RCRA FACILITY INVESTIGATION (RFI)
WORK PLAN ADDENDUM No. 9
EAST PLANT AREA

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

JULY 5, 2005
REF. NO. 13968 (127)
This report is printed on recycled paper.

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LIST OF FIGURES
(Following Text)

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	miligrams 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 this document that presents Addendum No. 9 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.

1.3 PURPOSE

On October 29, 2001, GM submitted a RFI Work Plan (CRA, October 2001) for completing the first phase of investigative activities within the Facility property.

The RFI Work Plan Addendum No. 1 (CRA, November 2002) described additional proposed on-Facility and off-Facility investigative activities based on preliminary RFI results. The purpose of the proposed additional investigative activities was to further define the extent of hazardous constituents in soil at the Facility, and to obtain

additional information on the relationship between the groundwater and surface water system at and near the Facility.

The RFI Work Plan Addendum No. 2 (CRA, May 2003) described additional investigative activities at the Former North Disposal Area which was identified as Area of Interest (AOI) 4 in the Current Conditions Report (CRA, May 2001).

The RFI Work Plan Addendum No. 3 (CRA, March 2004) presented additional investigative activities at the GM hourly parking lot and in the vicinity of Breckenridge Street and GM Drive.

The RFI Work Plan Addendum No. 4 (CRA, May 2004) presented proposed test pit locations and soil sampling protocols for the verification of detected anomalies in the surface geophysical survey conducted on the Facility property and at off-Facility locations.

The RFI Work Plan Addendum No. 5 (CRA, July 2004) presented additional investigation activities. The investigation, based on the results of the groundwater sampling conducted in 2003, included: an aerial thermal imaging survey, dye trace testing to assist in the understanding of groundwater flow through the Mississippian carbonate rocks underlying the Bedford Facility, and the installation and sampling of shallow bedrock groundwater monitoring wells at various locations within and away from the Facility.

The RFI Work Plan Addendum No. 6 (CRA, September 2004) presented an approach for dye trace testing at two small swallet features within the off-Facility stream channel. In conjunction with the dye trace test, it was proposed that a stream flow study also be conducted to determine the volume of surface water entering each of the two swallets, and the volume of water being discharged at various springs located downstream.

The RFI Work Plan Addendum No. 7 (CRA, November 2004) proposed to delineate the extent of elevated polychlorinated biphenyls (PCBs), lead, and mercury in surface soil identified during implementation of the RFI Work Plan Addendum No. 3. Additional delineation activities were necessary in order to evaluate potential interim measures activities (e.g., soil removal, additional stormwater management, etc.) in these areas.

The RFI Work Plan Addendum No. 8 (CRA, March 2005) presented a proposed approach for additional dye trace testing in the East Plant Area, specifically AOI 4 and AOI 6.

CRA has prepared this RFI Work Plan Addendum No. 9 to supplement the existing RFI investigations and to address the following additional specific East Plant Area Corrective Measure (CM) pre-design objectives:

- further delineate areas with ≥50 milligrams per kilogram (mg/kg) PCBs in the East Plant Area;
- further define the topographic surface and strength of the bedrock in the East Plant Area;
- further identify bedrock valleys/potential preferential groundwater flow pathways to assist in focusing groundwater collection systems for the East Plant Area; and
- provide stratigraphic definition primarily along the northern and eastern sides of the East Plant Area to support the design of a downgradient 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 foundry sands and other 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 appears to decrease 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 is also 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.

2.3 EAST PLANT AREA EXISTING SAMPLE LOCATIONS

The locations in the East Plant Area where sampling and investigative boreholes have been completed during the RFI are presented on Figure 2.1. Current conditions in the East Plant Area are presented on Figure 2.2.

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 investigations will be used in the design of the CM for this area of the Facility.

The investigations are summarized as follows:

- geophysical resistivity survey across the East Plant Area (Figure 3.1);
- installation of 38 surficial shallow perimeter boreholes (0 to 4 feet below ground surface (ft bgs)) (Figure 3.2);
- installation of approximately 20 overburden boreholes to further delineate areas of known PCB-impacted media (≥50 mg/kg PCBs) in order to further define a prescriptive soil excavation CM component (Figure 3.3);
- installation of 10 interior coreholes approximately 20 feet (ft) into competent bedrock to further define the stratigraphy and strength of the shallow bedrock areally across the East Plant Area (Figure 3.4);
- downhole investigations of interior coreholes, including:
    - geotechnical investigations – foc, grain size analysis, moisture content, Atterburg limits (overburden), uniaxial compression tests (of bedrock), and standard penetration tests (SPT), and
    - geophysical investigations - borehole information processing systems (BIPs), caliper, gamma ray, resistivity, temperature, conductivity; and
- installation of 33 coreholes along the proposed alignment of the perimeter and AOI 8 groundwater collection systems (Figure 3.5).

3.1 GEOPHYSICAL SURVEY

A surficial trial resistivity survey will be conducted in a small portion of the East Plant Area. If the resistivity survey method is successful, the surficial trial resistivity survey will be conducted for the entire East Plant Area to further map the overburden-bedrock interface and stratigraphy between existing boreholes. The success of the trial resistivity survey will be based upon the ability to correlate the trial resistivity survey data to known subsurface conditions (e.g., overburden/bedrock interface) within a specified section of the East Plant Area. The purpose of the trial resistivity survey is to help identify potential preferential groundwater flow and potential contaminant migration

pathways (e.g., bedrock valleys), determine the presence of subsurface fracture systems, and to image the structural and stratigraphic heterogeneities below that may have developed in the bedrock.

In a resistivity survey, an electric current is applied to electrodes placed in the ground along a profile line. By changing the spacing of the electrodes, resistivity information for different depths is obtained. These data are then used to model a cross-section of the earth along the profile line. A primary goal of this survey is to map small-scale features (on the order of 1 ft to 2 ft in size).

Resistivity data will be collected using a dipole-dipole array (or other appropriate array) along north-south profile lines. The electrodes will be spaced to maximize resolution and depth ranges.

The proposed horizontal limits of the proposed resistivity survey are presented on Figure 3.1. Select survey locations may be re-established at some proposed locations in the field to account for accessibility (e.g., locations near or within stormwater pond, etc.).

3.2 PERIMETER SURFACE SOIL PCB DELINEATION

A total of approximately 38 shallow boreholes (0 to 4 ft bgs) will be installed by direct-push drilling techniques at approximate 300-foot centers along the perimeter of the proposed cover system, except along GM Drive and in areas where PCB delineation or cleanup has already been completed (see Figure 3.2). The purpose of this sampling is to assist in providing lateral definition for the proposed cover system boundary. For each boring, two samples will be collected: 0 ft-2 ft in depth; and 2 ft-4 ft in depth. The 0 ft-2 ft sample will be analyzed immediately for PCBs. If a concentration greater than 7.4 mg/kg PCBs is detected, then the 2 ft-4 ft sample will be analyzed as well. Additional sampling may be completed based upon the results of the first set of borehole sample results.

The proposed locations of the surface soil delineation boreholes are presented on Figure 3.2. The proposed locations may be modified based upon changes in the proposed limit of the Cover System or field conditions which may be encountered.

3.3 FOCUSED PCB DELINEATION INVESTIGATIVE BOREHOLES

Based upon a review of existing RFI data, approximately 20 additional soil borings will be installed in the East Plant Area to further define the nature and extent of PCBs in the East Plant Area, focusing on known areas of PCB-impacted media that were presented in the Interim Measures Alternatives Review Report - East Plant Area (CRA, April 2005). The supplemental analytical results will be used in combination with previous analytical data and knowledge of the waste management practices to define the prescribed boundaries of overburden materials that can be safely and efficiently removed from the East Plant Area. The proposed locations of the supplemental investigative boreholes are presented on Figure 3.3. The proposed locations may be modified as further data is evaluated or based upon the field conditions which may be encountered.

3.4 EAST PLANT AREA INVESTIGATIVE COREHOLES

Approximately ten coreholes will be installed via hollow-stem auger (HSA) across the East Plant Area. These coreholes will be installed to:

- further define the stratigraphy and the nature of the upper fractured and weathered bedrock;
- provide additional information regarding the presence of potential karst features within the East Plant Area;
- provide known data within bedrock to correlate the resistivity survey; and
- provide control points for the resistivity survey.

The coreholes will extend approximately 20 ft into competent limestone. The proposed locations of the investigative coreholes are presented on Figure 3.4.

3.5 PROPOSED GROUNDWATER COLLECTION SYSTEM ALIGNMENT INVESTIGATIVE COREHOLES

Approximately 33 coreholes will be installed, via HSA, around the alignment of the proposed perimeter and AOI 8 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 groundwater collection systems presented in the Interim Measures Alternatives Review Report - East Plant Area (CRA, April 2005). The proposed locations of these boreholes are presented on Figure 3.5. The proposed

locations may be modified based upon changes in the proposed alignments of the groundwater collection systems.

3.6 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 with a 2-foot sump and 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 immediately placed into wooden core boxes. Core boxes are 4 ft in length and consist of three rows for core placement, thus allowing for approximately 12 ft of core in each box. The top of the retrieved core will be placed in the upper left-hand corner (i.e., laid out from left to right, and from top to bottom). 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).

3.7 SAMPLING

3.7.1 PCB SOIL SAMPLING

Samples for laboratory analysis will be collected from the surface (e.g., 0 to 2 ft bgs) at all locations. Soil samples will then be collected every 5 ft from ground surface until the bottom of the borehole. An additional soil sample will be taken at the bottom of the borehole (at the top of rock). At some locations, an additional sample may be collected if

visual, olfactory, or photoionization detector (PID) readings indicate potential contamination.

Each borehole sample will also be analyzed to determine the presence of Non-Aqueous Phase Liquid (NAPL).

3.7.2 DOWNHOLE GEOTECHNICAL SAMPLING

Geotechnical samples will be taken within the ten proposed interior coreholes. Two soil samples will be collected per borehole: one of the fill (where present); one or two of the overburden (to be determined in the field).

Soil samples will be analyzed for:

- foc;
- moisture content;
- grain size/hydrometer; and
- Atterberg limits.

Five of the fill samples and five of the overburden samples will require collection of soils via Shelby tube for triaxial compression testing.

Five bedrock samples of competent rock and five bedrock samples of weathered fractured rock will be collected for uniaxial compression testing.

SPT will be utilized in the overburden/fill soils to determine blow counts.

3.7.3 DOWNHOLE GEOPHYSICAL ANALYSIS

Geophysical measurements will be taken within the ten proposed interior coreholes. The following list of down corehole geophysics will be completed (unless otherwise approved):

- down corehole video and logging (BIPS);
- Caliper;
- gamma ray;
- resistivity;
- temperature; and
- conductivity.

3.8 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. 9 will be presented 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. 9 will be initiated as soon as is practicable based upon U.S. EPA approval, contracting, and weather conditions.

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.

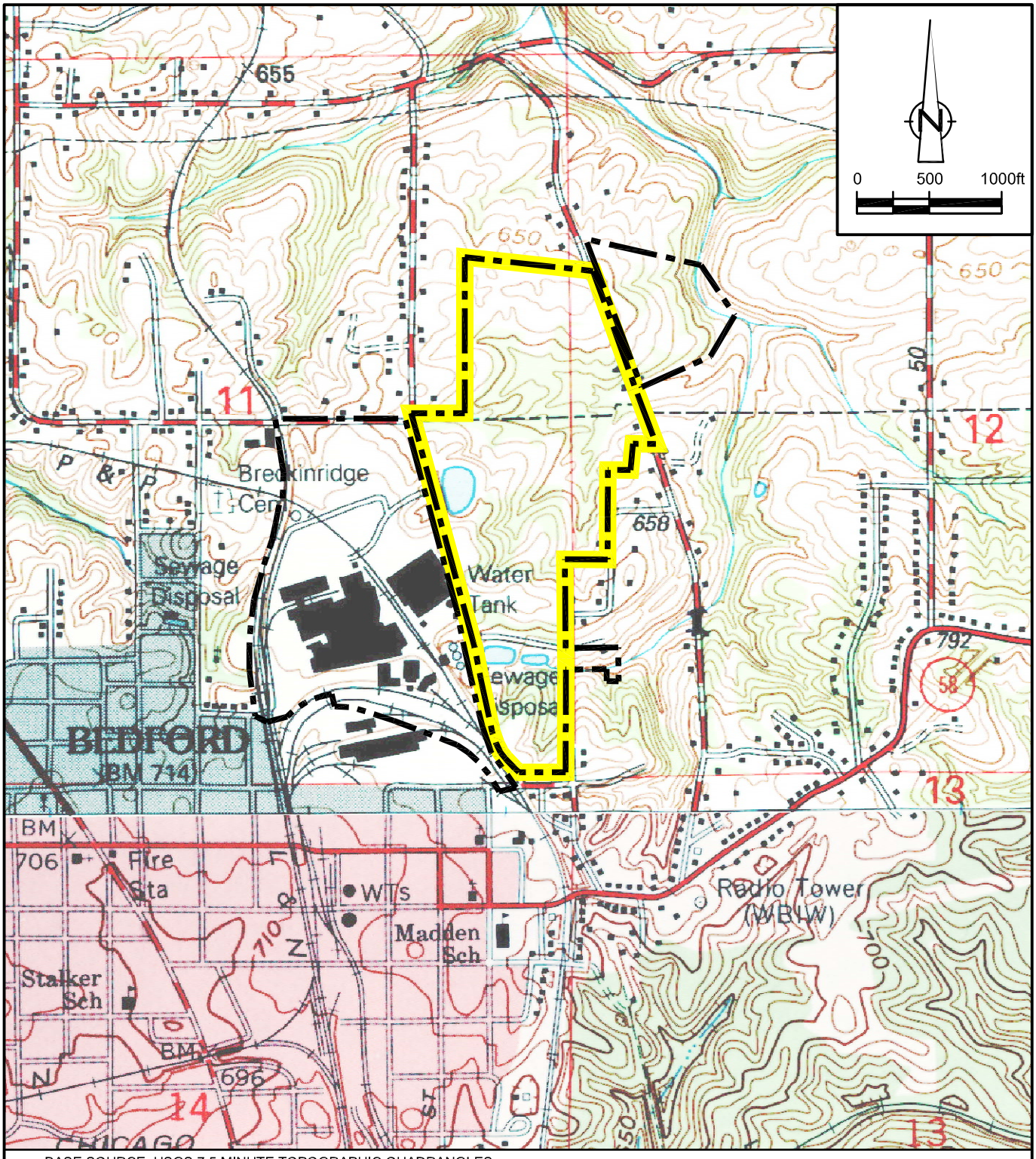
CRA, November 2004, RFI Work Plan Addendum No. 7, GM Powertrain Bedford Facility, Bedford Indiana.

CRA, March 14, 2005, RFI Work Plan Addendum No. 8, GM Powertrain Bedford Facility, Bedford, Indiana.

CRA, 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

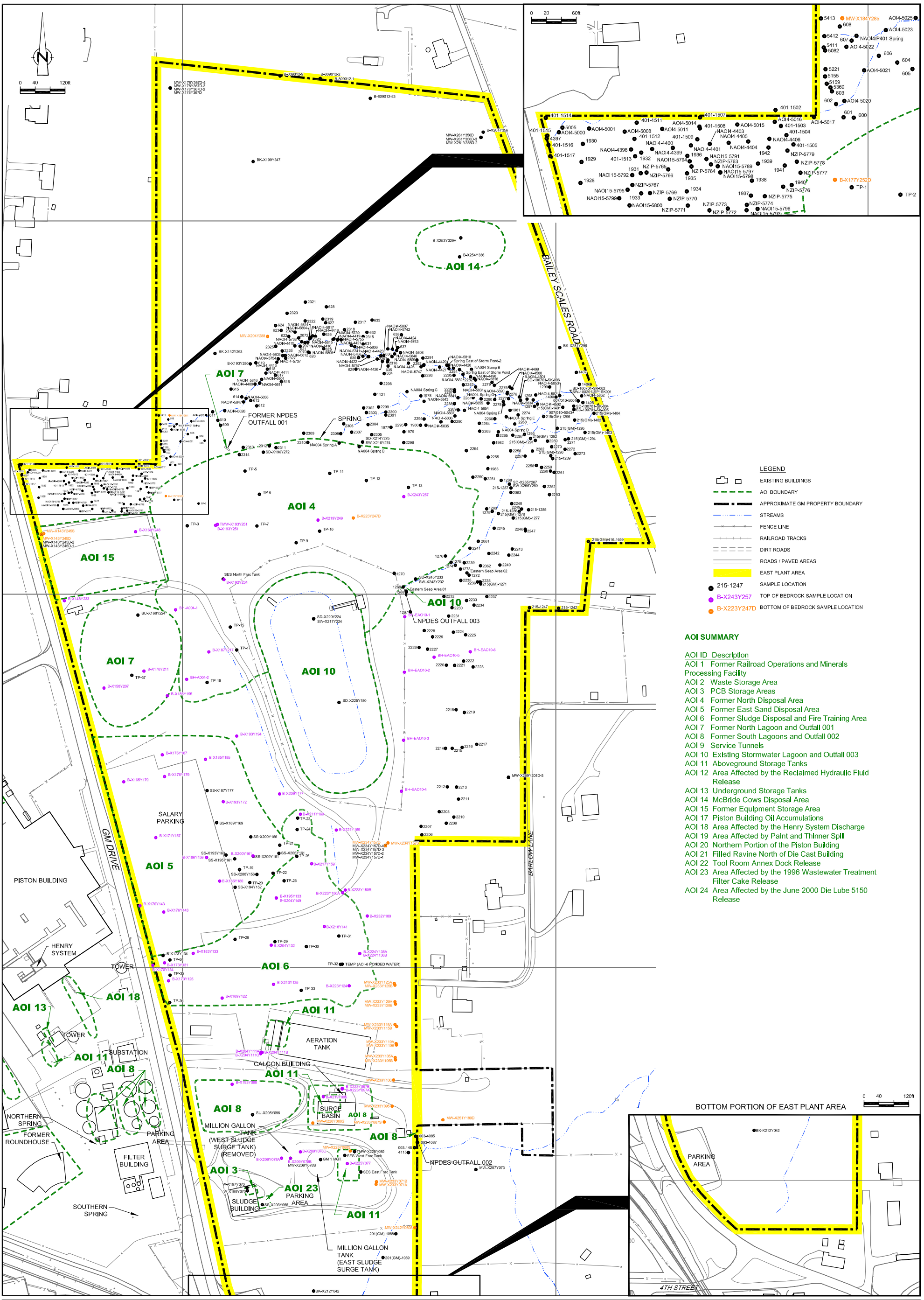
LEGEND

FACILITY BOUNDARY

EAST PLANT AREA

figure 1.1

FACILITY LOCATION
RFI ADDENDUM NO.9
GM POWERTRAIN BEDFORD FACILITY
Bedford, Indiana



AOI SUMMARY

AOI ID Description

AOI 1 Former Railroad Operations and Minerals Processing Facility
AOI 2 Waste Storage Area
AOI 3 PCB Storage Areas
AOI 4 Former North Disposal Area
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 9 Service Tunnels
AOI 10 Existing Stormwater Lagoon and Outfall 003
AOI 11 Aboveground Storage Tanks
AOI 12 Area Affected by the Reclaimed Hydraulic Fluid Release
AOI 13 Underground Storage Tanks
AOI 14 McBride Cows Disposal Area
AOI 15 Former Equipment Storage Area
AOI 17 Piston Building Oil Accumulations
AOI 18 Area Affected by the Henry System Discharge
AOI 19 Area Affected by Paint and Thinner Spill
AOI 20 Northern Portion of the Piston Building
AOI 21 Filled Ravine North of Die Cast Building
AOI 22 Tool Room Annex Dock Release
AOI 23 Area Affected by the 1996 Wastewater Treatment Filter Cake Release
AOI 24 Area Affected by the June 2000 Die Lube 5150 Release

NO	Revision	Date	Initial

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

GM POWERTRAIN BEDFORD FACILITY
BEDFORD, INDIANA

RFI ADDENDUM NO.9

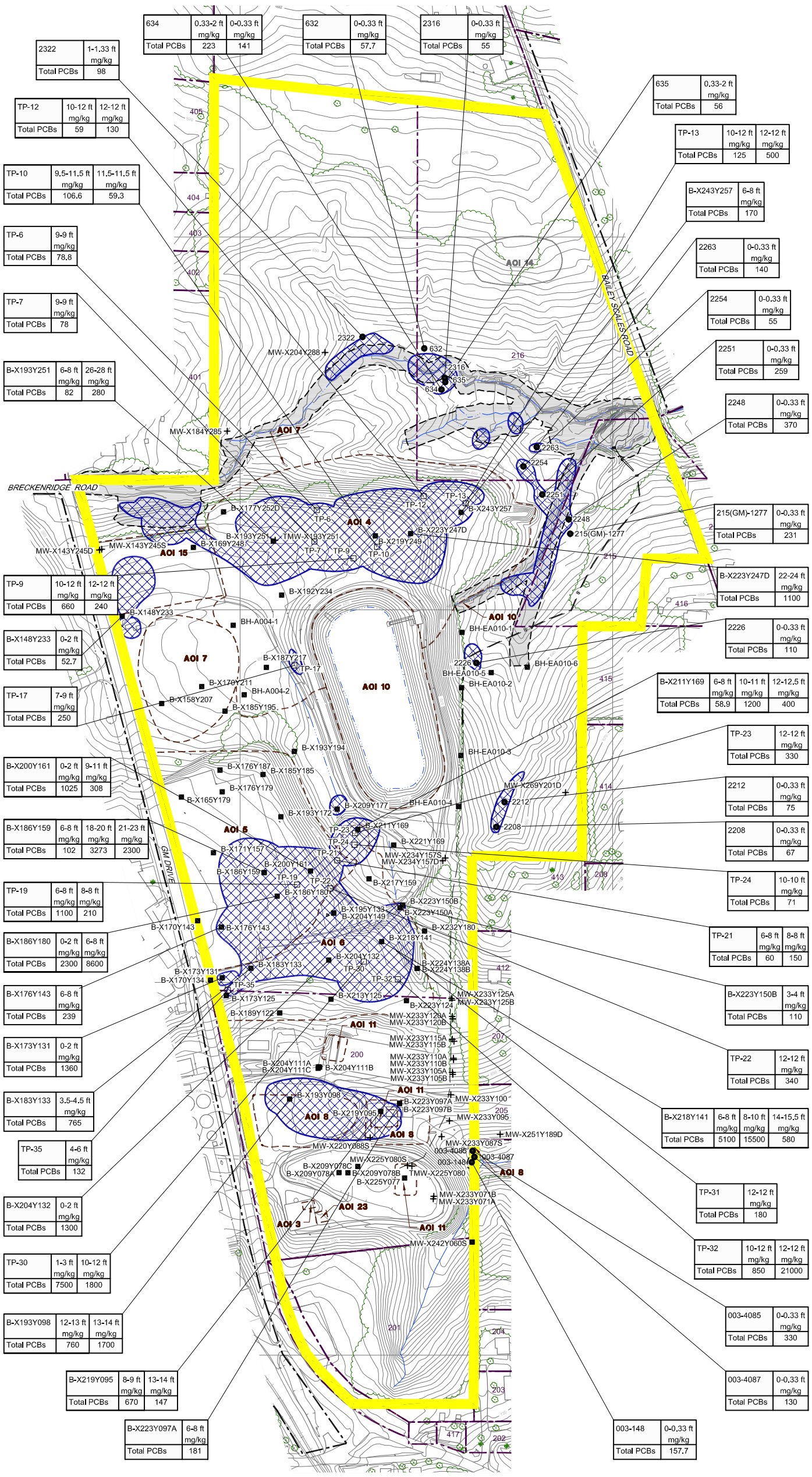
EXISTING SAMPLE LOCATIONS

CONESTOGA-ROVERS & ASSOCIATES

Source Reference: BASE MAP COMPLETED BY AIR-LAND SURVEYS, FLINT, MI, APRIL 2001.

Project Manager:	Reviewed By:	Date:	
J.M.	D.C.	FEBRUARY 2005	
Scale: AS SHOWN	Project No: 13968-00	Report No: 127	Drawing No: figure 2.1

13968-00(127)GN-WA005 JUL 05/2005



AOI SUMMARY

AOI ID	Description
AOI 3	PCB Storage Areas
AOI 4	Former North Disposal Area
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
AOI 23	Area Affected by the 1996 Wastewater Treatment Filter Cake Release

NOTE: PROPERTY BOUNDARY LOCATIONS APPROXIMATED FROM THE LAWRENCE COUNTY SURVEY PLATS. LOCATIONS MAY NOT ACCURATELY REPRESENT THE TRUE BOUNDARIES

No	Revision	Date	Initial

SCALE VERIFICATION

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Approved

GM POWERTRAIN BEDFORD FACILITY
BEDFORD, INDIANA

RFI ADDENDUM NO.9

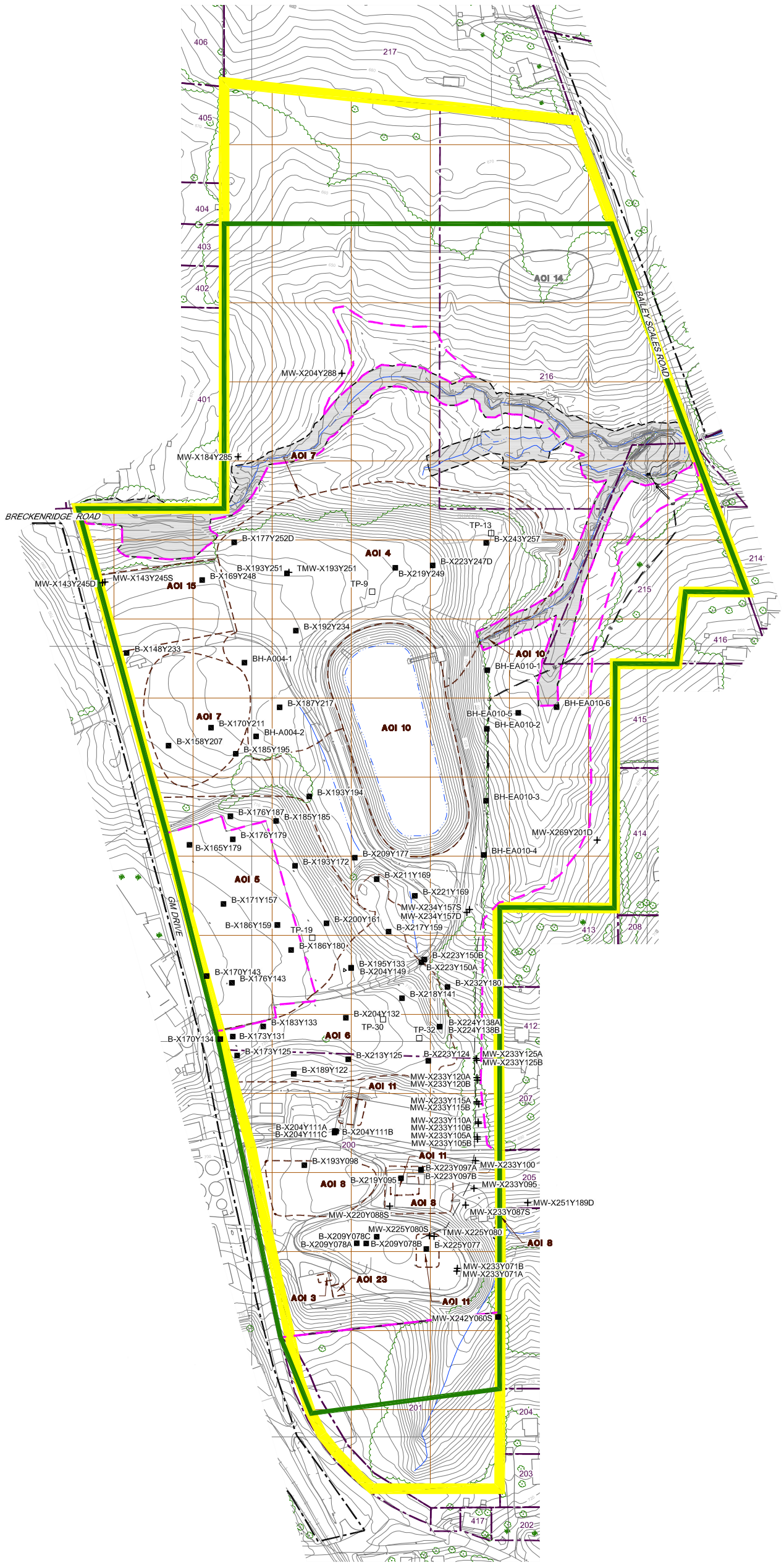
CURRENT CONDITIONS OF EAST PLANT AREA

CONESTOGA-ROVERS & ASSOCIATES

Source Reference: BASE MAP COMPLETED BY AIR-LAND SURVEYS, FLINT, MI, APRIL 2001.

Project Manager:	Reviewed By:	Date:	
J.M.	D.C.	FEBRUARY 2005	
Scale: AS SHOWN	Project No: 13968-00	Report No: 127	Drawing No: figure 2.2

13968-00(127)GN-WA003 JUL 05/2005



LEGEND

- EXISTING GROUND SURFACE ELEVATION CONTOURS (feet AMSL)
- EXISTING VEGETATION
- EXISTING BUILDINGS
- FENCE LINE
- RAILROAD TRACKS
- DIRT ROADS
- ROADS / PAVED AREAS
- APPROXIMATE SURFACE WATER LOCATION
- APPROXIMATE GM PROPERTY BOUNDARY
- APPROXIMATE PROPERTY BOUNDARY
- AOI BOUNDARY
- 200 X 200 GRID
- EAST PLANT AREA
- REMOVAL ACTION EXCAVATION AREA NOT INCLUDED IN EAST PLANT AREA IM
- TP-9 — EXISTING TESTPIT LOCATION
- BH-EA010-6 — EXISTING BOREHOLE TO ROCK
- MW-X269Y201D — EXISTING MONITORING WELL TO/IN ROCK
- ELECTRICAL POWER LINE
- EXISTING FORCEMAIN TO TREATMENT FACILITY
- PROPOSED COVER LIMIT
- GEOPHYSICAL SURVEY LIMITS

AOI SUMMARY

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GM POWERTRAIN BEDFORD FACILITY
BEDFORD, INDIANA

RFI ADDENDUM NO.9

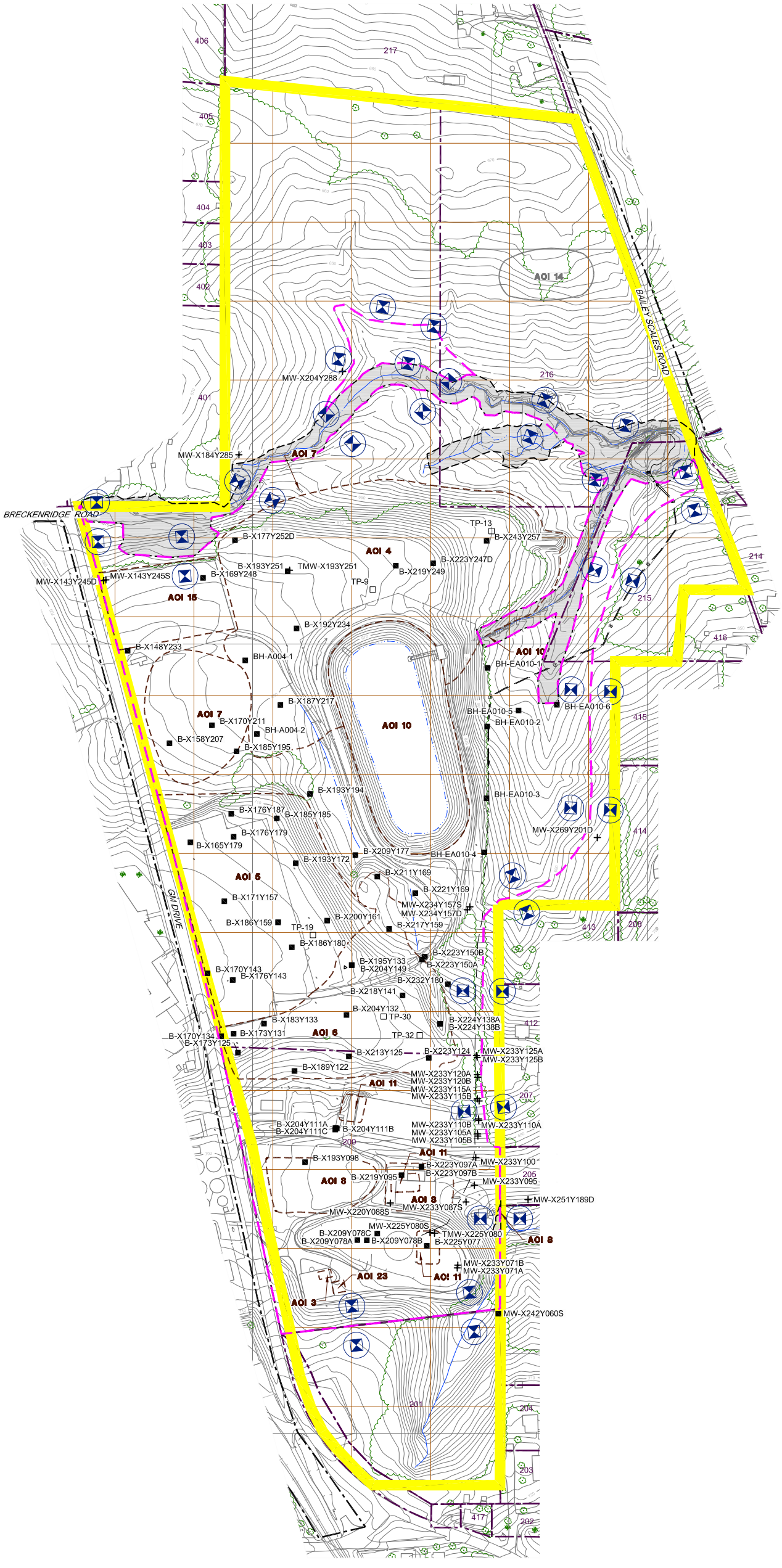
PROPOSED GEOPHYSICAL SURVEY LIMITS

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:
BASE MAP COMPLETED BY AIR-LAND SURVEYS, FLINT, MI, APRIL 2001.

Project Manager:	Reviewed By:	Date:	
J.M.	D.C.	FEBRUARY 2005	
Scale: AS SHOWN	Project Nº: 13968-00	Report Nº: 127	Drawing Nº: figure 3.1

13968-00(127)GN-WA010 JUL 05/2005



0 50 150ft

LEGEND

- EXISTING GROUND SURFACE ELEVATION CONTOURS (feet AMSL)
- EXISTING VEGETATION
- EXISTING BUILDINGS
- FENCE LINE
- RAILROAD TRACKS
- DIRT ROADS
- ROADS / PAVED AREAS
- APPROXIMATE SURFACE WATER LOCATION
- APPROXIMATE GM PROPERTY BOUNDARY
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- BH-EA010-6 EXISTING BOREHOLE TO ROCK
- MW-X269Y201D EXISTING MONITORING WELL TO/IN ROCK
- PCB SOIL DELINEATION SAMPLE LOCATION
- ELECTRICAL POWER LINE
- EXISTING FORCEMAIN TO TREATMENT FACILITY
- PROPOSED COVER SYSTEM LIMIT

AOI SUMMARY

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GM POWERTRAIN BEDFORD FACILITY
BEDFORD, INDIANA

RFI ADDENDUM NO.9

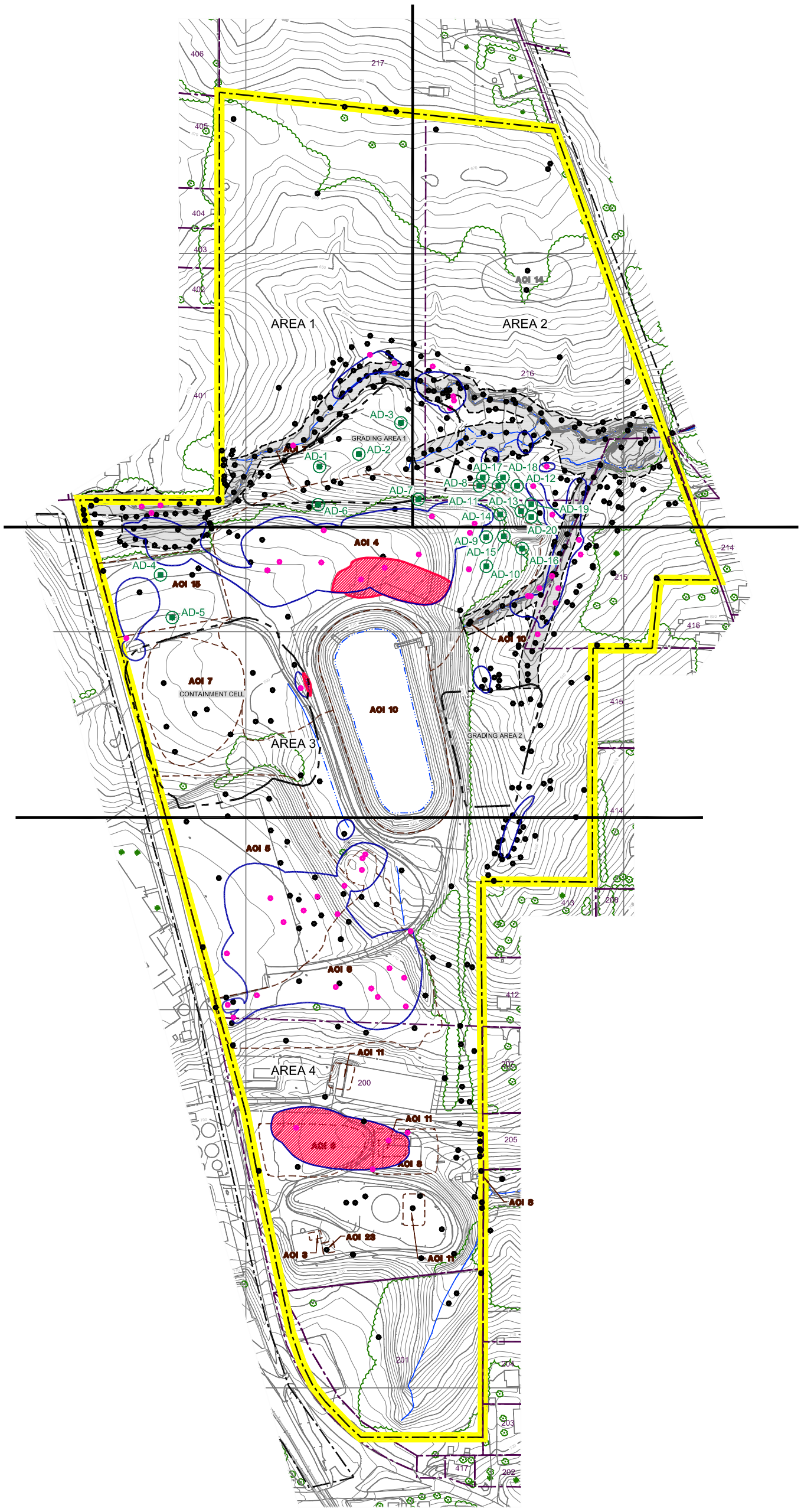
PROPOSED COVER SYSTEM
PERIMETER SOIL DELINEATION

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:
BASE MAP COMPLETED BY AIR-LAND SURVEYS, FLINT, MI, APRIL 2001.

Project Manager:	Reviewed By:	Date:	
J.M.	D.C.	FEBRUARY 2005	
Scale: AS SHOWN	Project Nº: 13968-00	Report Nº: 127	Drawing Nº: figure 3.2

13968-00(127)GN-WA009 JUL 05/2005



N

0 50 150ft

LEGEND

- EXISTING GROUND SURFACE ELEVATION CONTOURS (feet AMSL)
- EXISTING VEGETATION
- EXISTING BUILDINGS
- FENCE LINE
- RAILROAD TRACKS
- DIRT ROADS
- ROADS / PAVED AREAS
- APPROXIMATE SURFACE WATER LOCATION
- APPROXIMATE GM PROPERTY BOUNDARY
- APPROXIMATE PROPERTY BOUNDARY
- AOI BOUNDARY
- EAST PLANT AREA
- REMOVAL ACTION EXCAVATION AREA NOT INCLUDED IN EAST PLANT AREA IM
- APPROXIMATE AREAS OF KNOWN PCB - IMPACTED MEDIA (≥50 mg/kg OF PCBs)
- MATERIAL WHICH IS IMPRACTICAL TO REMOVE
- EXISTING SOIL SAMPLE LOCATION (PCBs < 50 mg/kg)
- EXISTING SOIL SAMPLE LOCATION (PCBs ≥ 50 mg/kg)
- PROPOSED BOREHOLE LOCATION

AOI SUMMARY

AOI ID	Description
AOI 3	PCB Storage Areas
AOI 4	Former North Disposal Area
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
AOI 23	Area Affected by the 1996 Wastewater Treatment Filter Cake Release

NOTE: PROPERTY BOUNDARY LOCATIONS APPROXIMATED FROM THE LAWRENCE COUNTY SURVEY PLATS. LOCATIONS MAY NOT ACCURATELY REPRESENT THE TRUE BOUNDARIES

Nº	Revision	Date	Initial

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

GM POWERTRAIN BEDFORD FACILITY
BEDFORD, INDIANA

RFI ADDENDUM NO. 9

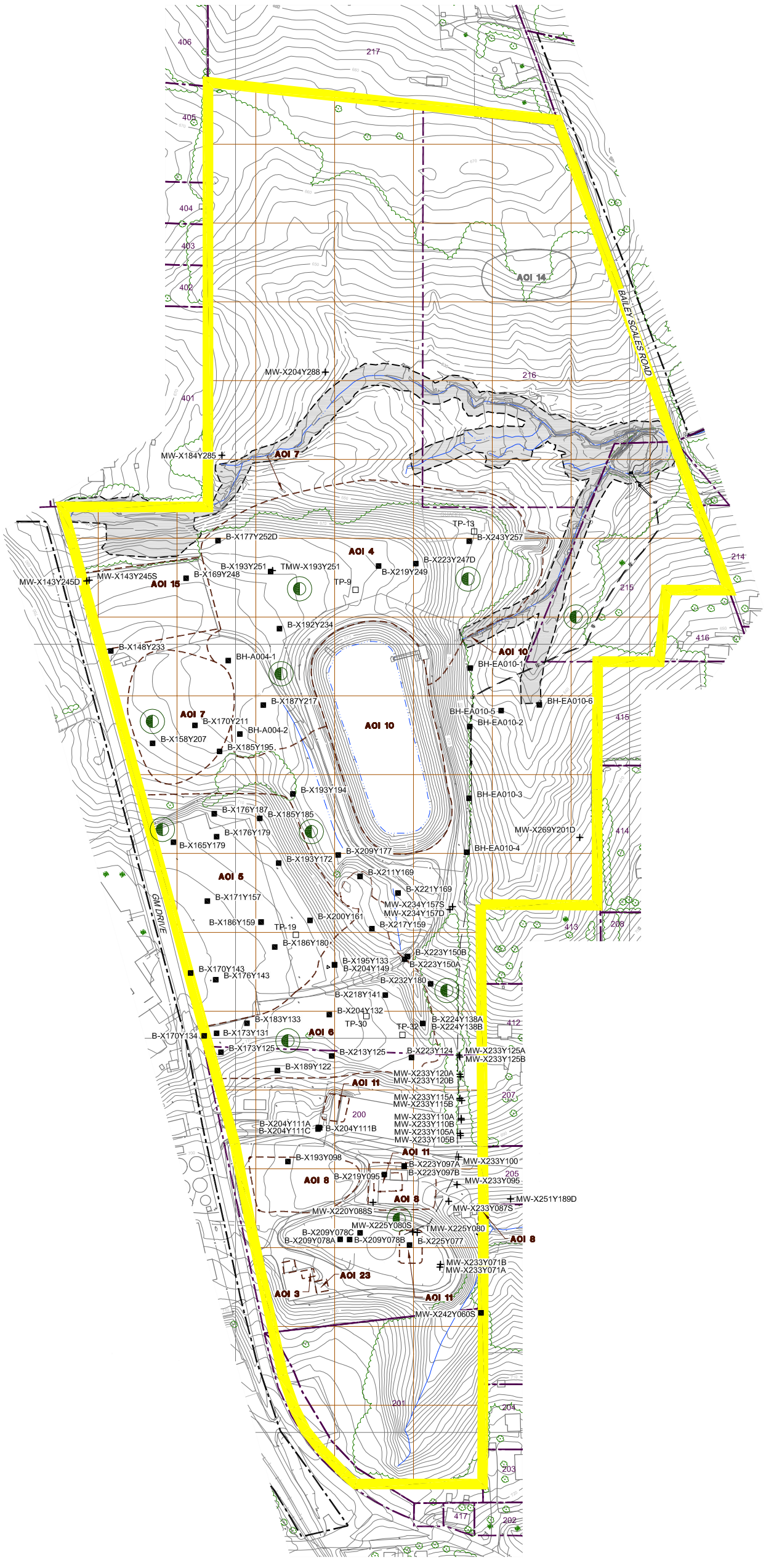
FOCUSED PCB DELINEATION
PROPOSED BOREHOLE LOCATIONS

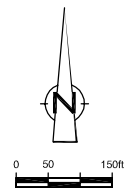
CONESTOGA-ROVERS & ASSOCIATES

Source Reference: BASE MAP COMPLETED BY AIR-LAND SURVEYS, FLINT, MI, APRIL 2001.

Project Manager:	Reviewed By:	Date:	
J.M.	M.K.	APRIL 2005	
Scale: AS SHOWN	Project Nº: 13968-00	Report Nº: 127	Drawing Nº: figure 3.3

13968-00(127)GN-WA018 JUL 05/2005





LEGEND

- EXISTING GROUND SURFACE ELEVATION CONTOURS (feet AMSL)
- EXISTING VEGETATION
- EXISTING BUILDINGS
- FENCE LINE
- RAILROAD TRACKS
- DIRT ROADS
- ROADS / PAVED AREAS
- APPROXIMATE SURFACE WATER LOCATION
- APPROXIMATE GM PROPERTY BOUNDARY
- APPROXIMATE PROPERTY BOUNDARY
- AOI BOUNDARY
- 200 X 200 GRID
- EAST PLANT AREA
- REMOVAL ACTION EXCAVATION AREA NOT INCLUDED IN EAST PLANT AREA IM
- TP-9 — EXISTING TESTPIT LOCATION
- BH-EA010-6 — EXISTING BOREHOLE TO ROCK
- MW-X269Y201D — EXISTING MONITORING WELL TO/IN ROCK
- PROPOSED BEDROCK COREHOLE
- ELECTRICAL POWER LINE
- EXISTING FORCEMAIN TO TREATMENT FACILITY

AOI SUMMARY

AOI ID	Description
AOI 3	PCB Storage Areas
AOI 4	Former North Disposal Area
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
AOI 23	Area Affected by the 1996 Wastewater Treatment Filter Cake Release

NOTE: PROPERTY BOUNDARY LOCATIONS APPROXIMATED FROM THE LAWRENCE COUNTY SURVEY PLATS. LOCATIONS MAY NOT ACCURATELY REPRESENT THE TRUE BOUNDARIES

№	Revision	Date	Initial

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

GM POWERTRAIN BEDFORD FACILITY
BEDFORD, INDIANA

RFI ADDENDUM NO.9

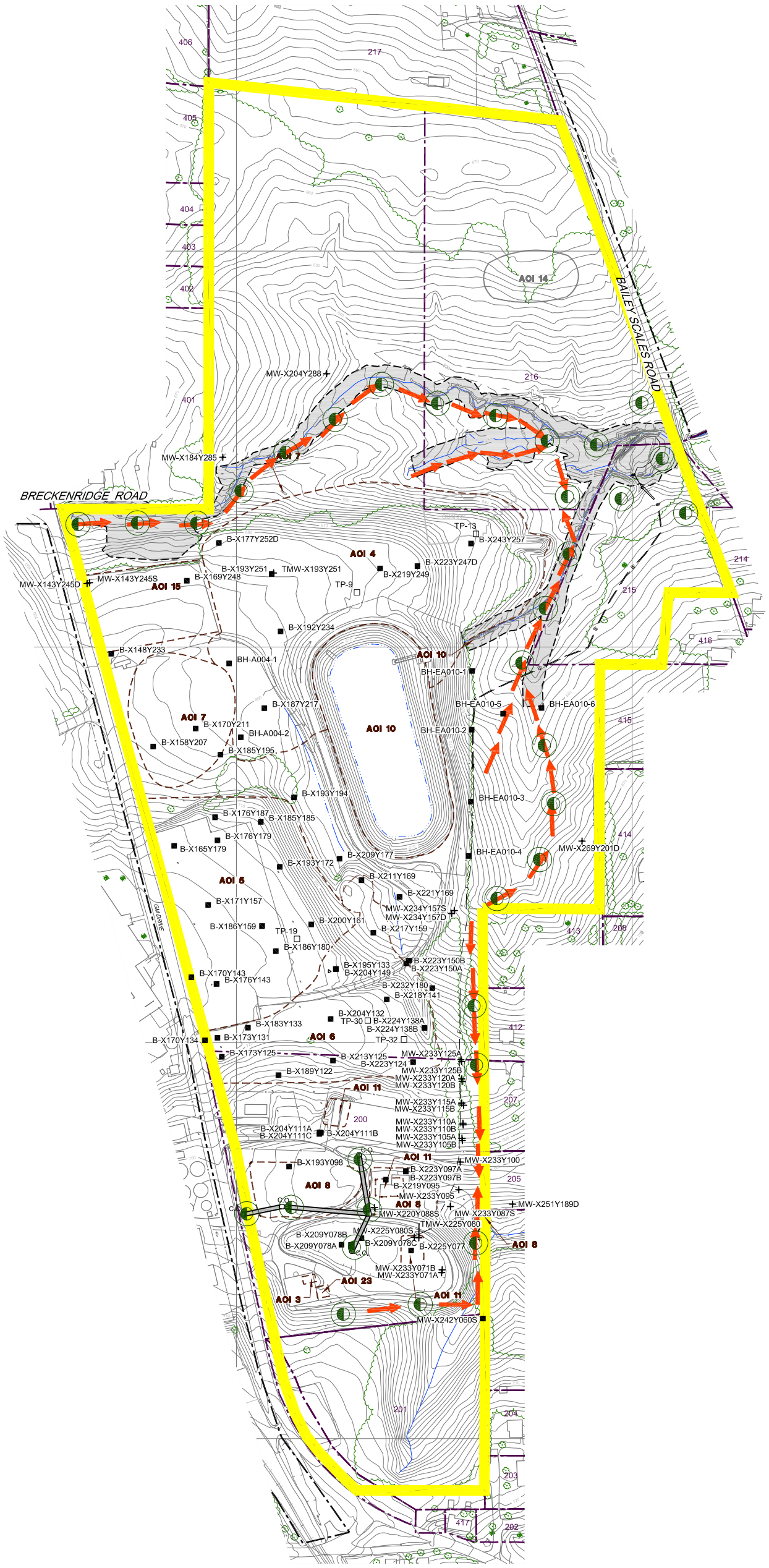
EAST PLANT AREA INVESTIGATION
PROPOSED COREHOLE LOCATIONS

CONESTOGA-ROVERS & ASSOCIATES

Source Reference: BASE MAP COMPLETED BY AIR-LAND SURVEYS, FLINT, MI, APRIL 2001.

Project Manager:	Reviewed By:	Date:	
J.M.	D.C.	FEBRUARY 2005	
Scale: AS SHOWN	Project №: 13968-00	Report №: 127	Drawing №: figure 3.4

13968-00(127)GN-WA014 JUL 05/2005



AOI SUMMARY

AOI ID	Description
AOI 3	PCB Storage Areas
AOI 4	Former North DIsposal Area
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
AOI 23	Area Affected by the 1996 Wastewater Treatment Filter Cake Release

NOTE: PROPERTY BOUNDARY LOCATIONS APPROXIMATED FROM THE LAWRENCE COUNTY SURVEY PLATS. LOCATIONS MAY NOT ACCURATELY REPRESENT THE TRUE BOUNDARIES

Nº	Revision	Date	Initial

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

GM POWERTRAIN BEDFORD FACILITY
BEDFORD, INDIANA

RFI ADDENDUM NO. 9

PROPOSED COREHOLES ALONG GROUNDWATER COLLECTION SYSTEM ALIGNMENTS

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:
BASE MAP COMPLETED BY AIR-LAND SURVEYS, FLINT, MI, APRIL 2001.

Project Manager:	Reviewed By:	Date:	
J.M.	D.C.	FEBRUARY 2005	
Scale: AS SHOWN	Project Nº: 13968-00	Report Nº: 127	Drawing Nº: figure 3.5

13968-00(127)GN-WA012 JUL 05/2005