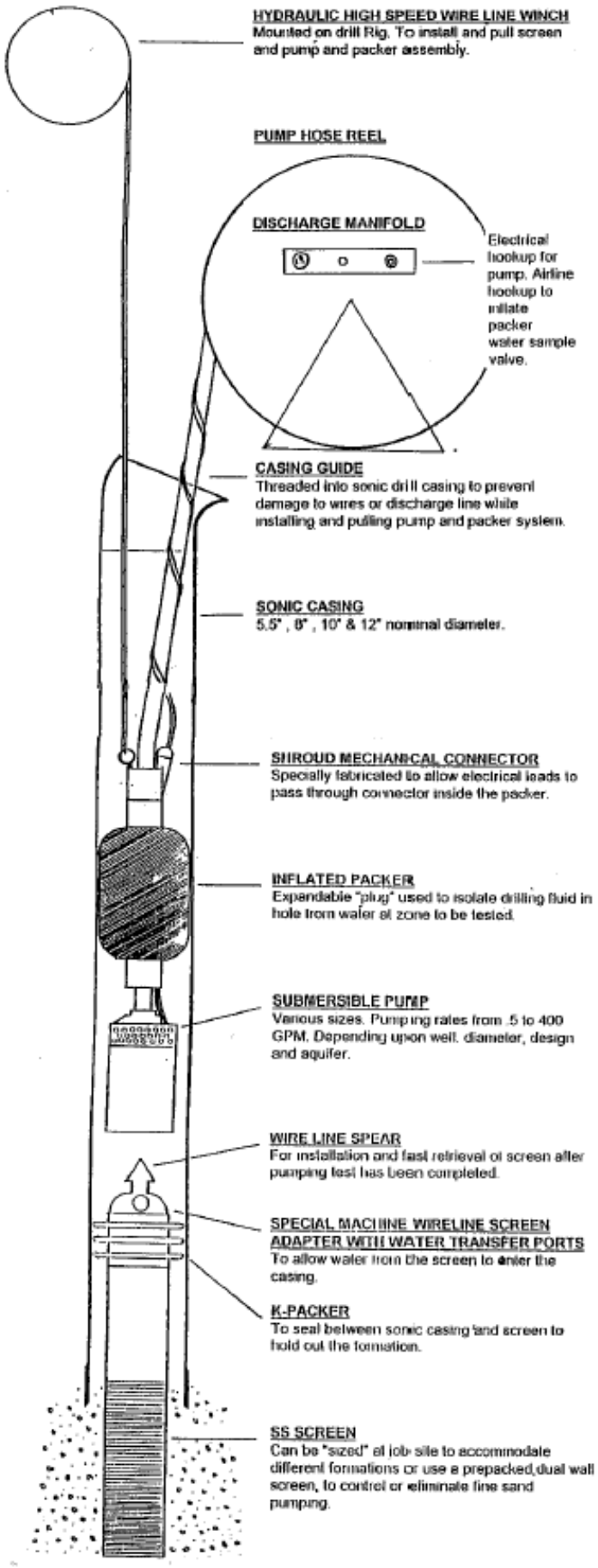
LOCATION OF BORINGS & MONITORING WELLS

C&D TECHNOLOGIES
ATTICA, INDIANA

Clayton GROUP SERVICES

FIGURE 3

Figure 4 -- Boart Longyear Sonic Borehole Wireline Water Sampling System



Appendix B

Boring Logs

PROJECT NO: **25-05019**	PROJECT NAME: **C&D Technologies**	**BORING NO: MW-1**
BORING LOCATION: **Between C&D building and public supply wells**	COORDINATES:	
DRILLING CO: **Boart Longyear**	G.S. ELEVATION:	LOGGED BY: **CCS**
DRILLER: **Jim Robinson**	STICKUP: **flush-mount**	CHECKED BY: **RJR**
DRILLING EQUIP: **Mini Sonic**	TOP of CASING ELEVATION:	START DATE: **1/31/06**
STATIC WATER LEVEL: **Approx. 30 feet bgs**	SCREEN INTERVAL: **95-105 feet bgs**	START TIME (hours): **1000**
BOREHOLE DIA: **6"**	SCREEN MTL/SLOT: **PVC/0.010"**	FINISH DATE: **1/31/06**
BORING CLOSURE: **Monitoring Well**	RISER DIA/MTL/LGTH: **2"/PVC/94.5'**	FINISH TIME (hours): **1400**

DEPTH	Description	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID (ppm) SCAN	PID (ppm) HEADSPACE	REMARKS
0–4	**Topsoil and Silty Clay (0-5')** Brown, slightly moist, fill material		concrete	A	5			0/0.3	Lithology based on Mini Sonic boring completed 1/13/06
4–8	**Fill Sand (5-9.6')** Slightly moist			B	5			0/0.6	
8–12	**Silty Clay (9.6-13')** Black to dark gray, slightly moist, soft to moist		bentonite grout	C	5			0.5/1.1	
12–16	**Sand and Gravel (13-31')** Light brown, dry, poorly sorted, rock fragments throughout			D	5			0/0.3	
16–20	dry, clayey @ 15'		casing	E	5			0/0	
20–24									
24–28				F	10			0/0.1	
28–30	grades light gray to green, slightly moist								
30–34	**Clayey Sand and Gravel (31-35')** Light brown, slightly moist to moist at bottom, few rocks and pebbles, poorly sorted							0/0	
34–38	**No Recovery (35-40')**			G	0			-/-	
38–42	**Sand and Gravel (40-47.5')** Light yellow to brown, wet, poorly sorted, sub-angular to well rounded			H	5			0/0	
42–46									
46–48	**Gray Till (47.5-53.5')** Trace gravel, very firm			I	5			0/0	
48–50									

Well No.: MW-1

PROJECT NO: 25-05019	PROJECT NAME: C&D Technologies	BORING NO: MW-1

DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID SCAN	PID HEADSPACE	REMARKS
52				J	5			0/0	
54	**Sand (53.5-75')** Brown and reddish brown, wet, loose, fine to coarse grained, well sorted								
56				K	5			0/0	
58									
60				L	5			0/0	
62									
64									
66				M	5			0/0	
68									
70				N	5			0/0	
72									
74									
76	**No Recovery (75-85')**			O	0			-/-	
78									
80				P	0			-/-	
82									
84									
86	**Sand (85-90')** brown and reddish brown, wet, loose, fine to coarse grained, well sorted			Q	3			0/0	
88									
90	**Sand and Gravel (90-110')** brown and reddish brown, wet, loose, fine to coarse grained, well sorted		bentonite	R	4			0/0	
92									
94	Gravel content increases with depth								
96				S	5			0/0	
98									
100									

Well No.: MW-1

PROJECT NO: 25-05019	PROJECT NAME: C&D Technologies	BORING NO: MW-1

DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID SCAN	PID HEADSPACE	REMARKS
102, 104, 106, 108			screen, sand	T	4			0.5/1.5	
				U	4			1.7/0.8	
110, 112, 114	**No Recovery (110-143')**			V	0		-/-		
116, 118				W	0	-/-			
120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142	Cobbles above bedrock			X	0			-/-	
144	**Bedrock (143-145')**			Y	2			-/-	
146, 148, 150	End of boring @145 feet bgs								

Well No.: MW-1

PROJECT NO: **25-05019**	PROJECT NAME: **C&D Technologies**	**BORING NO: MW-2**
BORING LOCATION:	COORDINATES:	
DRILLING CO: **Boart Longyear**	G.S. ELEVATION:	LOGGED BY: **CCS**
DRILLER: **Jim Robinson**	STICKUP: **flush-mount**	CHECKED BY: **RJR**
DRILLING EQUIP: **Mini Sonic**	TOP of CASING ELEVATION:	START DATE: **1/30/06**
STATIC WATER LEVEL: **Approx. 35 feet bgs**	SCREEN INTERVAL: **85 - 95 feet bgs**	START TIME (hours): **1430**
BOREHOLE DIA: **6"**	SCREEN MTL/SLOT: **PVC/0.010"**	FINISH DATE: **1/31/06**
BORING CLOSURE: **Monitoring Well**	RISER DIA/MTL/LGTH: **2"/PVC/84.5'**	FINISH TIME (hours): **0930**

DEPTH	Description	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID (ppm) SCAN	PID (ppm) HEADSPACE	REMARKS
0–2	**Topsoil (0-2.5')** Black, moist, loose		concrete	A	4			0.4/1.4	Lithology based on Mini Sonic boring completed 1/19/06
2–15	**Sand (2.5-15')** Brown, moist, fine grain, poorly sorted, loose		bentonite grout	B	5			0.3/0.3	
				C	1			0.1/0.8	
15–20	**Sandy Clay (15-20')** Brown, moist, fine grain, poorly sorted, semi-firm, trace gravel			D	5			3.6/2.3	
20–38	**Clayey Sand and Gravel (20-38')** Brown, moist, fine to coarse grain, well sorted, loose, trace cobbles		casing	E	5			1.9/1.5	
				F	5			0.8/1.2	
	wet @ 30'			G	4			0.2/1.8	
	cobble in cutting head @ 35'			H	5			1.2/2.5	
38–40	**Sand (38-40')** Brown, wet, fine to coarse grained, loose, well sorted								
40–50	**Clayey Sand and Gravel (40-50')** Brown, wet, fine to coarse grain, well sorted, loose, trace cobbles			I	5			1.7/2.2	
				J	5			1.5/2.1	

Well No.: **MW-2**

PROJECT NO: **25-05019** | PROJECT NAME: **C&D Technologies** | **BORING NO: MW-2**

DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID SCAN	PID HEADSPACE	REMARKS
52–54	**Clay (50-55')** Brown, moist, very firm, some sand and gravel			K	3			2.7/1.3	
56–58	**Sand (55-83')** Brown, wet, fine to coarse grain, loose, well sorted			L	5			0/3.6	
60–62				M	5			4.8/4.7	
64–66				N	5			4.3/4.7	
68–70				O	5			0/0.8	
72–74				P	3			0/0	
76–78				Q	5			0.7/0.6	
80–82			bentonite						
84–86	**Sand and Gravel (83-110')** Brown, wet, fine to coarse grain, loose, well sorted		screen	R	4			0.3/0	
88–90									
92–94			sand	S	1			2.3/1.7	
96–98				T	5			3.2/2.9	
100									

Well No.: **MW-2**

PROJECT NO: 25-05019	PROJECT NAME: C&D Technologies	BORING NO: MW-2

DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID SCAN	PID HEADSPACE	REMARKS
102				U	2.5			0.7/0.3	
104									
106				V	2.5			4.6/3.2	
108									
110	No Recovery (110-120')			W	0			-/-	
112									
114									
116				X	0			-/-	
118									
120	End of boring @120 feet bgs								
122									
124									
126									
128									
130									
132									
134									
136									
138									
140									
142									
144									
146									
148									
150									

Well No.: MW-2

PROJECT NO: **25-05019**	PROJECT NAME: **C&D Technologies**	**BORING NO: MW-3**
BORING LOCATION:	COORDINATES:	
DRILLING CO: **Boart Longyear**	G.S. ELEVATION:	LOGGED BY: **CCS**
DRILLER: **Jim Robinson**	STICKUP: **flush-mount**	CHECKED BY: **RJR**
DRILLING EQUIP: **Mini Sonic**	TOP of CASING ELEVATION:	START DATE: **1/30/06**
STATIC WATER LEVEL: **Approx. 30 feet bgs**	SCREEN INTERVAL: **105-115 feet bgs**	START TIME (hours): **0830**
BOREHOLE DIA: **6"**	SCREEN MTL/SLOT: **PVC/0.010"**	FINISH DATE: **1/30/06**
BORING CLOSURE: **Monitoring Well**	RISER DIA/MTL/LGTH: **2"/PVC/104.5'**	FINISH TIME (hours): **1345**

DEPTH	Description	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID (ppm) SCAN	PID (ppm) HEADSPACE	REMARKS
0	**Topsoil (0-2')** Black, moist, loose, some gravel		concrete	A	5			0/0	Lithology based on Mini Sonic boring completed 1/24/06
2	**Clay (2-25')** Brown, moist, very firm, some gravel								
4									
6				B	5			0/0	
8									
10	grades dry and loose @ 10'		bentonite grout	C	1			0/0	
12									
14	some cobbles @ 15'								
16				D	4			0/0	
18									
20			casing	E	5			0/0	
22									
24									
26	**Clayey Sand and Gravel (25-46')** Brown, dry, fine to coarse grain, loose, well sorted, some cobbles			F	5			0/0	
28									
30	wet @ 30'								
32				G	5			0/0	
34									
36				H	5			0/0	
38									
40									
42				I	5			0/0	
44									
46	**Sand (46-50')** Brown, wet, fine to coarse grained, loose, well sorted			J	5			0/0	
48									
50									

Well No.: **MW-3**

PROJECT NO: 25-05019	PROJECT NAME: C&D Technologies	BORING NO: MW-3

DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID SCAN	PID HEADSPACE	REMARKS
52, 54	**Clayey Sand and Gravel (50-55.5')** Brown, wet, fine to coarse grain, well sorted, loose			K	5			0/0	
56, 58	**Gray Till (55.5-60')** very firm, trace gravel			L	5			0/0	
60, 62, 64	**Sand (60-65')** Brown, wet, fine to coarse grain, loose, well sorted			M	5			0/0	
66, 68	**No Recovery (65-70')**			N	0			-/-	
70, 72, 74	**Sand (70-75')** Brown, wet, fine to coarse grain, well sorted, loose			O	5			0/0	
76, 78	**Sand and Gravel (75-80')** Brown, wet, fine to coarse grain, loose, well sorted			P	5			0/0	
80, 82, 84	**No Recovery (80-90')**			Q	0			-/-	
86, 88				R	0			-/-	
90, 92, 94	**Sand and Gravel (90-120')** Brown, wet, fine to coarse grain, well sorted, loose			S	5			1.2/1.8	
96, 98, 100				T	5			0.9/0.6	

Well No.: MW-3

PROJECT NO: 25-05019	PROJECT NAME: C&D Technologies	BORING NO: MW-3

DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID SCAN	PID HEADSPACE	REMARKS
102			bentonite	U	5			1.3/0.4	
104									
106			screen	V	5			0.6/0	
108									
110									
112			sand	W	3			1.9/1.5	
114									
116									
118				X	5			1.2/0	
120	End of boring @120 feet bgs								
122									
124									
126									
128									
130									
132									
134									
136									
138									
140									
142									
144									
146									
148									
150									

Well No.: MW-3

PROJECT NO: **25-05019**	PROJECT NAME: **C&D Technologies**	**BORING NO: MW-4**
BORING LOCATION:	COORDINATES:	
DRILLING CO: **Boart Longyear**	G.S. ELEVATION:	LOGGED BY: **CCS**
DRILLER: **Jim Robinson**	STICKUP: **flush-mount**	CHECKED BY: **RJR**
DRILLING EQUIP: **Mini Sonic**	TOP of CASING ELEVATION:	START DATE: **2/1/06**
STATIC WATER LEVEL: **Approx. 25 feet bgs**	SCREEN INTERVAL: **55 - 65 feet bgs**	START TIME (hours): **1040**
BOREHOLE DIA: **6"**	SCREEN MTL/SLOT: **PVC/0.010"**	FINISH DATE: **2/1/06**
BORING CLOSURE: **Monitoring Well**	RISER DIA/MTL/LGTH: **2"/PVC/54.5**	FINISH TIME (hours): **1300**

DEPTH	Description	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID (ppm) SCAN	PID (ppm) HEADSPACE	REMARKS
0	**Asphalt with Stone Base (0-1')**								Lithology based on Mini Sonic boring completed 1/27/06
2	**Sandy Clay Fill Material (1-5')** Brownish black, moist, firm, some gravel		concrete	A	4			0/0	
4									
6	**Sand Fill Material (5-7.5')** Brown, fine to medium grained, moist, loose			B	5			0/0	
8	**Sand Fill Material (7.5-13')** Brownish black, moist, loose, trace clay								
10			bentonite grout						
12				C	5			3.7/0	
14	**Sand and Clay Fill Material (13-17')** Olive green, brown, reddish brown and black, moist, loose, trace brick, trace glass, trace metal, trace gravel								
16				D	5			0/0	
18	**Silty Clay (17-20')** Brown, moist, firm, trace gravel								
20	**No Recovery (20-25')**		casing						
22				E	0			-/-	
24									
26	**Silty Clay (25-29')** Dark brown, moist, very firm trace gravel			F	5			0/0	
28									
30	**Clayey Sand and Gravel (29-30')** Brown, wet, fine to coarse grain, loose, well sorted								
32	**No Recovery (30-35')**			G	0			-/-	
34									
36	**Clayey Sand and Gravel (35-40')** Brown, wet, fine to coarse grain, loose, well sorted			H	5			0/0	
38									
40	**No Recovery (40-47')**								
42				I	0			-/-	
44									
46									
48	**Clayey Sand and Gravel (47-50')** Brown, wet, fine to coarse grain, loose, well sorted			J	3			0/0	
50									

Well No.: **MW-4**

PROJECT NO: 25-05019	PROJECT NAME: C&D Technologies	BORING NO: MW-4

DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID SCAN	PID HEADSPACE	REMARKS
52, 54	**No Recovery (50-55')**		bentonite	K	0			-/-	
56, 58	**Clayey Sand and Gravel (55-60')** Brown, wet, fine to coarse grain, loose, well sorted		screen	L	5			0/0	
60, 62, 64	**No Recovery (60-65')**		sand	M	0			-/-	
66, 68, 70, 72, 74, 76, 78	**Sand (65-79')** Brown, wet, fine to coarse grained, loose, well sorted Cobble @ 72'			N	5			0/0	
				O	4			0/0	
				P	5			0/0	
80, 82, 84, 86, 88, 90, 92, 94	**Sand and Gravel (79-95')** Brown, wet, fine to coarse grain, loose, well sorted			Q	3			0/0	
				R	5			0/0	
				S	4			0/0	
96, 98, 100	**No Recovery (95-100')**			T	0			-/-	

Well No.: MW-4

PROJECT NO: 25-05019	PROJECT NAME: C&D Technologies	BORING NO: MW-4

DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID SCAN	PID HEADSPACE	REMARKS
	Sand and Gravel (100-110') Brown, wet, fine to coarse grain, well sorted, loose								
102				U	1			0/0	
104									
106				V	1			0/0	
108									
110	**No Recovery (110-120')**								
112				W	0			-/-	
114									
116				X	0			-/-	
118									
120	End of boring @120 feet bgs								
122									
124									
126									
128									
130									
132									
134									
136									
138									
140									
142									
144									
146									
148									
150									

Well No.: MW-4

PROJECT NO: **25-05019**	PROJECT NAME: **C&D Technologies**	**BORING NO: MW-5**
BORING LOCATION:	COORDINATES:	
DRILLING CO: **Boart Longyear**	G.S. ELEVATION:	LOGGED BY: **CCS**
DRILLER: **Jim Robinson**	STICKUP: **flush-mount**	CHECKED BY: **RJR**
DRILLING EQUIP: **Mini Sonic**	TOP of CASING ELEVATION:	START DATE: **2/1/06**
STATIC WATER LEVEL: **Approx. 25 feet bgs**	SCREEN INTERVAL: **55 - 65 feet bgs**	START TIME (hours): **1340**
BOREHOLE DIA: **6"**	SCREEN MTL/SLOT: **PVC/0.010"**	FINISH DATE: **2/1/06**
BORING CLOSURE: **Monitoring Well**	RISER DIA/MTL/LGTH: **2"/PVC/54.5**	FINISH TIME (hours): **1500**

DEPTH	Description	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID (ppm) SCAN	PID (ppm) HEADSPACE	REMARKS
0	**Asphalt with Stone Base (0-1')**								Lithology based on Mini Sonic boring completed 1/27/06
2	**Sandy Clay Fill Material (1-5')** Brownish black, moist, firm, some gravel		concrete	A	4			0/0	
4									
6	**Sand Fill Material (5-7.5')** Brown, fine to medium grained, moist, loose			B	5			0/0	
8	**Sand Fill Material (7.5-13')** Brownish black, moist, loose, trace clay								
10			bentonite grout						
12				C	5			3.7/0	
14	**Sand and Clay Fill Material (13-17')** Olve green, brown, reddish brown and black, moist, loose, trace brick, trace glass, trace metal, trace gravel								
16				D	5			0/0	
18	**Silty Clay (17-20')** Brown, moist, firm, trace gravel								
20	**No Recovery (20-25')**		casing						
22				E	0			-/-	
24									
26	**Silty Clay (25-29')** Dark brown, moist, very firm trace gravel			F	5			0/0	
28									
30	**Clayey Sand and Gravel (29-30')** Brown, wet, fine to coarse grain, loose, well sorted								
32	**No Recovery (30-35')**			G	0	-/-			
34									
36	**Clayey Sand and Gravel (35-40')** Brown, wet, fine to coarse grain, loose, well sorted			H	5			0/0	
38									
40	**No Recovery (40-47')**								
42				I	0			-/-	
44									
46									
48	**Clayey Sand and Gravel (47-50')** Brown, wet, fine to coarse grain, loose, well sorted			J	3			0/0	
50									

Well No.: **MW-5**

PROJECT NO: 25-05019	PROJECT NAME: C&D Technologies	BORING NO: MW-5

DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID SCAN	PID HEADSPACE	REMARKS
52, 54	**No Recovery (50-55')**		bentonite	K	0			-/-	
56, 58	**Clayey Sand and Gravel (55-60')** Brown, wet, fine to coarse grain, loose, well sorted		screen	L	5			0/0	
60, 62, 64	**No Recovery (60-65')**		sand	M	0			-/-	
66, 68, 70, 72, 74, 76, 78	**Sand (65-79')** Brown, wet, fine to coarse grained, loose, well sorted Cobble @ 72'			N	5			0/0	
				O	4			0/0	
				P	5			0/0	
80, 82, 84, 86, 88, 90, 92, 94	**Sand and Gravel (79-95')** Brown, wet, fine to coarse grain, loose, well sorted			Q	3			0/0	
				R	5			0/0	
				S	4			0/0	
96, 98, 100	**No Recovery (95-100')**			T	0			-/-	

Well No.: MW-5

PROJECT NO: 25-05019	PROJECT NAME: C&D Technologies	BORING NO: MW-5

DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID SCAN	PID HEADSPACE	REMARKS
102	**Sand and Gravel (100-110')** Brown, wet, fine to coarse grain, well sorted, loose			U	1			0/0	
104									
106				V	1			0/0	
108									
110	**No Recovery (110-120')**			W	0			-/-	
112									
114									
116				X	0			-/-	
118									
120	End of boring @120 feet bgs								
122									
124									
126									
128									
130									
132									
134									
136									
138									
140									
142									
144									
146									
148									
150									

Well No.: MW-5

PROJECT NO: **25-05019**	PROJECT NAME: **C&D Technologies**	**BORING NO: SB-1**
BORING LOCATION: **Between C&D building and public supply wells**	COORDINATES:	
DRILLING CO: **Boart Longyear**	G.S. ELEVATION: **NA**	LOGGED BY: **CCS**
DRILLER: **Jim Robinson**	STICKUP: **NA**	CHECKED BY: **RJR**
DRILLING EQUIP: **Mini Sonic**	TOP of CASING ELEVATION: **NA**	START DATE: **1/9/06**
STATIC WATER LEVEL: **Approx. 30 feet bgs**	SCREEN INTERVAL: **NA**	START TIME (hours): **1330**
BOREHOLE DIA: **6"**	SCREEN MTL/SLOT: **NA**	FINISH DATE: **1/13/06**
BORING CLOSURE: **Bentonite**	RISER DIA/MTL/LGTH: **NA**	FINISH TIME (hours): **1630**

DEPTH	Description	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID (ppm) SCAN	PID (ppm) HEADSPACE	REMARKS
0–4	**Topsoil Silty Clay (0-5')** Brown, slightly moist, fill material			A	5			0/0.3	
4–8	**Fill Sand (5-9.6')** Slightly moist			B	5			0/0.6	
8–12	**Silty Clay (9.6-13')** Black to dark gray, slightly moist, soft to moist			C	5			0.5/1.1	
12–16	**Sand and Gravel (13-31')** Light brown, dry, poorly sorted, rock fragments throughout			D	5			0/0.3	
16–20	dry, clayey @ 15'			E	5			0/0	
20–24									
24–28				F	10			0/0.1	
28–32	grades light gray to green, slightly moist								
32–34	**Clayey Sand and Gravel (31-35')** Light brown, slightly moist to moist at bottom, few rocks and pebbles, poorly sorted							0/0	
34–38	**No Recovery (35-40')**			G	0			-/-	
38–42	**Sand and Gravel (40-47.5')** Light yellow to brown, wet, poorly sorted, sub-angular to well rounded			H	5			0/0	
42–46									
46–48				I	5			0/0	
48–50	**Gray Till (47.5-53.5')** Trace gravel, very firm								

Well No.: NA

PROJECT NO: 25-05019	PROJECT NAME: C&D Technologies	BORING NO: SB-1

DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID SCAN	PID HEADSPACE	REMARKS
52				J	5			0/0	
54	**Sand (53.5-75')** Brown and reddish brown, wet, loose, fine to coarse grained, well sorted								
56				K	5			0/0	
58									
60				L	5			0/0	
62									
64									
66				M	5			0/0	
68									
70				N	5			0/0	
72									
74									
76	**No Recovery (75-85')**			O	0			-/-	
78									
80				P	0			-/-	
82									
84									
86	**Sand (85-90')** brown and reddish brown, wet, loose, fine to coarse grained, well sorted			Q	3			0/0	
88									
90	**Sand and Gravel (90-110')** brown and reddish brown, wet, loose, fine to coarse grained, well sorted			R	4			0/0	
92									
94	Gravel content increases with depth								
96				S	5			0/0	
98									
100									

Well No.: NA

PROJECT NO: 25-05019	PROJECT NAME: C&D Technologies	BORING NO: SB-1

DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID SCAN	PID HEADSPACE	REMARKS
102				T	4			0.5/1.5	
104									
106				U	4			1.7/0.8	
108									
110	**No Recovery (110-143')**			V	0		-/-		
112									
114									
116				W	0	-/-			
118									
120				X	0			-/-	
122									
124									
126									
128									
130									
132									
134									
136									
138									
140									
142	Cobbles above bedrock								
144	**Bedrock (143-145')**			Y	2			-/-	
146	End of boring @145 feet bgs								
148									
150									

Well No.: NA

PROJECT NO: **25-05019**	PROJECT NAME: **C&D Technologies**	**BORING NO: SB-2**
BORING LOCATION:	COORDINATES:	
DRILLING CO: **Boart Longyear**	G.S. ELEVATION: **NA**	LOGGED BY: **CCS**
DRILLER: **Jim Robinson**	STICKUP: **NA**	CHECKED BY: **RJR**
DRILLING EQUIP: **Mini Sonic**	TOP of CASING ELEVATION: **NA**	START DATE: **1/16/06**
STATIC WATER LEVEL: **Approx. 30 feet bgs**	SCREEN INTERVAL: **NA**	START TIME (hours): **1040**
BOREHOLE DIA: **6"**	SCREEN MTL/SLOT: **NA**	FINISH DATE: **1/19/06**
BORING CLOSURE: **Bentonite**	RISER DIA/MTL/LGTH: **NA**	FINISH TIME (hours): **800**

DEPTH	Description	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID (ppm) SCAN	PID (ppm) HEADSPACE	REMARKS
0	**Topsoil (0-2.5')** Black, moist, loose								
2	**Sand (2.5-15')** Brown, moist, fine grain, poorly sorted, loose			A	4			0.4/1.4	
4									
6				B	5			0.3/0.3	
8									
10									
12				C	1			0.1/0.8	
14									
16	**Sandy Clay (15-20')** Brown, moist, fine grain, poorly sorted, semi-firm, trace gravel			D	5			3.6/2.3	
18									
20	**Clayey Sand and Gravel (20-38')** Brown, moist, fine to coarse grain, well sorted, loose, trace cobbles			E	5			1.9/1.5	
22									
24									
26				F	5			0.8/1.2	
28									
30	wet @ 30'								
32				G	4			0.2/1.8	
34									
36	cobble in cutting head @ 35'			H	5			1.2/2.5	
38	**Sand (38-40')** Brown, wet, fine to coarse grained, loose, well sorted								
40	**Clayey Sand and Gravel (40-50')** Brown, wet, fine to coarse grain, well sorted, loose, trace cobbles			I	5			1.7/2.2	
42									
44									
46				J	5			1.5/2.1	
48									
50									

Well No.: NA

PROJECT NO: **25-05019** | PROJECT NAME: **C&D Technologies** | **BORING NO: SB-2**

DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID SCAN	PID HEADSPACE	REMARKS
52–54	**Clay (50-55') -- Till** Brown, moist, very firm, some sand and gravel			K	3			2.7/1.3	
56–82	**Sand (55-83')** Brown, wet, fine to coarse grain, loose, well sorted			L	5			0/3.6	
				M	5			4.8/4.7	
				N	5			4.3/4.7	
				O	5			0/0.8	
				P	3			0/0	
				Q	5			0.7/0.6	
84–100	**Sand and Gravel (83-110')** Brown, wet, fine to coarse grain, loose, well sorted			R	4			0.3/0	
				S	1			2.3/1.7	
				T	5			3.2/2.9	

Well No.: **NA**

PROJECT NO: 25-05019	PROJECT NAME: C&D Technologies	BORING NO: SB-2

DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID SCAN	PID HEADSPACE	REMARKS
102				U	2.5			0.7/0.3	
104									
106				V	2.5			4.6/3.2	
108									
110	**No Recovery (110-120')**			W	0			-/-	
112									
114									
116				X	0			-/-	
118									
120	End of boring @120 feet bgs								
122									
124									
126									
128									
130									
132									
134									
136									
138									
140									
142									
144									
146									
148									
150									

Well No.: NA

PROJECT NO: **25-05019**	PROJECT NAME: **C&D Technologies**	**BORING NO: SB-3**
BORING LOCATION:	COORDINATES:	
DRILLING CO: **Boart Longyear**	G.S. ELEVATION: **NA**	LOGGED BY: **CCS**
DRILLER: **Jim Robinson**	STICKUP: **NA**	CHECKED BY: **RJR**
DRILLING EQUIP: **Mini Sonic**	TOP of CASING ELEVATION: **NA**	START DATE: **1/19/06**
STATIC WATER LEVEL: **Approx. 30 feet bgs**	SCREEN INTERVAL: **NA**	START TIME (hours): **1010**
BOREHOLE DIA: **6"**	SCREEN MTL/SLOT: **NA**	FINISH DATE: **1/24/06**
BORING CLOSURE: **Bentonite**	RISER DIA/MTL/LGTH: **NA**	FINISH TIME (hours): **1700**

DEPTH	Description	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID (ppm) SCAN	PID (ppm) HEADSPACE	REMARKS
0	**Topsoil (0-2')** Black, moist, loose, some gravel								
2	**Clay (2-25')** Brown, moist, very firm, some gravel			A	5			0/0	
4									
6				B	5			0/0	
8									
10	grades dry and loose @ 10'			C	1			0/0	
12									
14	some cobbles @ 15'			D	4			0/0	
16									
18				E	5			0/0	
20									
22									
24									
26	**Clayey Sand and Gravel (25-46')** Brown, dry, fine to coarse grain, loose, well sorted, some cobbles			F	5			0/0	
28									
30	wet @ 30'			G	5			0/0	
32									
34									
36				H	5			0/0	
38									
40				I	5			0/0	
42									
44									
46	**Sand (46-50')** Brown, wet, fine to coarse grained, loose, well sorted			J	5			0/0	
48									
50									

Well No.: NA

PROJECT NO: 25-05019	PROJECT NAME: C&D Technologies	BORING NO: SB-3

DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID SCAN	PID HEADSPACE	REMARKS
52, 54	**Clayey Sand and Gravel (50-55.5')** Brown, wet, fine to coarse grain, well sorted, loose			K	5			0/0	
56, 58	**Gray Till (55.5-60')** very firm, trace gravel			L	5			0/0	
60, 62, 64	**Sand (60-65')** Brown, wet, fine to coarse grain, loose, well sorted			M	5			0/0	
66, 68	**No Recovery (65-70')**			N	0			-/-	
70, 72, 74	**Sand (70-75')** Brown, wet, fine to coarse grain, well sorted, loose			O	5			0/0	
76, 78	**Sand and Gravel (75-80')** Brown, wet, fine to coarse grain, loose, well sorted			P	5			0/0	
80, 82, 84	**No Recovery (80-90')**			Q	0			-/-	
86, 88				R	0			-/-	
90, 92, 94	**Sand and Gravel (90-120')** Brown, wet, fine to coarse grain, well sorted, loose			S	5			1.2/1.8	
96, 98, 100				T	5			0.9/0.6	

Well No.: NA

PROJECT NO: 25-05019	PROJECT NAME: C&D Technologies	BORING NO: SB-3

DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID SCAN	PID HEADSPACE	REMARKS
102				U	5			1.3/0.4	
104									
106				V	5			0.6/0	
108									
110				W	3			1.9/1.5	
112									
114									
116				X	5			1.2/0	
118									
120	End of boring @120 feet bgs								
122									
124									
126									
128									
130									
132									
134									
136									
138									
140									
142									
144									
146									
148									
150									

Well No.: NA

PROJECT NO: **25-05019**	PROJECT NAME: **C&D Technologies**	**BORING NO: SB-4**
BORING LOCATION:	COORDINATES:	
DRILLING CO: **Boart Longyear**	G.S. ELEVATION: **NA**	LOGGED BY: **CCS**
DRILLER: **Jim Robinson**	STICKUP: **NA**	CHECKED BY: **RJR**
DRILLING EQUIP: **Mini Sonic**	TOP of CASING ELEVATION: **NA**	START DATE: **1/25/06**
STATIC WATER LEVEL: **Approx. 25 feet bgs**	SCREEN INTERVAL: **NA**	START TIME (hours): **1035**
BOREHOLE DIA: **6"**	SCREEN MTL/SLOT: **NA**	FINISH DATE: **1/27/06**
BORING CLOSURE: **Bentonite**	RISER DIA/MTL/LGTH: **NA**	FINISH TIME (hours): **1300**

DEPTH	Description	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID (ppm) SCAN	PID (ppm) HEADSPACE	REMARKS
0	**Asphalt with Stone Base (0-1')**								
2	**Sandy Clay Fill Material (1-5')** Brownish black, moist, firm, some gravel			A	4			0/0	
4									
6	**Sand Fill Material (5-7.5')** Brown, fine to medium grained, moist, loose			B	5			0/0	
8	**Sand Fill Material (7.5-13')** Brownish black, moist, loose, trace clay								
10									Soil Sample 10-12.5' submitted for laboratory analysis
12				C	5			3.7/0	
14	**Sand and Clay Fill Material (13-17')** Olve green, brown, reddish brown and black, moist, loose, trace brick, trace glass, trace metal, trace gravel								
16									
18	**Silty Clay (17-20')** Brown, moist, firm, trace gravel			D	5			0/0	
20	**No Recovery (20-25')**								
22				E	0			-/-	
24									
26	**Silty Clay (25-29')** Dark brown, moist, very firm trace gravel								
28				F	5			0/0	
30	**Clayey Sand and Gravel (29-30')** Brown, wet, fine to coarse grain, loose, well sorted								
32	**No Recovery (30-35')**			G	0			-/-	
34									
36	**Clayey Sand and Gravel (35-40')** Brown, wet, fine to coarse grain, loose, well sorted								
38				H	5			0/0	
40	**No Recovery (40-47')**								
42				I	0			-/-	
44									
46									
48	**Clayey Sand and Gravel (47-50')** Brown, wet, fine to coarse grain, loose, well sorted			J	3			0/0	
50									

Well No.: NA

PROJECT NO: 25-05019	PROJECT NAME: C&D Technologies	BORING NO: SB-4

DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID SCAN	PID HEADSPACE	REMARKS
52, 54	**No Recovery (50-55')**			K	0			-/-	
56, 58, 60	**Clayey Sand and Gravel (55-60')** Brown, wet, fine to coarse grain, loose, well sorted			L	5			0/0	
62, 64	**No Recovery (60-65')**			M	0			-/-	
66, 68, 70, 72, 74, 76, 78	**Sand (65-79')** Brown, wet, fine to coarse grained, loose, well sorted Cobble @ 72'			N	5			0/0	
				O	4			0/0	
				P	5			0/0	
80, 82, 84, 86, 88, 90, 92, 94	**Sand and Gravel (79-95')** Brown, wet, fine to coarse grain, loose, well sorted			Q	3			0/0	
				R	5			0/0	
				S	4			0/0	
96, 98, 100	**No Recovery (95-100')**			T	0			-/-	

Well No.: NA

PROJECT NO: 25-05019	PROJECT NAME: C&D Technologies	BORING NO: SB-4

DEPTH	DESCRIPTION	GRAPHIC	WELL	SAMPLES NUMBER	SAMPLES RECOVERY	SAMPLES MOISTURE	PID SCAN	PID HEADSPACE	REMARKS
102	**Sand and Gravel (100-110')** Brown, wet, fine to coarse grain, well sorted, loose			U	1			0/0	
104									
106				V	1			0/0	
108									
110	**No Recovery (110-120')**			W	0			-/-	
112									
114									
116				X	0			-/-	
118									
120	End of boring @120 feet bgs								
122									
124									
126									
128									
130									
132									
134									
136									
138									
140									
142									
144									
146									
148									
150									

Well No.: NA

Appendix C

Analytical Reports – Soil Samples

January 27, 2006

Chris Sloffer
CLAYTON INDIANAPOLIS
9376 Castlegate Drive
Indianapolis, IN 46256-

Clayton Work Order No. 06010792

Reference: 25-05019.00.004/

Dear Chris Sloffer:

Clayton Group Services received 1 sample on 1/26/2006 for the analyses presented in the following report.

Enclosed is a copy of the Chain-of-Custody record, acknowledging receipt of these samples. Please note that any unused portion of the samples will be discarded 30 days after the date of this report, unless you have requested otherwise.

This material is confidential and is intended solely for the person to whom it is addressed. If this is received in error, please contact the number provided below.

We appreciate the opportunity to assist you. If you have any questions concerning this report, please contact a Client Services Representative at (800) 806-5887.

Sincerely,

Karen Coonan

Karen Coonan
Client Services Representative

cc:

Clayton Group Services, Inc.
A Bureau Veritas Company
22345 Roethel Drive
Novi, MI 48375

Main: (248) 344-1770
Fax: (248) 344-2655
www.us.bureauveritas.com

CASE NARRATIVE

Date: ***27-Jan-06***

Client: **CLAYTON INDIANAPOLIS**

Project: **25-05019.00.004/**

Work Order No **06010792**

All quality control results associated with this sample set were within acceptable limits and/or do not adversely affect the reported results, unless otherwise noted below.

Samples were received at the laboratory at an average temperature of 1.4 °C.

Analytical Comments for Method 8260SLL, sample -001A: Please note that the internal and surrogate standard recoveries are above/below acceptance criteria. The results are not affected.

ANALYTICAL RESULTS

Date: *27-Jan-06*

Client: CLAYTON INDIANAPOLIS
Work Order No.: 06010792
Project: 25-05019.00.004/
Lab ID: 06010792-001A

Client Sample ID: SB-4 10-12.5
Tag Number:
Collection Date: 1/25/2006 11:00:00 AM
Matrix: SOIL

Analyses	Result	Qual	MDL	Reporting Limit	Units	DF	Date Analyzed
GC/MS VOLATILES; METHOD EPA 8260B		**SW8260A**				Analyst: **DRS**	
Diethyl ether	ND		2.8	9.3	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Acetone	29	J	11	93	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Acrylonitrile	ND		0.61	93	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Benzene	0.67	J	0.55	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Bromobenzene	ND		0.69	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Bromochloromethane	ND		0.86	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Bromodichloromethane	ND		0.74	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Bromoform	ND		0.59	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Bromomethane	ND		1.4	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
2-Butanone	ND		7.3	93	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
n-Butylbenzene	ND		1.6	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
sec-Butylbenzene	ND		1.3	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
tert-Butylbenzene	ND		0.93	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Carbon Disulfide	1.4	J	1.3	9.3	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Carbon tetrachloride	ND		0.91	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Chlorobenzene	ND		0.61	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Chloroethane	ND		0.90	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Chloroform	ND		0.63	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Chloromethane	ND		1.5	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
1,2-Dibromo-3-chloropropane	ND		0.95	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Dibromochloromethane	ND		0.39	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
1,2-Dibromoethane	ND		0.48	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Dibromomethane	ND		0.76	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
1,2-Dichlorobenzene	ND		0.68	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
1,3-Dichlorobenzene	ND		1.1	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
1,4-Dichlorobenzene	ND		0.96	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Dichlorodifluoromethane	ND		0.93	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
1,1-Dichloroethane	ND		0.72	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
1,2-Dichloroethane	ND		1.0	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
1,1-Dichloroethene	ND		0.83	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
cis-1,2-Dichloroethene	ND		0.69	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
trans-1,2-Dichloroethene	ND		0.94	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
1,2-Dichloropropane	ND		0.65	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
cis-1,3-Dichloropropene	ND		0.56	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
trans-1,3-Dichloropropene	ND		0.49	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Ethylbenzene	ND		0.71	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).
J - Analyte detected below the Reporting Limit
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *27-Jan-06*

Client: CLAYTON INDIANAPOLIS
Work Order No.: 06010792
Project: 25-05019.00.004/
Lab ID: 06010792-001A

Client Sample ID: SB-4 10-12.5
Tag Number:
Collection Date: 1/25/2006 11:00:00 AM
Matrix: SOIL

Analyses	Result	Qual	MDL	Reporting Limit	Units	DF	Date Analyzed
2-Hexanone	ND		9.3	93	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Isopropylbenzene	ND		1.1	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
4-Isopropyltoluene	ND		9.3	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
2-Methylnaphthalene	ND		9.3	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
4-Methyl-2-Pentanone	ND		12	93	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Methyl tert-butyl ether	ND		0.89	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Methylene Chloride	ND		2.7	9.3	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Naphthalene	ND		1.1	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
n-Propylbenzene	ND		0.91	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Styrene	ND		0.56	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
1,1,2,2-Tetrachloroethane	ND		0.71	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
1,1,1,2-Tetrachloroethane	ND		0.42	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Tetrachloroethene	ND		1.0	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Tetrahydrofuran	ND		93	93	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Toluene	ND		3.9	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
1,2,3-Trichlorobenzene	ND		1.3	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
1,2,4-Trichlorobenzene	ND		1.7	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
1,1,1-Trichloroethane	ND		0.88	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
1,1,2-Trichloroethane	ND		0.86	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Trichloroethene	ND		0.59	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Trichlorofluoromethane	ND		0.78	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
1,2,3-Trichloropropane	ND		1.1	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
1,2,4-Trimethylbenzene	ND		0.80	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
1,3,5-Trimethylbenzene	ND		1.0	4.6	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Vinyl Chloride	ND		0.90	1.9	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
o-Xylene	ND		0.52	9.3	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
m,p-Xylene	ND		1.5	19	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM
Xylenes, Total	ND		2.1	28	µg/Kg-dry	0.818	1/27/2006 2:47:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).
J - Analyte detected below the Reporting Limit
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *27-Jan-06*

Client:	CLAYTON INDIANAPOLIS	**Client Sample ID:**	SB-4 10-12.5
Work Order No.:	06010792	**Tag Number:**	
Project:	25-05019.00.004/	**Collection Date:**	1/25/2006 11:00:00 AM
Lab ID:	06010792-001B	**Matrix:**	SOIL

Analyses	Result	Qual	MDL	Reporting Limit	Units	DF	Date Analyzed
ASTM D2216		**D2216**					Analyst: **MWS**
Percent Moisture	12		0	0	wt%	1	1/26/2006

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).
J - Analyte detected below the Reporting Limit
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
T - Tentatively Identified Compound (TIC)

Clayton Group Services

Date: *27-Jan-06*

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010792
Project: 25-05019.00.004/

QC SUMMARY REPORT

Method Blank

Sample ID **06010000-BLK1** Batch ID: **R77672** Units: **µg/Kg** Analysis Date **1/27/2006 8:18:00 AM** Prep Date:

Client ID: Run ID: **MS_HP12L_060127A** SeqNo: **909440**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diethyl ether	ND	10									
Acetone	ND	100									
Acrylonitrile	ND	100									
Benzene	ND	10									
Bromobenzene	ND	10									
Bromochloromethane	ND	10									
Bromodichloromethane	ND	10									
Bromoform	ND	10									
Bromomethane	ND	10									
2-Butanone	ND	100									
n-Butylbenzene	ND	10									
sec-Butylbenzene	ND	10									
tert-Butylbenzene	ND	10									
Carbon Disulfide	ND	100									
Carbon tetrachloride	ND	10									
Chlorobenzene	ND	10									
Chloroethane	ND	10									
Chloroform	ND	10									
Chloromethane	ND	10									
1,2-Dibromo-3-chloropropane	ND	10									
Dibromochloromethane	ND	10									
1,2-Dibromoethane	ND	10									
Dibromomethane	ND	10									
1,2-Dichlorobenzene	ND	10									
1,3-Dichlorobenzene	ND	10									
1,4-Dichlorobenzene	ND	10									
Dichlorodifluoromethane	ND	10									

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below Reporting Limit
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010792
Project: 25-05019.00.004/

QC SUMMARY REPORT
Method Blank

1,1-Dichloroethane	ND	10
1,2-Dichloroethane	ND	10
1,1-Dichloroethene	ND	10
cis-1,2-Dichloroethene	ND	10
trans-1,2-Dichloroethene	ND	10
1,2-Dichloropropane	ND	10
cis-1,3-Dichloropropene	ND	10
trans-1,3-Dichloropropene	ND	10
Ethylbenzene	ND	10
2-Hexanone	ND	100
Isopropylbenzene	ND	10
4-Isopropyltoluene	ND	10
2-Methylnaphthalene	ND	10
4-Methyl-2-Pentanone	ND	100
Methyl tert-butyl ether	ND	10
Methylene Chloride	ND	10
Naphthalene	ND	10
n-Propylbenzene	ND	10
Styrene	ND	10
1,1,2,2-Tetrachloroethane	ND	10
1,1,1,2-Tetrachloroethane	ND	10
Tetrachloroethene	ND	10
Tetrahydrofuran	ND	100
Toluene	ND	10
1,2,3-Trichlorobenzene	ND	10
1,2,4-Trichlorobenzene	ND	10
1,1,1-Trichloroethane	ND	10
1,1,2-Trichloroethane	ND	10
Trichloroethene	ND	10
Trichlorofluoromethane	ND	10
1,2,3-Trichloropropane	ND	10
1,2,4-Trimethylbenzene	ND	10
1,3,5-Trimethylbenzene	ND	10

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below Reporting Limit
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010792
Project: 25-05019.00.004/

QC SUMMARY REPORT

Method Blank

Vinyl Chloride	ND	10						
o-Xylene	ND	10						
m,p-Xylene	ND	20						
Xylenes, Total	ND	30						
Surr: 4-Bromofluorobenzene	47.06	0	50	0	94.1	79.8	120	0
Surr: 1,2-Dichloroethane-d4	49.05	0	50	0	98.1	74.3	130	0
Surr: Pentafluorobenzene	54.11	0	50	0	108	66.4	131	0
Surr: Toluene-d8	48.63	0	50	0	97.3	69.4	133	0

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below Reporting Limit
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Clayton Group Services

Date: *27-Jan-06*

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010792
Project: 25-05019.00.004/

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID **06010547-018AMS** Batch ID: **R77672** Units: **µg/Kg-dry** Analysis Date **1/24/2006 6:53:00 AM** Prep Date:

Client ID: Run ID: **MS_HP12L_060127A** SeqNo: **909442**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acetone	21.91	140	71.43	0	30.7	0.5	162	0			J
Acrylonitrile	61.77	140	71.43	0	86.5	29.2	151	0			J
Benzene	83.36	14	71.43	0	117	62.3	137	0			
Bromobenzene	87.04	14	71.43	0	122	32.9	95.4	0			S
Bromochloromethane	80.19	14	71.43	0	112	41.1	138	0			
Bromodichloromethane	82.14	14	71.43	0	115	56.9	135	0			
Bromoform	74.77	14	71.43	0	105	31.4	133	0			
Bromomethane	78.6	14	71.43	0	110	0.5	146	0			
2-Butanone	36.84	140	71.43	0	51.6	12.5	159	0			J
n-Butylbenzene	90.51	14	71.43	0	127	0.5	128	0			
sec-Butylbenzene	88.84	14	71.43	0	124	0.5	116	0			S
tert-Butylbenzene	88.06	14	71.43	0	123	0	0	0			S
Carbon Disulfide	80.77	140	71.43	0	113	50.4	145	0			J
Carbon tetrachloride	92	14	71.43	0	129	48.6	147	0			
Chlorobenzene	86.59	14	71.43	0	121	56	138	0			
Chloroethane	80.71	14	71.43	0	113	60	151	0			
Chloroform	78.71	14	71.43	0	110	73	129	0			
Chloromethane	54.81	14	71.43	0	76.7	22.7	155	0			
1,2-Dibromo-3-chloropropane	58.13	14	71.43	0	81.4	41.4	125	0			
Dibromochloromethane	80.09	14	71.43	0	112	49.3	134	0			
1,2-Dibromoethane	81.13	14	71.43	0	114	63	130	0			
Dibromomethane	76.57	14	71.43	0	107	32.8	146	0			
1,2-Dichlorobenzene	84.03	14	71.43	0	118	37.9	144	0			
1,3-Dichlorobenzene	88.39	14	71.43	0	124	37.6	151	0			
1,4-Dichlorobenzene	87.01	14	71.43	0	122	35.4	151	0			
Dichlorodifluoromethane	66.59	14	71.43	0	93.2	31.8	123	0			
1,1-Dichloroethane	78.21	14	71.43	0	110	64.4	139	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below Reporting Limit
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010792
Project: 25-05019.00.004/

QC SUMMARY REPORT

Sample Matrix Spike

1,2-Dichloroethane	84.69	14	71.43	0	119	61.7	131	0	
1,1-Dichloroethene	82.41	14	71.43	0	115	64.2	140	0	
cis-1,2-Dichloroethene	80.13	14	71.43	0	112	66.4	135	0	
trans-1,2-Dichloroethene	83.14	14	71.43	0	116	66.6	137	0	
1,2-Dichloropropane	78.2	14	71.43	0	109	55.2	139	0	
cis-1,3-Dichloropropene	80.54	14	71.43	0	113	51	132	0	
trans-1,3-Dichloropropene	73.41	14	71.43	0	103	44.4	130	0	
Ethylbenzene	86.06	14	71.43	0	120	54.5	140	0	
2-Hexanone	47.81	140	71.43	0	66.9	10	147	0	J
Isopropylbenzene	83.71	14	71.43	0	117	16.7	155	0	
4-Isopropyltoluene	89.7	14	71.43	0	126	75	125	0	S
2-Methylnaphthalene	56.11	14	71.43	0	78.6	0	0	0	S
4-Methyl-2-Pentanone	59.8	140	71.43	0	83.7	14.6	196	0	J
Methyl tert-butyl ether	71.64	14	71.43	0	100	59.8	133	0	
Methylene Chloride	72.11	14	71.43	0	101	60.3	142	0	
Naphthalene	63.66	14	71.43	0	89.1	0.5	113	0	
n-Propylbenzene	89.44	14	71.43	0	125	83.2	109	0	S
Styrene	84.01	14	71.43	0	118	28	146	0	
1,1,2,2-Tetrachloroethane	69.06	14	71.43	0	96.7	29.3	146	0	
1,1,1,2-Tetrachloroethane	83.57	14	71.43	0	117	49.5	83.1	0	S
Tetrachloroethene	89.69	14	71.43	0	126	48	152	0	
Toluene	85.89	14	71.43	0	120	46.7	147	0	
1,2,3-Trichlorobenzene	76.97	14	71.43	0	108	9.78	89.2	0	S
1,2,4-Trichlorobenzene	83.57	14	71.43	0	117	4.76	142	0	
1,1,1-Trichloroethane	80.7	14	71.43	0	113	60.8	139	0	
1,1,2-Trichloroethane	73.61	14	71.43	0	103	50.8	138	0	
Trichloroethene	87.7	14	71.43	0	123	57.1	139	0	
Trichlorofluoromethane	82.36	14	71.43	0	115	50	142	0	
1,2,3-Trichloropropane	67.99	14	71.43	0	95.2	13.2	145	0	
1,2,4-Trimethylbenzene	88.37	14	71.43	0	124	38.7	160	0	
1,3,5-Trimethylbenzene	88.47	14	71.43	0	124	25.2	173	0	
Vinyl Chloride	74.24	14	71.43	0	104	57.3	144	0	
o-Xylene	82.37	14	71.43	0	115	18.5	155	0	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below Reporting Limit
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010792
Project: 25-05019.00.004/

QC SUMMARY REPORT

Sample Matrix Spike

m,p-Xylene	178.5	29	142.9	0	125	14.5	159	0
Xylenes, Total	260.9	43	214.3	0	122	69.5	135	0
Surr: 4-Bromofluorobenzene	68.37	0	71.43	0	95.7	70.5	125	0
Surr: 1,2-Dichloroethane-d4	66.73	0	71.43	0	93.4	75.5	126	0
Surr: Pentafluorobenzene	74.53	0	71.43	0	104	69.3	145	0
Surr: Toluene-d8	71.49	0	71.43	0	100	77.9	123	0

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below Reporting Limit
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010792
Project: 25-05019.00.004/

QC SUMMARY REPORT

Sample Matrix Spike Duplicate

Sample ID **06010547-018AMSD** Batch ID: **R77672** Units: **µg/Kg-dry** Analysis Date **1/24/2006 7:28:00 AM** Prep Date:

Client ID: Run ID: **MS_HP12L_060127A** SeqNo: **909443**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acetone	ND	140	71.43	0	0	0.5	162	21.91	0	61.5	S
Acrylonitrile	46.17	140	71.43	0	64.6	29.2	151	61.77	28.9	39.5	J
Benzene	73.83	14	71.43	0	103	62.3	137	83.36	12.1	24.3	
Bromobenzene	76.86	14	71.43	0	108	32.9	95.4	87.04	12.4	27	S
Bromochloromethane	72.31	14	71.43	0	101	41.1	138	80.19	10.3	43.2	
Bromodichloromethane	71.57	14	71.43	0	100	56.9	135	82.14	13.8	23.5	
Bromoform	64.73	14	71.43	0	90.6	31.4	133	74.77	14.4	41.8	
Bromomethane	81.16	14	71.43	0	114	0.5	146	78.6	3.2	59.4	
2-Butanone	28.86	140	71.43	0	40.4	12.5	159	36.84	24.3	43.5	J
n-Butylbenzene	78.46	14	71.43	0	110	0.5	128	90.51	14.3	128	
sec-Butylbenzene	79.84	14	71.43	0	112	0.5	116	88.84	10.7	79.6	
tert-Butylbenzene	77.73	14	71.43	0	109	0	0	88.06	12.5	25	S
Carbon Disulfide	75.04	140	71.43	0	105	50.4	145	80.77	7.35	25.5	J
Carbon tetrachloride	87.29	14	71.43	0	122	48.6	147	92	5.26	21.8	
Chlorobenzene	73.44	14	71.43	0	103	56	138	86.59	16.4	31.3	
Chloroethane	74.81	14	71.43	0	105	60	151	80.71	7.59	30	
Chloroform	70.3	14	71.43	0	98.4	73	129	78.71	11.3	19.4	
Chloromethane	56.6	14	71.43	0	79.2	22.7	155	54.81	3.21	65.9	
1,2-Dibromo-3-chloropropane	42.77	14	71.43	0	59.9	41.4	125	58.13	30.4	38.9	
Dibromochloromethane	69.21	14	71.43	0	96.9	49.3	134	80.09	14.6	31.9	
1,2-Dibromoethane	66.1	14	71.43	0	92.5	63	130	81.13	20.4	48.9	
Dibromomethane	59.77	14	71.43	0	83.7	32.8	146	76.57	24.6	50.8	
1,2-Dichlorobenzene	72.33	14	71.43	0	101	37.9	144	84.03	15	47	
1,3-Dichlorobenzene	77.99	14	71.43	0	109	37.6	151	88.39	12.5	44.2	
1,4-Dichlorobenzene	76.74	14	71.43	0	107	35.4	151	87.01	12.5	46.3	
Dichlorodifluoromethane	66.69	14	71.43	0	93.4	31.8	123	66.59	0.15	22.1	
1,1-Dichloroethane	70.4	14	71.43	0	98.6	64.4	139	78.21	10.5	23	
1,2-Dichloroethane	69.11	14	71.43	0	96.8	61.7	131	84.69	20.2	26	

Qualifiers:
ND - Not Detected at the Reporting Limit
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R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010792
Project: 25-05019.00.004/

QC SUMMARY REPORT

Sample Matrix Spike Duplicate

1,1-Dichloroethene	76.63	14	71.43	0	107	64.2	140	82.41	7.28	28.4	
cis-1,2-Dichloroethene	73.8	14	71.43	0	103	66.4	135	80.13	8.22	21.1	
trans-1,2-Dichloroethene	74.67	14	71.43	0	105	66.6	137	83.14	10.7	22.3	
1,2-Dichloropropane	68.29	14	71.43	0	95.6	55.2	139	78.2	13.5	21.7	
cis-1,3-Dichloropropene	72.54	14	71.43	0	102	51	132	80.54	10.5	26.7	
trans-1,3-Dichloropropene	64.17	14	71.43	0	89.8	44.4	130	73.41	13.4	31.9	
Ethylbenzene	74.53	14	71.43	0	104	54.5	140	86.06	14.4	24.9	
2-Hexanone	30.24	140	71.43	0	42.3	10	147	47.81	45	37.8	JR
Isopropylbenzene	76.69	14	71.43	0	107	16.7	155	83.71	8.76	26.2	
4-Isopropyltoluene	78.6	14	71.43	0	110	75	125	89.7	13.2	25	
2-Methylnaphthalene	42.99	14	71.43	0	60.2	0	0	56.11	26.5	25	SR
4-Methyl-2-Pentanone	44.11	140	71.43	0	61.8	14.6	196	59.8	30.2	35.7	J
Methyl tert-butyl ether	62.21	14	71.43	0	87.1	59.8	133	71.64	14.1	26	
Methylene Chloride	67.06	14	71.43	0	93.9	60.3	142	72.11	7.27	22.3	
Naphthalene	51.19	14	71.43	0	71.7	0.5	113	63.66	21.7	95	
n-Propylbenzene	78.7	14	71.43	0	110	83.2	109	89.44	12.8	25	S
Styrene	73.63	14	71.43	0	103	28	146	84.01	13.2	49.2	
1,1,2,2-Tetrachloroethane	55.94	14	71.43	0	78.3	29.3	146	69.06	21	80.2	
1,1,1,2-Tetrachloroethane	73.97	14	71.43	0	104	49.5	83.1	83.57	12.2	7.68	SR
Tetrachloroethene	80.04	14	71.43	0	112	48	152	89.69	11.4	25.2	
Toluene	75.8	14	71.43	0	106	46.7	147	85.89	12.5	21.2	
1,2,3-Trichlorobenzene	63.67	14	71.43	0	89.1	9.78	89.2	76.97	18.9	42.9	
1,2,4-Trichlorobenzene	70.03	14	71.43	0	98	4.76	142	83.57	17.6	74.7	
1,1,1-Trichloroethane	74.49	14	71.43	0	104	60.8	139	80.7	8.01	19.8	
1,1,2-Trichloroethane	62.71	14	71.43	0	87.8	50.8	138	73.61	16	30.4	
Trichloroethene	77.44	14	71.43	0	108	57.1	139	87.7	12.4	24.7	
Trichlorofluoromethane	79.54	14	71.43	0	111	50	142	82.36	3.48	20.3	
1,2,3-Trichloropropane	51.67	14	71.43	0	72.3	13.2	145	67.99	27.3	75.9	
1,2,4-Trimethylbenzene	79.47	14	71.43	0	111	38.7	160	88.37	10.6	39	
1,3,5-Trimethylbenzene	79.07	14	71.43	0	111	25.2	173	88.47	11.2	37.6	
Vinyl Chloride	72.36	14	71.43	0	101	57.3	144	74.24	2.57	31.9	
o-Xylene	71.71	14	71.43	0	100	18.5	155	82.37	13.8	24.6	
m,p-Xylene	154.7	29	142.9	0	108	14.5	159	178.5	14.3	25.2	

Qualifiers:
ND - Not Detected at the Reporting Limit
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R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010792
Project: 25-05019.00.004/

QC SUMMARY REPORT

Sample Matrix Spike Duplicate

Xylenes, Total	226.4	43	214.3	0	106	69.5	135	260.9	14.2	25.2
Surr: 4-Bromofluorobenzene	66.93	0	71.43	0	93.7	79.8	120	68.37	2.13	16.4
Surr: 1,2-Dichloroethane-d4	60.63	0	71.43	0	84.9	74.3	130	66.73	9.58	9.92
Surr: Pentafluorobenzene	76.43	0	71.43	0	107	66.4	131	74.53	2.52	10.3
Surr: Toluene-d8	73.1	0	71.43	0	102	69.4	133	71.49	2.23	12.9

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below Reporting Limit
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Clayton Group Services

Date: 27-Jan-06

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010792
Project: 25-05019.00.004/
Analysis: Volatile Organics; Soil: Method 8260B

QC SUMMARY REPORT
SURROGATE RECOVERIES

Sample ID	BR4FBZ	BZMED8	DCA12D4	PFBZ				
06010000-BLK1	94.1	97.3	98.1	108				
06010547-018AMS	95.7	100	93.4	104				
06010547-018AMS	93.7	102	84.9	107				
06010792-001A	72.6 *	119	93.2	97.3				

Acronym		Surrogate	QC Limits
BR4FBZ	=	4-Bromofluorobenzene	79.8-120
BZMED8	=	Toluene-d8	69.4-133
DCA12D4	=	1,2-Dichloroethane-d4	74.3-130
PFBZ	=	Pentafluorobenzene	66.4-131

*** Surrogate recovery outside acceptance limits**

Clayton
Group Services

REQUEST FOR LABORATORY ANALYTICAL SERVICES

IMPORTANT: Date results required: normal turnaround

Page: 1 of 1

Rush charges authorized? Yes ☐ No ■

Fax or E-mail results ■

E-mail Address: chris.sloffer@us.bureauveritas.com

For Clayton Use Only
Lab Project No. 06010792

Report results to:
Name Chris Sloffer
Company Clayton Group Services
Mailing Address 9376 Castlegate Drive
City, State, Zip Indianapolis, Indiana
Telephone No. 317-570-4582 Fax No. 317-570-4586

Client Project Number: 25-05019.00.004

Send invoice to:
Name
Company
Address
City, State, Zip

P.O. No.

Soil samples only: Which state are these from? **Indiana**

Special instructions and/or specific regulatory requirements:
(method, limit of detection, etc.)
Methanol in one vial
Lowest possible detection limits

Water samples are:
Drinking water
Groundwater
Wastewater

Enter a "P" here if preservative added.

Client Sample Identification	Date Sampled	Time Sampled	Matrix/Media	Air Volume (Liters)	# of Containers	ANALYSIS REQUESTED (List each analyte on the lines below, multiple analytes per line)	
SB-4 10-12.5	1/25/06	1100	Soil	NA	4	VOCs - 5035	P

Collected by: Chris Sloffer ***Date/Time*** 1/25/06
Relinquished by: ***Date/Time*** 1/25/06 1900
Relinquished by: ***Date/Time***
Method of Shipment: FedEx
Authorized by:
Date/Time:

Collector's Signature: ***Date/Time*** 1/25/06
Received by: ***Date/Time***
Received by: ***Date/Time***
Sample Condition on Receipt:
Acceptable ***Other:***
(Explain)

(Signature MUST accompany request!)

Ship to:

Detroit (IH, Environmental, & Asbestos)	**Atlanta** (Asbestos, TEM & SEM)	**Seattle** (Asbestos Only)
22345 Roethel Drive	*3380 Chastain Meadows Pkwy., Suite 300*	*4636 E. Marginal Way S., Suite 140*
Novi, Michigan, 48375	*Kennesaw, Georgia 30144*	*Seattle, Washington 98134*
Phone: 248.344.2652, Toll-free 800.806.5887	*Phone: 770.499.7500, Toll-free 800.252.9919*	*Phone: 206.763.7264, Toll-free 800.564.7755*
Fax: 248-344-2655	*Fax: 770.499.7511*	*Fax: 206.763.4189*

Visit our website: http:labonline.claytongrp.com

Appendix D

Analytical Reports – Groundwater Profile Samples

January 27, 2006

Chris Sloffer
CLAYTON INDIANAPOLIS
9376 Castlegate Drive
Indianapolis, IN 46256-

Clayton Work Order No. 06010791

Reference: 25-05019.00.004/

Dear Chris Sloffer:

Clayton Group Services received 2 samples on 1/26/2006 for the analyses presented in the following report.

Enclosed is a copy of the Chain-of-Custody record, acknowledging receipt of these samples. Please note that any unused portion of the samples will be discarded 30 days after the date of this report, unless you have requested otherwise.

This material is confidential and is intended solely for the person to whom it is addressed. If this is received in error, please contact the number provided below.

We appreciate the opportunity to assist you. If you have any questions concerning this report, please contact a Client Services Representative at (800) 806-5887.

Sincerely,

Karen Coonan

Karen Coonan
Client Services Representative

cc:

Clayton Group Services, Inc.
A Bureau Veritas Company
22345 Roethel Drive
Novi, MI 48375

Main: (248) 344-1770
Fax: (248) 344-2655
www.us.bureauveritas.com

CASE NARRATIVE

Date: *27-Jan-06*

Client: **CLAYTON INDIANAPOLIS**

Project: **25-05019.00.004/**

Work Order No **06010791**

All quality control results associated with this sample set were within acceptable limits and/or do not adversely affect the reported results, unless otherwise noted below.

Samples were received at the laboratory at an average temperature of 1.4 °C.

Analytical Comments for Method 8260W_MI, sample -001A: Please note that the surrogate standard recovery for 4-Bromofluorobenzene was above acceptance criteria. The results are not affected.

ANALYTICAL RESULTS

Date: *27-Jan-06*

Client: CLAYTON INDIANAPOLIS
Work Order No.: 06010791
Project: 25-05019.00.004/
Lab ID: 06010791-001A

Client Sample ID: WATER SOURCE
Tag Number:
Collection Date: 1/25/2006 3:25:00 PM
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Reporting Limit	Units	DF	Date Analyzed
GC/MS VOLATILES; METHOD EPA 8260B		**SW8260A**				Analyst: **DRS**	
Diethyl ether	ND		1.0	10	µg/L	1	1/26/2006 1:10:00 PM
Iodomethane	ND		1.0	1.0	µg/L	1	1/26/2006 1:10:00 PM
trans-1,4-Dichloro-2-butene	ND		5.0	1.0	µg/L	1	1/26/2006 1:10:00 PM
Acetone	ND		9.4	50	µg/L	1	1/26/2006 1:10:00 PM
Acrylonitrile	ND		0.40	2.0	µg/L	1	1/26/2006 1:10:00 PM
Benzene	ND		0.31	1.0	µg/L	1	1/26/2006 1:10:00 PM
Bromobenzene	ND		0.25	1.0	µg/L	1	1/26/2006 1:10:00 PM
Bromochloromethane	ND		0.36	1.0	µg/L	1	1/26/2006 1:10:00 PM
Bromodichloromethane	4.9		0.22	1.0	µg/L	1	1/26/2006 1:10:00 PM
Bromoform	1.1		0.34	1.0	µg/L	1	1/26/2006 1:10:00 PM
Bromomethane	ND		1.3	5.0	µg/L	1	1/26/2006 1:10:00 PM
2-Butanone	ND		1.9	25	µg/L	1	1/26/2006 1:10:00 PM
n-Butylbenzene	ND		0.27	1.0	µg/L	1	1/26/2006 1:10:00 PM
sec-Butylbenzene	ND		0.27	1.0	µg/L	1	1/26/2006 1:10:00 PM
tert-Butylbenzene	ND		0.24	1.0	µg/L	1	1/26/2006 1:10:00 PM
Carbon Disulfide	ND		0.15	5.0	µg/L	1	1/26/2006 1:10:00 PM
Carbon tetrachloride	ND		0.38	1.0	µg/L	1	1/26/2006 1:10:00 PM
Chlorobenzene	ND		0.17	1.0	µg/L	1	1/26/2006 1:10:00 PM
Chloroethane	ND		0.59	5.0	µg/L	1	1/26/2006 1:10:00 PM
Chloroform	3.4		0.35	1.0	µg/L	1	1/26/2006 1:10:00 PM
Chloromethane	ND		0.58	5.0	µg/L	1	1/26/2006 1:10:00 PM
1,2-Dibromo-3-chloropropane	ND		0.82	5.0	µg/L	1	1/26/2006 1:10:00 PM
Dibromochloromethane	3.8	J	0.24	5.0	µg/L	1	1/26/2006 1:10:00 PM
1,2-Dibromoethane	ND		0.12	1.0	µg/L	1	1/26/2006 1:10:00 PM
Dibromomethane	ND		0.29	5.0	µg/L	1	1/26/2006 1:10:00 PM
1,2-Dichlorobenzene	ND		0.22	1.0	µg/L	1	1/26/2006 1:10:00 PM
1,3-Dichlorobenzene	ND		0.24	1.0	µg/L	1	1/26/2006 1:10:00 PM
1,4-Dichlorobenzene	ND		0.25	1.0	µg/L	1	1/26/2006 1:10:00 PM
Dichlorodifluoromethane	ND		0.18	5.0	µg/L	1	1/26/2006 1:10:00 PM
1,1-Dichloroethane	ND		0.47	1.0	µg/L	1	1/26/2006 1:10:00 PM
1,2-Dichloroethane	ND		0.43	1.0	µg/L	1	1/26/2006 1:10:00 PM
1,1-Dichloroethene	ND		0.83	1.0	µg/L	1	1/26/2006 1:10:00 PM
cis-1,2-Dichloroethene	ND		0.30	1.0	µg/L	1	1/26/2006 1:10:00 PM
trans-1,2-Dichloroethene	ND		0.42	1.0	µg/L	1	1/26/2006 1:10:00 PM
1,2-Dichloropropane	ND		0.22	1.0	µg/L	1	1/26/2006 1:10:00 PM
cis-1,3-Dichloropropene	ND		0.15	1.0	µg/L	1	1/26/2006 1:10:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).
J - Analyte detected below the Reporting Limit
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *27-Jan-06*

Client: CLAYTON INDIANAPOLIS
Work Order No.: 06010791
Project: 25-05019.00.004/
Lab ID: 06010791-001A

Client Sample ID: WATER SOURCE
Tag Number:
Collection Date: 1/25/2006 3:25:00 PM
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Reporting Limit	Units	DF	Date Analyzed
trans-1,3-Dichloropropene	ND		0.25	1.0	µg/L	1	1/26/2006 1:10:00 PM
Ethylbenzene	ND		0.15	1.0	µg/L	1	1/26/2006 1:10:00 PM
2-Hexanone	ND		10	50	µg/L	1	1/26/2006 1:10:00 PM
Isopropylbenzene	ND		0.14	5.0	µg/L	1	1/26/2006 1:10:00 PM
4-Isopropyltoluene	ND		0.23	5.0	µg/L	1	1/26/2006 1:10:00 PM
2-Methylnaphthalene	ND		5.0	5.0	µg/L	1	1/26/2006 1:10:00 PM
4-Methyl-2-Pentanone	ND		11	50	µg/L	1	1/26/2006 1:10:00 PM
Methyl tert-butyl ether	ND		0.15	5.0	µg/L	1	1/26/2006 1:10:00 PM
Methylene Chloride	ND		0.48	5.0	µg/L	1	1/26/2006 1:10:00 PM
Naphthalene	ND		1.4	5.0	µg/L	1	1/26/2006 1:10:00 PM
n-Propylbenzene	ND		0.27	1.0	µg/L	1	1/26/2006 1:10:00 PM
Styrene	ND		0.18	1.0	µg/L	1	1/26/2006 1:10:00 PM
1,1,2,2-Tetrachloroethane	ND		0.19	1.0	µg/L	1	1/26/2006 1:10:00 PM
1,1,1,2-Tetrachloroethane	ND		0.30	1.0	µg/L	1	1/26/2006 1:10:00 PM
Tetrachloroethene	ND		0.30	1.0	µg/L	1	1/26/2006 1:10:00 PM
Tetrahydrofuran	ND		0.58	90	µg/L	1	1/26/2006 1:10:00 PM
Toluene	ND		0.17	1.0	µg/L	1	1/26/2006 1:10:00 PM
1,2,3-Trichlorobenzene	ND		1.4	5.0	µg/L	1	1/26/2006 1:10:00 PM
1,2,4-Trichlorobenzene	ND		1.1	5.0	µg/L	1	1/26/2006 1:10:00 PM
1,1,1-Trichloroethane	ND		0.34	1.0	µg/L	1	1/26/2006 1:10:00 PM
1,1,2-Trichloroethane	ND		0.35	1.0	µg/L	1	1/26/2006 1:10:00 PM
Trichloroethene	ND		0.28	1.0	µg/L	1	1/26/2006 1:10:00 PM
Trichlorofluoromethane	ND		0.23	1.0	µg/L	1	1/26/2006 1:10:00 PM
1,2,3-Trichloropropane	ND		0.37	1.0	µg/L	1	1/26/2006 1:10:00 PM
1,2,4-Trimethylbenzene	ND		0.20	1.0	µg/L	1	1/26/2006 1:10:00 PM
1,3,5-Trimethylbenzene	ND		0.22	1.0	µg/L	1	1/26/2006 1:10:00 PM
Vinyl Chloride	ND		0.26	1.0	µg/L	1	1/26/2006 1:10:00 PM
o-Xylene	ND		0.25	1.0	µg/L	1	1/26/2006 1:10:00 PM
m,p-Xylene	ND		0.39	2.0	µg/L	1	1/26/2006 1:10:00 PM

Qualifiers:

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J - Analyte detected below the Reporting Limit
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *27-Jan-06*

Client: CLAYTON INDIANAPOLIS
Work Order No.: 06010791
Project: 25-05019.00.004/
Lab ID: 06010791-002A

Client Sample ID: EQ BLANK (4-INCH)
Tag Number:
Collection Date: 1/25/2006 3:30:00 PM
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Reporting Limit	Units	DF	Date Analyzed
GC/MS VOLATILES; METHOD EPA 8260B		**SW8260A**				Analyst: **DRS**	
Diethyl ether	ND		1.0	10	µg/L	1	1/26/2006 1:41:00 PM
Iodomethane	ND		1.0	1.0	µg/L	1	1/26/2006 1:41:00 PM
trans-1,4-Dichloro-2-butene	ND		5.0	1.0	µg/L	1	1/26/2006 1:41:00 PM
Acetone	ND		9.4	50	µg/L	1	1/26/2006 1:41:00 PM
Acrylonitrile	ND		0.40	2.0	µg/L	1	1/26/2006 1:41:00 PM
Benzene	ND		0.31	1.0	µg/L	1	1/26/2006 1:41:00 PM
Bromobenzene	ND		0.25	1.0	µg/L	1	1/26/2006 1:41:00 PM
Bromochloromethane	ND		0.36	1.0	µg/L	1	1/26/2006 1:41:00 PM
Bromodichloromethane	1.2		0.22	1.0	µg/L	1	1/26/2006 1:41:00 PM
Bromoform	ND		0.34	1.0	µg/L	1	1/26/2006 1:41:00 PM
Bromomethane	ND		1.3	5.0	µg/L	1	1/26/2006 1:41:00 PM
2-Butanone	ND		1.9	25	µg/L	1	1/26/2006 1:41:00 PM
n-Butylbenzene	ND		0.27	1.0	µg/L	1	1/26/2006 1:41:00 PM
sec-Butylbenzene	ND		0.27	1.0	µg/L	1	1/26/2006 1:41:00 PM
tert-Butylbenzene	ND		0.24	1.0	µg/L	1	1/26/2006 1:41:00 PM
Carbon Disulfide	ND		0.15	5.0	µg/L	1	1/26/2006 1:41:00 PM
Carbon tetrachloride	ND		0.38	1.0	µg/L	1	1/26/2006 1:41:00 PM
Chlorobenzene	ND		0.17	1.0	µg/L	1	1/26/2006 1:41:00 PM
Chloroethane	ND		0.59	5.0	µg/L	1	1/26/2006 1:41:00 PM
Chloroform	1.5		0.35	1.0	µg/L	1	1/26/2006 1:41:00 PM
Chloromethane	ND		0.58	5.0	µg/L	1	1/26/2006 1:41:00 PM
1,2-Dibromo-3-chloropropane	ND		0.82	5.0	µg/L	1	1/26/2006 1:41:00 PM
Dibromochloromethane	0.83	J	0.24	5.0	µg/L	1	1/26/2006 1:41:00 PM
1,2-Dibromoethane	ND		0.12	1.0	µg/L	1	1/26/2006 1:41:00 PM
Dibromomethane	ND		0.29	5.0	µg/L	1	1/26/2006 1:41:00 PM
1,2-Dichlorobenzene	ND		0.22	1.0	µg/L	1	1/26/2006 1:41:00 PM
1,3-Dichlorobenzene	ND		0.24	1.0	µg/L	1	1/26/2006 1:41:00 PM
1,4-Dichlorobenzene	ND		0.25	1.0	µg/L	1	1/26/2006 1:41:00 PM
Dichlorodifluoromethane	ND		0.18	5.0	µg/L	1	1/26/2006 1:41:00 PM
1,1-Dichloroethane	ND		0.47	1.0	µg/L	1	1/26/2006 1:41:00 PM
1,2-Dichloroethane	ND		0.43	1.0	µg/L	1	1/26/2006 1:41:00 PM
1,1-Dichloroethene	ND		0.83	1.0	µg/L	1	1/26/2006 1:41:00 PM
cis-1,2-Dichloroethene	ND		0.30	1.0	µg/L	1	1/26/2006 1:41:00 PM
trans-1,2-Dichloroethene	ND		0.42	1.0	µg/L	1	1/26/2006 1:41:00 PM
1,2-Dichloropropane	ND		0.22	1.0	µg/L	1	1/26/2006 1:41:00 PM
cis-1,3-Dichloropropene	ND		0.15	1.0	µg/L	1	1/26/2006 1:41:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).
J - Analyte detected below the Reporting Limit
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *27-Jan-06*

Client: CLAYTON INDIANAPOLIS
Work Order No.: 06010791
Project: 25-05019.00.004/
Lab ID: 06010791-002A

Client Sample ID: EQ BLANK (4-INCH)
Tag Number:
Collection Date: 1/25/2006 3:30:00 PM
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Reporting Limit	Units	DF	Date Analyzed
trans-1,3-Dichloropropene	ND		0.25	1.0	µg/L	1	1/26/2006 1:41:00 PM
Ethylbenzene	ND		0.15	1.0	µg/L	1	1/26/2006 1:41:00 PM
2-Hexanone	ND		10	50	µg/L	1	1/26/2006 1:41:00 PM
Isopropylbenzene	ND		0.14	5.0	µg/L	1	1/26/2006 1:41:00 PM
4-Isopropyltoluene	ND		0.23	5.0	µg/L	1	1/26/2006 1:41:00 PM
2-Methylnaphthalene	ND		5.0	5.0	µg/L	1	1/26/2006 1:41:00 PM
4-Methyl-2-Pentanone	ND		11	50	µg/L	1	1/26/2006 1:41:00 PM
Methyl tert-butyl ether	ND		0.15	5.0	µg/L	1	1/26/2006 1:41:00 PM
Methylene Chloride	ND		0.48	5.0	µg/L	1	1/26/2006 1:41:00 PM
Naphthalene	ND		1.4	5.0	µg/L	1	1/26/2006 1:41:00 PM
n-Propylbenzene	ND		0.27	1.0	µg/L	1	1/26/2006 1:41:00 PM
Styrene	ND		0.18	1.0	µg/L	1	1/26/2006 1:41:00 PM
1,1,2,2-Tetrachloroethane	ND		0.19	1.0	µg/L	1	1/26/2006 1:41:00 PM
1,1,1,2-Tetrachloroethane	ND		0.30	1.0	µg/L	1	1/26/2006 1:41:00 PM
Tetrachloroethene	ND		0.30	1.0	µg/L	1	1/26/2006 1:41:00 PM
Tetrahydrofuran	ND		0.58	90	µg/L	1	1/26/2006 1:41:00 PM
Toluene	1.8		0.17	1.0	µg/L	1	1/26/2006 1:41:00 PM
1,2,3-Trichlorobenzene	ND		1.4	5.0	µg/L	1	1/26/2006 1:41:00 PM
1,2,4-Trichlorobenzene	ND		1.1	5.0	µg/L	1	1/26/2006 1:41:00 PM
1,1,1-Trichloroethane	ND		0.34	1.0	µg/L	1	1/26/2006 1:41:00 PM
1,1,2-Trichloroethane	ND		0.35	1.0	µg/L	1	1/26/2006 1:41:00 PM
Trichloroethene	ND		0.28	1.0	µg/L	1	1/26/2006 1:41:00 PM
Trichlorofluoromethane	ND		0.23	1.0	µg/L	1	1/26/2006 1:41:00 PM
1,2,3-Trichloropropane	ND		0.37	1.0	µg/L	1	1/26/2006 1:41:00 PM
1,2,4-Trimethylbenzene	ND		0.20	1.0	µg/L	1	1/26/2006 1:41:00 PM
1,3,5-Trimethylbenzene	ND		0.22	1.0	µg/L	1	1/26/2006 1:41:00 PM
Vinyl Chloride	ND		0.26	1.0	µg/L	1	1/26/2006 1:41:00 PM
o-Xylene	ND		0.25	1.0	µg/L	1	1/26/2006 1:41:00 PM
m,p-Xylene	ND		0.39	2.0	µg/L	1	1/26/2006 1:41:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).
J - Analyte detected below the Reporting Limit
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
T - Tentatively Identified Compound (TIC)

Clayton Group Services

Date: *27-Jan-06*

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010791
Project: 25-05019.00.004/

QC SUMMARY REPORT

Method Blank

Sample ID **06010000-BLK3** Batch ID: **R77634** Units: **µg/L** Analysis Date **1/26/2006 11:00:00 AM** Prep Date:

Client ID: Run ID: **MS_HP11K_060126A** SeqNo: **909005**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diethyl ether	ND	10									
Iodomethane	ND	1									
trans-1,4-Dichloro-2-butene	ND	1									
Acetone	ND	50									
Acrylonitrile	ND	2									
Benzene	ND	1									
Bromobenzene	ND	1									
Bromochloromethane	ND	1									
Bromodichloromethane	ND	1									
Bromoform	ND	1									
Bromomethane	ND	5									
2-Butanone	ND	25									
n-Butylbenzene	ND	1									
sec-Butylbenzene	ND	1									
tert-Butylbenzene	ND	1									
Carbon Disulfide	ND	5									
Carbon tetrachloride	ND	1									
Chlorobenzene	ND	1									
Chloroethane	ND	5									
Chloroform	ND	1									
Chloromethane	ND	5									
1,2-Dibromo-3-chloropropane	ND	5									
Dibromochloromethane	ND	5									
1,2-Dibromoethane	ND	1									
Dibromomethane	ND	5									
1,2-Dichlorobenzene	ND	1									
1,3-Dichlorobenzene	ND	1									

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below Reporting Limit
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010791
Project: 25-05019.00.004/

QC SUMMARY REPORT
Method Blank

1,4-Dichlorobenzene	ND	1
Dichlorodifluoromethane	ND	5
1,1-Dichloroethane	ND	1
1,2-Dichloroethane	ND	1
1,1-Dichloroethene	ND	1
cis-1,2-Dichloroethene	ND	1
trans-1,2-Dichloroethene	ND	1
1,2-Dichloropropane	ND	1
cis-1,3-Dichloropropene	ND	1
trans-1,3-Dichloropropene	ND	1
Ethylbenzene	ND	1
2-Hexanone	ND	50
Isopropylbenzene	ND	5
4-Isopropyltoluene	ND	5
2-Methylnaphthalene	ND	5
4-Methyl-2-Pentanone	ND	50
Methyl tert-butyl ether	ND	5
Methylene Chloride	ND	5
Naphthalene	ND	5
n-Propylbenzene	ND	1
Styrene	ND	1
1,1,2,2-Tetrachloroethane	ND	1
1,1,1,2-Tetrachloroethane	ND	1
Tetrachloroethene	ND	1
Tetrahydrofuran	ND	90
Toluene	ND	1
1,2,3-Trichlorobenzene	ND	5
1,2,4-Trichlorobenzene	ND	5
1,1,1-Trichloroethane	ND	1
1,1,2-Trichloroethane	ND	1
Trichloroethene	ND	1
Trichlorofluoromethane	ND	1
1,2,3-Trichloropropane	ND	1

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below Reporting Limit
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010791
Project: 25-05019.00.004/

QC SUMMARY REPORT

Method Blank

1,2,4-Trimethylbenzene	ND	1						
1,3,5-Trimethylbenzene	ND	1						
Vinyl Chloride	ND	1						
o-Xylene	ND	1						
m,p-Xylene	ND	2						
Surr: 4-Bromofluorobenzene	54.02	0	50	0	108	82.2	110	0
Surr: 1,2-Dichloroethane-d4	52.35	0	50	0	105	86	118	0
Surr: Pentafluorobenzene	47.01	0	50	0	94	73.8	120	0
Surr: Toluene-d8	50.71	0	50	0	101	79	121	0

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below Reporting Limit
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Clayton Group Services

Date: *27-Jan-06*

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010791
Project: 25-05019.00.004/

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID **06010794-004AMS** Batch ID: **R77634** Units: **µg/L** Analysis Date **1/27/2006 7:00:00 AM** Prep Date:

Client ID: Run ID: **MS_HP11K_060126A** SeqNo: **909012**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diethyl ether	36.52	10	50	0	73	62.4	129	0			
Iodomethane	17.62	1	50	0	35.2	24.4	171	0			
trans-1,4-Dichloro-2-butene	53.53	1	50	0	107	37.4	142	0			
Acetone	51.76	50	50	0	104	3.97	167	0			
Acrylonitrile	49.19	2	50	0	98.4	42.7	150	0			
Benzene	50.33	1	50	0	101	72	131	0			
Bromobenzene	41.26	1	50	0	82.5	70.6	129	0			
Bromochloromethane	43.77	1	50	0	87.5	64.3	131	0			
Bromodichloromethane	48.61	1	50	0	97.2	62.9	132	0			
Bromoform	44.21	1	50	0	88.4	49.2	136	0			
Bromomethane	25.17	5	50	0	50.3	17.3	142	0			
2-Butanone	50.31	25	50	0	101	30	157	0			
n-Butylbenzene	41.62	1	50	0	83.2	76.4	130	0			
sec-Butylbenzene	40.6	1	50	0	81.2	76.4	130	0			
tert-Butylbenzene	38.46	1	50	0	76.9	74.2	131	0			
Carbon Disulfide	47.05	5	50	0	94.1	57.5	134	0			
Carbon tetrachloride	38.51	1	50	0	77	33.6	150	0			
Chlorobenzene	47.15	1	50	0	94.3	69.8	127	0			
Chloroethane	45.16	5	50	0	90.3	57.7	137	0			
Chloroform	42.74	1	50	0	85.5	74.7	123	0			
Chloromethane	51.77	5	50	0	104	46.2	145	0			
1,2-Dibromo-3-chloropropane	43.09	5	50	0	86.2	32.1	150	0			
Dibromochloromethane	42.69	5	50	0	85.4	65.2	132	0			
1,2-Dibromoethane	43.86	1	50	0	87.7	73.2	126	0			
Dibromomethane	53.96	5	50	0	108	63.2	134	0			
1,2-Dichlorobenzene	40.38	1	50	0	80.8	69	131	0			
1,3-Dichlorobenzene	40.28	1	50	0	80.6	69.8	132	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below Reporting Limit
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010791
Project: 25-05019.00.004/

QC SUMMARY REPORT

Sample Matrix Spike

1,4-Dichlorobenzene	40.67	1	50	0	81.3	69.7	131	0	
Dichlorodifluoromethane	35.71	5	50	0	71.4	30.9	146	0	
1,1-Dichloroethane	50.13	1	50	0	100	70.4	132	0	
1,2-Dichloroethane	43.99	1	50	0	88	69.2	130	0	
1,1-Dichloroethene	40.39	1	50	0	80.8	64.3	135	0	
cis-1,2-Dichloroethene	41.63	1	50	0	83.3	70.9	128	0	
trans-1,2-Dichloroethene	37.3	1	50	0	74.6	65.1	132	0	
1,2-Dichloropropane	50.71	1	50	0	101	70.8	132	0	
cis-1,3-Dichloropropene	46.69	1	50	0	93.4	65.4	131	0	
trans-1,3-Dichloropropene	49.02	1	50	0	98	60.8	129	0	
Ethylbenzene	48.64	1	50	0	97.3	72.3	129	0	
2-Hexanone	54.32	50	50	0	109	37	154	0	
Isopropylbenzene	49.62	5	50	0	99.2	69.7	135	0	
4-Isopropyltoluene	39.7	5	50	0	79.4	78.5	131	0	
2-Methylnaphthalene	69.77	5	50	0	140	37	152	0	
4-Methyl-2-Pentanone	59.72	50	50	0	119	52.7	148	0	
Methyl tert-butyl ether	36.24	5	50	0	72.5	33.4	152	0	
Methylene Chloride	50.55	5	50	0	101	66.4	129	0	
Naphthalene	44.41	5	50	0	88.8	45.6	150	0	
n-Propylbenzene	38.99	1	50	0	78	73.4	131	0	
Styrene	53	1	50	0	106	56.1	140	0	
1,1,2,2-Tetrachloroethane	57.59	1	50	0	115	65.3	137	0	
1,1,1,2-Tetrachloroethane	40.38	1	50	0	80.8	70.1	131	0	
Tetrachloroethene	40.08	1	50	0	80.2	64.2	133	0	
Tetrahydrofuran	79.17	90	50	0	158	38.8	151	0	JS
Toluene	46.2	1	50	0	92.4	70.7	129	0	
1,2,3-Trichlorobenzene	40.74	5	50	0	81.5	62.3	135	0	
1,2,4-Trichlorobenzene	40.02	5	50	0	80	50.3	146	0	
1,1,1-Trichloroethane	39.01	1	50	0	78	64.7	128	0	
1,1,2-Trichloroethane	51.41	1	50	0	103	71	134	0	
Trichloroethene	42.36	1	50	0.87	83	67.2	129	0	
Trichlorofluoromethane	52.08	1	50	0	104	60.2	139	0	
1,2,3-Trichloropropane	54.16	1	50	0	108	63.5	136	0	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below Reporting Limit
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010791
Project: 25-05019.00.004/

QC SUMMARY REPORT

Sample Matrix Spike

1,2,4-Trimethylbenzene	40.81	1	50	0	81.6	65.9	137	0	
1,3,5-Trimethylbenzene	40.23	1	50	0	80.5	65.2	136	0	
Vinyl Chloride	48.08	1	50	0	96.2	62.5	135	0	
o-Xylene	51.3	1	50	0	103	67.9	135	0	
m,p-Xylene	97.54	2	100	0	97.5	71.1	132	0	
Surr: 4-Bromofluorobenzene	60.4	0	50	0	121	82.7	109	0	S
Surr: 1,2-Dichloroethane-d4	47.45	0	50	0	94.9	81	123	0	
Surr: Pentafluorobenzene	41.94	0	50	0	83.9	71.4	132	0	
Surr: Toluene-d8	50.91	0	50	0	102	80.5	117	0	

Please note that the matrix spike/matrix spike duplicate (MS/MSD) recovery of one or more analytes was above statistical limits. The results reported are not affected.

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below Reporting Limit
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010791
Project: 25-05019.00.004/

QC SUMMARY REPORT

Sample Matrix Spike Duplicate

Sample ID **06010794-004AMSD** Batch ID: **R77634** Units: **µg/L** Analysis Date **1/27/2006 7:42:00 AM** Prep Date:

Client ID: Run ID: **MS_HP11K_060126A** SeqNo: **909013**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diethyl ether	42.8	10	50	0	85.6	62.4	129	36.52	15.8	22.1	
Iodomethane	27.14	1	50	0	54.3	24.4	171	17.62	42.5	19.8	R
trans-1,4-Dichloro-2-butene	55.58	1	50	0	111	37.4	142	53.53	3.76	22.5	
Acetone	49.57	50	50	0	99.1	3.97	167	51.76	4.32	45.7	J
Acrylonitrile	50.17	2	50	0	100	42.7	150	49.19	1.97	35.6	
Benzene	52.7	1	50	0	105	72	131	50.33	4.6	17	
Bromobenzene	46.76	1	50	0	93.5	70.6	129	41.26	12.5	15.2	
Bromochloromethane	51.8	1	50	0	104	64.3	131	43.77	16.8	18.6	
Bromodichloromethane	50	1	50	0	100	62.9	132	48.61	2.82	20.3	
Bromoform	50.67	1	50	0	101	49.2	136	44.21	13.6	20.4	
Bromomethane	34.21	5	50	0	68.4	17.3	142	25.17	30.4	58.6	
2-Butanone	52.69	25	50	0	105	30	157	50.31	4.62	43.1	
n-Butylbenzene	48.19	1	50	0	96.4	76.4	130	41.62	14.6	15.6	
sec-Butylbenzene	48.36	1	50	0	96.7	76.4	130	40.6	17.4	17.3	R
tert-Butylbenzene	46.71	1	50	0	93.4	74.2	131	38.46	19.4	17.4	R
Carbon Disulfide	51.71	5	50	0	103	57.5	134	47.05	9.44	20.8	
Carbon tetrachloride	41.61	1	50	0	83.2	33.6	150	38.51	7.74	49.8	
Chlorobenzene	51.74	1	50	0	103	69.8	127	47.15	9.28	18.8	
Chloroethane	49.63	5	50	0	99.3	57.7	137	45.16	9.43	32.3	
Chloroform	47.95	1	50	0	95.9	74.7	123	42.74	11.5	16.9	
Chloromethane	53.11	5	50	0	106	46.2	145	51.77	2.56	44.5	
1,2-Dibromo-3-chloropropane	49.67	5	50	0	99.3	32.1	150	43.09	14.2	48.2	
Dibromochloromethane	48.88	5	50	0	97.8	65.2	132	42.69	13.5	20	
1,2-Dibromoethane	49.36	1	50	0	98.7	73.2	126	43.86	11.8	19.7	
Dibromomethane	55.29	5	50	0	111	63.2	134	53.96	2.43	21.9	
1,2-Dichlorobenzene	47.06	1	50	0	94.1	69	131	40.38	15.3	21.2	
1,3-Dichlorobenzene	47.76	1	50	0	95.5	69.8	132	40.28	17	21.2	
1,4-Dichlorobenzene	46.75	1	50	0	93.5	69.7	131	40.67	13.9	20.9	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below Reporting Limit
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010791
Project: 25-05019.00.004/

QC SUMMARY REPORT

Sample Matrix Spike Duplicate

Dichlorodifluoromethane	43.44	5	50	0	86.9	30.9	146	35.71	19.5	20.3	
1,1-Dichloroethane	55.39	1	50	0	111	70.4	132	50.13	9.97	18.9	
1,2-Dichloroethane	47.42	1	50	0	94.8	69.2	130	43.99	7.5	17.2	
1,1-Dichloroethene	46.45	1	50	0	92.9	64.3	135	40.39	14	20.8	
cis-1,2-Dichloroethene	48.03	1	50	0	96.1	70.9	128	41.63	14.3	17.1	
trans-1,2-Dichloroethene	43.93	1	50	0	87.9	65.1	132	37.3	16.3	18.8	
1,2-Dichloropropane	51.43	1	50	0	103	70.8	132	50.71	1.41	17.7	
cis-1,3-Dichloropropene	50.9	1	50	0	102	65.4	131	46.69	8.63	23.5	
trans-1,3-Dichloropropene	51.07	1	50	0	102	60.8	129	49.02	4.1	20.3	
Ethylbenzene	52.55	1	50	0	105	72.3	129	48.64	7.73	17.1	
2-Hexanone	55.76	50	50	0	112	37	154	54.32	2.62	33.5	
Isopropylbenzene	56.39	5	50	0	113	69.7	135	49.62	12.8	17.5	
4-Isopropyltoluene	47.18	5	50	0	94.4	78.5	131	39.7	17.2	14.5	R
2-Methylnaphthalene	80.89	5	50	0	162	37	152	69.77	14.8	55.5	S
4-Methyl-2-Pentanone	58.73	50	50	0	117	52.7	148	59.72	1.67	24.8	
Methyl tert-butyl ether	42.14	5	50	0	84.3	33.4	152	36.24	15.1	44.8	
Methylene Chloride	55.14	5	50	0	110	66.4	129	50.55	8.69	18.5	
Naphthalene	52.36	5	50	0	105	45.6	150	44.41	16.4	65.4	
n-Propylbenzene	46.85	1	50	0	93.7	73.4	131	38.99	18.3	17.6	R
Styrene	59.02	1	50	0	118	56.1	140	53	10.7	66.6	
1,1,2,2-Tetrachloroethane	61.3	1	50	0	123	65.3	137	57.59	6.24	26.2	
1,1,1,2-Tetrachloroethane	46.01	1	50	0	92	70.1	131	40.38	13	19.5	
Tetrachloroethene	46.2	1	50	0	92.4	64.2	133	40.08	14.2	18.5	
Tetrahydrofuran	55.92	90	50	0	112	38.8	151	79.17	34.4	45.9	J
Toluene	49.67	1	50	0	99.3	70.7	129	46.2	7.24	18.4	
1,2,3-Trichlorobenzene	49.13	5	50	0	98.3	62.3	135	40.74	18.7	21.9	
1,2,4-Trichlorobenzene	48.68	5	50	0	97.4	50.3	146	40.02	19.5	69	
1,1,1-Trichloroethane	43.12	1	50	0	86.2	64.7	128	39.01	10	17.9	
1,1,2-Trichloroethane	53.43	1	50	0	107	71	134	51.41	3.85	16.7	
Trichloroethene	47.04	1	50	0.87	92.3	67.2	129	42.36	10.5	17.4	
Trichlorofluoromethane	60.68	1	50	0	121	60.2	139	52.08	15.3	31.9	
1,2,3-Trichloropropane	60.74	1	50	0	121	63.5	136	54.16	11.5	22.1	
1,2,4-Trimethylbenzene	47.48	1	50	0	95	65.9	137	40.81	15.1	20.4	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below Reporting Limit
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010791
Project: 25-05019.00.004/

QC SUMMARY REPORT

Sample Matrix Spike Duplicate

1,3,5-Trimethylbenzene	45.9	1	50	0	91.8	65.2	136	40.23	13.2	32.1	
Vinyl Chloride	54.63	1	50	0	109	62.5	135	48.08	12.8	19.7	
o-Xylene	56.74	1	50	0	113	67.9	135	51.3	10.1	18	
m,p-Xylene	111.1	2	100	0	111	71.1	132	97.54	13	16.8	
Surr: 4-Bromofluorobenzene	58.39	0	50	0	117	82.2	110	60.4	3.38	11.7	S
Surr: 1,2-Dichloroethane-d4	47.05	0	50	0	94.1	86	118	47.45	0.847	5.42	
Surr: Pentafluorobenzene	44.6	0	50	0	89.2	73.8	120	41.94	6.15	6.63	
Surr: Toluene-d8	50.27	0	50	0	101	79	121	50.91	1.27	10.9	

Please note that the relative percent difference (RPD) of one or more analytes was above statictical limits. The results reported are not affected.

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below Reporting Limit
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Clayton Group Services

Date: 27-Jan-06

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010791
Project: 25-05019.00.004/
Analysis: Volatile Organics; Water: Method 8260B

QC SUMMARY REPORT SURROGATE RECOVERIES

Sample ID	BR4FBZ	BZMED8	DCA12D4	PFBZ				
06010000-BLK3	108	101	105	94.0				
06010791-001A	111 *	102	105	86.4				
06010791-002A	108	101	104	85.2				
06010794-001A	110 *	104	108	82.8				
06010794-002A	108	101	106	84.5				
06010794-003A	108	104	110	86.6				
06010794-004A	111 *	105	110	81.3				
06010794-004AMS	121 *	102	94.9	83.9				
06010794-004AMS	117 *	101	94.1	89.2				

Acronym		Surrogate	QC Limits
BR4FBZ	=	4-Bromofluorobenzene	82.2-110
BZMED8	=	Toluene-d8	79-121
DCA12D4	=	1,2-Dichloroethane-d4	86-118
PFBZ	=	Pentafluorobenzene	73.8-120

*** Surrogate recovery outside acceptance limits**

Clayton
Group Services

REQUEST FOR LABORATORY ANALYTICAL SERVICES

IMPORTANT: Date results required: Normal turnaround

Rush charges authorized? Yes ☐ No ■

Fax or E-mail results ■

E-mail Address: chris.sloffer@us.bureauveritas.com

Page: 1 of 1

For Clayton Use Only
Lab Project No. 06010791

Report results to:
Name Chris Sloffer
Company Clayton Group Services
Mailing Address 9376 Castlegate Drive
City, State, Zip Indianapolis, Indiana
Telephone No. 317-570-4582 Fax No. 317-570-4586

Client Project Number: 25-05019.00.004

Send invoice to:
Name
Company
Address
City, State, Zip

P.O. No.

Soil samples only: Which state are these from? Indiana

Special instructions and/or specific regulatory requirements:
(method, limit of detection, etc.)
VOCs - 8260 (with HCl preservative)
lowest possible detection limits

Water samples are:
Drinking water
Groundwater X
Wastewater

Enter a "P" here if preservative added.

Client Sample Identification	Date Sampled	Time Sampled	Matrix/Media	Air Volume (Liters)	# of Containers	ANALYSIS REQUESTED (List each analyte on the lines below, multiple analytes per line)	
✓ Water Source	1/25/06	1525	GW	NA	3	VOCs - 8260	P
✓ EQ Blank (4-inch)	1/25/06	1530	GW	NA	3	VOCs - 8260	P
			GW	NA		VOCs - 8260	P
			GW	NA		VOCs - 8260	P
			GW	NA		VOCs - 8260	P
			GW	NA		VOCs - 8260	P
			GW	NA		VOCs - 8260	P
			GW	NA		VOCs - 8260	P
			GW	NA		VOCs - 8260	P
			GW	NA		VOCs - 8260	P

Collected by: Chris Sloffer *Date/Time* 1/25/06
Relinquished by: [signature] *Date/Time* 1/25/06 1900
Relinquished by: *Date/Time*
Method of Shipment: FedEx
Authorized by:
Date/Time:

Collector's Signature: [signature] *Date/Time* 1/25/06
Received by: Julie Maher *Date/Time* 1/26/06 11:25
Received by: *Date/Time*
Sample Condition on Receipt: *Acceptable* *Other:* *(Explain)*

(Signature MUST accompany request!)

Ship to:

Detroit (IH, Environmental, & Asbestos)	Atlanta (Asbestos, TEM & SEM)	Seattle (Asbestos Only)
22345 Roethel Drive	3380 Chastain Meadows Pkwy., Suite 300	4636 E. Marginal Way S., Suite 140
Novi, Michigan, 48375	Kennesaw, Georgia 30144	Seattle, Washington 98134
Phone: 248.344.2652, Toll-free 800.806.5887	Phone: 770.499.7500, Toll-free 800.252.9919	Phone: 206.763.7264, Toll-free 800.564.7755
Fax: 248-344-2655	Fax: 770.499.7511	Fax: 206.763.4189

Visit our website: http:labonline.claytongrp.com

1.3
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Appendix E

Monitoring Well Construction Diagrams

Appendix F

Analytical Reports – Monitoring Well Samples

BUREAU VERITAS

January 27, 2006

Chris Sloffer
CLAYTON INDIANAPOLIS
9376 Castlegate Drive
Indianapolis, IN 46256-

Clayton Work Order No. 06010794

Reference: 25-05019.00.004/

Dear Chris Sloffer:

Clayton Group Services received 4 samples on 1/26/2006 for the analyses presented in the following report.

Enclosed is a copy of the Chain-of-Custody record, acknowledging receipt of these samples. Please note that any unused portion of the samples will be discarded 30 days after the date of this report, unless you have requested otherwise.

This material is confidential and is intended solely for the person to whom it is addressed. If this is received in error, please contact the number provided below.

We appreciate the opportunity to assist you. If you have any questions concerning this report, please contact a Client Services Representative at (800) 806-5887.

Sincerely,

Karen Coonan

Karen Coonan
Client Services Representative

cc:

Clayton Group Services, Inc.
A Bureau Veritas Company
22345 Roethel Drive
Novi, MI 48375

Main: (248) 344-1770
Fax: (248) 344-2655
www.us.bureauveritas.com

CASE NARRATIVE

Date: *27-Jan-06*

Client: **CLAYTON INDIANAPOLIS**

Project: **25-05019.00.004/**

Work Order No **06010794**

All quality control results associated with this sample set were within acceptable limits and/or do not adversely affect the reported results, unless otherwise noted below.

Samples were received at the laboratory at an average temperature of 1.4 °C.

Matrix Spike/Matrix Spike Duplicate (MS/MSD):

Analytical Comments for Method 8260W_MI, sample -004A, -004MS, -004MSD: Please note that the surrogate standard recovery for 4-Bromofluorobenzene was above acceptance criteria. The results are not affected.

Analytical Comments for Method 8260W_MI, sample -004A: Please note that the MS recovery for Tetrahydrofuran and the MSD recovery for 2-Methylnaphthalene were above statistical limits. The results reported are not affected.

Analytical Comments for Method 8260W_MI, sample -004A MSD: Note that the relative percent difference (RPD) of soem analytes were above statictical limits. The results reported are not affected.

ANALYTICAL RESULTS

Date: *27-Jan-06*

Client: CLAYTON INDIANAPOLIS
Work Order No.: 06010794
Project: 25-05019.00.004/
Lab ID: 06010794-001A

Client Sample ID: TRIP BLANK
Tag Number:
Collection Date: 1/25/2006
Matrix: AQUEOUS

Analyses	Result	Qual	MDL	Reporting Limit	Units	DF	Date Analyzed
GC/MS VOLATILES; METHOD EPA 8260B		**SW8260A**				Analyst: **DRS**	
Diethyl ether	ND		1.0	10	µg/L	1	1/26/2006 2:11:00 PM
Iodomethane	ND		1.0	1.0	µg/L	1	1/26/2006 2:11:00 PM
trans-1,4-Dichloro-2-butene	ND		5.0	1.0	µg/L	1	1/26/2006 2:11:00 PM
Acetone	ND		9.4	50	µg/L	1	1/26/2006 2:11:00 PM
Acrylonitrile	ND		0.40	2.0	µg/L	1	1/26/2006 2:11:00 PM
Benzene	ND		0.31	1.0	µg/L	1	1/26/2006 2:11:00 PM
Bromobenzene	ND		0.25	1.0	µg/L	1	1/26/2006 2:11:00 PM
Bromochloromethane	ND		0.36	1.0	µg/L	1	1/26/2006 2:11:00 PM
Bromodichloromethane	4.4		0.22	1.0	µg/L	1	1/26/2006 2:11:00 PM
Bromoform	ND		0.34	1.0	µg/L	1	1/26/2006 2:11:00 PM
Bromomethane	ND		1.3	5.0	µg/L	1	1/26/2006 2:11:00 PM
2-Butanone	ND		1.9	25	µg/L	1	1/26/2006 2:11:00 PM
n-Butylbenzene	ND		0.27	1.0	µg/L	1	1/26/2006 2:11:00 PM
sec-Butylbenzene	ND		0.27	1.0	µg/L	1	1/26/2006 2:11:00 PM
tert-Butylbenzene	ND		0.24	1.0	µg/L	1	1/26/2006 2:11:00 PM
Carbon Disulfide	ND		0.15	5.0	µg/L	1	1/26/2006 2:11:00 PM
Carbon tetrachloride	ND		0.38	1.0	µg/L	1	1/26/2006 2:11:00 PM
Chlorobenzene	ND		0.17	1.0	µg/L	1	1/26/2006 2:11:00 PM
Chloroethane	ND		0.59	5.0	µg/L	1	1/26/2006 2:11:00 PM
Chloroform	7.8		0.35	1.0	µg/L	1	1/26/2006 2:11:00 PM
Chloromethane	ND		0.58	5.0	µg/L	1	1/26/2006 2:11:00 PM
1,2-Dibromo-3-chloropropane	ND		0.82	5.0	µg/L	1	1/26/2006 2:11:00 PM
Dibromochloromethane	0.91	J	0.24	5.0	µg/L	1	1/26/2006 2:11:00 PM
1,2-Dibromoethane	ND		0.12	1.0	µg/L	1	1/26/2006 2:11:00 PM
Dibromomethane	ND		0.29	5.0	µg/L	1	1/26/2006 2:11:00 PM
1,2-Dichlorobenzene	ND		0.22	1.0	µg/L	1	1/26/2006 2:11:00 PM
1,3-Dichlorobenzene	ND		0.24	1.0	µg/L	1	1/26/2006 2:11:00 PM
1,4-Dichlorobenzene	ND		0.25	1.0	µg/L	1	1/26/2006 2:11:00 PM
Dichlorodifluoromethane	ND		0.18	5.0	µg/L	1	1/26/2006 2:11:00 PM
1,1-Dichloroethane	ND		0.47	1.0	µg/L	1	1/26/2006 2:11:00 PM
1,2-Dichloroethane	ND		0.43	1.0	µg/L	1	1/26/2006 2:11:00 PM
1,1-Dichloroethene	ND		0.83	1.0	µg/L	1	1/26/2006 2:11:00 PM
cis-1,2-Dichloroethene	ND		0.30	1.0	µg/L	1	1/26/2006 2:11:00 PM
trans-1,2-Dichloroethene	ND		0.42	1.0	µg/L	1	1/26/2006 2:11:00 PM
1,2-Dichloropropane	ND		0.22	1.0	µg/L	1	1/26/2006 2:11:00 PM
cis-1,3-Dichloropropene	ND		0.15	1.0	µg/L	1	1/26/2006 2:11:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).
J - Analyte detected below the Reporting Limit
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *27-Jan-06*

Client: CLAYTON INDIANAPOLIS
Work Order No.: 06010794
Project: 25-05019.00.004/
Lab ID: 06010794-001A

Client Sample ID: TRIP BLANK
Tag Number:
Collection Date: 1/25/2006
Matrix: AQUEOUS

Analyses	Result	Qual	MDL	Reporting Limit	Units	DF	Date Analyzed
trans-1,3-Dichloropropene	ND		0.25	1.0	µg/L	1	1/26/2006 2:11:00 PM
Ethylbenzene	ND		0.15	1.0	µg/L	1	1/26/2006 2:11:00 PM
2-Hexanone	ND		10	50	µg/L	1	1/26/2006 2:11:00 PM
Isopropylbenzene	ND		0.14	5.0	µg/L	1	1/26/2006 2:11:00 PM
4-Isopropyltoluene	ND		0.23	5.0	µg/L	1	1/26/2006 2:11:00 PM
2-Methylnaphthalene	ND		5.0	5.0	µg/L	1	1/26/2006 2:11:00 PM
4-Methyl-2-Pentanone	ND		11	50	µg/L	1	1/26/2006 2:11:00 PM
Methyl tert-butyl ether	ND		0.15	5.0	µg/L	1	1/26/2006 2:11:00 PM
Methylene Chloride	ND		0.48	5.0	µg/L	1	1/26/2006 2:11:00 PM
Naphthalene	ND		1.4	5.0	µg/L	1	1/26/2006 2:11:00 PM
n-Propylbenzene	ND		0.27	1.0	µg/L	1	1/26/2006 2:11:00 PM
Styrene	ND		0.18	1.0	µg/L	1	1/26/2006 2:11:00 PM
1,1,2,2-Tetrachloroethane	ND		0.19	1.0	µg/L	1	1/26/2006 2:11:00 PM
1,1,1,2-Tetrachloroethane	ND		0.30	1.0	µg/L	1	1/26/2006 2:11:00 PM
Tetrachloroethene	ND		0.30	1.0	µg/L	1	1/26/2006 2:11:00 PM
Tetrahydrofuran	ND		0.58	90	µg/L	1	1/26/2006 2:11:00 PM
Toluene	ND		0.17	1.0	µg/L	1	1/26/2006 2:11:00 PM
1,2,3-Trichlorobenzene	ND		1.4	5.0	µg/L	1	1/26/2006 2:11:00 PM
1,2,4-Trichlorobenzene	ND		1.1	5.0	µg/L	1	1/26/2006 2:11:00 PM
1,1,1-Trichloroethane	ND		0.34	1.0	µg/L	1	1/26/2006 2:11:00 PM
1,1,2-Trichloroethane	ND		0.35	1.0	µg/L	1	1/26/2006 2:11:00 PM
Trichloroethene	ND		0.28	1.0	µg/L	1	1/26/2006 2:11:00 PM
Trichlorofluoromethane	ND		0.23	1.0	µg/L	1	1/26/2006 2:11:00 PM
1,2,3-Trichloropropane	ND		0.37	1.0	µg/L	1	1/26/2006 2:11:00 PM
1,2,4-Trimethylbenzene	ND		0.20	1.0	µg/L	1	1/26/2006 2:11:00 PM
1,3,5-Trimethylbenzene	ND		0.22	1.0	µg/L	1	1/26/2006 2:11:00 PM
Vinyl Chloride	ND		0.26	1.0	µg/L	1	1/26/2006 2:11:00 PM
o-Xylene	ND		0.25	1.0	µg/L	1	1/26/2006 2:11:00 PM
m,p-Xylene	ND		0.39	2.0	µg/L	1	1/26/2006 2:11:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).
J - Analyte detected below the Reporting Limit
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *27-Jan-06*

Client: CLAYTON INDIANAPOLIS
Work Order No.: 06010794
Project: 25-05019.00.004/
Lab ID: 06010794-002A

Client Sample ID: GW-4 35-40
Tag Number:
Collection Date: 1/25/2006 1:30:00 PM
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Reporting Limit	Units	DF	Date Analyzed
GC/MS VOLATILES; METHOD EPA 8260B		**SW8260A**				Analyst: **DRS**	
Diethyl ether	ND		1.0	10	µg/L	1	1/26/2006 2:42:00 PM
Iodomethane	ND		1.0	1.0	µg/L	1	1/26/2006 2:42:00 PM
trans-1,4-Dichloro-2-butene	ND		5.0	1.0	µg/L	1	1/26/2006 2:42:00 PM
Acetone	ND		9.4	50	µg/L	1	1/26/2006 2:42:00 PM
Acrylonitrile	ND		0.40	2.0	µg/L	1	1/26/2006 2:42:00 PM
Benzene	ND		0.31	1.0	µg/L	1	1/26/2006 2:42:00 PM
Bromobenzene	ND		0.25	1.0	µg/L	1	1/26/2006 2:42:00 PM
Bromochloromethane	ND		0.36	1.0	µg/L	1	1/26/2006 2:42:00 PM
Bromodichloromethane	ND		0.22	1.0	µg/L	1	1/26/2006 2:42:00 PM
Bromoform	ND		0.34	1.0	µg/L	1	1/26/2006 2:42:00 PM
Bromomethane	ND		1.3	5.0	µg/L	1	1/26/2006 2:42:00 PM
2-Butanone	ND		1.9	25	µg/L	1	1/26/2006 2:42:00 PM
n-Butylbenzene	ND		0.27	1.0	µg/L	1	1/26/2006 2:42:00 PM
sec-Butylbenzene	ND		0.27	1.0	µg/L	1	1/26/2006 2:42:00 PM
tert-Butylbenzene	ND		0.24	1.0	µg/L	1	1/26/2006 2:42:00 PM
Carbon Disulfide	ND		0.15	5.0	µg/L	1	1/26/2006 2:42:00 PM
Carbon tetrachloride	ND		0.38	1.0	µg/L	1	1/26/2006 2:42:00 PM
Chlorobenzene	ND		0.17	1.0	µg/L	1	1/26/2006 2:42:00 PM
Chloroethane	ND		0.59	5.0	µg/L	1	1/26/2006 2:42:00 PM
Chloroform	ND		0.35	1.0	µg/L	1	1/26/2006 2:42:00 PM
Chloromethane	ND		0.58	5.0	µg/L	1	1/26/2006 2:42:00 PM
1,2-Dibromo-3-chloropropane	ND		0.82	5.0	µg/L	1	1/26/2006 2:42:00 PM
Dibromochloromethane	ND		0.24	5.0	µg/L	1	1/26/2006 2:42:00 PM
1,2-Dibromoethane	ND		0.12	1.0	µg/L	1	1/26/2006 2:42:00 PM
Dibromomethane	ND		0.29	5.0	µg/L	1	1/26/2006 2:42:00 PM
1,2-Dichlorobenzene	ND		0.22	1.0	µg/L	1	1/26/2006 2:42:00 PM
1,3-Dichlorobenzene	ND		0.24	1.0	µg/L	1	1/26/2006 2:42:00 PM
1,4-Dichlorobenzene	ND		0.25	1.0	µg/L	1	1/26/2006 2:42:00 PM
Dichlorodifluoromethane	ND		0.18	5.0	µg/L	1	1/26/2006 2:42:00 PM
1,1-Dichloroethane	ND		0.47	1.0	µg/L	1	1/26/2006 2:42:00 PM
1,2-Dichloroethane	ND		0.43	1.0	µg/L	1	1/26/2006 2:42:00 PM
1,1-Dichloroethene	ND		0.83	1.0	µg/L	1	1/26/2006 2:42:00 PM
cis-1,2-Dichloroethene	ND		0.30	1.0	µg/L	1	1/26/2006 2:42:00 PM
trans-1,2-Dichloroethene	ND		0.42	1.0	µg/L	1	1/26/2006 2:42:00 PM
1,2-Dichloropropane	ND		0.22	1.0	µg/L	1	1/26/2006 2:42:00 PM
cis-1,3-Dichloropropene	ND		0.15	1.0	µg/L	1	1/26/2006 2:42:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).
J - Analyte detected below the Reporting Limit
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *27-Jan-06*

Client: CLAYTON INDIANAPOLIS
Work Order No.: 06010794
Project: 25-05019.00.004/
Lab ID: 06010794-002A

Client Sample ID: GW-4 35-40
Tag Number:
Collection Date: 1/25/2006 1:30:00 PM
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Reporting Limit	Units	DF	Date Analyzed
trans-1,3-Dichloropropene	ND		0.25	1.0	µg/L	1	1/26/2006 2:42:00 PM
Ethylbenzene	ND		0.15	1.0	µg/L	1	1/26/2006 2:42:00 PM
2-Hexanone	ND		10	50	µg/L	1	1/26/2006 2:42:00 PM
Isopropylbenzene	ND		0.14	5.0	µg/L	1	1/26/2006 2:42:00 PM
4-Isopropyltoluene	ND		0.23	5.0	µg/L	1	1/26/2006 2:42:00 PM
2-Methylnaphthalene	ND		5.0	5.0	µg/L	1	1/26/2006 2:42:00 PM
4-Methyl-2-Pentanone	ND		11	50	µg/L	1	1/26/2006 2:42:00 PM
Methyl tert-butyl ether	ND		0.15	5.0	µg/L	1	1/26/2006 2:42:00 PM
Methylene Chloride	ND		0.48	5.0	µg/L	1	1/26/2006 2:42:00 PM
Naphthalene	ND		1.4	5.0	µg/L	1	1/26/2006 2:42:00 PM
n-Propylbenzene	ND		0.27	1.0	µg/L	1	1/26/2006 2:42:00 PM
Styrene	ND		0.18	1.0	µg/L	1	1/26/2006 2:42:00 PM
1,1,2,2-Tetrachloroethane	ND		0.19	1.0	µg/L	1	1/26/2006 2:42:00 PM
1,1,1,2-Tetrachloroethane	ND		0.30	1.0	µg/L	1	1/26/2006 2:42:00 PM
Tetrachloroethene	ND		0.30	1.0	µg/L	1	1/26/2006 2:42:00 PM
Tetrahydrofuran	ND		0.58	90	µg/L	1	1/26/2006 2:42:00 PM
Toluene	ND		0.17	1.0	µg/L	1	1/26/2006 2:42:00 PM
1,2,3-Trichlorobenzene	ND		1.4	5.0	µg/L	1	1/26/2006 2:42:00 PM
1,2,4-Trichlorobenzene	ND		1.1	5.0	µg/L	1	1/26/2006 2:42:00 PM
1,1,1-Trichloroethane	ND		0.34	1.0	µg/L	1	1/26/2006 2:42:00 PM
1,1,2-Trichloroethane	ND		0.35	1.0	µg/L	1	1/26/2006 2:42:00 PM
Trichloroethene	ND		0.28	1.0	µg/L	1	1/26/2006 2:42:00 PM
Trichlorofluoromethane	ND		0.23	1.0	µg/L	1	1/26/2006 2:42:00 PM
1,2,3-Trichloropropane	ND		0.37	1.0	µg/L	1	1/26/2006 2:42:00 PM
1,2,4-Trimethylbenzene	ND		0.20	1.0	µg/L	1	1/26/2006 2:42:00 PM
1,3,5-Trimethylbenzene	ND		0.22	1.0	µg/L	1	1/26/2006 2:42:00 PM
Vinyl Chloride	ND		0.26	1.0	µg/L	1	1/26/2006 2:42:00 PM
o-Xylene	ND		0.25	1.0	µg/L	1	1/26/2006 2:42:00 PM
m,p-Xylene	ND		0.39	2.0	µg/L	1	1/26/2006 2:42:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).
J - Analyte detected below the Reporting Limit
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *27-Jan-06*

Client: CLAYTON INDIANAPOLIS
Work Order No.: 06010794
Project: 25-05019.00.004/
Lab ID: 06010794-003A

Client Sample ID: GW-4 45-50
Tag Number:
Collection Date: 1/25/2006 2:47:00 PM
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Reporting Limit	Units	DF	Date Analyzed
GC/MS VOLATILES; METHOD EPA 8260B		**SW8260A**				Analyst: **DRS**	
Diethyl ether	ND		1.0	10	µg/L	1	1/26/2006 3:13:00 PM
Iodomethane	ND		1.0	1.0	µg/L	1	1/26/2006 3:13:00 PM
trans-1,4-Dichloro-2-butene	ND		5.0	1.0	µg/L	1	1/26/2006 3:13:00 PM
Acetone	ND		9.4	50	µg/L	1	1/26/2006 3:13:00 PM
Acrylonitrile	ND		0.40	2.0	µg/L	1	1/26/2006 3:13:00 PM
Benzene	ND		0.31	1.0	µg/L	1	1/26/2006 3:13:00 PM
Bromobenzene	ND		0.25	1.0	µg/L	1	1/26/2006 3:13:00 PM
Bromochloromethane	ND		0.36	1.0	µg/L	1	1/26/2006 3:13:00 PM
Bromodichloromethane	ND		0.22	1.0	µg/L	1	1/26/2006 3:13:00 PM
Bromoform	ND		0.34	1.0	µg/L	1	1/26/2006 3:13:00 PM
Bromomethane	ND		1.3	5.0	µg/L	1	1/26/2006 3:13:00 PM
2-Butanone	ND		1.9	25	µg/L	1	1/26/2006 3:13:00 PM
n-Butylbenzene	ND		0.27	1.0	µg/L	1	1/26/2006 3:13:00 PM
sec-Butylbenzene	ND		0.27	1.0	µg/L	1	1/26/2006 3:13:00 PM
tert-Butylbenzene	ND		0.24	1.0	µg/L	1	1/26/2006 3:13:00 PM
Carbon Disulfide	ND		0.15	5.0	µg/L	1	1/26/2006 3:13:00 PM
Carbon tetrachloride	ND		0.38	1.0	µg/L	1	1/26/2006 3:13:00 PM
Chlorobenzene	ND		0.17	1.0	µg/L	1	1/26/2006 3:13:00 PM
Chloroethane	ND		0.59	5.0	µg/L	1	1/26/2006 3:13:00 PM
Chloroform	ND		0.35	1.0	µg/L	1	1/26/2006 3:13:00 PM
Chloromethane	ND		0.58	5.0	µg/L	1	1/26/2006 3:13:00 PM
1,2-Dibromo-3-chloropropane	ND		0.82	5.0	µg/L	1	1/26/2006 3:13:00 PM
Dibromochloromethane	ND		0.24	5.0	µg/L	1	1/26/2006 3:13:00 PM
1,2-Dibromoethane	ND		0.12	1.0	µg/L	1	1/26/2006 3:13:00 PM
Dibromomethane	ND		0.29	5.0	µg/L	1	1/26/2006 3:13:00 PM
1,2-Dichlorobenzene	ND		0.22	1.0	µg/L	1	1/26/2006 3:13:00 PM
1,3-Dichlorobenzene	ND		0.24	1.0	µg/L	1	1/26/2006 3:13:00 PM
1,4-Dichlorobenzene	ND		0.25	1.0	µg/L	1	1/26/2006 3:13:00 PM
Dichlorodifluoromethane	ND		0.18	5.0	µg/L	1	1/26/2006 3:13:00 PM
1,1-Dichloroethane	ND		0.47	1.0	µg/L	1	1/26/2006 3:13:00 PM
1,2-Dichloroethane	ND		0.43	1.0	µg/L	1	1/26/2006 3:13:00 PM
1,1-Dichloroethene	ND		0.83	1.0	µg/L	1	1/26/2006 3:13:00 PM
cis-1,2-Dichloroethene	ND		0.30	1.0	µg/L	1	1/26/2006 3:13:00 PM
trans-1,2-Dichloroethene	ND		0.42	1.0	µg/L	1	1/26/2006 3:13:00 PM
1,2-Dichloropropane	ND		0.22	1.0	µg/L	1	1/26/2006 3:13:00 PM
cis-1,3-Dichloropropene	ND		0.15	1.0	µg/L	1	1/26/2006 3:13:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).
J - Analyte detected below the Reporting Limit
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *27-Jan-06*

Client: CLAYTON INDIANAPOLIS
Work Order No.: 06010794
Project: 25-05019.00.004/
Lab ID: 06010794-003A

Client Sample ID: GW-4 45-50
Tag Number:
Collection Date: 1/25/2006 2:47:00 PM
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Reporting Limit	Units	DF	Date Analyzed
trans-1,3-Dichloropropene	ND		0.25	1.0	µg/L	1	1/26/2006 3:13:00 PM
Ethylbenzene	ND		0.15	1.0	µg/L	1	1/26/2006 3:13:00 PM
2-Hexanone	ND		10	50	µg/L	1	1/26/2006 3:13:00 PM
Isopropylbenzene	ND		0.14	5.0	µg/L	1	1/26/2006 3:13:00 PM
4-Isopropyltoluene	ND		0.23	5.0	µg/L	1	1/26/2006 3:13:00 PM
2-Methylnaphthalene	ND		5.0	5.0	µg/L	1	1/26/2006 3:13:00 PM
4-Methyl-2-Pentanone	ND		11	50	µg/L	1	1/26/2006 3:13:00 PM
Methyl tert-butyl ether	ND		0.15	5.0	µg/L	1	1/26/2006 3:13:00 PM
Methylene Chloride	ND		0.48	5.0	µg/L	1	1/26/2006 3:13:00 PM
Naphthalene	ND		1.4	5.0	µg/L	1	1/26/2006 3:13:00 PM
n-Propylbenzene	ND		0.27	1.0	µg/L	1	1/26/2006 3:13:00 PM
Styrene	ND		0.18	1.0	µg/L	1	1/26/2006 3:13:00 PM
1,1,2,2-Tetrachloroethane	ND		0.19	1.0	µg/L	1	1/26/2006 3:13:00 PM
1,1,1,2-Tetrachloroethane	ND		0.30	1.0	µg/L	1	1/26/2006 3:13:00 PM
Tetrachloroethene	ND		0.30	1.0	µg/L	1	1/26/2006 3:13:00 PM
Tetrahydrofuran	ND		0.58	90	µg/L	1	1/26/2006 3:13:00 PM
Toluene	ND		0.17	1.0	µg/L	1	1/26/2006 3:13:00 PM
1,2,3-Trichlorobenzene	ND		1.4	5.0	µg/L	1	1/26/2006 3:13:00 PM
1,2,4-Trichlorobenzene	ND		1.1	5.0	µg/L	1	1/26/2006 3:13:00 PM
1,1,1-Trichloroethane	ND		0.34	1.0	µg/L	1	1/26/2006 3:13:00 PM
1,1,2-Trichloroethane	ND		0.35	1.0	µg/L	1	1/26/2006 3:13:00 PM
Trichloroethene	ND		0.28	1.0	µg/L	1	1/26/2006 3:13:00 PM
Trichlorofluoromethane	ND		0.23	1.0	µg/L	1	1/26/2006 3:13:00 PM
1,2,3-Trichloropropane	ND		0.37	1.0	µg/L	1	1/26/2006 3:13:00 PM
1,2,4-Trimethylbenzene	ND		0.20	1.0	µg/L	1	1/26/2006 3:13:00 PM
1,3,5-Trimethylbenzene	ND		0.22	1.0	µg/L	1	1/26/2006 3:13:00 PM
Vinyl Chloride	ND		0.26	1.0	µg/L	1	1/26/2006 3:13:00 PM
o-Xylene	ND		0.25	1.0	µg/L	1	1/26/2006 3:13:00 PM
m,p-Xylene	ND		0.39	2.0	µg/L	1	1/26/2006 3:13:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).
J - Analyte detected below the Reporting Limit
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *27-Jan-06*

Client: CLAYTON INDIANAPOLIS
Work Order No.: 06010794
Project: 25-05019.00.004/
Lab ID: 06010794-004A

Client Sample ID: GW-4 55-60
Tag Number:
Collection Date: 1/25/2006 4:04:00 PM
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Reporting Limit	Units	DF	Date Analyzed
GC/MS VOLATILES; METHOD EPA 8260B		**SW8260A**				Analyst: **DRS**	
Diethyl ether	ND		1.0	10	µg/L	1	1/26/2006 3:44:00 PM
Iodomethane	ND		1.0	1.0	µg/L	1	1/26/2006 3:44:00 PM
trans-1,4-Dichloro-2-butene	ND		5.0	1.0	µg/L	1	1/26/2006 3:44:00 PM
Acetone	ND		9.4	50	µg/L	1	1/26/2006 3:44:00 PM
Acrylonitrile	ND		0.40	2.0	µg/L	1	1/26/2006 3:44:00 PM
Benzene	ND		0.31	1.0	µg/L	1	1/26/2006 3:44:00 PM
Bromobenzene	ND		0.25	1.0	µg/L	1	1/26/2006 3:44:00 PM
Bromochloromethane	ND		0.36	1.0	µg/L	1	1/26/2006 3:44:00 PM
Bromodichloromethane	ND		0.22	1.0	µg/L	1	1/26/2006 3:44:00 PM
Bromoform	ND		0.34	1.0	µg/L	1	1/26/2006 3:44:00 PM
Bromomethane	ND		1.3	5.0	µg/L	1	1/26/2006 3:44:00 PM
2-Butanone	ND		1.9	25	µg/L	1	1/26/2006 3:44:00 PM
n-Butylbenzene	ND		0.27	1.0	µg/L	1	1/26/2006 3:44:00 PM
sec-Butylbenzene	ND		0.27	1.0	µg/L	1	1/26/2006 3:44:00 PM
tert-Butylbenzene	ND		0.24	1.0	µg/L	1	1/26/2006 3:44:00 PM
Carbon Disulfide	ND		0.15	5.0	µg/L	1	1/26/2006 3:44:00 PM
Carbon tetrachloride	ND		0.38	1.0	µg/L	1	1/26/2006 3:44:00 PM
Chlorobenzene	ND		0.17	1.0	µg/L	1	1/26/2006 3:44:00 PM
Chloroethane	ND		0.59	5.0	µg/L	1	1/26/2006 3:44:00 PM
Chloroform	ND		0.35	1.0	µg/L	1	1/26/2006 3:44:00 PM
Chloromethane	ND		0.58	5.0	µg/L	1	1/26/2006 3:44:00 PM
1,2-Dibromo-3-chloropropane	ND		0.82	5.0	µg/L	1	1/26/2006 3:44:00 PM
Dibromochloromethane	ND		0.24	5.0	µg/L	1	1/26/2006 3:44:00 PM
1,2-Dibromoethane	ND		0.12	1.0	µg/L	1	1/26/2006 3:44:00 PM
Dibromomethane	ND		0.29	5.0	µg/L	1	1/26/2006 3:44:00 PM
1,2-Dichlorobenzene	ND		0.22	1.0	µg/L	1	1/26/2006 3:44:00 PM
1,3-Dichlorobenzene	ND		0.24	1.0	µg/L	1	1/26/2006 3:44:00 PM
1,4-Dichlorobenzene	ND		0.25	1.0	µg/L	1	1/26/2006 3:44:00 PM
Dichlorodifluoromethane	ND		0.18	5.0	µg/L	1	1/26/2006 3:44:00 PM
1,1-Dichloroethane	ND		0.47	1.0	µg/L	1	1/26/2006 3:44:00 PM
1,2-Dichloroethane	ND		0.43	1.0	µg/L	1	1/26/2006 3:44:00 PM
1,1-Dichloroethene	ND		0.83	1.0	µg/L	1	1/26/2006 3:44:00 PM
cis-1,2-Dichloroethene	ND		0.30	1.0	µg/L	1	1/26/2006 3:44:00 PM
trans-1,2-Dichloroethene	ND		0.42	1.0	µg/L	1	1/26/2006 3:44:00 PM
1,2-Dichloropropane	ND		0.22	1.0	µg/L	1	1/26/2006 3:44:00 PM
cis-1,3-Dichloropropene	ND		0.15	1.0	µg/L	1	1/26/2006 3:44:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit (RL).
J - Analyte detected below the Reporting Limit
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
T - Tentatively Identified Compound (TIC)

ANALYTICAL RESULTS

Date: *27-Jan-06*

Client: CLAYTON INDIANAPOLIS
Work Order No.: 06010794
Project: 25-05019.00.004/
Lab ID: 06010794-004A

Client Sample ID: GW-4 55-60
Tag Number:
Collection Date: 1/25/2006 4:04:00 PM
Matrix: GROUNDWATER

Analyses	Result	Qual	MDL	Reporting Limit	Units	DF	Date Analyzed
trans-1,3-Dichloropropene	ND		0.25	1.0	µg/L	1	1/26/2006 3:44:00 PM
Ethylbenzene	ND		0.15	1.0	µg/L	1	1/26/2006 3:44:00 PM
2-Hexanone	ND		10	50	µg/L	1	1/26/2006 3:44:00 PM
Isopropylbenzene	ND		0.14	5.0	µg/L	1	1/26/2006 3:44:00 PM
4-Isopropyltoluene	ND		0.23	5.0	µg/L	1	1/26/2006 3:44:00 PM
2-Methylnaphthalene	ND		5.0	5.0	µg/L	1	1/26/2006 3:44:00 PM
4-Methyl-2-Pentanone	ND		11	50	µg/L	1	1/26/2006 3:44:00 PM
Methyl tert-butyl ether	ND		0.15	5.0	µg/L	1	1/26/2006 3:44:00 PM
Methylene Chloride	ND		0.48	5.0	µg/L	1	1/26/2006 3:44:00 PM
Naphthalene	ND		1.4	5.0	µg/L	1	1/26/2006 3:44:00 PM
n-Propylbenzene	ND		0.27	1.0	µg/L	1	1/26/2006 3:44:00 PM
Styrene	ND		0.18	1.0	µg/L	1	1/26/2006 3:44:00 PM
1,1,2,2-Tetrachloroethane	ND		0.19	1.0	µg/L	1	1/26/2006 3:44:00 PM
1,1,1,2-Tetrachloroethane	ND		0.30	1.0	µg/L	1	1/26/2006 3:44:00 PM
Tetrachloroethene	ND		0.30	1.0	µg/L	1	1/26/2006 3:44:00 PM
Tetrahydrofuran	ND		0.58	90	µg/L	1	1/26/2006 3:44:00 PM
Toluene	ND		0.17	1.0	µg/L	1	1/26/2006 3:44:00 PM
1,2,3-Trichlorobenzene	ND		1.4	5.0	µg/L	1	1/26/2006 3:44:00 PM
1,2,4-Trichlorobenzene	ND		1.1	5.0	µg/L	1	1/26/2006 3:44:00 PM
1,1,1-Trichloroethane	ND		0.34	1.0	µg/L	1	1/26/2006 3:44:00 PM
1,1,2-Trichloroethane	ND		0.35	1.0	µg/L	1	1/26/2006 3:44:00 PM
Trichloroethene	0.87	J	0.28	1.0	µg/L	1	1/26/2006 3:44:00 PM
Trichlorofluoromethane	ND		0.23	1.0	µg/L	1	1/26/2006 3:44:00 PM
1,2,3-Trichloropropane	ND		0.37	1.0	µg/L	1	1/26/2006 3:44:00 PM
1,2,4-Trimethylbenzene	ND		0.20	1.0	µg/L	1	1/26/2006 3:44:00 PM
1,3,5-Trimethylbenzene	ND		0.22	1.0	µg/L	1	1/26/2006 3:44:00 PM
Vinyl Chloride	ND		0.26	1.0	µg/L	1	1/26/2006 3:44:00 PM
o-Xylene	ND		0.25	1.0	µg/L	1	1/26/2006 3:44:00 PM
m,p-Xylene	ND		0.39	2.0	µg/L	1	1/26/2006 3:44:00 PM

Qualifiers:

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B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
T - Tentatively Identified Compound (TIC)

Clayton Group Services

Date: *27-Jan-06*

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010794
Project: 25-05019.00.004/

QC SUMMARY REPORT

Method Blank

Sample ID **06010000-BLK3** Batch ID: **R77634** Units: **µg/L** Analysis Date **1/26/2006 11:00:00 AM** Prep Date:

Client ID: Run ID: **MS_HP11K_060126A** SeqNo: **909005**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diethyl ether	ND	10									
Iodomethane	ND	1									
trans-1,4-Dichloro-2-butene	ND	1									
Acetone	ND	50									
Acrylonitrile	ND	2									
Benzene	ND	1									
Bromobenzene	ND	1									
Bromochloromethane	ND	1									
Bromodichloromethane	ND	1									
Bromoform	ND	1									
Bromomethane	ND	5									
2-Butanone	ND	25									
n-Butylbenzene	ND	1									
sec-Butylbenzene	ND	1									
tert-Butylbenzene	ND	1									
Carbon Disulfide	ND	5									
Carbon tetrachloride	ND	1									
Chlorobenzene	ND	1									
Chloroethane	ND	5									
Chloroform	ND	1									
Chloromethane	ND	5									
1,2-Dibromo-3-chloropropane	ND	5									
Dibromochloromethane	ND	5									
1,2-Dibromoethane	ND	1									
Dibromomethane	ND	5									
1,2-Dichlorobenzene	ND	1									
1,3-Dichlorobenzene	ND	1									

Qualifiers:
ND - Not Detected at the Reporting Limit
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S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010794
Project: 25-05019.00.004/

QC SUMMARY REPORT
Method Blank

1,4-Dichlorobenzene	ND	1
Dichlorodifluoromethane	ND	5
1,1-Dichloroethane	ND	1
1,2-Dichloroethane	ND	1
1,1-Dichloroethene	ND	1
cis-1,2-Dichloroethene	ND	1
trans-1,2-Dichloroethene	ND	1
1,2-Dichloropropane	ND	1
cis-1,3-Dichloropropene	ND	1
trans-1,3-Dichloropropene	ND	1
Ethylbenzene	ND	1
2-Hexanone	ND	50
Isopropylbenzene	ND	5
4-Isopropyltoluene	ND	5
2-Methylnaphthalene	ND	5
4-Methyl-2-Pentanone	ND	50
Methyl tert-butyl ether	ND	5
Methylene Chloride	ND	5
Naphthalene	ND	5
n-Propylbenzene	ND	1
Styrene	ND	1
1,1,2,2-Tetrachloroethane	ND	1
1,1,1,2-Tetrachloroethane	ND	1
Tetrachloroethene	ND	1
Tetrahydrofuran	ND	90
Toluene	ND	1
1,2,3-Trichlorobenzene	ND	5
1,2,4-Trichlorobenzene	ND	5
1,1,1-Trichloroethane	ND	1
1,1,2-Trichloroethane	ND	1
Trichloroethene	ND	1
Trichlorofluoromethane	ND	1
1,2,3-Trichloropropane	ND	1

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below Reporting Limit
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010794
Project: 25-05019.00.004/

QC SUMMARY REPORT

Method Blank

1,2,4-Trimethylbenzene	ND	1						
1,3,5-Trimethylbenzene	ND	1						
Vinyl Chloride	ND	1						
o-Xylene	ND	1						
m,p-Xylene	ND	2						
Surr: 4-Bromofluorobenzene	54.02	0	50	0	108	82.2	110	0
Surr: 1,2-Dichloroethane-d4	52.35	0	50	0	105	86	118	0
Surr: Pentafluorobenzene	47.01	0	50	0	94	73.8	120	0
Surr: Toluene-d8	50.71	0	50	0	101	79	121	0

Qualifiers:
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S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Clayton Group Services

Date: *27-Jan-06*

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010794
Project: 25-05019.00.004/

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID **06010794-004AMS** Batch ID: **R77634** Units: **µg/L** Analysis Date **1/27/2006 7:00:00 AM** Prep Date:

Client ID: **GW-4 55-60** Run ID: **MS_HP11K_060126A** SeqNo: **909012**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diethyl ether	36.52	10	50	0	73	62.4	129	0			
Iodomethane	17.62	1	50	0	35.2	24.4	171	0			
trans-1,4-Dichloro-2-butene	53.53	1	50	0	107	37.4	142	0			
Acetone	51.76	50	50	0	104	3.97	167	0			
Acrylonitrile	49.19	2	50	0	98.4	42.7	150	0			
Benzene	50.33	1	50	0	101	72	131	0			
Bromobenzene	41.26	1	50	0	82.5	70.6	129	0			
Bromochloromethane	43.77	1	50	0	87.5	64.3	131	0			
Bromodichloromethane	48.61	1	50	0	97.2	62.9	132	0			
Bromoform	44.21	1	50	0	88.4	49.2	136	0			
Bromomethane	25.17	5	50	0	50.3	17.3	142	0			
2-Butanone	50.31	25	50	0	101	30	157	0			
n-Butylbenzene	41.62	1	50	0	83.2	76.4	130	0			
sec-Butylbenzene	40.6	1	50	0	81.2	76.4	130	0			
tert-Butylbenzene	38.46	1	50	0	76.9	74.2	131	0			
Carbon Disulfide	47.05	5	50	0	94.1	57.5	134	0			
Carbon tetrachloride	38.51	1	50	0	77	33.6	150	0			
Chlorobenzene	47.15	1	50	0	94.3	69.8	127	0			
Chloroethane	45.16	5	50	0	90.3	57.7	137	0			
Chloroform	42.74	1	50	0	85.5	74.7	123	0			
Chloromethane	51.77	5	50	0	104	46.2	145	0			
1,2-Dibromo-3-chloropropane	43.09	5	50	0	86.2	32.1	150	0			
Dibromochloromethane	42.69	5	50	0	85.4	65.2	132	0			
1,2-Dibromoethane	43.86	1	50	0	87.7	73.2	126	0			
Dibromomethane	53.96	5	50	0	108	63.2	134	0			
1,2-Dichlorobenzene	40.38	1	50	0	80.8	69	131	0			
1,3-Dichlorobenzene	40.28	1	50	0	80.6	69.8	132	0			

Qualifiers:
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S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010794
Project: 25-05019.00.004/

QC SUMMARY REPORT

Sample Matrix Spike

1,4-Dichlorobenzene	40.67	1	50	0	81.3	69.7	131	0	
Dichlorodifluoromethane	35.71	5	50	0	71.4	30.9	146	0	
1,1-Dichloroethane	50.13	1	50	0	100	70.4	132	0	
1,2-Dichloroethane	43.99	1	50	0	88	69.2	130	0	
1,1-Dichloroethene	40.39	1	50	0	80.8	64.3	135	0	
cis-1,2-Dichloroethene	41.63	1	50	0	83.3	70.9	128	0	
trans-1,2-Dichloroethene	37.3	1	50	0	74.6	65.1	132	0	
1,2-Dichloropropane	50.71	1	50	0	101	70.8	132	0	
cis-1,3-Dichloropropene	46.69	1	50	0	93.4	65.4	131	0	
trans-1,3-Dichloropropene	49.02	1	50	0	98	60.8	129	0	
Ethylbenzene	48.64	1	50	0	97.3	72.3	129	0	
2-Hexanone	54.32	50	50	0	109	37	154	0	
Isopropylbenzene	49.62	5	50	0	99.2	69.7	135	0	
4-Isopropyltoluene	39.7	5	50	0	79.4	78.5	131	0	
2-Methylnaphthalene	69.77	5	50	0	140	37	152	0	
4-Methyl-2-Pentanone	59.72	50	50	0	119	52.7	148	0	
Methyl tert-butyl ether	36.24	5	50	0	72.5	33.4	152	0	
Methylene Chloride	50.55	5	50	0	101	66.4	129	0	
Naphthalene	44.41	5	50	0	88.8	45.6	150	0	
n-Propylbenzene	38.99	1	50	0	78	73.4	131	0	
Styrene	53	1	50	0	106	56.1	140	0	
1,1,2,2-Tetrachloroethane	57.59	1	50	0	115	65.3	137	0	
1,1,1,2-Tetrachloroethane	40.38	1	50	0	80.8	70.1	131	0	
Tetrachloroethene	40.08	1	50	0	80.2	64.2	133	0	
Tetrahydrofuran	79.17	90	50	0	158	38.8	151	0	JS
Toluene	46.2	1	50	0	92.4	70.7	129	0	
1,2,3-Trichlorobenzene	40.74	5	50	0	81.5	62.3	135	0	
1,2,4-Trichlorobenzene	40.02	5	50	0	80	50.3	146	0	
1,1,1-Trichloroethane	39.01	1	50	0	78	64.7	128	0	
1,1,2-Trichloroethane	51.41	1	50	0	103	71	134	0	
Trichloroethene	42.36	1	50	0.87	83	67.2	129	0	
Trichlorofluoromethane	52.08	1	50	0	104	60.2	139	0	
1,2,3-Trichloropropane	54.16	1	50	0	108	63.5	136	0	

Qualifiers: ND - Not Detected at the Reporting Limit
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R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010794
Project: 25-05019.00.004/

QC SUMMARY REPORT

Sample Matrix Spike

1,2,4-Trimethylbenzene	40.81	1	50	0	81.6	65.9	137	0	
1,3,5-Trimethylbenzene	40.23	1	50	0	80.5	65.2	136	0	
Vinyl Chloride	48.08	1	50	0	96.2	62.5	135	0	
o-Xylene	51.3	1	50	0	103	67.9	135	0	
m,p-Xylene	97.54	2	100	0	97.5	71.1	132	0	
Surr: 4-Bromofluorobenzene	60.4	0	50	0	121	82.7	109	0	S
Surr: 1,2-Dichloroethane-d4	47.45	0	50	0	94.9	81	123	0	
Surr: Pentafluorobenzene	41.94	0	50	0	83.9	71.4	132	0	
Surr: Toluene-d8	50.91	0	50	0	102	80.5	117	0	

Please note that the matrix spike/matrix spike duplicate (MS/MSD) recovery of one or more analytes was above statistical limits. The results reported are not affected.

Qualifiers:
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CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010794
Project: 25-05019.00.004/

QC SUMMARY REPORT

Sample Matrix Spike Duplicate

Sample ID **06010794-004AMSD** Batch ID: **R77634** Units: **µg/L** Analysis Date **1/27/2006 7:42:00 AM** Prep Date:

Client ID: **GW-4 55-60** Run ID: **MS_HP11K_060126A** SeqNo: **909013**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diethyl ether	42.8	10	50	0	85.6	62.4	129	36.52	15.8	22.1	
Iodomethane	27.14	1	50	0	54.3	24.4	171	17.62	42.5	19.8	R
trans-1,4-Dichloro-2-butene	55.58	1	50	0	111	37.4	142	53.53	3.76	22.5	
Acetone	49.57	50	50	0	99.1	3.97	167	51.76	4.32	45.7	J
Acrylonitrile	50.17	2	50	0	100	42.7	150	49.19	1.97	35.6	
Benzene	52.7	1	50	0	105	72	131	50.33	4.6	17	
Bromobenzene	46.76	1	50	0	93.5	70.6	129	41.26	12.5	15.2	
Bromochloromethane	51.8	1	50	0	104	64.3	131	43.77	16.8	18.6	
Bromodichloromethane	50	1	50	0	100	62.9	132	48.61	2.82	20.3	
Bromoform	50.67	1	50	0	101	49.2	136	44.21	13.6	20.4	
Bromomethane	34.21	5	50	0	68.4	17.3	142	25.17	30.4	58.6	
2-Butanone	52.69	25	50	0	105	30	157	50.31	4.62	43.1	
n-Butylbenzene	48.19	1	50	0	96.4	76.4	130	41.62	14.6	15.6	
sec-Butylbenzene	48.36	1	50	0	96.7	76.4	130	40.6	17.4	17.3	R
tert-Butylbenzene	46.71	1	50	0	93.4	74.2	131	38.46	19.4	17.4	R
Carbon Disulfide	51.71	5	50	0	103	57.5	134	47.05	9.44	20.8	
Carbon tetrachloride	41.61	1	50	0	83.2	33.6	150	38.51	7.74	49.8	
Chlorobenzene	51.74	1	50	0	103	69.8	127	47.15	9.28	18.8	
Chloroethane	49.63	5	50	0	99.3	57.7	137	45.16	9.43	32.3	
Chloroform	47.95	1	50	0	95.9	74.7	123	42.74	11.5	16.9	
Chloromethane	53.11	5	50	0	106	46.2	145	51.77	2.56	44.5	
1,2-Dibromo-3-chloropropane	49.67	5	50	0	99.3	32.1	150	43.09	14.2	48.2	
Dibromochloromethane	48.88	5	50	0	97.8	65.2	132	42.69	13.5	20	
1,2-Dibromoethane	49.36	1	50	0	98.7	73.2	126	43.86	11.8	19.7	
Dibromomethane	55.29	5	50	0	111	63.2	134	53.96	2.43	21.9	
1,2-Dichlorobenzene	47.06	1	50	0	94.1	69	131	40.38	15.3	21.2	
1,3-Dichlorobenzene	47.76	1	50	0	95.5	69.8	132	40.28	17	21.2	
1,4-Dichlorobenzene	46.75	1	50	0	93.5	69.7	131	40.67	13.9	20.9	

Qualifiers:
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R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010794
Project: 25-05019.00.004/

QC SUMMARY REPORT

Sample Matrix Spike Duplicate

Dichlorodifluoromethane	43.44	5	50	0	86.9	30.9	146	35.71	19.5	20.3	
1,1-Dichloroethane	55.39	1	50	0	111	70.4	132	50.13	9.97	18.9	
1,2-Dichloroethane	47.42	1	50	0	94.8	69.2	130	43.99	7.5	17.2	
1,1-Dichloroethene	46.45	1	50	0	92.9	64.3	135	40.39	14	20.8	
cis-1,2-Dichloroethene	48.03	1	50	0	96.1	70.9	128	41.63	14.3	17.1	
trans-1,2-Dichloroethene	43.93	1	50	0	87.9	65.1	132	37.3	16.3	18.8	
1,2-Dichloropropane	51.43	1	50	0	103	70.8	132	50.71	1.41	17.7	
cis-1,3-Dichloropropene	50.9	1	50	0	102	65.4	131	46.69	8.63	23.5	
trans-1,3-Dichloropropene	51.07	1	50	0	102	60.8	129	49.02	4.1	20.3	
Ethylbenzene	52.55	1	50	0	105	72.3	129	48.64	7.73	17.1	
2-Hexanone	55.76	50	50	0	112	37	154	54.32	2.62	33.5	
Isopropylbenzene	56.39	5	50	0	113	69.7	135	49.62	12.8	17.5	
4-Isopropyltoluene	47.18	5	50	0	94.4	78.5	131	39.7	17.2	14.5	R
2-Methylnaphthalene	80.89	5	50	0	162	37	152	69.77	14.8	55.5	S
4-Methyl-2-Pentanone	58.73	50	50	0	117	52.7	148	59.72	1.67	24.8	
Methyl tert-butyl ether	42.14	5	50	0	84.3	33.4	152	36.24	15.1	44.8	
Methylene Chloride	55.14	5	50	0	110	66.4	129	50.55	8.69	18.5	
Naphthalene	52.36	5	50	0	105	45.6	150	44.41	16.4	65.4	
n-Propylbenzene	46.85	1	50	0	93.7	73.4	131	38.99	18.3	17.6	R
Styrene	59.02	1	50	0	118	56.1	140	53	10.7	66.6	
1,1,2,2-Tetrachloroethane	61.3	1	50	0	123	65.3	137	57.59	6.24	26.2	
1,1,1,2-Tetrachloroethane	46.01	1	50	0	92	70.1	131	40.38	13	19.5	
Tetrachloroethene	46.2	1	50	0	92.4	64.2	133	40.08	14.2	18.5	
Tetrahydrofuran	55.92	90	50	0	112	38.8	151	79.17	34.4	45.9	J
Toluene	49.67	1	50	0	99.3	70.7	129	46.2	7.24	18.4	
1,2,3-Trichlorobenzene	49.13	5	50	0	98.3	62.3	135	40.74	18.7	21.9	
1,2,4-Trichlorobenzene	48.68	5	50	0	97.4	50.3	146	40.02	19.5	69	
1,1,1-Trichloroethane	43.12	1	50	0	86.2	64.7	128	39.01	10	17.9	
1,1,2-Trichloroethane	53.43	1	50	0	107	71	134	51.41	3.85	16.7	
Trichloroethene	47.04	1	50	0.87	92.3	67.2	129	42.36	10.5	17.4	
Trichlorofluoromethane	60.68	1	50	0	121	60.2	139	52.08	15.3	31.9	
1,2,3-Trichloropropane	60.74	1	50	0	121	63.5	136	54.16	11.5	22.1	
1,2,4-Trimethylbenzene	47.48	1	50	0	95	65.9	137	40.81	15.1	20.4	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below Reporting Limit
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010794
Project: 25-05019.00.004/

QC SUMMARY REPORT

Sample Matrix Spike Duplicate

1,3,5-Trimethylbenzene	45.9	1	50	0	91.8	65.2	136	40.23	13.2	32.1	
Vinyl Chloride	54.63	1	50	0	109	62.5	135	48.08	12.8	19.7	
o-Xylene	56.74	1	50	0	113	67.9	135	51.3	10.1	18	
m,p-Xylene	111.1	2	100	0	111	71.1	132	97.54	13	16.8	
Surr: 4-Bromofluorobenzene	58.39	0	50	0	117	82.2	110	60.4	3.38	11.7	S
Surr: 1,2-Dichloroethane-d4	47.05	0	50	0	94.1	86	118	47.45	0.847	5.42	
Surr: Pentafluorobenzene	44.6	0	50	0	89.2	73.8	120	41.94	6.15	6.63	
Surr: Toluene-d8	50.27	0	50	0	101	79	121	50.91	1.27	10.9	

Please note that the relative percent difference (RPD) of one or more analytes was above statictical limits. The results reported are not affected.

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below Reporting Limit
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

Clayton Group Services

Date: 27-Jan-06

CLIENT: CLAYTON INDIANAPOLIS
Work Order: 06010794
Project: 25-05019.00.004/
Analysis: Volatile Organics; Water: Method 8260B

QC SUMMARY REPORT
SURROGATE RECOVERIES

Sample ID	BR4FBZ	BZMED8	DCA12D4	PFBZ				
06010000-BLK3	108	101	105	94.0				
06010791-001A	111 *	102	105	86.4				
06010791-002A	108	101	104	85.2				
06010794-001A	110 *	104	108	82.8				
06010794-002A	108	101	106	84.5				
06010794-003A	108	104	110	86.6				
06010794-004A	111 *	105	110	81.3				
06010794-004AMS	121 *	102	94.9	83.9				
06010794-004AMS	117 *	101	94.1	89.2				

Acronym		Surrogate	QC Limits
BR4FBZ	=	4-Bromofluorobenzene	82.2-110
BZMED8	=	Toluene-d8	79-121
DCA12D4	=	1,2-Dichloroethane-d4	86-118
PFBZ	=	Pentafluorobenzene	73.8-120

*** Surrogate recovery outside acceptance limits**

Clayton
Group Services

REQUEST FOR LABORATORY ANALYTICAL SERVICES

IMPORTANT: Date results required: normal turnaround

Rush charges authorized? Yes ☐ No ■

Fax or E-mail results ■

E-mail Address: chris.sloffer@us.bureauveritas.com

Page: 1 of 1

For Clayton Use Only
Lab Project No. 06010794

Report results to:
Name Chris Sloffer
Company Clayton Group Services
Mailing Address 9376 Castlegate Drive
City, State, Zip Indianapolis, Indiana
Telephone No. 317-570-4582 Fax No. 317-570-4586

Client Project Number: 25-05019.00.004

Send invoice to:
Name
Company
Address
City, State, Zip

P.O. No.

Soil samples only: Which state are these from? Indiana

Special instructions and/or specific regulatory requirements:
(method, limit of detection, etc.)
VOCs - 8260 (with HCl preservative)
lowest possible detection limits

Water samples are:
Drinking water
Groundwater X
Wastewater

Enter a "P" here if preservative added.

Client Sample Identification	Date Sampled	Time Sampled	Matrix/Media	Air Volume (Liters)	# of Containers	ANALYSIS REQUESTED (List each analyte on the lines below, multiple analytes per line)	
trip blank	1/25/06	NA	GW	NA	3	VOCs - 8260	P
GW-4 35-40	1/25/06	1330	GW	NA	3	VOCs - 8260	P
GW-4 45-50	1/25/06	1447	GW	NA	3	VOCs - 8260	P
GW-4 55-60	1/25/06	1604	GW	NA	3	VOCs - 8260	P
			GW	NA		VOCs - 8260	P
			GW	NA		VOCs - 8260	P
			GW	NA		VOCs - 8260	P
			GW	NA		VOCs - 8260	P
			GW	NA		VOCs - 8260	P
			GW	NA		VOCs - 8260	P

Collected by: Chris Sloffer *Date/Time* 1/25/06
Relinquished by: *Date/Time* 1/25/06 1900
Relinquished by: *Date/Time*
Method of Shipment: FedEx
Authorized by:
Date/Time:

Collector's Signature: *Date/Time* 1/25/06
Received by: *Date/Time*
Received by: *Date/Time*
Sample Condition on Receipt:
Acceptable *Other:*
(Explain)

(Signature MUST accompany request!)

Ship to:

Detroit (IH, Environmental, & Asbestos)
22345 Roethel Drive
Novi, Michigan, 48375
Phone: 248.344.2652, Toll-free 800.806.5887
Fax: 248-344-2655

Atlanta (Asbestos, TEM & SEM)
3380 Chastain Meadows Pkwy., Suite 300
Kennesaw, Georgia 30144
Phone: 770.499.7500, Toll-free 800.252.9919
Fax: 770.499.7511

Seattle (Asbestos Only)
4636 E. Marginal Way S., Suite 140
Seattle, Washington 98134
Phone: 206.763.7264, Toll-free 800.564.7755
Fax: 206.763.4189

Visit our website: http:labonline.claytongrp.com

APPENDIX G

UST Closure Report