MiHpt Investigation Workplan Borg-Warner, Inc. Facility Water Valley, Mississippi

January 12, 2017

Prepared by: First Environment, Inc. 91 Fulton Street Boonton, New Jersey 07005



CERTIFICATION STATEMENT

I <u>Bernard T. Delaney, Ph.D., P.E., BCEE</u> certify that I am currently a registered professional engineer in the State of Mississippi and had primary direct responsibility for the preparation of the January 12, 2017 MiHpt Investigation Workplan. I certify that this MiHpt Investigation Workplan was completed in conformance with the laws and regulations of the State of Mississippi. I certify that all information and statements in this certification form are true.

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04/13/2017

Bernard V the lancy

Mississippi Professional Engineer No. Date

Signature

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Introduction

First Environment, Inc. ("First Environment"), on behalf of EnPro Industries, Inc., is submitting this scope-of-work for MiHpt investigation along the perimeter of the Borg-Warner, Inc. facility located in Water Valley, Mississippi ("the Site"). The following is a workplan for a focused soil investigation using the Geoprobe Systems direct image MiHpt technology in the area along and immediately south of the southern wall of the plant (GP015, GP017, and GP018) and along the western and northern wall of the building. The direct image MiHpt technology is a proven technology that produces real-time data for assessing the following aquifer characteristics: volatile organics in soil, formation permeability, soil pore pressure, and soil type. This data will support a more accurate conceptual site model (CSM) and focused remedial action.

In November 2016, R.J. Rudy, LLC (RJR) submitted a Supplemental Assessment Activities and Results Report. As part of the Supplemental Assessment, RJR, with First Environment's oversight, drilled 20 soil borings (GP001 to GP020) at the Site in October 2016; 16 of the soil borings were completed along the northern, western, and southern boundary of the Plant Site's building. The objective of the Supplemental Assessment was to determine whether or not residual soil contamination is present above the aquifer that is contributing to the identified contamination, and to evaluate the potential "shallow perched sand lenses" that were described in historic assessment and soil excavation documents.

Based on the results of the Supplemental Assessment, the most significantly impacted soil was identified on the south side of the building in the area of the former Aboveground Storage Tanks. Specifically, this area is located along and immediately south of the southern wall of the plant at the location of soil borings GP015, GP017, and GP018, as illustrated in Figure 1.

It should be noted that soil borings GP015, GP017, and GP018 exhibited the highest concentrations of TCE at the depth interval of 12.0 to 18.0 feet below ground surface (bgs). The concentrations identified at this interval were 7,260 µg/kg, 45,600 µg/kg, and 12,100 µg/kg, respectively. The Mississippi Department of Environmental Quality's (MDEQ) TCE Target Remediation Goals (TRG) for "Restricted Use" is 7.920 ug/kg and the groundwater cleanup standard is 5 ug/l. Given these results, this area likely represents a continuing source for the identified TCE impacts to groundwater and is contributing to elevated TCE groundwater concentrations, which were identified at concentrations up to 15,300 ug/l in monitoring well MW-8S. It should also be noted that monitoring well MW-8S is located 500 feet immediately downgradient of the highest TCE soil impacts identified on the opposite side of the building at the location of GP015, GP017, and GP018. Based on the current data, it is not known whether or not TCE soil impacts exist beneath the floor inside the building and could be contributing to TCE impacts to groundwater. However, initial sub-slab soil gas data suggests that there may be an additional source or sources in the building that may also be impacting groundwater. A comprehensive soil gas investigation is scheduled for January 2017, at which time First Environment will be able to better address if potential sources of contamination exist under the building subfloor.

Based on the foregoing assessment and in an effort to further assess potential source areas that are believed to be contributing to the identified plume, First Environment's scope will implement a focused soil investigation using the Geoprobe Systems direct image MiHpt technology in the area along and immediately south of the southern wall of the plant (GP015, GP017, and GP018) and along the western and northern wall of the building. First Environment's scope is minimally intrusive and is not expect to span more than six days.

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MiHpt Technology

The Geoprobe[®] Systems engineered MiHpt probe represents the latest development for evaluating subsurface conditions and has significant capabilities with respect to the detection of contaminants in soil and groundwater using the Membrane Interface Probe (MIP) technology combined with a Hydraulic Profiling Tool (Hpt) to determine saturated soil hydraulic conductivities. The MIP is used for in-situ screening of Chlorinated Hydrocarbons (CHC) and other Volatile Organic Compounds (VOCs) in both the saturated and vadose zone. The Hpt is designed to evaluate the subsurface hydraulic properties of the site. While the probe is being advanced through the subsurface using a Geoprobe 7822 track-mounted direct push drill rig, an in-line pressure sensor in the probe being advanced measures the pressure response of the surrounding soil/groundwater. The ability for water to flow into the formation layers is dependent upon the hydraulic properties of the soil. A low-pressure response would indicate a large grain size and the ability to easily transmit water; whereas a high-pressure response would indicate a small grain size and the relative inability for the aguifer to transmit water. Pressure and flow rate are both logged versus depth. The Hpt tool can therefore be used to identify potential contaminant migration pathways. Similarly, it can help to identify zones for remedial material injection or provide qualitative guidance on how difficult injection may be in different zones of the formation. A more detailed specification of how the MiHpt system works has been provided in Appendix A.

Although not required, the data acquired in the field can be transferred online and processed using software to provide 2D/3D-visualization of the data. If such services are requested, First Environment will provide a separate scope-of-work.

This technology complements RJR's soil analytical data in support of a more accurate conceptual site model and in support of a more focused remedial action. The information obtained by utilizing this technology will allow for the development of a focused remedial approach for soil that is continuing to act as a source of TCE impact to groundwater that is located outside the building. The benefits of the technology include minimal-invasive investigation of the subsurface, while simultaneously providing detailed measurements of VOCs in soil, soil classification, and hydraulic characteristics, as well as electrical conductivity and dynamic pore water pressure.

Scope-of-Work

Upon approval, First Environment will initiate the following tasks to refine the understanding of the VOCs in soil and their relationship to the site hydrogeology to support a more accurate and refined conceptual site model for the soil remediation. As required by the MDEQ regulation, First Environment will submit a draft MiHpt Work Plan. Once all comments have been incorporated, a final version of the Work Plan will be prepared and submitted to the MDEQ.

Task 1 – Utility Mark-out and HASP Preparation

The site project will be managed from our Mississippi Office location. Prior to initiating any intrusive on-site activities, a Health and Safety Plan (HASP) will be prepared for the Site. The HASP contains general pertinent emergency information regarding the Site and health and safety protocols that must be adhered to by First Environment employees while on site. This information includes a Site plan, Site location information, contact numbers for emergency services, proper PPE requirements and recommendations, MSDS for materials used and

encountered during remedial activities, and job safety analysis for each activity conducted on site. First Environment, or its subcontractors, will notify utility authorities for the purpose of completing the required utility mark out before initiating drilling activities.

Task 2 – MiHpt Investigation

First Environment estimates that 17 boring equivalents to approximately 600 linear feet of MiHpt soil characterization will be necessary to fully develop the conceptual site model and provide a focused remediation strategy for the areas outside the building. First Environment estimates six days will be required to complete the proposed 17 MiHpt direct push locations. The locations of the proposed borings are illustrated in Figure 1. First Environment will focus the characterization from the surface to 35.0 feet below ground surface (bgs). A number of the MiHpt locations have been proposed immediately adjacent to the previous RJR (GP) soil boring locations to correlate laboratory results to MiHpt results. The sample locations and numbers may be modified based on in-the-field observations and the pending VI investigation.

A real-time decision will be made in the field if deeper MiHpt soil borings are required. Specifically, if borings exceeding a depth of 35 feet will be necessary, additional drilling time may also be necessary. As discussed previously, the proposed MiHpt investigation will focus on the south side of the plant building in the area of the former borings GP015, GP017, and GP018. The results of RJR October 2016 soil laboratory results revealed the majority of the TCE soil contamination is present in the 12.0 to 20.0 feet bgs interval at the former location of the aboveground tank location.

The MiHpt probe will be properly cleaned after each MiHpt location is completed using the U.S. EPA's Region IV Standard Operating Procedures – Science and Ecosystem Support Division (SESD) Operating Procedure for Field Equipment Cleaning and Decontamination. MDEQ soil sampling guidance documents also will be used as a reference to prevent potential cross contamination between locations.

Task 3 – Data Evaluation and Reporting

Upon receiving laboratory MiHpt results, First Environment will evaluate the data to finalize our source(s) area assessment outside the building and refine our conceptual model. For this purpose, First Environment will also review all available Remedial Investigation Reports (RIRs) and results of all groundwater sampling data prepared and collected to date.

The results of this assessment, as well as all the details of the field investigations, will be summarized in the MiHpt results report.

Task 4 – Project Management

The site project will be managed from our Mississippi location and coordination will occur from First Environment's New Jersey Office, it may be necessary for one field staff from New Jersey to accompany and support the Mississippi field staff for the MiHpt six day event.

Limitations

This scope-of-work was developed based on available information regarding the Site and the specifics of each task. It does not include any regulatory compliance, reporting, permitting, or any other regulatory requirements, whether they are additional investigation or remediation activities that may be imposed by USEPA, MSDEQ, or other local agencies.

FIGURE



1

Legend

- **+**
- Shallow Monitoring Well Location Proposed Geoprobe MiHpt Locations (Locations may change based on field observations) RJR Geoprobe Oct 2016 Soil Sample Locations
- 0

W - E	environment	Proposed MiHpt Location Map				
		Borg Warner Facility Water Valley, MS Figure 1				
inch = 100 feet	91 Fulton Street Boonton, New Jersey 07005	Revised	Drawn LS	Checked	Approved	Date 12/14/16

APPENDIX A

ENVIRONMENTAL • GEOTECHNICAL • GEOTHERMAL • EXPLORATION

Direct Image®

Membrane Interface &

Hydraulic Profiling Tool (MI-HPT)

The new probe detects volatile contaminants with the MIP, measures soil electrical conductivity with a standard (MIP) dipole array, and measures HPT injection pressure using the same down-hole transducer as the Geoprobe® stand-alone HPT system. In post-processing the log data with Geoprobe® DI Viewer software, the user is able to estimate hydraulic conductivity (K) and water table elevation, as well as prepare graphical outputs of the log data.

· Log of VOCs and formation permeability in one push

Ideal for remediation investigations

Great for determining contaminant mobility and migration pathways



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