



**RCRA FACILITY INVESTIGATION (RFI)  
WORK PLAN ADDENDUM No. 12  
EAST PLANT AREA**

**GENERAL MOTORS POWERTRAIN BEDFORD FACILITY  
BEDFORD, INDIANA  
U.S. EPA ID NO. IND 006036099**

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LIST OF FIGURES  
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FIGURE 1.1 FACILITY LOCATION

FIGURE 3.1 PROPOSED COREHOLE AND BOREHOLE LOCATIONS

LIST OF ACRONYMS AND SHORT FORMS

Agreement	RCRA Corrective Action Agreement
AOI	Area of Interest
BIPs	borehole information processing system
CM	Corrective Measure
CRA	Conestoga-Rovers & Associates, Inc.
CSM	Conceptual Site Model
Facility	GM Powertrain Bedford Facility
ft bgs	feet below ground surface
ft	feet
GM	General Motors Corporation
HSA	hollow-stem auger
mg/kg	milligrams per kilogram
NAPL	Non-Aqueous Phase Liquid
PCBs	polychlorinated biphenyls
PID	Photoionization Detector
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SPT	standard penetration tests
U.S. EPA	United States Environmental Protection Agency
USDA	United States Department of Agriculture

## **1.0 INTRODUCTION**

Conestoga-Rovers & Associates, Inc. (CRA) has prepared Addendum No. 12 to the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Work Plan for the General Motors Corporation (GM) Powertrain Bedford Facility (Facility), located in Bedford, Indiana.

### **1.1 GENERAL**

The Facility is located at 105 GM Drive, Bedford, Lawrence County, Indiana, 47421 (Figure 1.1). The Facility produces aluminum casting products, such as transmission cases, pistons, and engine blocks. Major aluminum production processes include die casting and permanent molding. The Facility has been operating as an aluminum foundry since 1942, with major facility modifications completed in 1950, 1953, 1966, 1971, 1974, 1977, 1979, and 1980.

The Facility, located on 152.5 acres, contains approximately 915,000 square feet of floor space and employs approximately 1,000 people.

### **1.2 RFI APPROACH**

GM signed a Performance-Based RCRA Corrective Action Agreement (Agreement) with the United States Environmental Protection Agency (U.S. EPA) for the Facility on March 20, 2001, as amended on October 1, 2002. The signed Agreement states that GM will work with the U.S. EPA to identify and define the nature and extent of releases of hazardous waste and/or hazardous constituents at or from the Facility. This RFI effort is being conducted as a phased investigation, with each phase building on information obtained in earlier phases of investigation.

### **1.3 PURPOSE**

The purpose of this RFI Work Plan Addendum No. 12 is to further define the stratigraphy along the proposed bedrock/groundwater trench collection system east of the expanded Grading Area 2 and to further define the identified bedrock valley north of Area of Interest (AOI) 4. This investigation will be used to support the design of the perimeter groundwater collection system.

These objectives will be achieved by completing the activities outlined in Section 3.0.

## **2.0 REVIEW OF EXISTING CONDITIONS**

### **2.1 LOCAL SETTING**

The local setting is based upon the various phases of investigations that have been completed at the Facility since 2001.

#### **2.1.1 LOCAL GEOLOGY**

The natural soil in the immediate vicinity of the Facility is known as Crider. Crider soil is a fine-grained, silt loam to silty clay loam. Crider soil develops on 20 inches to 45 inches of silty loess over clayey material derived from limestone [United States Department of Agriculture (USDA), 1985].

The overburden materials at the East Plant Area consist of fill materials, and clay and silt. The thickness of the overburden materials varies considerably across the East Plant Area. Overburden is generally thickest in AOIs 4, 5, 6, and 7, where filling activities are known to have occurred over the years.

The overburden within the East Plant Area is underlain by the St. Louis and Salem Limestone Formations. The St. Louis Formation has been identified to be highly weathered and fractured near surface. Fracture density and size decreases with depth. The highly weathered and fractured St. Louis Limestone is underlain by the Salem Limestone (also known as the Indiana, Bedford, or Oolitic Limestone), which is the limestone formation utilized by local quarries for fine building stone. The Salem Limestone can also be weathered and fractured at the surface, but is generally more massive and less weathered and fractured than the St. Louis Limestone.

Additional information on the East Plant Area geology is presented in the Technical Memorandum RFI, Soil, Sediment, Surface Water, Wipe Sampling (CRA, April 2004) and RFI Work Plan (CRA, October 2001).

#### **2.1.2 LOCAL HYDROGEOLOGY**

The Conceptual Site Model (CSM) for fill/overburden and shallow bedrock groundwater flow describes the shallow groundwater flow (i.e., unconfined water table) through the unconsolidated overburden and upper fractured/weathered bedrock at the Facility. Recharge to the water table aquifer occurs through the overburden materials

and directly into bedrock, where exposed. Discharge of groundwater from the overburden and shallow bedrock occurs through springs and seeps in topographically low areas (e.g., creeks and ditches). The results of groundwater sampling across the Facility and the results of the dye trace testing completed in September 2004 support this CSM of the shallow groundwater flow at the Facility.

## **2.2 EAST PLANT AREA AREAS OF INTEREST**

The following AOIs are within the East Plant Area:

- AOI 3 - PCB Storage Area;
- AOI 4 - Former North Disposal Area;
- Area North of AOI 4;
- AOI 5 - Former East sand Disposal Area;
- AOI 6 - Former Sludge Disposal and Fire Training Area;
- AOI 7 - Former North Lagoon and Outfall 001;
- AOI 8 - Former South Lagoons and Outfall 002;
- AOI 10 - Existing Stormwater Lagoon and Outfall 003;
- AOI 11 - Aboveground Storage Tanks;
- AOI 15 - Former Equipment Storage Area; and
- AOI 23 - Area Affected by the 1996 Wastewater Treatment Filter Cake Release.

### 3.0 SCOPE OF WORK

This section outlines the proposed investigations and methods required to achieve the objectives presented in Section 1.0. The information acquired through these coreholes will be used in the design of the perimeter groundwater collection system in this area of the Facility.

The investigations are summarized as follows:

- installation of five coreholes along the proposed re-alignment of the perimeter groundwater collection systems on the eastern portion of the expanded Grading Area 2;
- installation of two coreholes in area north of AOI 4, to be located on either side of the existing corehole CH-29 (corehole CH-29 was installed in the area of the bedrock valley northeast of the landfill); and
- installation of two geoprobe borings to further define the limits of the identified bedrock valley at CH-29.

The proposed corehole and borehole locations are presented on Figure 3.1.

### 3.1 PROPOSED GROUNDWATER COLLECTION SYSTEM ALIGNMENT INVESTIGATIVE COREHOLES

Approximately seven coreholes will be installed, via hollow-stem auger (HSA) and wireline coring methods around the re-alignment of the proposed perimeter groundwater collection systems. These coreholes will provide information on the depth to bedrock and the depth to competent bedrock needed to support the design of the shallow groundwater collection systems presented in the Interim Measures Alternatives Review Report - East Plant Area (CRA, April 2005). The proposed locations of these coreholes and boreholes are presented on Figure 3.1. The proposed locations may be modified based upon changes in field conditions, which may be encountered.

### 3.2 COREHOLE INSTALLATION AND DESIGN

At each location, the overburden material will be sealed from the bedrock with a four-inch steel casing, grouted into the upper portion of the bedrock surface. The grout will be allowed to cure for a minimum of 48 hours prior to continuing the advancement



of the borehole. The bedrock will then be cored using a HQ (approximately 3.8-inch diameter) wireline core barrel. Cores will be observed and described at ten-foot increments during advancement.

Upon completion to the final depth (approximately 10 to 20 ft into bedrock), each borehole will be completed as an open-hole and will be left available for future evaluation.

Each borehole will be completed with a locking, hinged cap, welded into place on the four-inch outer casing. Bumper posts will be installed as protection around any outer casing near traffic lanes.

Bedrock cores will be retrieved from the core barrel and placed into wooden core boxes. Each core box will be labeled as to contents on the top and front, photographed, and placed into a storage container located at the Facility.

The boreholes/coreholes will be completed consistent with the protocols presented in the RFI Work Plan (CRA, October 2001).

### **3.3 GEOPROBE BORINGS**

Two geoprobe borings will also be placed along the proposed alignment of the proposed perimeter trench within the vicinity of the bedrock valley encountered in corehole CH-29. These borings will be used as visual confirmation of top of rock to further confirm the information obtained from the two proposed coreholes in this area and further define the bedrock valley.

### **3.4 DISPOSAL OF INVESTIGATION DERIVED WASTE**

Procedures outlined in the Waste Management Plan (CRA, October 2002) will be followed for the transportation, staging, and disposal of investigative derived waste materials from the East Plant Area.

#### **4.0 COMPLIANCE WITH FACILITY PROTOCOLS**

All activities will be performed following the protocols of the RFI Work Plan (CRA, October 2001).

Quality Control/Quality Assurance procedures outlined in the RFI Work Plan and Quality Assurance Project Plan (QAPP) (CRA, July 2001) will be followed for all investigative activities.

## 5.0 REPORTING AND SCHEDULE

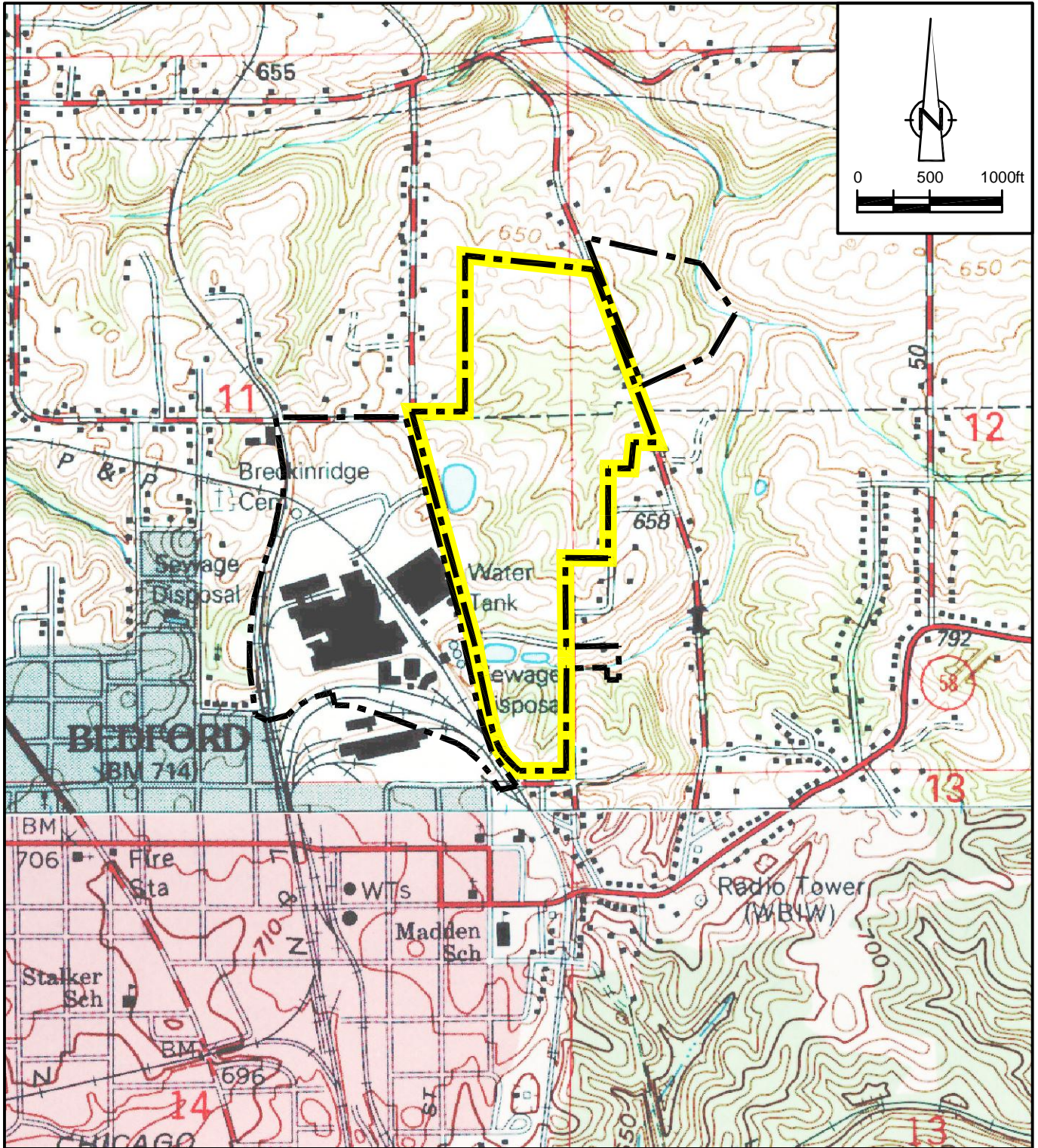
The results of this RFI Work Plan Addendum No. 12 will be presented to the U.S. EPA and Indiana Department of Environmental Management in a technical memorandum.

The Scope of Work presented in this RFI Work Plan Addendum No. 12 will be initiated as soon as is practicable based upon U.S. EPA approval, contracting, and weather conditions. It is anticipated that the coreholes and boreholes installation will take approximately 4-6 weeks.

## 6.0 REFERENCES

- CRA, May 25, 2001, Current Conditions Report, GM Powertrain Bedford Facility, Bedford, Indiana.
- CRA, July 18, 2001, QAPP Preliminary RFI Activities, GM Powertrain Bedford Facility, Bedford Indiana.
- CRA, October 29, 2001, RFI Work Plan, GM Powertrain Bedford Facility, Bedford, Indiana.
- CRA, October 2002, Waste Management Plan, GM Powertrain Bedford Facility, Bedford Indiana.
- CRA, November 18, 2002, RFI Work Plan Addendum No. 1, GM Powertrain Bedford Facility, Bedford Indiana.
- CRA, May 22, 2003, RFI Work Plan Addendum No. 2, GM Powertrain Bedford Facility, Bedford Indiana.
- CRA, March 2004, RFI Work Plan Addendum No. 3, GM Powertrain Bedford Facility, Bedford Indiana.
- CRA, April 15, 2004, Technical Memorandum RFI, Soil, Sediment, Surface Water, Wipe Sampling, GM Powertrain Bedford Facility, Bedford, Indiana.
- CRA, May 3, 2004, RFI Work Plan Addendum No. 4, GM Powertrain Bedford Facility, Bedford Indiana.
- CRA, July 26, 2004, RFI Work Plan Addendum No. 5, GM Powertrain Bedford Facility, Bedford Indiana, 13968 (083).
- CRA, September 27, 2004, RFI Work Plan Addendum No. 6 (Draft), GM Powertrain Bedford Facility, Bedford, Indiana.
- CRA, November 2004, RFI Work Plan Addendum No. 7, GM Powertrain Bedford Facility, Bedford Indiana.
- CRA, March 14, 2005, RFI Work Plan Addendum No. 8, GM Powertrain Bedford Facility, Bedford, Indiana.
- CRA, July 5, 2005, RFI Work Plan Addendum No. 9, GM Powertrain Bedford Facility, Bedford, Indiana.
- CRA, April 13, 2005, Interim Measures Alternatives Review Report - East Plant Area (Revision 0), GM Powertrain Bedford Facility, Bedford, Indiana.
- Indiana Geological Survey, <http://www.adamite.igs.indiana.edu/index.htm>, 2001.
- USDA, 1985, Soil Survey of Lawrence County, Indiana, Soil Conservation Service.





BASE SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLES;  
 BARTLETTSVILLE, INDIANA 1994  
 BEDFORD EAST, INDIANA 1978  
 BEDFORD WEST, INDIANA 1993  
 OOLITIC, INDIANA 1987



**LEGEND**

- FACILITY BOUNDARY
- EAST PLANT AREA

figure 1.1

**FACILITY LOCATION**  
**RFI ADDENDUM No.12**  
**GM POWERTRAIN BEDFORD FACILITY**  
*Bedford, Indiana*

