GE
159 Plastics Avenue
Pittsfield, MA 01201
USA

Transmitted Via Overnight Courier

March 20, 2008

Mr. Richard Fisher
U.S. Environmental Protection Agency
EPA New England
One Congress Street, Suite 1100
Boston, Massachusetts 02114-2023

Re: **GE-Pittsfield/Housatonic River Site**
Groundwater Management Area 2 (GECD320)
Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007

Dear Mr. Fisher:

Enclosed is the *Groundwater Management Area 2 Long-Term Monitoring Program Monitoring Event Evaluation Report for Fall 2007* (GMA 2 Fall 2007 Monitoring Event Evaluation Report). This report was prepared in accordance with section 2.7 of the Statement of Work for Removal Action Outside the River (SOW) (Appendix E to the CD), with further details presented in Section 7.0 of Attachment H to the SOW (Groundwater/NAPL Monitoring Assessment , and Response Programs).

The GMA 2 Fall 2007 Monitoring Event Evaluation Report is the first report to be submitted as part of the long-term monitoring program for this GMA. It summarizes activities performed at GMA 2 (also known as the Former Oxbow Areas J and K GMA) during fall 2007, and presents the results of the latest round of sampling and analysis of groundwater performed as part of the groundwater quality monitoring program.

Please call Andrew Silfer or me if you have any questions regarding this report and proposal.

Sincerely,

Richard W. Gates
Remediation Project Manager

Enclosure
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cc: Dean Tagliaferro, EPA
Rose Howell, EPA (CD-ROM)
Tim Conway, EPA*
Holly Inglis, EPA (CD-ROM)
K.C. Mitkevicius, USACE (CD-ROM)
Linda Palmieri, Weston (2 hard copies and CD-ROM)
Anna Symington, MDEP*
Jane Rothchild, MDEP*
Susan Steenstrup, MDEP (2 copies)
Thomas Angus, MDEP*
Mayor James Ruberto, City of Pittsfield
Thomas Hickey, Director, PEDA
Jeffery Bernstein, BCK Law
Theresa Bowers, Gradient
Nancy E. Harper, MA AG
Dale Young, MA EOEA
Michael Carroll, GE *
Andrew Silfer, GE (CD-ROM)
Rod McLaren, GE*
James Nuss, ARCADIS
James Bieke, Goodwin Procter
John Ciampa, SPECTRA
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ARCADIS
Infrastructure, environment, facilities

General Electric Company
Pittsfield, Massachusetts

Groundwater Management Area 2 Long-Term Monitoring Program Monitoring Event Evaluation Report for Fall 2007

March 2008

ARCADIS

Groundwater Management Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007

(GMA 2 Fall 2007 Monitoring Event Evaluation Report)

Prepared for:
General Electric Company
Pittsfield, Massachusetts

Prepared by:
ARCADIS
6723 Towpath Road
P.O. Box 66
Syracuse
New York 13214-0066
Tel 315.446.9120
Fax 315.449.0017

Our Ref.:
B0030154

Date:
March 2008

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1. Introduction

1.1 General

On October 27, 2000, a Consent Decree (CD) executed in 1999 by the General Electric Company (GE), the United States Environmental Protection Agency (EPA), the Massachusetts Department of Environmental Protection (MDEP), and several other government agencies was entered by the United States District Court for the District of Massachusetts. The CD governs (among other things) the performance of response actions to address polychlorinated biphenyls (PCBs) and other hazardous constituents in soil, sediment, and groundwater in several Removal Action Areas (RAAs) located in or near Pittsfield, Massachusetts that collectively comprise the GE-Pittsfield/Housatonic River Site (the Site). For groundwater and non-aqueous-phase liquid (NAPL), the RAAs at and near the GE Pittsfield facility have been divided into five separate Groundwater Management Areas (GMAs), which are illustrated on Figure 1. These GMAs are described, together with the Performance Standards established for the response actions at and related to them, in Section 2.7 of the *Statement of Work for Removal Actions Outside the River* (SOW) (Appendix E to the CD), with further details presented in Attachment H to the SOW (Groundwater/NAPL Monitoring, Assessment, and Response Programs). This report relates to the Former Oxbows J and K Groundwater Management Area, also known as and referred to herein as GMA 2.

The Consent Decree and Attachment H to the SOW specify a series of steps to be taken at each of the GMAs to investigate and, as appropriate, respond to groundwater conditions. These documents provide initially for the design and implementation of a baseline monitoring program at each of the GMAs. Pursuant to Section 1.1.1 of Attachment H, the objective of the baseline monitoring program was to establish existing conditions in order to assess whether the existing response actions are protecting surface water, groundwater and sediment quality, and human health in occupied buildings. Additionally, the baseline monitoring program provides the basis for evaluating the effectiveness of future response actions, including the identification of any additional response actions that may be necessary to attain the Performance Standards. The baseline data are to be used in the future for comparison with collected under the long-term monitoring program.

The baseline monitoring program consists of semi-annual groundwater quality sampling and quarterly elevation monitoring and generally lasts for a minimum two-year period. Section 6.1.3 of Attachment H to the SOW allows for the modification and/or continuation of the baseline monitoring program if the two-year baseline period ends prior to the completion of soil-related response actions at all the RAAs in a GMA. As the removal action for Former Oxbow Areas J and K comprising GMA 2 had not yet been completed at the end of the two -year period, GE proposed, and EPA approved, an interim groundwater monitoring

program. In June 2007, following the completion of the remediation work at Former Oxbow Areas J and K, GE submitted a *Baseline Assessment Final Report and Long-Term Monitoring Program Proposal for GMA 2* (GMA2 Long-term Monitoring Proposal), which was conditionally approved by EPA on October 9, 2007. That report proposed a long-term groundwater monitoring program for GMA 2. This report constitutes the initial monitoring event evaluation report submitted pursuant to the long-term groundwater quality monitoring program at GMA 2.

1.2 Background Information

1.2.1 Description of GMA 2

GMA 2 encompasses the Former Oxbow Areas J and K RAA, comprised of approximately 8.5 acres adjacent to the Housatonic River, located approximately 2,500 feet upstream of the Newell Street Bridge (Figures 1 and 2). This GMA contains a combination of non-GE-owned commercial areas, residential properties, and recreational areas. Certain portions of this GMA originally consisted of land associated with oxbows or low-lying areas of the Housatonic River. As shown on Figure 1 and 2, the Housatonic River flows through the central portion of this GMA, separating Former Oxbow Areas J and K. Re-channelization and straightening of the Housatonic River in the early 1940s by the City of Pittsfield and the United States Army Corps of Engineers (USACE) separated several such oxbows and low-lying areas from the active course of the river. These oxbows and low-lying areas were subsequently filled with various materials from a variety of sources, resulting in the current surface elevations and topography.

Former Oxbow Area J encompasses approximately 6 acres located north of the Housatonic River, south of East Street, and between Fasce Street and Commercial Street. Commercial businesses occupy a portion of this area along East Street. The west side of this portion of GMA 2 consists of a wooded recreational area and footpath, and the rights-of-way for undeveloped Longview Terrace and Zeno Street. The remainder of Former Oxbow Area J contains commercial properties and small, wooded recreational areas.

Former Oxbow Area K encompasses an area of approximately 2.5 acres south of the Housatonic River, across from the eastern portion of Former Oxbow Area J and generally to the northeast of Ventura Avenue. This area consists of a large open field on the south side of the river, and the right-of-way for Longview Terrace. The majority of this generally flat area is undeveloped and covered with grass and low brush. However, residential properties occupy a portion of this area along Ventura Avenue.

Removal Actions performed by GE at the Former Oxbow Areas J and K RAA were implemented between July and November 2006, and generally included site preparation, soil removal/replacement, and property restoration. The excavations were generally completed to depths of one to three feet, with the exceptions that one six-foot removal for PAHs was performed at Parcel K10-11-3 and one seven-foot removal for PCBs was performed at Parcel K10-10-6. The final limits of soil removal were completed to the general limits shown on the EPA-approved technical drawings included in the *Final Removal Design/Removal Action Work Plan for Former Oxbow Areas J and K* (September 2005), as modified in the *Addendum to Final Removal Design/Removal Action Work Plan for Former Oxbow Areas J and K* (April 2006). Overall, approximately 1,955 cubic yards of soil were removed from Former Oxbow Areas J and K and placed within the appropriate On-Plant Consolidation Area.

1.2.2 Overview of Hydrogeologic Conditions at the Site

In general, two unconsolidated hydrogeologic units are present within GMA 2. These units are briefly described below:

Surficial Deposits - This unit generally consists of heterogeneous fill materials and alluvial sands and gravels. These sands and sandy gravels are well-sorted and were deposited as glacial outwash and/or in association with recent depositional processes within the Housatonic River. Isolated peat deposits are also present, typically at depths corresponding to the bottom elevations of the river and the former oxbows. At certain locations within GMA 2, non-native fill materials are present above the alluvial deposits. These fill materials typically consist of sand, gravel, metallic debris, and wood.

The alluvial unit extends from ground surface to depths of at least 25 feet. Fill materials, where present, have been observed to depths down to 7 feet. From a hydrogeologic perspective, the fill and the sand/gravel deposits act as a single unit. The existing monitoring wells within GMA 2 are screened within this unit, as it is the upper and primary water-bearing unit within the GMA. Groundwater is encountered under unconfined conditions within this unit at depths between approximately 4 and 15 feet below ground surface.

Glacial Till - Based on boring results at nearby locations within East Street Area 1-South (within GMA 1), glacial till underlies the alluvial deposits and typically consists of dense silt containing varying amounts of clay, sand, and gravel. Till is generally encountered at depths ranging from approximately 10 to over 40 feet beneath East Street Area 1-South and East Street Area 2-South, further to the west.

The unconsolidated units at GMA 2 overlie bedrock. Based on information obtained from nearby areas, bedrock occurs at depths up to approximately 50 to 60 feet near the Housatonic River. The bedrock consists of white coarse-grained marble associated with the Stockbridge Formation.

Groundwater at GMA 2 generally flows toward the Housatonic River and is primarily influenced by the existing topography and the area's location (adjacent to the river). Figure 3 illustrates typical water table conditions, using groundwater data obtained during the fall 2007 groundwater monitoring event. In general, the depth to groundwater is greater on the northern side of the Housatonic River due to the presence of a steeper riverbank than on the south of the river. The average depth to groundwater at Former Oxbow Area J ranges from approximately 11 feet (in the center portion) to approximately 14 feet (to the east and west of the former oxbow). The average depth to groundwater at Former Oxbow Area K ranges from approximately 4 feet (in the northern portion, adjacent to the Housatonic River) to approximately 10 feet (at the southernmost monitoring point).

Hydraulic conductivity data (as previously presented on Table 3 and Appendix C of the Groundwater Quality Monitoring Report for Spring 2002) indicate a wide range in conductivities at each former oxbow area. Hydraulic conductivities at Former Oxbow Area J ranged from 10.44 feet/day (at well GMA2-1) to 139.52 feet per day (at well GMA2-6), with a geometric mean of 45.57 feet per day. At Former Oxbow Area K, hydraulic conductivities varied from 7.98 feet/day (at well GMA2-9) to 138.47 feet per day (at well GMA2-5), with a geometric mean of 43.52 feet per day. The overall geometric mean of the calculated hydraulic conductivity values for GMA 2 is 44.65 feet per day.

Calculated groundwater velocities using the above-referenced hydraulic conductivities, as well as representative horizontal gradients and porosities, range from 0.84 feet per day to 16.74 feet per day to the north of the river, and from 0.53 feet per day to 13.85 feet per day in the southern portion of the GMA. The overall geometric mean of the calculated groundwater velocities at GMA 2 is 4.03 feet per day.

Two surface features may also affect groundwater flow within Former Oxbow Areas J and K. A drainage ditch is present along the western limb of Former Oxbow Area J that extends to the Housatonic River, while a small intermittent creek which extends between the Housatonic River and Goodrich Pond crosses the eastern portion of Former Oxbow Area K. The presence of these surface drainage features may locally influence groundwater flow in their immediate vicinity, but the overall groundwater flow direction is directed toward the Housatonic River.

Monitoring for the presence of NAPL is performed as part of the routine groundwater elevation monitoring activities at this GMA. NAPL has not been observed within any of the GE monitoring wells monitored to date at GMA 2 as part of the baseline program.

1.2.3 Overview of the Nature and Extent of Substances in Groundwater at the Site

Based on current information, the principal potential constituent sources that could affect groundwater quality within GMA 2 appear to include the former oxbows and existing or historical commercial businesses located within or upgradient of this GMA. These potential sources are described below.

Former Oxbows - As a result of the straightening of the Housatonic River channel in the late 1930s and early 1940s, Former Oxbows J and K were isolated from the newly formed channel of the river. These oxbows were subsequently filled with materials originating from the GE facility as well as other sources. There are no available records that provide information regarding the specific type or origin of the fill materials, or parties involved in the filling activities. The former oxbow areas are labeled as “disposal areas” on re-channelization drawings developed by the City of Pittsfield in 1940. These areas were publicly accessible and it is likely that a variety of industries and/or individuals contributed fill material. Based on a review of available aerial photographs, it is unclear when these former oxbows were filled.

Other Sources - In addition to fill materials that have been placed within the former oxbows, it is possible that there are other potential contributing sources of groundwater constituents to GMA 2. Commercial businesses present within or upgradient of GMA 2 include a gas station, restaurant, and an automotive electrical repair shop located within Former Oxbow Area J.

Very few constituents were consistently detected in groundwater at GMA 2. At most locations, the observed detections were sporadic temporally and spatially, resulting in an apparent scattered distribution of isolated and occasionally-detected constituents. Low levels of certain VOCs and PCBs have been detected on a more frequent basis at isolated locations, generally in or near the western portion of Oxbow Areas J and K.

1.2.4 Overview of Groundwater Investigation Activities at GMA 2

In February 2001, GE submitted a *Baseline Monitoring Program Proposal for Former Oxbows J and K Groundwater Management Area* (GMA 2 Baseline Monitoring Proposal). The GMA 2 Baseline Monitoring Proposal summarized the hydrogeologic information available at that time for GMA 2 and proposed groundwater monitoring activities for the baseline monitoring period at this GMA. EPA provided conditional approval of the GMA 2

Baseline Monitoring Proposal by letter of September 6, 2001. Thereafter, certain modifications were made to the GMA 2 baseline monitoring program as a result of EPA approval conditions and/or findings during field reconnaissance of the selected monitoring locations and, subsequently, during implementation of the baseline monitoring program.

The baseline monitoring program, which was initiated in spring 2002, consisted of four semi-annual groundwater quality sampling events (with intervening quarterly groundwater elevation monitoring) followed by preparation and submittal of semi-annual reports summarizing the groundwater monitoring results, comparing the groundwater results with applicable Performance Standards, and, as appropriate, proposing modifications to the monitoring program. The fourth baseline monitoring report for GMA 2 entitled *Groundwater Management Area 2 Baseline Groundwater Quality Interim Report for Fall 2003* (Fall 2003 GMA 2 Groundwater Quality Report), was submitted to EPA on January 30, 2004**.**

As noted above, Section 6.1.3 of Attachment H to the SOW provides that if the two-year baseline monitoring period ends prior to the completion of soil-related response actions at all the RAAs in a GMA, GE may make a proposal to EPA to modify and/or extend the Baseline Monitoring Program based on the results of the initial assessment and the estimated timing of future response actions at the RAAs in the GMA. The approved GMA 2 Baseline Monitoring Proposal also allows GE to propose a modification and/or extension of the baseline monitoring program based on the results of the initial assessment and the estimated timing of future response actions. Therefore, as the soil-related Removal Actions at the RAA within GMA 2 were not yet complete, the Fall 2003 GMA 2 Groundwater Quality Report included a proposal to modify and extend baseline groundwater quality monitoring activities at GMA 2 (under a program referred to as the interim monitoring program) until such time as the soil-related Removal Actions at the GMA 2 RAA were completed and the needs for a long-term groundwater quality monitoring program were fully delineated.

EPA conditionally approved the Fall 2003 GMA 2 Groundwater Quality Report in a letter dated May 13, 2004. Under the approved interim monitoring program, annual water quality sampling (alternating between the spring and fall seasons) and semi-annual water level monitoring at selected GMA 2 wells was initiated in spring 2004. Subsequent interim sampling events were conducted in fall 2005 and spring 2006.

The results of the round of interim groundwater sampling activities performed at this GMA in spring 2006 were provided in GE's July 2006 *Groundwater Management Area 2 Groundwater Quality Interim Report for Spring 2006* (Spring 2006 GMA 2 Groundwater Quality Report), which proposed to perform supplemental sampling activities in fall 2006 at one monitoring well (GMA2-1) where anomalous concentrations of PCBs were detected in spring 2006. That report was conditionally approved by EPA in a letter dated November 16, 2006. In that letter, EPA required GE to collect an additional sample from well GMA2-1 in

spring 2007 and, since soil-related Removal Actions at Former Oxbow Areas J and K were completed in November 2006, to submit a final baseline assessment report and proposal for long-term groundwater quality monitoring at GMA 2.

GE conducted the required spring 2007 groundwater elevation monitoring and sampling activities and submitted the GMA 2 Long-term Monitoring Proposal to EPA in June 2007. The GMA 2 Long-Term Monitoring Proposal provided a summary of the sampling activities conducted in spring 2007 at GMA 2, evaluated the overall groundwater quality at the GMA pursuant to the requirements of Attachment H of the SOW, and contained a proposal for long-term groundwater quality monitoring activities. Locations were considered for inclusion in the long-term program if:

- Exceedances of applicable MCP GW-2 or GW-3 standards were reported during the baseline monitoring program.

- The well is located downgradient of a location where exceedances of applicable MCP GW-2 or GW-3 standards were reported during the baseline monitoring program.

- A review of the available data indicates the potential presence of an increasing trend in the concentrations of certain constituents at levels approaching the applicable MCP GW-2 or GW-3 standards

In that report, as a result of the evaluations, GE proposed to conduct long term groundwater monitoring at seven wells in GMA 2 (i.e., wells GMA2-1, GMA2-2, GMA2-3, GMA2-4, GMA2-6, GMA2-9, and J-1R). In EPA's October 9, 2007 conditional approval letter, EPA directed GE to install GMA 2-10 and add that well, plus existing well OJ-MW-2, to the long-term monitoring program.

GE conducted the initial round of the required groundwater elevation monitoring and sampling activities in fall 2007, including the installation and sampling of the new well. The results of those activities are described herein.

1.3 Format of Document

The remainder of this report is presented in five sections. Section 2 describes the groundwater-related activities performed at GMA 2 in fall 2007. Section 3 presents the analytical results obtained during the fall 2007 sampling event, including a summary of the applicable groundwater quality Performance Standards identified in the CD and SOW, and a comparison of the fall 2007 results to those Performance Standards. Section 4 provides an overall assessment of groundwater quality at GMA 2 since initiation of baseline monitoring activities in spring 2002, including an evaluation of the analytical dataset for the

wells that were sampled as part of the fall 2007 sampling event, and an assessment of the need for follow-up investigations or response actions. Finally, Section 5 presents the schedule for future field and reporting activities related to groundwater quality at GMA 2.

2. Fall 2007 Field and Analytical Procedures

2.1 General

The activities conducted as part of the baseline/interim groundwater monitoring program in fall 2007, and summarized herein, involved new well installation, the measurement of groundwater levels and the collection and analysis of groundwater samples at select monitoring wells within GMA 2 as summarized in Table 1. A summary of construction details for the GMA 2 wells that were monitored and/or sampled during fall 2007 is provided in Table 2. The field sampling data for the fall 2007 sampling event are presented in Appendix A. This section discusses the field procedures used to perform the activities listed above, as well as the methods used to analyze the groundwater samples. All activities were performed in accordance with GE's approved *Field Sampling Plan/Quality Assurance Project Plan* (FSP/QAPP).

2.2 Well Installation and Development

On November 27, 2007, GE installed one new monitoring well (GMA2-10) at the location shown on Figure 2. Table 2 shows the survey data and well construction detail for this new well, along with the other existing wells utilized in the GMA 2 monitoring program. The monitoring well log for well GMA2-10 is presented in Appendix B.

Following installation, the new monitoring well was developed to remove fine materials (e.g., fine sand, silt, clay) that may have accumulated in the filter pack and to ensure that the well screen was transmitting groundwater representative of the surrounding formation. Development was performed by surging the saturated portion of the well screen with a surge block and removing groundwater with a submersible pump and a positive displacement pump. Development of the well was continued until temperature/ pH/conductivity field parameters stabilized and the purged groundwater was relatively free of sediment (i.e., less than 50 NTU).

2.3 Groundwater Elevation Monitoring

Groundwater elevations were collected from the 12 wells listed in Table 3, plus one Housatonic River surface water monitoring point, during the fall 2007 groundwater monitoring elevation event performed on November 1, 2007. Groundwater elevations in fall 2007 were, on average, approximately 0.05 feet lower then the elevations measured during fall 2006 for wells gauged during both monitoring events. The fall 2007 data presented in Table 3 were used to prepare a groundwater elevation contour map for fall 2007 (Figure 3). A summary of all groundwater elevation data collected in fall 2007 is contained in Appendix E.

As shown on Figure 3 and consistent with prior monitoring data, groundwater flow patterns at GMA 2 generally reflect the topography of the site with flow towards the Housatonic River. Overall, the hydraulic gradient to the south of the river is relatively flat in comparison to the portion of GMA 2 located north of the river. In particular, a relatively steep groundwater gradient is observed at the northeast corner of the Former Oxbow J Area as a result of a change in topography between well OJ-MW-1 and wells GMA2-7 and OJ-MW-2.

In addition, monitoring for the potential presence of NAPL was performed as part of these well gauging events. No NAPL was observed during these monitoring events or any of the previous monitoring events conducted by GE at GMA 2.

2.4 Groundwater Sampling and Analysis

Groundwater samples were collected from the eight existing GMA 2 wells subject to long term monitoring between November 9 and 14, 2007. New well GMA 2-10, which was installed in late November 2007, was sampled on December 18, 2007. Samples were collected for analysis for the constituents shown in Table 1.

Low-flow sampling techniques using a bladder pump or peristaltic pump were utilized for purging the wells and collection of groundwater samples during this sampling event. Each monitoring well was purged utilizing low-flow sampling techniques until field parameters (including temperature, pH, specific conductivity, oxidation-reduction potential, dissolved oxygen, and turbidity) stabilized. Field parameters were measured in combination with the sampling activities at the monitoring wells. The field parameter measurements are presented in Table 4 and the field sampling records are provided in Appendix A. A general summary of the field measurement results during the fall 2007 monitoring event is provided below:

Parameter	Units	Range
Turbidity	Nephelometric turbidity units (NTU)	1.0 to 4.0
pH	pH units	5.04 to 7.50
Specific Conductivity	Millisiemens per centimeter	0.431 to 5.050
Oxidation-Reduction Potential	Millivolts	-103.2 to 277.1
Dissolved Oxygen	Milligrams per liter	0.28 to 3.47
Temperature	Degrees Celsius	10.25 to 14.03

As shown above, for this sampling event, none of the groundwater extracted from the monitoring wells had turbidity levels greater than 4.0 NTU. These results indicate that the procedures utilized during this sampling event were effective in obtaining groundwater samples with low turbidity.

The collected groundwater samples were submitted to SGS Environmental Services, Inc. (SGS) in Wilmington, North Carolina for laboratory analysis. The samples from wells GMA2-10 and OJ-MW-2 were analyzed for VOCs (using EPA method 8260B) while filtered samples from wells GMA2-1, GMA2-2, GMA2-3, GMA2-4, GMA2-6, GMA2-9, and J1-R were analyzed for PCBs (using EPA method 8082).

Following receipt of the analytical data on the GE samples from the laboratory, the preliminary results were reviewed for completeness and compared to the Massachusetts Contingency Plan (MCP) Method 1 GW-2 (where applicable) and GW-3 standards, and to the MCP Upper Concentration Limits (UCLs) for groundwater. The preliminary analytical results were presented in the next monthly report on overall activities at the GE-Pittsfield/Housatonic River Site, along with the identification, when applicable, of sample results above the applicable MCP Method 1 standards and/or UCLs.

Finally, the data were validated in accordance with the FSP/QAPP and the validated results were utilized in the preparation of this report. As discussed in the validation report provided as Appendix D, 99.8% of the fall 2007 groundwater quality data are considered to be useable, which is greater than the minimum required usability of 90% as specified in the FSP/QAPP. The PCB sample results were found to be 100% usable. VOC sample results were found to be 99.6% usable. The only rejected data were the VOC results for 2-chloroethylvinylether from one groundwater sample (OJ-MW-2), which was rejected due to MS/MSD recovery deviations. A duplicate sample result for 2-chloroethylvinylether analyzed from this well was not rejected and therefore provides a usable result.

3. Fall 2007 Groundwater Analytical Results

3.1 General

A description of the fall 2007 groundwater analytical results is presented in this section. Tables 5 and 6 provide a comparison of the concentrations of all detected constituents with the currently applicable groundwater quality Performance Standards established in the CD and SOW, while Table 7 presents a comparison of the concentrations of detected constituents with the UCLs for groundwater. These Performance Standards are described in Section 3.2 below and an assessment of the fall 2007 results relative to those groundwater quality Performance Standards and the UCLs is provided in Section 3.4.

3.2 Groundwater Quality Performance Standards

The Performance Standards applicable to response actions for groundwater at GMA 2 are set forth in Section 2.7 and Attachment H (Section 4.1) of the SOW. In general, the Performance Standards for groundwater quality are based on the groundwater classification categories designated in the MCP. The MCP identifies three potential groundwater categories that may be applicable to a given site. One of these, GW-1 groundwater, applies to groundwater that is a current or potential source of potable drinking water. None of the groundwater at any of the GMAs at the Site is classified as GW-1; however, the remaining MCP groundwater categories are applicable to GMA 2 and are described below:

- GW-2 groundwater is defined as groundwater that is a potential source of vapors to the indoor air of buildings. Groundwater is classified as GW-2 if it is located within 30 feet of an existing occupied building and has an average annual depth below ground surface (bgs) of 15 feet or less. Under the MCP, volatile constituents present within GW-2 groundwater represent a potential source of organic vapors to the indoor air of the overlying and nearby occupied structures.

- GW-3 groundwater is defined as groundwater that discharges to surface water. By MCP definition, all groundwater at a site is classified as GW-3 since it is considered to ultimately discharge to surface water. In accordance with the CD and SOW, all groundwater at GMA 2 is considered as GW-3.

The CD and the SOW allow for the establishment of standards for GW-2 and GW-3 groundwater at the GMAs through use of one of three methods, as generally described in the MCP. The first, known as Method 1, consists of the application of pre-established numerical “Method 1” standards set forth in the MCP for both GW-2 and GW-3 groundwater (310 CMR 40.0974). These “default” standards have been developed to be conservative

and will serve as the initial basis for evaluating groundwater at GMA 2. The current MCP Method 1 GW-2 and GW-3 standards for the constituents detected in the fall 2007 sampling event are listed in Tables 5 and 6, respectively.

For constituents for which Method 1 standards do not exist, the MCP provides procedures, known as Method 2, for developing such standards (Method 2 standards) for both GW-2 (310 CMR 40.0983(2)) and GW-3 (310 CMR 40.0983(4)) groundwater. For such constituents that are detected in groundwater during the baseline monitoring program, Attachment H to the SOW states that in the Baseline Monitoring Program Final Report, GE must propose to develop Method 2 standards using the MCP procedures or alternate procedures approved by EPA, or provide a rationale for why such standards need not be developed. As discussed in Section 3.2.1 below, GE has developed two such Method 2 standards and proposes that they be applied to the groundwater at GMA 2.

For constituents whose concentrations exceed the applicable Method 1 (or Method 2) standards, GE may develop and propose to EPA alternative GW-2 and/or GW-3 standards based on a site-specific risk assessment. This procedure is known as Method 3 in the MCP. Upon EPA approval, these alternative risk-based GW-2 and/or GW-3 standards may be used in lieu of the Method 1 (or Method 2) standards. Of course, whichever method is used to establish such groundwater standards, GW-2 standards will be applied to GW-2 groundwater and GW-3 standards will be applied to GW-3 groundwater.

Based on consideration of the above points, the specific groundwater quality Performance Standards for GMA 2 consist of the following:

1. At monitoring wells designated as compliance points to assess GW-2 groundwater (i.e., groundwater located at an average depth of 15 feet or less from the ground surface and within 30 feet of an existing occupied building), groundwater quality shall achieve any of the following:

    a) the Method 1 GW-2 groundwater standards set forth in the MCP (or, for constituents for which no such standards exist, Method 2 GW-2 standards once developed, unless GE provides and EPA approves a rationale for not developing such Method 2 standards);

    b) alternative risk-based GW-2 standards developed by GE and approved by EPA as protective against unacceptable risks due to volatilization and transport of volatile chemicals from groundwater to the indoor air of nearby occupied buildings; or

c) a condition, based on a demonstration approved by EPA, in which constituents in the groundwater do not pose an unacceptable risk to occupants of nearby occupied buildings via volatilization and transport to the indoor air of such buildings.

2. Groundwater quality shall ultimately achieve the following standards at the perimeter monitoring wells designated as compliance points for GW-3 standards:

   a) the Method 1 GW-3 groundwater standards set forth in the MCP (or, for constituents for which no such standards exist, Method 2 GW-3 standards once developed, unless GE provides and EPA approves a rationale for not developing such Method 2 standards); or

   b) alternative risk-based GW-3 standards proposed by GE and approved by EPA as protective against unacceptable risks in surface water due to potential migration of constituents in groundwater.

These Performance Standards are to be applied to the results of the individual monitoring wells included in the monitoring program. Several monitoring wells have been designated as the compliance points for attainment of the Performance Standards identified above. Those compliance wells that are sampled under the long-term monitoring program are identified in Table 1. As shown in that table, compliance with the applicable performance standards at several other wells has been verified during performance of the baseline monitoring program at GMA 2.

In addition to the Performance Standards described above, analytical results from all groundwater monitoring wells sampled during the fall 2007 sampling event were compared to the MCP UCLs for groundwater.

3.2.1 Development of Guidance Values for Copper and Cobalt

As stated above, for constituents that are detected in groundwater during the baseline monitoring program for which Method 1 standards do not exist, Attachment H to the SOW states that GE must propose to develop Method 2 standards using the MCP procedures or alternate procedures approved by EPA, or provide a rationale for why such standards need not be developed. In its October 9, 2007 conditional approval letter, EPA required GE to discuss the baseline analytical results for cobalt and copper (for which Method 1 GW-3 standards do not exist) and to either develop Method 2 GW-3 standards for those two inorganic constituents or explain why such standards are not necessary. The baseline analytical results for cobalt and copper are discussed in Section 4.3 and GE's efforts to develop Method 2 GW-3 Standards for these two constituents are described in Appendix G.

As described more fully in that Appendix, the procedures for deriving Method 2 GW-3 standards prescribed by the MCP require various inputs, including the Soil Organic Carbon-Water Partitioning Coefficient (Koc). However, Koc values are not available for either cobalt or copper.

Therefore, as described in Appendix G, GE has calculated low-, mid-, high-range guidance values for copper and cobalt to approximate the range of Method 2 GW-3 standards for these substances. Those values are as follows:

Constituent	Low-Range Guidance Value	Mid-Range Guidance Value	High-Range Guidance Value
Copper	0.225 mg/L	2.25 mg/L	9 mg/L
Cobalt	0.075 mg/L	0.75 mg/L	3 mg/L

In Section 4.3, GE presents a comparison of these values with the baseline analytical results for copper and cobalt at GMA 2 to demonstrate that the establishment of definitive Method 2 GW-3 standards for these substances is not necessary at this GMA.

3.3 Fall 2007 Groundwater Quality Results

The following subsections provide an overview of the fall 2007 analytical results from the GMA 2 monitoring wells for each constituent group that was analyzed.

3.3.1 VOC Results

Groundwater samples collected from two groundwater quality monitoring wells were analyzed for VOCs during the fall 2007 sampling event. The VOC analytical results are summarized in Table 7 (for detected constituents compared to MCP UCLs for groundwater) and Table C-1 of Appendix C (for all constituents analyzed). VOCs were detected at both sampling locations analyzed in fall 2007. Vinyl chloride and trans-1,2-dichloroethene were detected at well GMA2-10 at estimated concentrations below their respective practical quantitation limit (PQL). Trichloroethene (TCE) was detected in well OJ-MW-2 at a concentration of 0.015 parts per million (ppm) in both the field sample and duplicate field sample. As shown in Tables 5 and 6 and discussed below, no VOCs were detected at levels exceeding the applicable Method 1 GW-2 or Method 1 GW-3 standards during the fall 2007 sampling round.

3.3.2 PCB Results

Filtered groundwater samples from seven wells were analyzed for PCBs as part of the fall 2007 sampling event. The PCB analytical results are presented in Tables 7 and C-1. PCBs were not detected at any of the seven sampling locations.

3.4 Evaluation of Groundwater Quality – Fall 2007

For the purpose of assessing current groundwater conditions, the analytical results from the fall 2007 groundwater sampling event were compared to the applicable groundwater Performance Standards for GMA 2. These Performance Standards are described in Section 3.2 above and are currently based on the MCP Method 1 GW-2 and/or GW-3 standards. The following subsections discuss the fall 2007 groundwater analytical results in relation to these Performance Standards, as well as in relation to the MCP UCLs for groundwater. In support of those discussions, Tables 5 and 6 provide a comparison of the concentrations of detected constituents with the currently applicable GW-2 and GW-3 standards, respectively, while Table 7 presents a comparison of the concentrations of detected constituents with the groundwater UCLs.

3.4.1 Fall 2007 Groundwater Results Relative to GW-2 Performance Standards

During the fall 2007 interim groundwater quality monitoring event at GMA 2, groundwater samples collected from two wells designated as GW-2 monitoring locations (i.e., wells GMA2-10 and OJ-MW-2) were analyzed for constituents subject to the GW-2 Performance Standards. The fall 2007 groundwater analytical results for all detected constituents subject to MCP Method 1 GW-2 standards are presented in Table 5, along with a comparison of those results to the applicable GW-2 standards. Trans-1,2-dichloroethene, TCE, and vinyl chloride were the only VOCs detected in any of the GW-2 wells. TCE was detected in well OJ-MW-2 at a concentration of 0.015 ppm, which is below the MCP GW-2 standard of 0.03 ppm. The other two VOCs were detected in well GMA2-10 at estimated concentrations below their respective PQLs and well below the respective GW-2 standards.

Neither of the two GW-2 wells exhibited total VOC concentrations above 5 ppm (the level specified in the SOW as a notification level for GW-2 wells located within 30 feet of a school or occupied residential structure and as a trigger level for the proposal of interim response actions).

3.4.2 Fall 2007 Groundwater Results Relative GW-3 Performance Standards

Groundwater samples were collected from nine wells designated as GW-3 monitoring points during the fall 2007 interim sampling event. The fall 2007 groundwater analytical results for all constituents detected in these wells and a comparison of those results with MCP Method 1 GW-3 standards are presented in Table 6. As shown in the table none of the constituents exceeded the applicable GW-3 standards at any of the designated GW-3 sampling points.

3.4.3 Comparison of Fall 2007 Groundwater Results to Upper Concentration Limits

In addition to comparing the fall 2007 groundwater analytical results with applicable MCP Method 1 GW-2 and GW-3 standards, the analytical results from all wells that were sampled were compared with the UCLs for groundwater specified in the MCP (310 CMR 40.09996(7)). These comparisons, presented in Table 7, show that none of the detected constituents exceeded its respective UCL.

3.5 NAPL Evaluation

Consistent with prior monitoring results, no NAPL was observed in any of the GMA 2 monitoring wells during the groundwater elevation and sampling activities conducted in fall 2007.

During the Long-Term Monitoring Program, if NAPL is observed to be discharging to any surface water or creating a sheen on the water in a location in which such NAPL discharge was not previously observed or measures are not in place to effectively contain the sheen, GE will notify EPA and MDEP within two hours of obtaining knowledge of such observation. This will be followed by written notice to EPA within seven (7) days. The written notification will include a proposal to EPA for interim response actions to contain such discharge. Upon EPA approval, GE will conduct the approved interim response actions to contain the NAPL discharge.

Also under the approved GMA 2 Long-Term Monitoring Proposal, if NAPL is observed to be discharging to any surface water or creating a sheen on the water in a location in which such NAPL discharge was previously observed and measures are in place to contain the sheen, GE will notify EPA of the continued presence of such NAPL in the next monthly progress report for overall work at the Site.

For groundwater, if a NAPL thickness of greater than or equal to 1/2-inch is observed in any monitoring well, GE will notify EPA and MDEP within seventy-two hours of obtaining knowledge of such a condition, unless such conditions are consistent with the types, nature,

and quantities of NAPL which were previously observed and reported to the Agencies. This notification will be followed by written notice to the EPA within 60 days. The written notification will include a proposal to EPA for interim response actions to be conducted which may include NAPL sampling, additional assessment/monitoring, or NAPL removal activities. Upon EPA approval, GE will conduct the approved interim response actions. If a NAPL thickness of greater than or equal to 1/8-inch, but less than 1/2-inch is observed in a monitoring well, GE will notify EPA and MDEP in the next monthly progress report, unless the results are consistent with the types, nature, and quantities of NAPL which have previously been observed and reported to the Agencies.

4. Assessment of Groundwater Quality

4.1 General

This report constitutes the first monitoring event evaluation report submitted since commencement of the GMA 2 long-term groundwater monitoring program. The information presented herein is based on the laboratory results obtained during the course of the GMA 2 baseline and long-term groundwater monitoring programs.

For the purpose of assessing overall groundwater conditions at GMA 2, the analytical results from the fall 2007 groundwater sampling event were compared to the applicable groundwater Performance Standards for GMA 2, as described in Section 3.4 above. In addition, GE has compared the fall 2007 results to prior data to evaluate variations and/or potential trends in constituent concentrations in GMA 2 groundwater.

The following sections present the results of those overall assessments of groundwater quality, including an evaluation of the need for follow-up investigations, assessments, interim response actions, or other modifications to the long-term monitoring program.

4.2 Evaluation of Variations in Groundwater Quality

For the purpose of assessing current groundwater conditions, the analytical results from the fall 2007 groundwater sampling event were compared to the previous baseline and interim sampling events, and the most recent fall round of sampling data. In addition, the variability of the data was evaluated. The results of these comparisons are described below.

4.2.1 Comparison of Fall 2007 Analytical Results to Baseline Data

Graphs illustrating historical total VOC and total PCB concentrations for all wells sampled and analyzed for those constituent during fall 2007 (excluding new well GMA2-10, which has no prior data) at GMA 2 are presented in Appendix E. In addition, Appendix E contains a graph of historical concentrations of historical TCE concentrations at well OJ-MW-2, as this well is included in the long-term monitoring program primarily to assess TCE concentrations in that portion of the GMA.

VOCs have been detected at well OJ-MW-2 during each monitoring round since the inception of the baseline monitoring program in fall 2002. In each case, TCE was the only VOC detected. The fall 2007 results at this well are identical to those observed during fall 2003. These two sampling events have shown the highest VOC/TCE concentrations since sampling was initiated at this well, but those results are similar to the data from the fall 2002 sampling event and are below both GW-2 and GW-3 standards.

During the fall 2007 sampling event PCBs were not detected at any of the wells where filtered samples were analyzed for this constituent. Prior to fall 2007, PCBs were detected at levels slightly above or below the MCP GW-3 standard on at least one occasion at each of these wells. However, PCBs were also not detected in these same wells during other sampling events.

4.2.2 Comparison of Fall 2007 Analytical Results to Previous Sampling Round

Table E-2 in Appendix E presents a comparison of the fall 2007 analytical results to the most recent fall sampling data collected from each well for constituents that were analyzed during the fall 2007 sampling event. Since some, but not all, wells were sampled during the interim monitoring program, the historical data used in these comparisons did not originate from the same sampling event at all locations. The fall 2007 results represented the initial sampling round at well GMA2-10, so those results could not be compared to prior data.

As seen in Table E-2 the most recent fall sampling event conducted at well OJ-MW-2 prior to the fall 2007 sampling event was fall 2003. The total VOC concentrations, which were entirely attributed to TCE, were identical during these two sampling events.

Table E-2 also compares the fall 2007 PCB results to historical PCB concentrations from the most recent prior fall sampling event. As discussed above, PCBs were not detected during the fall 2007 event, which is consistent with the next most recent (fall 2006) data from well GMA2-1. All of the remaining wells had PCB detections in the fall sampling events conducted in 2003 or 2005. As seen on the historical PCB concentration graphs presented in Appendix E, the fall 2007 PCB concentrations were significantly less than the prior fall sampling event at locations where PCBs had been detected. The PCB concentrations detected during the most recent prior fall sampling at wells GMA2-2, GMA2-3, GMA2-4, GMA2-6, GMA2-9, and J-1R were the high values recorded for each well, with the exception of well GMA2-2 where the concentration was close to the high value observed in spring 2003. . Thus, the non-detection of PCBs in these wells in fall 2007 stands in contrast to the prior fall detections.

4.2.3 Evaluation of Variability in Data

To evaluate the potential presence of seasonal trends in the groundwater quality data at GMA 2, GE has reviewed the analytical data from the wells included in the long-term monitoring program. Inspection of the historical concentration graphs contained in Appendix E indicates that ranges of data collected in the spring vs. fall seasons are within the same order of magnitude at GMA 2 for TCE, total PCBs, and total VOCs. Based on these preliminary evaluations, it does not appear that seasonal variability is significantly affecting the results at GMA 2.

4.3 Statistical Assessment of Data

To assess potential trends in groundwater constituent concentrations over time (i.e., long-term increasing or decreasing concentrations) as well as seasonal cycles, various statistical methods can be utilized depending on the extent of the overall sampling period and the frequency of sampling events within the sampling period. Graphical representations such as a simple plot of concentration data versus time may reveal long-term cyclical patterns as well as pulses, both of which may explain temporal trends. As described in the GMA 2 Long-Term Monitoring Proposal, three statistical techniques may be utilized to evaluate temporal trends in GMA 2 groundwater and to determine the statistical significance of any potential trends that are identified: (1) Mann-Kendall Test; (2) Sen's slope estimator; and (3) Seasonal Kendall Tau estimator. Such statistical evaluations will be conducted as the long-term monitoring program progresses and will be summarized in the Long-Term Trend Evaluation Reports for GMA 5 as appropriate.

In addition to the concentration versus time graphs discussed above, GE has prepared a general summary of the analytical results for all wells/constituents included in the long-term monitoring program. The summary statistics of the analytical data for the GMA 2 wells where long-term monitoring is being conducted are contained in Appendix F and are discussed below.

Two monitoring wells (GMA2-10 and OJ-MW-2) are analyzed for VOCs as part of the long-term monitoring program. Since well GMA2-10 was sampled for the first time in fall 2007, the statistical summary shown in Appendix F is entirely compiled from that monitoring event. The two VOCs that were detected were observed at concentrations an order of magnitude or more below the applicable GW-2 standards. As shown in Table F-9 in Appendix F, TCE has been detected at well OJ-MW-2 during each of five sampling events that have been conducted and is the only VOC that has been found at this location. The maximum TCE concentration observed (0.015 ppm) is equal to half of the applicable GW-2 standard for this constituent (0.03 ppm). The average TCE concentration at well OJ-MW-2 is an order of magnitude below that standard.

As shown in the statistical breakdown tables presented in Appendix G, PCBs have been detected during approximately half of the sampling events conducted at each of the seven wells included in the long-term monitoring program for that constituent. No PCBs were detected in any of these wells in fall 2007. The average concentrations of PCBs are below the applicable GW-3 standard of 0.0003 ppm at all GMA2 wells, except for well GMA2-3. However, well GMA2-3 was generally utilized as a GW-2 monitoring point during the baseline monitoring program and the available dataset for PCBs is limited. PCBs were analyzed only during two supplemental sampling events conducted in 2003 (where PCB

concentrations exceeded the GW-3 standard) and in fall 2007 (where no PCBs were detected).

4.4 Overall Assessment of Groundwater Quality Data

A limited number of constituents have been sporadically detected in groundwater at GMA 2. Specifically, low levels of certain VOCs and PCBs are detected at several locations in GMA 2. In general, higher constituent concentrations and more frequent detections have been observed in the central and western portions of Oxbow Areas J and K (although PCBs and inorganic constituents were detected at various locations within each former oxbow area). The long-term groundwater quality monitoring program is focused on those areas.

The following subsections provide an overview of the groundwater quality data at GMA 2, focused on the constituents and locations that are included in the long-term monitoring program and/or were sampled in fall 2007.

4.4.1 VOCs

Two wells were included in the fall 2007 long-term sampling event for VOC analysis. Well GMA2-10 was installed and sampled for the first time in fall 2007 to satisfy an EPA requirement to assess groundwater conditions near an existing building in this area. Trace concentrations of two VOCs were detected in the samples analyzed from this well, each at levels well below the applicable GW-2 standard.

Total VOC concentrations at well OJ-MW-2 represent the concentrations of TCE, as TCE is the only volatile constituent detected in this well. TCE has been detected in well OJ-MW-2 during each sampling round, as shown in the graph in Appendix E. The concentration of TCE detected in this well has never exceeded the GW-2 standard of 0.03 ppm. This well currently meets the criterion for demonstrating achievement of the Performance Standards, as there have been four consecutive sampling events showing results below the applicable standards. However, GE plans to continue to collect additional VOC data from this well during the long-term monitoring program.

4.4.2 PCBs

Seven wells were included in the fall 2007 long-term sampling event for PCB analysis. No PCBs were detected in filtered samples analyzed from any of these wells.

Filtered samples from well GMA2-1 have been analyzed for PCBs during ten sampling events. On three occasions, the data indicated exceedance of the MCP GW-3 standard for PCBs of 0.0003 ppm. The most recent GW-3 exceedance at this well was recorded in

spring 2006. No PCBs have been detected in well GMA2-1 in three sampling events performed since that sampling event.

To further evaluate PCB concentrations downgradient of well GMA2-1, well GMA2-2 was added to the long-term monitoring program. This well has been analyzed for PCBs on five occasions and has never shown an exceedance of the GW-3 standard. The maximum concentration observed in filtered samples was 0.00023 ppm, which is below the applicable standard for PCBs.

Well GMA2-3 was originally included in the baseline monitoring program as a GW-2 sentinel well. Supplemental analyses for PCBs were performed during the spring 2003 and fall 2003 sampling events and the results during each sampling round were greater than the MCP GW-3 standard. Fall 2007 was the first sampling event conducted since that time and no PCBs were detected.

Filtered samples from wells GMA2-4 and GMA2-9 have each been analyzed for PCBs during eight sampling events, two of which showed exceedances of the GW-3 standard in each well, most recently in fall 2005. Since fall 2005, no PCBs have been detected during two sampling events at well GMA2-4. PCB were detected at well GMA2-9 at a concentration an order of magnitude below the GW-3 standard in spring 2006 and decreased to non-detectable levels during the current monitoring period.

Wells GMA2-6 and J-1R have only been sampled and analyzed for PCBs during the four baseline monitoring rounds and the initial long-term sampling event. No exceedances of the GW-3 standard have been documented at either location. Each well was added to the long-term monitoring program to assess potential increases in PCB concentrations (to levels between approximately one-half to two-thirds of the applicable standard) observed at the conclusion of the baseline monitoring period.

At the four wells where previous filtered PCB concentrations exceeded Performance Standards (GMA2-1, GMA2-3, GMA2-4, and GMA2-9), the fall 2007 results for filtered PCBs were all non-detect. However, additional monitoring at these four wells is required to demonstrate compliance with the Performance Standards since only one to three sampling events have been conducted since the last PCB exceedance was observed. The three other wells (GMA2-2, GMA2-6, and J-1R) meet the criteria of four consecutive sampling events showing results below the applicable standards to demonstrate that the groundwater Performance Standards for PCBs have been achieved. However, each of those wells had a time gap in sampling and is included in the program for other reasons (i.e., wells GMA2-2 and GMA2-6 to monitor downgradient of well GMA2-1 and well J-1R to monitor downgradient of well GMA2-3). As such, GE plans to continue to monitor these wells during future long-term monitoring events.

4.5 Evaluation of Cobalt and Copper in GMA 2 Groundwater

In its October 9, 2007 conditional approval letter, EPA required GE to discuss the baseline analytical results for cobalt and copper (for which Method 1 GW-3 standards do not exist) and to either develop Method 2 GW-3 standards for those two inorganic constituents or explain why such standards are not necessary. GE's efforts to develop guidance values for these substances, approximating a range in Method 2 GW-3 Standards, are described in Section 3.2.1 and Appendix G. The baseline analytical results for cobalt and copper and the need to develop Method 2 GW-3 standards for these constituents are discussed below.

4.5.1 Cobalt

During the baseline monitoring program, samples from ten GMA 2 monitoring wells were analyzed for cobalt. The baseline analytical results for cobalt at those locations are summarized in Table 8. Cobalt was detected in filtered samples analyzed from four of these wells (i.e., wells GMA2-2, GMA2-5, GMA2-6, and OJ-MW-2). At each location, cobalt was only observed during one of four baseline sampling events, and at estimated concentrations between the instrument detection limit (IDL) and the practical quantitation limit (PQL). Estimated concentrations ranged from 0.0016 ppm (well GMA2-6 in fall 2003) to 0.0029 ppm (well OJ-MW-2 in fall 2002).

As described in Section 3.2.1 and Appendix G, GE calculated low-, mid-, and high-range guidance values for the Method 2 GW-3 standards based on a range of assumed Koc values, as a known Koc value for cobalt does not exist. Those guidance values are:

- 0.075 ppm, assuming a Koc value for cobalt of less than 1,000;
- 0.75 ppm, assuming a Koc value for cobalt greater than or equal to 1,000, but less than 100,000; or
- 3 ppm, assuming a Koc value for cobalt of greater than 100,000.

Based on estimated Koc values ranging from 4,000 to 37,500 developed by using default values, the most appropriate guidance value for a Method 2 GW-3 standard for cobalt appears to be 0.75 ppm. A comparison of the of this guidance value with the baseline monitoring results shows that the maximum cobalt concentration observed at GMA 2 (estimated concentration of 0.0029 ppm) is not only well below this mid-range guidance value, but is also an order of magnitude below the most conservative potential low-range guidance value that was calculated. In addition, the conservative low-range guidance value is above the PQL for cobalt (0.05 ppm), indicating that the non-detected results also would not have exceeded these most conservative low-range guidance values. Therefore,

although GE was unable to develop a definitive Method 2 GW-3 standard for cobalt, it does not appear that such a standard is needed at GMA 2. As such, GE does not believe that any additional monitoring or other steps with regard to cobalt are warranted at GMA 2.

4.5.2 Copper

During the baseline monitoring program, samples from ten GMA 2 monitoring wells were analyzed for copper. The baseline analytical results for copper at those locations are summarized in Table 8. Copper was detected in filtered samples analyzed from five of these wells (i.e., wells GMA2-1, GMA2-4, GMA2-5, GMA2-7, and OJ-MW-2). At two of these locations (GMA2-4 and GMA2-7), copper was only observed during one of four baseline sampling events. At the other monitoring wells, copper was detected during two of four baseline sampling rounds. All detected levels of copper were at estimated concentrations between the IDL and the PQL. Estimated concentrations ranged from 0.0034 ppm (well GMA2-5 in fall 2002) to 0.013 ppm (well GMA2-4 in fall 2003).

As described in Section 3.2.1 and Appendix G, GE calculated low-, mid-, and high-range guidance values for the Method 2 GW-3 standards based on a range of assumed Koc values, as a known Koc value for copper does not exist. Those guidance values are:

- 0.225 ppm, assuming a Koc value for copper of less than 1,000;
- 2.25 ppm, assuming a Koc value for copper greater than or equal to 1,000, but less than 100,000; or
- 9 ppm, assuming a Koc value for copper of greater than 100,000.

As with cobalt, utilizing estimated Koc values ranging from 4,000 to 37,500, the most appropriate guidance value for a Method 2 GW-3 standard for copper appears to be 2.25 ppm. The maximum copper concentration observed at GMA 2 (estimated concentration of 0.013 ppm) is not only far below this mid-range potential guidance value, but is also well below the most conservative potential low-range guidance value that was calculated. In addition, the conservative low-range guidance value of 0.225 ppm is well above the PQL for copper (generally 0.025 ppm during the baseline monitoring program, with the exception of the spring 2002 sampling event when a PQL of 0.1 ppm was reported by the laboratory). Thus, the most conservative guidance value is above the PQLs, indicating that the non-detected results could not have exceeded any of the calculated standards. Therefore, it does not appear that a Method 2 GW-3 standard for copper is needed at this GMA. As such, GE does not believe that any additional monitoring or other steps with regard to copper are warranted at GMA 2.

4.6 Evaluation of the Need for Follow-up Investigations, Assessments, or Interim Response Actions

As stated in the GMA 2 Long-Term Monitoring Proposal, the analytical data obtained during the baseline monitoring programs did not reveal any significant data gaps concerning groundwater quality that would suggest the need for any further investigations or assessments, other than the installation of new well GMA2-10 near the building to the east of GW-2 sentinel well GMA2-6. Likewise, a review of the fall 2007 long-term monitoring data does not indicate the need for additional actions beyond the approved long-term monitoring activities.

In fall 2007, the detected concentrations were generally very low in relation to any applicable GW-2 or GW-3 standards, and, for PCBs, not detected at all. Based on the results during the fall 2007 sampling round, GE does not propose any changes to the long-term monitoring program. There have been no wells at which any detected concentration suggests the need for an interim response action apart from continued long-term monitoring at certain of these locations. If any exceedances of the groundwater-related Performance Standards persist at GMA 2, GE will evaluate the need for appropriate response actions and will propose any necessary actions for EPA approval.

A summary of the long-term groundwater sampling program activities proposed to be conducted in spring 2008 is provided in Table 9. The wells subjected to sampling in spring 2008 are illustrated on Figure 4.

5. Schedule of Future Activities

5.1 Field Activities Schedule

If approved by EPA, GE will conduct the spring 2008 long-term groundwater quality sampling event in April/May 2008. A round of groundwater elevation monitoring at the GMA 2 wells where such monitoring is required will also be performed at that time.

Prior to performance of these field activities, GE will provide EPA with 7 days advance notice to allow the assignment of oversight personnel. The schedule discussed above was developed under the assumption that GE will be able to obtain permission from the owners of the properties that comprise GMA 2 to conduct the monitoring and sampling activities in advance of their estimated performance dates. If that is not the case, GE will notify EPA of potential schedule impacts due to delays in obtaining such access to the properties.

5.2 Reporting Schedule

GE will continue to provide the results of preliminary groundwater analytical data in its monthly reports on overall activities at the GE-Pittsfield/Housatonic River Site. Those reports will also document the schedules for submittal of the Monitoring Event Evaluation Reports and Long-Term Trend Evaluation Reports, which are contingent upon receipt of the final analytical data packages from the groundwater sampling events, as discussed below.

In accordance with the previously-approved reporting schedule for this GMA, GE proposes to submit the Spring 2008 Monitoring Event Evaluation Report for GMA 2 within 60 days following receipt of the final analytical data packages from the event. That report will present the final, validated spring 2008 sampling results and a brief discussion of the results, including the evaluations of the data and any proposals to further modify the long-term monitoring program, if necessary.

Subsequent semi-annual Monitoring Event Evaluation Reports for GMA 2 will be submitted within 60 days following receipt of the final analytical data packages from each event.

In addition, as previously approved by EPA, a Long-Term Trend Evaluation Report will be submitted in place of a Monitoring Event Evaluation Report, at the completion of the fall 2009 sampling round. Subsequent Long-Term Trend Evaluation Reports for GMA 2 will be prepared at two-year intervals over the duration of the long-term monitoring program at GMA 2. Each such report will be submitted within 75 days following receipt of the final analytical data packages from the latest monitoring event included in the two-year evaluation cycle.

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Tables

Table 1
Fall 2007 Groundwater Monitoring Program

Groundwater Managment Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts

Well Number	Monitoring Well Usage	Sampling Schedule	Fall 2007 Analyses	Comments
GMA2-1	GW-3 Perimeter (GW-3 Compliance Well)	Semi-Annual	PCB	Long-term monitoring conducted to verify attainment of GW-3 Performance Standards for PCBs
GMA2-2	GW-2 Sentinel/GW-3 Perimeter (GW-3 Compliance Well)	Semi-Annual	PCB	Long-term monitoring conducted to verify attainment of GW-3 Performance Standards for PCBs
GMA2-3	GW-2 Sentinel/GW-3 Perimeter (Upgradient Well)	Semi-Annual	PCB	Long-term monitoring conducted to verify attainment of GW-3 Performance Standards for PCBs
GMA2-4	GW-3 Perimeter (GW-3 Compliance Well)	Semi-Annual	PCB	Long-term monitoring conducted to verify attainment of GW-3 Performance Standards for PCBs
GMA2-5	Groundwater Elevation Monitoring	None	None	Attainment of GW-2 and GW-3 Performance Standards verified during baseline monitoring program - no additional groundwater quality monitoring required.
GMA2-6	GW-3 Perimeter (GW-3 Compliance Well)	Semi-Annual	PCB	Long-term monitoring conducted to verify attainment of GW-3 Performance Standards for PCBs
GMA2-7	Groundwater Elevation Monitoring	None	None	Attainment of GW-3 Performance Standards verified during baseline monitoring program - no additional groundwater quality monitoring required.
GMA2-8	Groundwater Elevation Monitoring	None	None	Attainment of GW-3 Performance Standards verified during baseline monitoring program - no additional groundwater quality monitoring required.
GMA2-9	GW-3 Perimeter (GW-3 Compliance Well)	Semi-Annual	PCB	Long-term monitoring conducted to verify attainment of GW-3 Performance Standards for PCBs
GMA2-10	GW-2 Sentinel (GW-2 Compliance Well)	Semi-Annual	VOC	Long-term monitoring conducted to verify attainment of GW-2 Performance Standards for VOCs.
J-1R	GW-3 Perimeter (GW-3 Compliance Well)	Semi-Annual	PCB	Long-term monitoring conducted to verify attainment of GW-3 Performance Standards for PCBs
OJ-MW-1	Groundwater Elevation Monitoring (Upgradient well)	None	None	Utilized solely as groundwater elevation monitoring point.
OJ-MW-2	GW-2 Sentinel/GW-3 Perimeter (GW-2/GW-3 Compliance Well)	Semi-Annual	VOC	Long-term monitoring conducted to verify attainment of GW-2 Performance Standards for VOCs.
Staff Gauge	Surface Water Elevation Monitoring	None	None	Utilized solely as surface water elevation monitoring point.

Notes:

1. The above wells were sampled for the listed parameters during the long-term groundwater quality sampling event conducted in fall 2007.
2. The remaining wells and staff gauge were utilized for groundwater and surface water elevation monitoring only.

Table 2
Monitoring Well Construction

Groundwater Managment Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts

Well Number	Survey Coordinates		Well Diameter (inches)	Ground Surface Elevation (feet AMSL)	Measuring Point Elevation (feet AMSL)	Depth to Top of Screen (feet BGS)	Screen Length (feet)	Top of Screen Elevation (feet AMSL)	Base of Screen Elevation (feet AMSL)	Average Depth to Groundwater (feet BGS)	Average Groundwater Elevation (feet AMSL)
	Northing	Easting									
GMA2-1	534402.60	135510.20	2.00	988.30	991.36	13.80	10.00	974.50	964.50	12.26	976.04
GMA2-2	534264.30	135725.00	2.00	988.10	991.19	12.94	10.00	975.16	965.16	13.95	974.15
GMA2-3	534303.30	135295.50	2.00	991.59	991.48	8.59	10.00	983.00	973.00	14.70	976.89
GMA2-4	534167.60	135730.00	2.00	980.30	983.41	5.20	10.00	975.10	965.10	5.57	974.73
GMA2-5	533956.60	135712.80	2.00	986.11	985.85	5.98	10.00	980.13	970.13	9.99	976.12
GMA2-6	534296.40	135526.00	2.00	986.30	989.73	10.13	10.00	976.17	966.17	11.46	974.84
GMA2-7	534452.30	136034.50	2.00	989.84	989.64	8.49	10.00	981.35	971.35	14.80	975.04
GMA2-8	534235.50	135923.10	2.00	978.70	982.30	4.00	10.00	974.70	964.70	4.46	974.24
GMA2-9	534006.00	135431.40	2.00	978.10	981.29	4.00	10.00	974.10	964.10	4.11	973.99
GMA2-10	534313.80	135583.00	2.00	987.70	990.03	9.00	10.00	978.70	968.70	13.52	974.18
J-1R	534035.60	135266.60	2.00	988.61	988.25	11.55	10.00	977.06	967.06	14.93	973.68
OJ-MW-1	534463.40	136305.70	1.00	994.68	994.47	9.30	10.00	985.38	975.38	12.81	981.87
OJ-MW-2	534318.38	136180.30	1.00	991.90	991.64	9.60	10.00	982.30	972.30	14.42	977.48
Staff Gauge	--	--	--	--	989.82	--	--	--	--	--	973.28

Notes:

1. feet AMSL = feet above mean sea level.
2. feet BGS = feet below ground surface.
3. -- indicates that a value does not apply.

Table 3
Groundwater Elevation Data - Fall 2007

Groundwater Managment Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts

Well Number	Location	Spring 2007 (1) Groundwater Elevation
GMA2-1	Oxbow Area J	975.85
GMA2-2	Oxbow Area J	973.59
GMA2-3	Oxbow Area J	976.13
GMA2-4	Oxbow Area K	974.10
GMA2-5	Oxbow Area K	975.60
GMA2-6	Oxbow Area J	974.36
GMA2-7	Oxbow Area J	974.43
GMA2-8	Oxbow Area K	973.74
GMA2-9	Oxbow Area K	973.41
J-1R	Oxbow Area J	973.30
OJ-MW-1	Oxbow Area J	981.69
OJ-MW-2	Oxbow Area J	978.19
Staff Gauge	Housatonic River	972.77

Note:

1. Fall 2007 Groundwater elevation data was collected on 11/01/07, river elevation data was collected on 11/02/07.

Table 4
Field Parameter Measurements - Fall 2007

Groundwater Managment Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company-Pittsfield, Massachusetts

Well Number	Turbidity (NTU)	Temperature (Degrees Celsius)	pH (Standard Units)	Specific Conductivity (mS/cm)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)
GMA 2-1	1.00	12.50	7.06	1.589	277.1	0.69
GMA 2-2	3.00	12.26	6.98	1.566	-103.2	0.59
GMA 2-3	4.00	11.99	6.87	5.050	104.1	2.56
GMA 2-4	1.00	11.69	6.84	0.640	-70.8	0.28
GMA 2-6	2.00	14.03	5.22	1.322	-62.8	0.49
GMA 2-9	2.00	11.45	7.50	0.431	64.4	3.47
GMA2-10	4.00	10.25	6.65	1.482	34.7	0.69
J-1R	2.00	10.67	5.04	1.716	121.0	0.49
OJ-MW-2	1.00	13.16	6.56	1.008	200.4	1.16

Notes:

1. Measurements collected during fall 2007 groundwater sampling event performed between November 9 and December 18, 2007.
2. Well parameters were generally monitored continuously during purging by low-flow techniques. Final parameter readings are presented.
3. NTU - Nephelometric Turbidity Units.
4. mS/cm - Millisiemens per centimeter.
5. mV - Millivolts.
6. mg/L - Milligrams per liter (ppm).

Table 5
Comparison of Groundwater Analytical Results to MCP Method 1 GW-2 Standards

Groundwater Managment Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Date Collected:	Method 1 GW-2 Standards	GMA2-10 12/18/07	OJ-MW-2 11/15/07
Volatile Organics			
2-Chloroethylvinylether	Not Listed	ND(0.013) J	R [ND(0.013) J]
trans-1,2-Dichloroethene	0.09	0.00034 J	ND(0.0010) [ND(0.0010)]
Trichloroethene	0.03	ND(0.0010)	0.015 [0.015]
Vinyl Chloride	0.002	0.00047 J	ND(0.0010) [ND(0.0010)]
Total VOCs	5	0.00081 J	0.015 [0.015]

Notes:

1. Samples were collected by ARCADIS, and submitted to SGS Environmental Services, Inc. for analysis of volatiles and PCBs (filtered).
2. Samples have been validated as per Field Sampling Plan/Quality Assurance Project Plan (FSP/QAPP), General Electric Company, Pittsfield, Massachusetts, ARCADIS (approved March 15, 2007 and re-submitted March 30,
3. 2007).
4. Only volatiles are presented for the MCP Method 1 GW-2 Standards Comparison.
5. Only detected volatiles are summarized.
   Field duplicate sample results are presented in brackets.

Data Qualifiers:

Organics (volatiles)

J - Indicates that the associated numerical value is an estimated concentration.
R - Data was rejected due to a deficiency in the data generation process.

Table 6
Comparison of Groundwater Analytical Results to MCP Method 1 GW-3 Standards

Groundwater Managment Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Sample ID: / Parameter / Date Collected:	Method 1 GW-3 Standards	GMA2-1 11/14/07	GMA2-2 11/14/07	GMA2-3 11/09/07	GMA2-4 11/14/07	GMA2-6 11/09/07
Volatile Organics						
2-Chloroethylvinylether	Not Listed	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	50	NA	NA	NA	NA	NA
Trichloroethene	5	NA	NA	NA	NA	NA
Vinyl Chloride	50	NA	NA	NA	NA	NA
PCBs-Filtered						
Aroclor-1016	Not Listed	ND(0.000065)	ND(0.000065)	ND(0.000065) J	ND(0.000065)	ND(0.000065) J
Aroclor-1221	Not Listed	ND(0.000065)	ND(0.000065)	ND(0.000065) J	ND(0.000065)	ND(0.000065) J
Aroclor-1232	Not Listed	ND(0.000065)	ND(0.000065)	ND(0.000065) J	ND(0.000065)	ND(0.000065) J
Aroclor-1242	Not Listed	ND(0.000065)	ND(0.000065)	ND(0.000065) J	ND(0.000065)	ND(0.000065) J
Aroclor-1248	Not Listed	ND(0.000065)	ND(0.000065)	ND(0.000065) J	ND(0.000065)	ND(0.000065) J
Aroclor-1254	Not Listed	ND(0.000065)	ND(0.000065)	ND(0.000065) J	ND(0.000065)	ND(0.000065) J
Aroclor-1260	Not Listed	ND(0.000065)	ND(0.000065)	ND(0.000065) J	ND(0.000065)	ND(0.000065) J
Total PCBs	0.0003	ND(0.000065)	ND(0.000065)	ND(0.000065) J	ND(0.000065)	ND(0.000065) J

Table 6
Comparison of Groundwater Analytical Results to MCP Method 1 GW-3 Standards

Groundwater Managment Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Date Collected:	Method 1 GW-3 Standards	GMA2-9 11/14/07	GMA2-10 12/18/07	J-1R 11/09/07	OJ-MW-2 11/15/07
Volatile Organics					
2-Chloroethylvinylether	Not Listed	NA	ND(0.013) J	NA	R [ND(0.013) J]
trans-1,2-Dichloroethene	50	NA	0.00034 J	NA	ND(0.0010) [ND(0.0010)]
Trichloroethene	5	NA	ND(0.0010)	NA	0.015 [0.015]
Vinyl Chloride	50	NA	0.00047 J	NA	ND(0.0010) [ND(0.0010)]
PCBs-Filtered					
Aroclor-1016	Not Listed	ND(0.000065)	NA	ND(0.000065) J	NA
Aroclor-1221	Not Listed	ND(0.000065)	NA	ND(0.000065) J	NA
Aroclor-1232	Not Listed	ND(0.000065)	NA	ND(0.000065) J	NA
Aroclor-1242	Not Listed	ND(0.000065)	NA	ND(0.000065) J	NA
Aroclor-1248	Not Listed	ND(0.000065)	NA	ND(0.000065) J	NA
Aroclor-1254	Not Listed	ND(0.000065)	NA	ND(0.000065) J	NA
Aroclor-1260	Not Listed	ND(0.000065)	NA	ND(0.000065) J	NA
Total PCBs	0.0003	ND(0.000065)	NA	ND(0.000065) J	NA

Notes:
1. Samples were collected by ARCADIS, and submitted to SGS Environmental Services, Inc. for analysis of volatiles and PCBs (filtered).
2. Samples have been validated as per Field Sampling Plan/Quality Assurance Project Plan (FSP/QAPP), General Electric Company, Pittsfield, Massachusetts, ARCADIS (approved March 15, 2007 and re-submitted March 30, 2007).
3. NA - Not Analyzed.
4. ND - Analyte was not detected. The number in parenthesis is the associated detection limit.
5. Field duplicate sample results are presented in brackets.
6. Only those constituents detected in one or more samples are summarized.
7. -- Indicates that all constituents for the parameter group were not detected.

Data Qualifiers:

Organics (volatiles, PCBs)
J - Indicates that the associated numerical value is an estimated concentration.
R - Data was rejected due to a deficiency in the data generation process.

Table 7
Comparison of Groundwater Analytical Results to MCP UCLs for Groundwater

Groundwater Managment Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Sample ID: / Parameter / Date Collected:	MCP UCL for GroundWater	GMA2-1 11/14/07	GMA2-2 11/14/07	GMA2-3 11/09/07	GMA2-4 11/14/07	GMA2-6 11/09/07
Volatile Organics						
2-Chloroethylvinylether	Not Listed	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	100	NA	NA	NA	NA	NA
Trichloroethene	50	NA	NA	NA	NA	NA
Vinyl Chloride	100	NA	NA	NA	NA	NA
PCBs-Filtered						
Aroclor-1016	Not Listed	ND(0.000065)	ND(0.000065)	ND(0.000065) J	ND(0.000065)	ND(0.000065) J
Aroclor-1221	Not Listed	ND(0.000065)	ND(0.000065)	ND(0.000065) J	ND(0.000065)	ND(0.000065) J
Aroclor-1232	Not Listed	ND(0.000065)	ND(0.000065)	ND(0.000065) J	ND(0.000065)	ND(0.000065) J
Aroclor-1242	Not Listed	ND(0.000065)	ND(0.000065)	ND(0.000065) J	ND(0.000065)	ND(0.000065) J
Aroclor-1248	Not Listed	ND(0.000065)	ND(0.000065)	ND(0.000065) J	ND(0.000065)	ND(0.000065) J
Aroclor-1254	Not Listed	ND(0.000065)	ND(0.000065)	ND(0.000065) J	ND(0.000065)	ND(0.000065) J
Aroclor-1260	Not Listed	ND(0.000065)	ND(0.000065)	ND(0.000065) J	ND(0.000065)	ND(0.000065) J
Total PCBs	0.005	ND(0.000065)	ND(0.000065)	ND(0.000065) J	ND(0.000065)	ND(0.000065) J

Table 7
Comparison of Groundwater Analytical Results to MCP UCLs for Groundwater

Groundwater Managment Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Date Collected:	MCP UCL for GroundWater	GMA2-9 11/14/07	GMA2-10 12/18/07	J-1R 11/09/07	OJ-MW-2 11/15/07
Volatile Organics					
2-Chloroethylvinylether	Not Listed	NA	ND(0.013) J	NA	R [ND(0.013) J]
trans-1,2-Dichloroethene	100	NA	0.00034 J	NA	ND(0.0010) [ND(0.0010)]
Trichloroethene	50	NA	ND(0.0010)	NA	0.015 [0.015]
Vinyl Chloride	100	NA	0.00047 J	NA	ND(0.0010) [ND(0.0010)]
PCBs-Filtered					
Aroclor-1016	Not Listed	.000065) [ND(0.000	NA	ND(0.000065) J	NA
Aroclor-1221	Not Listed	.000065) [ND(0.000	NA	ND(0.000065) J	NA
Aroclor-1232	Not Listed	.000065) [ND(0.000	NA	ND(0.000065) J	NA
Aroclor-1242	Not Listed	.000065) [ND(0.000	NA	ND(0.000065) J	NA
Aroclor-1248	Not Listed	.000065) [ND(0.000	NA	ND(0.000065) J	NA
Aroclor-1254	Not Listed	.000065) [ND(0.000	NA	ND(0.000065) J	NA
Aroclor-1260	Not Listed	.000065) [ND(0.000	NA	ND(0.000065) J	NA
Total PCBs	0.005	.000065) [ND(0.000	NA	ND(0.000065) J	NA

Notes:
1. Samples were collected by ARCADIS, and submitted to SGS Environmental Services, Inc. for analysis of volatiles and PCBs (filtered).
2. Samples have been validated as per Field Sampling Plan/Quality Assurance Project Plan (FSP/QAPP), General Electric Company, Pittsfield, Massachusetts, ARCADIS (approved March 15, 2007 and re-submitted March 30, 2007).
3. NA - Not Analyzed.
4. ND - Analyte was not detected. The number in parenthesis is the associated detection limit.
5. Field duplicate sample results are presented in brackets.
6. Only those constituents detected in one or more samples are summarized.
7. -- Indicates that all constituents for the parameter group were not detected.

Data Qualifiers:

Organics (volatiles, PCBs)
J - Indicates that the associated numerical value is an estimated concentration.
R - Data was rejected due to a deficiency in the data generation process.

Table 8
Summary Of Historical Groundwater Analytical Results For Cobalt and Copper

Groundwater Management Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Well ID	Detection Frequency	Minimum Detect	Maximum Detect	Median Value	Arithmetic Average	Geometric Mean	Standard Deviation
Cobalt - Filtered							
GMA2-1	0/4	ND	ND	0.0250	0.0250	0.0250	0
GMA2-2	1/4	0.002	0.002	0.0250	0.0193	0.0133	0.0115
GMA2-3	0/0	NA	NA	NA	NA	NA	NA
GMA2-4	0/4	ND	ND	0.0250	0.0250	0.0250	0
GMA2-5	1/4	0.0024	0.0024	0.0250	0.0194	0.0139	0.0113
GMA2-6	1/4	0.0016	0.0016	0.0250	0.0192	0.0126	0.0117
GMA2-7	0/4	ND	ND	0.0250	0.0250	0.0250	0
GMA2-8	0/4	ND	ND	0.0250	0.0250	0.0250	0
GMA2-9	0/4	ND	ND	0.0250	0.0250	0.0250	0
J-1R	0/4	ND	ND	0.0250	0.0250	0.0250	0
OJ-MW-2	1/4	0.0029	0.0029	0.0250	0.0195	0.0146	0.0111
Copper - Filtered							
GMA2-1	2/4	0.0015	0.0045	0.00875	0.00800	0.00581	0.00590
GMA2-2	0/4	ND	ND	0.0130	0.0223	0.0182	0.0185
GMA2-3	0/0	NA	NA	NA	NA	NA	NA
GMA2-4	1/4	0.013	0.013	0.0130	0.0223	0.0182	0.0185
GMA2-5	2/4	0.0025	0.0034	0.00820	0.0172	0.00862	0.0224
GMA2-6	0/4	ND	ND	0.0130	0.0223	0.0182	0.0185
GMA2-7	1/4	0.0017	0.0037	0.0130	0.0197	0.0123	0.0208
GMA2-8	0/4	ND	ND	0.0130	0.0223	0.0182	0.0185
GMA2-9	0/4	ND	ND	0.0130	0.0223	0.0182	0.0185
J-1R	0/4	ND	ND	0.0130	0.0223	0.0182	0.0185
OJ-MW-2	2/4	0.0035	0.0057	0.00935	0.0182	0.0110	0.0216

Notes

1. Samples were collected by ARCADIS and submitted to SGS Environmental Services, Inc. for analysis.
2. NA - Not Analyzed.
3. ND - Analyte was not detected.

Table 9
Proposed Long Term Groundwater Monitoring Program Activities - Spring 2008

Groundwater Managment Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts

Well Number	Monitoring Well Usage	Sampling Schedule	Fall 2007 Analyses	Comments
GMA2-1	GW-3 Perimeter (GW-3 Compliance Well)	Semi-Annual	PCB	Additional long-term sampling to be conducted to verify attainment of GW-3 Performance Standards for PCBs
GMA2-2	GW-2 Sentinel/GW-3 Perimeter (GW-3 Compliance Well)	Semi-Annual	PCB	Additional long-term sampling to be conducted to verify attainment of GW-3 Performance Standards for PCBs
GMA2-3	GW-2 Sentinel/GW-3 Perimeter (Upgradient Well)	Semi-Annual	PCB	Additional long-term sampling to be conducted to verify attainment of GW-3 Performance Standards for PCBs
GMA2-4	GW-3 Perimeter (GW-3 Compliance Well)	Semi-Annual	PCB	Additional long-term sampling to be conducted to verify attainment of GW-3 Performance Standards for PCBs
GMA2-6	GW-3 Perimeter (GW-3 Compliance Well)	Semi-Annual	PCB	Additional long-term sampling to be conducted to verify attainment of GW-3 Performance Standards for PCBs
GMA2-9	GW-3 Perimeter (GW-3 Compliance Well)	Semi-Annual	PCB	Additional long-term sampling to be conducted to verify attainment of GW-3 Performance Standards for PCBs
GMA2-10	GW-2 Sentinel (GW-2 Compliance Well)	Semi-Annual	VOC	Additional long-term sampling to be conducted to verify attainment of GW-2 Performance Standards for VOCs.
J-1R	GW-3 Perimeter (GW-3 Compliance Well)	Semi-Annual	PCB	Additional long-term sampling to be conducted to verify attainment of GW-3 Performance Standards for PCBs
OJ-MW-2	GW-2 Sentinel/GW-3 Perimeter (GW-2/GW-3 Compliance Well)	Semi-Annual	VOC	Additional long-term sampling to be conducted to verify attainment of GW-2 Performance Standards for VOCs.

Notes:

1. The wells proposed for long-term groundwater quality sampling under a semi-annual schedule will be sampled for the listed parameters during the spring and fall seasons, generally during the months of April and October. The next scheduled sampling round is proposed to be conducted in spring 2008.
2. Only wells subject to long-term groundwater quality sampling are listed above. The remaining wells and staff gauge listed in Table 1 will continue to be utilized for groundwater and surface water elevation monitoring only.

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Figures

LEGEND:

GMA1	GMA 1–PLANT SITE 1
GMA2	GMA 2–FORMER OXBOWS J&K
GMA3	GMA 3–PLANT SITE 2
GMA4	GMA 4–PLANT SITE 3
GMA5	GMA 5–FORMER OXBOWS A&C

NOTES:

1. MAPPING IS BASED ON AERIAL PHOTOGRAPHS AND PHOTOGRAMMETRIC MAPPING BY LOCKWOOD MAPPING, INC. – FLOWN IN APRIL 1990; DATA PROVIDED BY GENERAL ELECTRIC COMPANY; AND BLASLAND & BOUCK ENGINEERS, P.C. CONSTRUCTION PLANS.
2. NOT ALL PHYSICAL FEATURES SHOWN.
3. SITE BOUNDARIES/LIMITS ARE APPROXIMATE.

0 500' 1000'
GRAPHIC SCALE

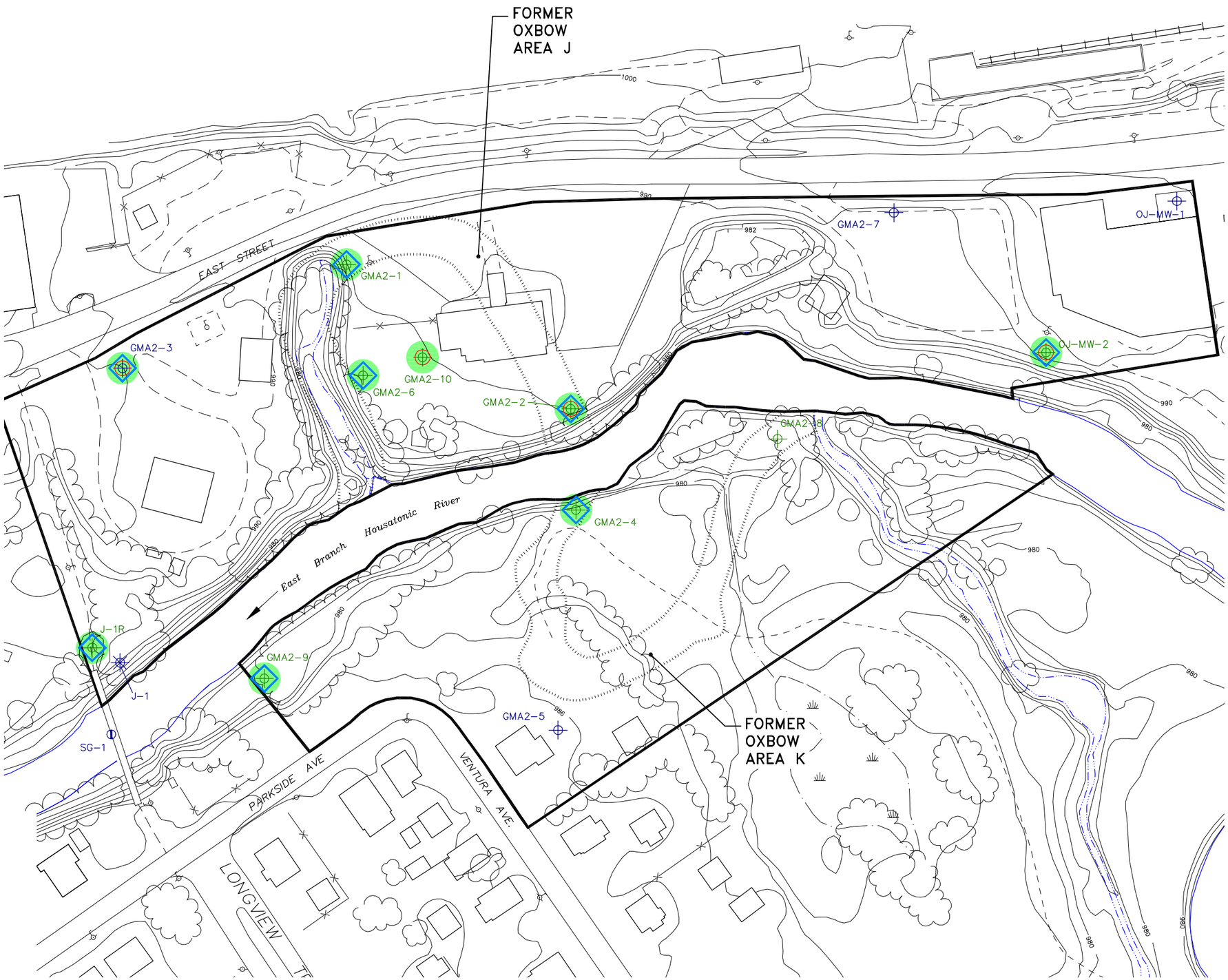
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
GMA 2 GROUNDWATER QUALITY MONITORING PROGRAM

GROUNDWATER MANAGEMENT AREAS

ARCADIS

FIGURE
1

CITY:SYRACUSE DIV/GROUP:85 DB:PGL PGL.LAF LD:DMW PIC: PM:K.CORNWELL TM: LYR:ON=*;OFF=*REF* ACADVER: 17.0S (LMS TECH) PAGESETUP: C4L02B-PDF PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 3/19/2008 9:52 AM BY: FORAKER, LYDIA
\\NY4FILE3\Data\CADGIS-CADD\ACTIVE\60301540\000\0004\DWG\301548\1.DWG LAYOUT: 1 SAVED: 3/17/2008 9:49 AM
XREFS: IMAGES: PROJECTNAME: ---
301542X00



LEGEND:

- GMA 2 BOUNDARY
- FORMER OXBOW/LOW-LYING AREA
- FENCE
- MONITORING WELL (OR)
- STAFF GUAGE
- GW-2 SENTINEL/COMPLIANCE WELL
- GW-3 PERIMETER WELL
- GW-3 COMPLIANCE POINT
- WELL SAMPLED IN FALL 2007
- DECOMMISIONED MONITORING WELL

NOTES:

1. MAPPING IS BASED ON AERIAL PHOTOGRAPHS AND PHOTOGRAMMETRIC MAPPING BY LOCKWOOD MAPPING, INC. FLOWN IN APRIL 1990; DATA PROVIDED BY GENERAL ELECTRIC COMPANY AND BLASLAND AND BOUCK ENGINEERS, P.C. CONSTRUCTION PLANS.
2. FORMER RIVER CHANNEL AND LOWLAND AREAS DELINEATED USING THE CITY OF PITTSFIELD'S RECHANNELIZATION MAPPING, 1940.
3. NOT ALL PHYSICAL FEATURES SHOWN.
4. SITE PROPERTY BOUNDARIES ARE APPROXIMATE.
5. ALL MONITORING WELL LOCATIONS ARE APPROXIMATE.

0 50' 100'
GRAPHIC SCALE

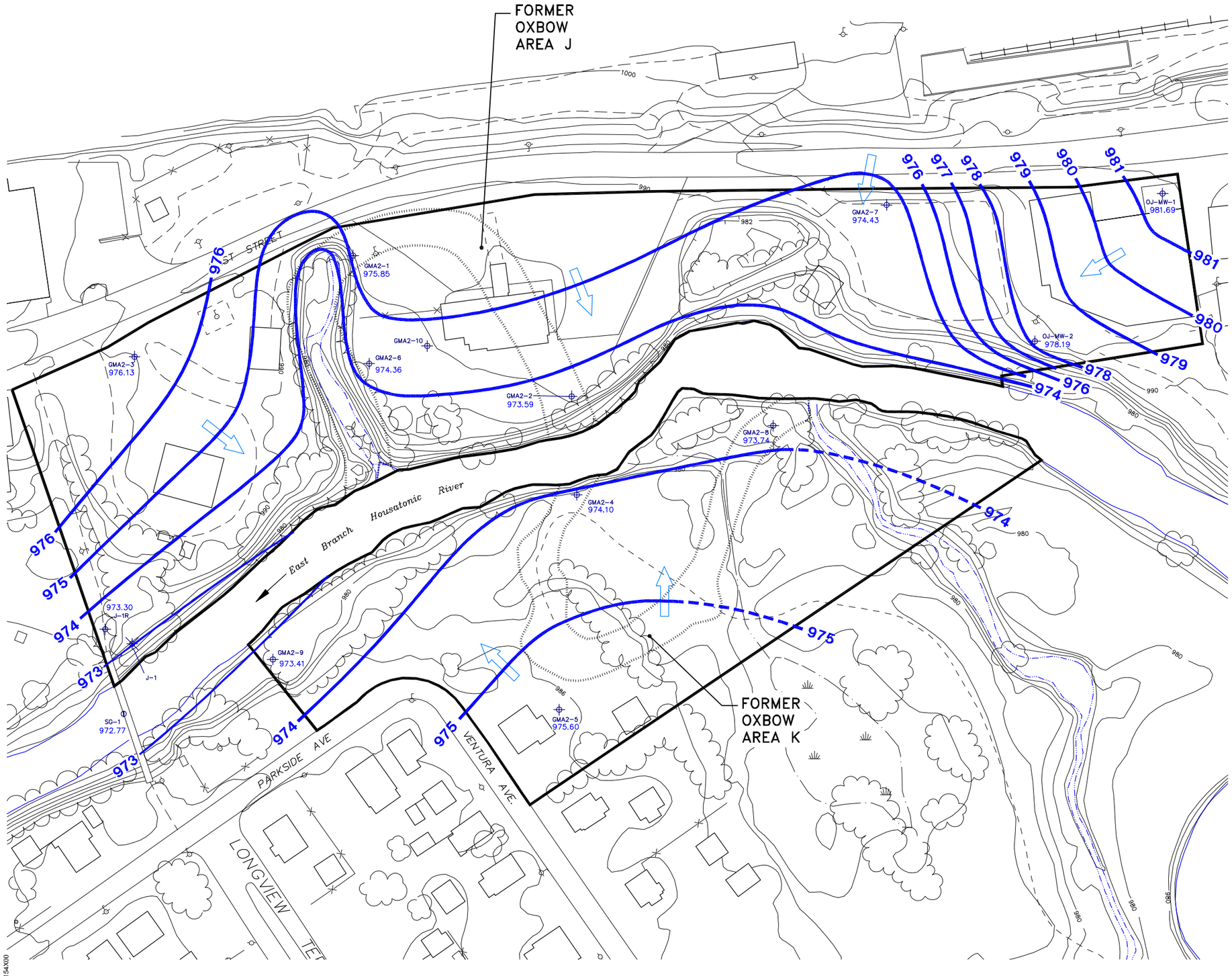
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
GMA 2 GROUNDWATER QUALITY MONITORING PROGRAM

MONITORING WELL LOCATIONS

ARCADIS

FIGURE
2

CITY: SYRACUSE DIV/GROUP: 85 DB: PGL PGL LAF LD: DMW PIC: PM: K. CORNWELL TM: LYR: ON=*;OFF=*REF*
\\NY4FILE3\Data\CAD\GE-CAD\NACTIB\60301549\0000000044\DWG\60154B12.DWG LAYOUT: 2 SAVED: 3/17/2008 9:49 AM ACADVER: 17.0S (LMS TECH) PAGESETUP: C4L02B-PDF PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 3/19/2008 9:52 AM BY: FORAKER, LYDIA
XREFS:
30154X01
30154X00
IMAGES:
PROJECTNAME: --



LEGEND:

- GMA 2 BOUNDARY
- FORMER OXBOW/LOW-LYING AREA
- FENCE
- MONITORING WELL
- STAFF GAUGE
- DECOMMISIONED MONITORING WELL
- 976.13 GROUNDWATER ELEVATION (FT AMSL)
- 976 GROUNDWATER ELEVATION CONTOUR (FT AMSL), DASHED WHERE INFERRED
- GROUNDWATER FLOW

NOTES:

1. MAPPING IS BASED ON AERIAL PHOTOGRAPHS AND PHOTOGRAMMETRIC MAPPING BY LOCKWOOD MAPPING, INC. FLOWN IN APRIL 1990; DATA PROVIDED BY GENERAL ELECTRIC COMPANY AND BLASLAND AND BOUCK ENGINEERS, P.C. CONSTRUCTION PLANS.
2. FORMER RIVER CHANNEL AND LOWLAND AREAS DELINEATED USING THE CITY OF PITTSFIELD'S RECHANNELIZATION MAPPING, 1940.
3. NOT ALL PHYSICAL FEATURES SHOWN.
4. SITE PROPERTY BOUNDARIES ARE APPROXIMATE.
5. ALL MONITORING WELL LOCATIONS ARE APPROXIMATE.
6. GROUNDWATER AND RIVER LEVEL MEASUREMENTS OBTAINED OCTOBER 30–31, 2007.

0 50' 100'
GRAPHIC SCALE

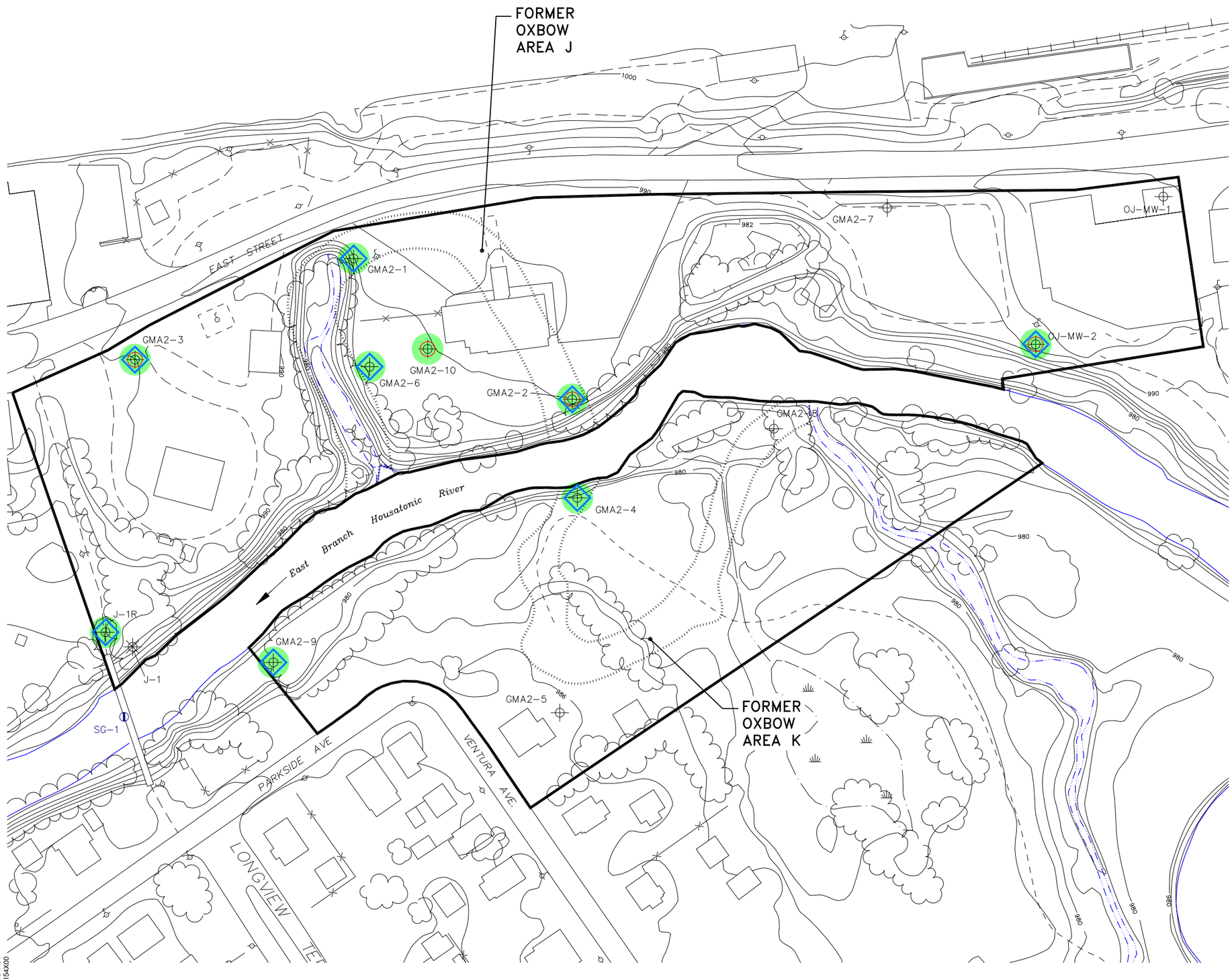
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
GMA 2 GROUNDWATER QUALITY MONITORING PROGRAM

WATER TABLE CONTOUR MAP - FALL 2007

ARCADIS

FIGURE 3

CITY: SYRACUSE DIV/GROUP: 85 DB: PGL PGL LAF LD: DMW PIC: PM: K. CORNWELL TM: LYR: ON=*;OFF=*REF* ACADVER: 17.0S (LMS TECH) PAGESETUP: C4-D2B-PDF PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 3/19/2008 9:53 AM BY: FORAKER, LYDIA
\\NY4FILE3\Data\CAD\GE-CAD\N-ACT\B0\30154\0\0\0\0\0\0\04\DWG\30154W16.DWG LAYOUT: 3 SAVED: 3/17/2008 9:48 AM ACADVER: 17.0S (LMS TECH)
XREFS: 30154X01 30154X00 IMAGES: PROJECTNAME: --



LEGEND:

- GMA 2 BOUNDARY
- FORMER OXBOW/LOW-LYING AREA
- FENCE
- MONITORING WELL
- STAFF GUAGE
- GW-2 SENTINEL/COMPLIANCE WELL
- GW-3 PERIMETER WELL
- WELL TO BE SAMPLED IN SPRING 2008
- DECOMMISIONED MONITORING WELL

NOTES:

1. MAPPING IS BASED ON AERIAL PHOTOGRAPHS AND PHOTOGRAMMETRIC MAPPING BY LOCKWOOD MAPPING, INC. FLOWN IN APRIL 1990; DATA PROVIDED BY GENERAL ELECTRIC COMPANY AND BLASLAND AND BOUCK ENGINEERS, P.C. CONSTRUCTION PLANS.
2. FORMER RIVER CHANNEL AND LOWLAND AREAS DELINEATED USING THE CITY OF PITTSFIELD'S RECHANNELIZATION MAPPING, 1940.
3. NOT ALL PHYSICAL FEATURES SHOWN.
4. SITE PROPERTY BOUNDARIES ARE APPROXIMATE.
5. ALL MONITORING WELL LOCATIONS ARE APPROXIMATE.

0 50' 100'
GRAPHIC SCALE

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS
GMA 2 GROUNDWATER QUALITY MONITORING PROGRAM

PROPOSED SPRING 2008 GROUNDWATER MONITORING PROGRAM

ARCADIS

FIGURE 4

CITY: SYRACUSE DIV/GROUP: 85 DB: PGL PGL.LAF LD: DMW PIC: PM: K. CORNWELL TM: LYR: ON=*;OFF=*REF*
G:\CAD\GE-CADIN-ACTIB\003015410000\0000041DWG\30154B13.DWG LAYOUT: 4 SAVED: 3/20/2008 2:01 PM ACADVER: 17.0S (LMS TECH) PAGESETUP: ---
XREFS: 30154X01 30154X00 IMAGES: PROJECTNAME: ---

Appendices

ARCADIS

Appendix A

Field Sampling Data

Table A-1
Summary of Groundwater Sampling Methods

Groundwater Management Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts

Well ID	Sampling Method									
	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004	Fall 2005	Spring 2006	Fall 2006	Spring 2007	Fall 2007
GMA2-1	BP	PP	PP	BP	BP	BP	BP	BP	BP	BP
	Spring 2007: Field parameters stabilized, but affected by extreme cold temperatures on the date of sampling (wind chill of negative 15 to 20 degrees Fahrenheit). Fall 2002: Flow-through turbidity meter malfunction; Hach meter used to measure turbidity.									
GMA2-2	PP/BA	PP	BP	BP	NS	NS	NS	NS	NS	BP
	Fall 2002: Flow-through turbidity meter malfunction; Hach meter used to measure turbidity. Spring 2002: VOCs collected with a disposable teflon bailer.									
GMA2-3	PP/BA	PP	PP	PP	NS	NS	NS	NS	NS	PP
	Spring 2002: VOCs collected with a disposable teflon bailer.									
GMA2-4	PP	PP	PP	PP	BP	BP	BP	NS	NS	BP
	Spring 2006: 4/11/2006 sample mishandled by laboratory. Well re-sampled on 4/19/2006. Fall 2002: Dissolved oxygen meter malfunction. Spring 2002: Dissolved oxygen meter malfunction.									
GMA2-6	PP	PP	PP	PP	NS	NS	NS	NS	NS	PP
	Spring 2002: Dissolved oxygen meter malfunction.									
GMA2-9	BP	PP	PP	PP	BP	BP	BP	NS	NS	BP
	Spring 2002: Flow-through turbidity meter malfunction; Hach meter used to measure turbidity.									
GMA2-10	NS	NS	NS	NS	NS	NS	NS	NS	NS	BP
	Fall 2007: Well installed and added to monitoring program.									
J-1R	BP	PP	PP	PP	NS	NS	NS	NS	NS	PP
	Fall 2002: Dissolved oxygen meter malfunction. Spring 2002: Dissolved oxygen meter malfunction; Hach meter used to measure turbidity.									
OJ-MW-2	PP/BA	PP	NS	PP	PP	NS	NS	NS	NS	PP
	Fall 2007: Water level too close to pump intake to measure during purging. Well dried during purging, sample collected after recharge. Spring 2003: Access to well was denied by property owner. Fall 2002: Well went dry during sampling. Several visits required to collect full sample volume. Spring 2002: VOCs collected with a disposable teflon bailer.									

Notes:

1. Sampling method abbreviations:
   BP - Bladder Pump.
   PP - Peristaltic Pump.
   PP/BA - Peristaltic Pump with Bailer used for VOC sample collection.
   NS - Not Sampled.
2. Baseline monitoring program conducted from spring 2002 to fall 2003.
3. Interim/baseline sampling conducted at select wells from spring 2004 to spring 2007.
4. Long-term monitoring program initiated in fall 2007.

GROUNDWATER SAMPLING LOG

Well No. GMA2-1
Key No. Ex-37
PID Background (ppm) –
Well Headspace (ppm) –

Site/GMA Name GMA2/GE Pittsfield
Sampling Personnel KIC
Date 10/4/07
Weather Sunny 40's

WELL INFORMATION

Reference Point Marked? Y N
Height of Reference Point _____ Meas. From _____
Well Diameter 2"
Screen Interval Depth 13.8-23.8 Meas. From Ground
Water Table Depth 15.58 Meas. From TIC
Well Depth 27.16 Meas. From TIC
Length of Water Column 11.58'
Volume of Water in Well 1.89 gallons
Intake Depth of Pump/Tubing ~19 Meas. From TIC

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Redevelop? Y (N)

Sample Time 1045
Sample ID GMA2-1
Duplicate ID —
MS/MSD —
Split Sample ID —

Required	Analytical Parameters:	Collected
( )	VOCs (Std. list)	( )
( )	VOCs (Exp. list)	( )
( )	SVOCs	( )
( )	PCBs (Total)	( )
(X)	PCBs (Dissolved)	(X)
( )	Metals/Inorganics (Total)	( )
( )	Metals/Inorganics (Dissolved)	( )
( )	EPA Cyanide (Dissolved)	( )
( )	PAC Cyanide (Dissolved)	( )
( )	PCDDs/PCDFs	( )
( )	Pesticides/Herbicides	( )
( )	Natural Attenuation	( )
( )	Other (Specify)	( )

EVACUATION INFORMATION

Pump Start Time 0935
Pump Stop Time 1100
Minutes of Pumping 85
Volume of Water Removed 2.75 gallons
Did Well Go Dry? Y (N)

Evacuation Method: Bailer ( ) Bladder Pump (X)
Peristaltic Pump ( ) Submersible Pump ( ) Other/Specify ( )
Pump Type: Marschalk's System One
Samples collected by same method as evacuation? (Y) N (specify)

Water Quality Meter Type(s) / Serial Numbers: YSI-556 MPS Hach 2100P Turbidimeter

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	Sp. Cond. (mS/cm) [3%]*	Turbidity (NTU) [10% or 1 NTU]*	DO (mg/l) [10% or 0.1 mg/l]*	ORP (mV) [10 mV]*
0940	300	0.40	16.91				39		
0945	150	0.60	16.04	11.38	7.09	1.481	17	2.11	322.8
0950	100	0.73	16.04	11.45	7.15	1.491	10	1.60	323.1
0955	100	0.86	15.94	11.63	7.11	1.518	7	1.23	322.9
1000	150	1.06	15.89	11.93	7.07	1.537	7	1.13	320.2
1006	150	1.26	15.88	12.04	7.10	1.557	3	1.00	316.1
1010	↓	1.46	15.88	12.34	7.07	1.570	3	0.90	309.1
1015	↓	1.66	15.88	12.27	7.[illegible]	1.576	2	0.84	305.3

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS

SAMPLE DESTINATION

Laboratory: SGS
Delivered Via: UPS
Airbill #: —

Field Sampling Coordinator: [signature]

GROUNDWATER SAMPLING LOG

Well No. GMA2-1

Site/GMA Name GMA2/GG Pitts Field
Sampling Personnel KLC
Date 11/14/07
Weather Sunny 40's

WELL INFORMATION - See Page 1

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	Sp. Cond. (mS/cm) [3%]*	Turbidity (NTU) [10% or 1 NTU]*	DO (mg/l) [10% or 0.1 mg/l]*	ORP (mV) [10 mV]*
1020	100	1.79	15.84	12.28	7.07	1.580	1	0.78	300.2
1025	↓	1.92	15.85	12.38	7.06	1.580	1	0.75	294.4
1030	↓	2.05	15.85	12.43	7.06	1.585	0	0.70	285.1
1035	↓	2.18	15.84	12.48	7.06	1.586	1	0.71	281.6
1040	↓	2.31	15.79	12.50	7.06	1.589	1	0.69	277.1
1045	Sampled at 1045 ←								

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS

GROUNDWATER SAMPLING LOG

Well No. GMA2-2. Site/GMA Name GMA-2
Key No. FX-37 Sampling Personnel RKU, RAB
PID Background (ppm) 0 Date 11/14/07
Well Headspace (ppm) 0 Weather Clear High 20's

WELL INFORMATION

Reference Point Marked? Y N
Height of Reference Point _____ Meas. From _____
Well Diameter 2"
Screen Interval Depth 12.94-22.94 Meas. From Ground
Water Table Depth 17.57 Meas. From TIC
Well Depth 25.16 Meas. From TIC
Length of Water Column 7.59'
Volume of Water in Well 1.24 gallon
Intake Depth of Pump/Tubing ~22' Meas. From TIC

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Redevelop? Y (N)

Sample Time 1010
Sample ID GMA2-2.
Duplicate ID —
MS/MSD —
Split Sample ID —

Required	Analytical Parameters:	Collected
( )	VOCs (Std. list)	( )
( )	VOCs (Exp. list)	( )
( )	SVOCs	( )
( )	PCBs (Total)	( )
(X)	PCBs (Dissolved)	(X)
( )	Metals/Inorganics (Total)	( )
( )	Metals/Inorganics (Dissolved)	( )
( )	EPA Cyanide (Dissolved)	( )
( )	PAC Cyanide (Dissolved)	( )
( )	PCDDs/PCDFs	( )
( )	Pesticides/Herbicides	( )
( )	Natural Attenuation	( )
( )	Other (Specify)	( )

EVACUATION INFORMATION

Pump Start Time 845
Pump Stop Time 1025
Minutes of Pumping 100
Volume of Water Removed 6.75 gallons
Did Well Go Dry? Y (N)

Evacuation Method: Bailer ( ) Bladder Pump (X)
Peristaltic Pump ( ) Submersible Pump ( ) Other/Specify ( )
Pump Type: Marschalk - System One
Samples collected by same method as evacuation? (Y) N (specify)

Water Quality Meter Type(s) / Serial Numbers: YSI-556 MPS Hach 2100P Turbidimeter

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	Sp. Cond. (mS/cm) [3%]*	Turbidity (NTU) [10% or 1 NTU]*	DO (mg/l) [10% or 0.1 mg/l]*	ORP (mV) [10 mV]*
8:50	650	0.86	—	—	—	—	8	—	—
9 05	300	2.04	17.59	12.22	6.84	1.598	8	10.13	-85.7
910	250	2.37	17.61	12.23	6.49	1.598	9	3.21	-74.5
915	250	2.70	17.61	12.17	6.60	1.603	9+0*	1.02	-82.6
920	250	3.03	17.61	12.12	6.66	1.596	8	0.65	-88.0
925	250	3.36	17.61	12.18	6.79	1.596	7	0.52	-94.9
930	250	3.69	17.62	12.16	6.84	1.588	7	0.84	-97.7
935	250	4.02	17.62	12.11	6.90	1.585	5	0.78	-98.9

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS 915 - Bottle Turbidity Bottle shaked wet, received

SAMPLE DESTINATION

Laboratory: SGS
Delivered Via: UPS
Airbill #: —

Field Sampling Coordinator: [signature]

GROUNDWATER SAMPLING LOG

Well No. GMA2-2

Site/GMA Name GMA2
Sampling Personnel RKY RAB
Date 11/14/07
Weather Sunny 1hr @ 30s

WELL INFORMATION - See Page 1

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	Sp. Cond. (mS/cm) [3%]*	Turbidity (NTU) [10% or 1 NTU]*	DO (mg/l) [10% or 0.1 mg/l]*	ORP (mV) [10 mV]*
940	250	4.35	17.62	12.24	6.93	1.579	5	0.99	-101.3
945		4.68	17.62	12.18	6.95	1.580	4	0.94	-102.0
950		5.01	17.62	12.32	6.95	1.570	4	0.81	-102.3
955		5.34	17.62	12.28	6.96	1.569	4	0.73	-102.6
1000		5.67	17.62	12.22	6.97	1.567	3	0.66	-102.2
1005		6.00	17.62	12.25	6.98	1.566	3	0.60	-103.0
1010		6.33	17.62	12.26	6.98	1.566	3	0.59	-103.2

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS

GROUNDWATER SAMPLING LOG

Well No. GMA2-3
Key No. —
PID Background (ppm) —
Well Headspace (ppm) —

Site/GMA Name GE Pittsfield / GMA2
Sampling Personnel KC
Date 11/9/07
Weather Part cloudy 50s

WELL INFORMATION

Reference Point Marked? (Y) N
Height of Reference Point ____ Meas. From ____
Well Diameter 2"
Screen Interval Depth 8.59-18.59 Meas. From Ground
Water Table Depth 15.88 Meas. From TIC
Well Depth 18.92 Meas. From TIC
Length of Water Column 3.06'
Volume of Water in Well 0.50 gallon
Intake Depth of Pump/Tubing ~17.5 Meas. From TIC

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Redevelop? Y (N)

Sample Time 1235
Sample ID GMA2-3
Duplicate ID —
MS/MSD —
Split Sample ID —

Required	Analytical Parameters:	Collected
( )	VOCs (Std. list)	( )
( )	VOCs (Exp. list)	( )
( )	SVOCs	( )
( )	PCBs (Total)	( )
(X)	PCBs (Dissolved)	(X)
( )	Metals/Inorganics (Total)	( )
( )	Metals/Inorganics (Dissolved)	( )
( )	EPA Cyanide (Dissolved)	( )
( )	PAC Cyanide (Dissolved)	( )
( )	PCDDs/PCDFs	( )
( )	Pesticides/Herbicides	( )
( )	Natural Attenuation	( )
( )	Other (Specify)	( )

EVACUATION INFORMATION

Pump Start Time 1050
Pump Stop Time 1250
Minutes of Pumping 120
Volume of Water Removed 4.75 gallons
Did Well Go Dry? Y (N)

Evacuation Method: Bailer ( ) Bladder Pump ( )
Peristaltic Pump (X) Submersible Pump ( ) Other/Specify ( )
Pump Type: Geopump 2
Samples collected by same method as evacuation? (Y) N (specify)

Water Quality Meter Type(s) / Serial Numbers: YSI-556 MPS Hach 2100P Turbidimeter

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	Sp. Cond. (mS/cm) [3%]*	Turbidity (NTU) [10% or 1 NTU]*	DO (mg/l) [10% or 0.1 mg/l]*	ORP (mV) [10 mV]*
1050	150	—	15.50	—	—	—	54	—	—
☆ 1055	150	0.20	15.68	—	—	—	49	—	—
1100	150	0.40	15.81	11.64	6.72	4.234	69	9.85	133.0
☆ 1105	100	0.53	15.88	11.61	6.74	4272	81	7.07	124
1110	100	0.66	15.89	—	—	—	110	—	—
1115	100	0.79	15.88	—	—	—	58	—	—
1120	100	0.92	15.88	—	—	—	32	—	—
1125	100	1.05	15.88	11.99	6.90	4.862	28	5.22	116.2

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS

-Soft bottom
1055 hooked up YSI
1105 turbidity 81, unhooked YSI. waited for turbidity to decrease. initial purge is cloudy yellow no odor.

SAMPLE DESTINATION

Laboratory: SGS
Delivered Via: UPS
Airbill #: —

Field Sampling Coordinator: [signature]

GROUNDWATER SAMPLING LOG

Well No. GMA2-3

Site/GMA Name GE Pittsfield/GMA2
Sampling Personnel KJC
Date 11/9/07
Weather 50's cloudy

WELL INFORMATION - See Page 1

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	Sp. Cond. (mS/cm) [3%]*	Turbidity (NTU) [10% or 1 NTU]*	DO (mg/l) [10% or 0.1 mg/l]*	ORP (mV) [10 mV]*
1130	150	1.25	15.88	12.12	6.86	4.842	23	3.36	114.4
1135	150	1.45	16.05	12.15	6.85	4.903	29	3.01	111.2
1140	150	1.65	16.11	12.15	6.86	4.956	29	2.95	109.2
1145	150	1.85	16.13	12.26	6.86	4.971	23	3.00	109.1
1150	150	2.05	16.14	12.18	6.87	4.997	18	3.10	106.6
1155	150	2.25	16.15	12.27	6.87	4.994	15	2.99	106.2
1200 ~~1175~~	150	2.45	16.15	12.39	6.87	5.013	13	2.93	105.2
1205	150	2.65	16.16	12.22	6.88	5.022	10	2.89	104.8
1210	150	2.85	16.16	12.21	6.89	5.024	8	2.82	104.2
(12)				~~12.09~~	~~6.88~~	~~5.030~~		~~2.78~~	
1215	150	3.05	16.17	11.97	6.87	5.039	6	2.63	104.1
1220	150	3.25	16.18	12.02	6.88	5.040	5	2.56	103.9
1225	150	3.45	16.20	11.95	6.87	5.051	4	2.55	104.0
1230	150	3.65		11.99	6.87	5.050	4	2.56	104.1
1235	→ Sampled ←								

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS

GROUNDWATER SAMPLING LOG

Well No. GMA2-4 | Site/GMA Name GMA2 / GG Pitts Rd(c)
Key No. Ex-37. | Sampling Personnel KLC
PID Background (ppm) 0 | Date 11/14/07
Well Headspace (ppm) 0 | Weather 60's Cloudy

WELL INFORMATION

Reference Point Marked? Y N
Height of Reference Point _____ Meas. From _____
Well Diameter 2"
Screen Interval Depth 5.2'-15.2' Meas. From Ground
Water Table Depth 9.30 Meas. From TIC
Well Depth 17.98 Meas. From TIC
Length of Water Column 8.68'
Volume of Water in Well 1.42 gallons
Intake Depth of Pump/Tubing ~15.00 Meas. From TIC

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Redevelop? Y (N)

Sample Time 1505
Sample ID GMA2-4
Duplicate ID _____
MS/MSD _____
Split Sample ID _____

Required	Analytical Parameters:	Collected
( )	VOCs (Std. list)	( )
( )	VOCs (Exp. list)	( )
( )	SVOCs	( )
( )	PCBs (Total)	( )
(X)	PCBs (Dissolved)	(X)
( )	Metals/Inorganics (Total)	( )
( )	Metals/Inorganics (Dissolved)	( )
( )	EPA Cyanide (Dissolved)	( )
( )	PAC Cyanide (Dissolved)	( )
( )	PCDDs/PCDFs	( )
( )	Pesticides/Herbicides	( )
( )	Natural Attenuation	( )
( )	Other (Specify)	( )

EVACUATION INFORMATION

Pump Start Time 1400
Pump Stop Time 1515
Minutes of Pumping 75
Volume of Water Removed ~3.0 gallons
Did Well Go Dry? Y (N)

Evacuation Method: Bailer ( ) Bladder Pump (X)
Peristaltic Pump ( ) Submersible Pump ( ) Other/Specify ( )
Pump Type: Marschalk-System One
Samples collected by same method as evacuation? (Y) N (specify)

Water Quality Meter Type(s) / Serial Numbers: YSI-556 MPS Hach 2100P Turbidimeter

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	Sp. Cond. (mS/cm) [3%]*	Turbidity (NTU) [10% or 1 NTU]*	DO (mg/l) [10% or 0.1 mg/l]*	ORP (mV) [10 mV]*
1405	150	0.20	9.34	—	—	—	136	—	—
1410	100	0.33	9.33	—	—	—	68	—	—
1415	100	0.46	9.32	—	—	—	15	—	—
1420	200	0.72	9.38	12.61	6.88	0.678	10	0.82	4.0
1425	↓	0.98	9.41	12.43	6.89	0.676	5	0.72	-0.1
1430		1.24	9.42	12.10	6.88	0.645	4	0.54	-28.8
1435	↓	1.50	9.43	11.96	6.85	0.646	3	0.53	-38.7
1440	150	1.70	9.44	11.80	6.85	0.642	2	0.39	-46.4

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS

Initial purge @ 1400, strong odor (eggs?) and blackish grey cloudy color.
1415 hooked up to YSI

SAMPLE DESTINATION

Laboratory: SGS
Delivered Via: UPS
Airbill #: —

Field Sampling Coordinator: [signature]

GROUNDWATER SAMPLING LOG

Well No. GMA2-4

Site/GMA Name GMA2 / GE Pittsfield

Sampling Personnel KLC

Date 11/4/07

Weather 60's v. cloudy

WELL INFORMATION - See Page 1

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	Sp. Cond. (mS/cm) [3%]*	Turbidity (NTU) [10% or 1 NTU]*	DO (mg/l) [10% or 0.1 mg/l]*	ORP (mV) [10 mV]*
1445	150	1.90	9.44	11.76	6.79	0.644	3	0.36	-54.8
1450	150	2.10	9.46	11.71	6.84	0.644	2	0.34	-60.8
1455	150	2.30	9.47	11.70	6.79	0.641	2	0.30	-61.5
1500	150	2.50	9.47	11.69	6.84	0.640	1	0.28	-70.8
1505 →	Sample @ 1505 ←								

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS

GROUNDWATER SAMPLING LOG

Well No. GMA2-6
Key No. EX37
PID Background (ppm) 0
Well Headspace (ppm) 0

Site/GMA Name GMA-2
Sampling Personnel RKU/RAB
Date 11/09/07
Weather P. Cloudy

WELL INFORMATION

Reference Point Marked? (Y) N
Height of Reference Point ____ Meas. From ____
Well Diameter 2.00"
Screen Interval Depth 10.13 - 20.13 Meas. From Ground
Water Table Depth 15.33' Meas. From TIC
Well Depth 23.44' Meas. From TIC
Length of Water Column 8.11
Volume of Water in Well 1.32 gallons
Intake Depth of Pump/Tubing 18' Meas. From TIC

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Redevelop? Y (N)

Sample Time 1355
Sample ID GMA2-6
Duplicate ID —
MS/MSD —
Split Sample ID ____

Required	Analytical Parameters:	Collected
( )	VOCs (Std. list)	( )
( )	VOCs (Exp. list)	( )
( )	SVOCs	( )
( )	PCBs (Total)	( )
(X)	PCBs (Dissolved)	(X)
( )	Metals/Inorganics (Total)	( )
( )	Metals/Inorganics (Dissolved)	( )
( )	EPA Cyanide (Dissolved)	( )
( )	PAC Cyanide (Dissolved)	( )
( )	PCDDs/PCDFs	( )
( )	Pesticides/Herbicides	( )
( )	Natural Attenuation	( )
( )	Other (Specify)	( )

EVACUATION INFORMATION

Pump Start Time 1315
Pump Stop Time 1405
Minutes of Pumping 50
Volume of Water Removed 2.75 gallons
Did Well Go Dry? Y (N)

Evacuation Method: Bailer ( ) Bladder Pump ( )
Peristaltic Pump (X) Submersible Pump ( ) Other/Specify ( )
Pump Type: Geopump 2
Samples collected by same method as evacuation? (Y) N (specify)

Water Quality Meter Type(s) / Serial Numbers: YSI-556 MPS Hach 2100P Turbidimeter

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	Sp. Cond. (mS/cm) [3%]*	Turbidity (NTU) [10% or 1 NTU]*	DO (mg/l) [10% or 0.1 mg/l]*	ORP (mV) [10 mV]*
1320	200	0.26	15.35	—	—	—	17	—	—
1325	200	0.52	15.35	14.08	5.14	1.170	16	1.11	-51.9
1330	200	0.78	15.35	14.13	5.16	1.175	11	0.83	-58.9
1335	200	1.04	15.35	14.01	5.18	1.190	6	0.72	-61.9
1340	200	1.30	~~15.38~~ 15.38	14.05	5.20	1.225	7	0.69	-62.6
1345	200	1.56	15.36	13.98	5.20	1.289	3	0.54	-62.2
1350	200	1.82	15.36	14.11	5.22	1.317	2	0.46	-62.4
1355	200	2.08		14.03	5.22	1.322	2	0.49	-62.8

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS ____

SAMPLE DESTINATION

Laboratory: SGS
Delivered Via: UPS
Airbill #: —

Field Sampling Coordinator: [signature]

C:\WORK\GEGroundwater\554199\Attachment\D-2

GROUNDWATER SAMPLING LOG

Well No. GMA2-9
Key No. FX-37
PID Background (ppm) ____
Well Headspace (ppm) ____

Site/GMA Name GMA-2
Sampling Personnel RKU RAB
Date 11/14/07
Weather Cloudy mid 40s

WELL INFORMATION

Reference Point Marked? Y N
Height of Reference Point ____ Meas. From ____
Well Diameter 2"
Screen Interval Depth 4'-14' Meas. From Ground
Water Table Depth 7.85 Meas. From TIC
Well Depth 16.91 Meas. From TIC
Length of Water Column 9.06'
Volume of Water in Well 1.48 gallons
Intake Depth of Pump/Tubing 12.4' Meas. From TIC

Pump Intake

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Redevelop? Y (N)

Sample Time 1310 1520
Sample ID GMA2-9
Duplicate ID GMA2-DUP-1
MS/MSD —
Split Sample ID —

Required	Analytical Parameters:	Collected
( )	VOCs (Std. list)	( )
( )	VOCs (Exp. list)	( )
( )	SVOCs	( )
( )	PCBs (Total)	( )
(X)	PCBs (Dissolved)	(X)
( )	Metals/Inorganics (Total)	( )
( )	Metals/Inorganics (Dissolved)	( )
( )	EPA Cyanide (Dissolved)	( )
( )	PAC Cyanide (Dissolved)	( )
( )	PCDDs/PCDFs	( )
( )	Pesticides/Herbicides	( )
( )	Natural Attenuation	( )
( )	Other (Specify)	( )

EVACUATION INFORMATION

Pump Start Time 1310
Pump Stop Time 1520
Minutes of Pumping 130
Volume of Water Removed 5.0 gallons
Did Well Go Dry? Y (N)

Evacuation Method: Bailer ( ) Bladder Pump (X)
Peristaltic Pump ( ) Submersible Pump ( ) Other/Specify ( )
Pump Type: Marschalk - System One
Samples collected by same method as evacuation? (Y) N (specify)

Water Quality Meter Type(s) / Serial Numbers: YSI-556 MPS Hach 2100P Turbidimeter

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	Sp. Cond. (mS/cm) [3%]*	Turbidity (NTU) [10% or 1 NTU]*	DO (mg/l) [10% or 0.1 mg/l]*	ORP (mV) [10 mV]*
1325	250	0.99	8.76				184		
1330	200	1.25	8.64				115		
1333	200	1.51	8.81				72		
1337	250	1.84	8.65				34		
1340	250	2.17	8.65	12.02	7.65	0.390	26	4.78	51.6
1345	200	2.43	8.45	11.91	7.62	0.386	12	4.44	52.5
1350	200	2.69	8.41	11.85	7.62	0.388	9	4.21	53.2
1355	200	2.95	8.45	11.87	7.60	0.395	5	4.01	56.7

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS YSI attached @ 1337

SAMPLE DESTINATION

Laboratory: SGS
Delivered Via: UPS
Airbill #: —

Field Sampling Coordinator: [signature]

GROUNDWATER SAMPLING LOG

Well No. GMA2-9

Site/GMA Name GMA-2
Sampling Personnel RKU, RAB
Date 11/14/07
Weather Cloudy mid 40s

WELL INFORMATION - See Page 1

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	Sp. Cond. (mS/cm) [3%]*	Turbidity (NTU) [10% or 1 NTU]*	DO (mg/l) [10% or 0.1 mg/l]*	ORP (mV) [10 mV]*
1400	Battery died on pump controller replaced battery								
1405	250		8.31	12.14	7.56	0.403	5	4.01	59.3
1410	"		8.20	12.02	7.56	0.402	4	3.92	62.5
1440	pump restarted								
1440	250	3.28	8.32	11.85	7.77	0.405	6	4.83	61.6
1445	250	3.61	8.66	11.62	7.65	0.408	4	3.98	62.2
1450	250	3.94	8.75	11.59	7.53	0.411	3	3.76	68.6
1455	150	4.14	8.55	11.55	7.56	0.422	3	3.58	63.2
1500	150	4.34	8.32	11.51	7.55	0.425	3	3.52	63.4
1505	150	4.54	8.15	11.45	7.56	0.433	2	~~0.t~~ 3.46	63.5
1510	150	4.74	8.35	11.45	7.50	0.431	2	3.47	64.4

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS 14:15 other battery died stopped pump disconnected from car - sent Robert for fresh battery

GROUNDWATER SAMPLING LOG

Well No. GMA2-10 | Site/GMA Name GMA2-10
Key No. / | Sampling Personnel EMC / TT
PID Background (ppm) / | Date 12/18/07
Well Headspace (ppm) / | Weather PIC, 20°s

WELL INFORMATION

Reference Point Marked? Y (N)
Height of Reference Point ____ Meas. From TIC
Well Diameter 2"
Screen Interval Depth 9-19' Meas. From gravel
Water Table Depth 15.85 Meas. From TIC
Well Depth 21.49 Meas. From TIC
Length of Water Column 5.64
Volume of Water in Well 0.91 9
Intake Depth of Pump/Tubing 18.67 Meas. From TIC

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Redevelop? Y (N)

Sample Time 15:55
Sample ID ~~MW-~~ GMA2-10
Duplicate ID N/A
MS/MSD N/A
Split Sample ID N/A

Required	Analytical Parameters:	Collected
(X)	VOCs (Std. list)	(X)
( )	VOCs (Exp. list)	( )
( )	SVOCs	( )
( )	PCBs (Total)	( )
( )	PCBs (Dissolved)	( )
( )	Metals/Inorganics (Total)	( )
( )	Metals/Inorganics (Dissolved)	( )
( )	EPA Cyanide (Dissolved)	( )
( )	PAC Cyanide (Dissolved)	( )
( )	PCDDs/PCDFs	( )
( )	Pesticides/Herbicides	( )
( )	Natural Attenuation	( )
( )	Other (Specify)	( )

EVACUATION INFORMATION

Pump Start Time 15:00
Pump Stop Time 15:50
Minutes of Pumping 50
Volume of Water Removed 3520 ml
Did Well Go Dry? Y (N)

Evacuation Method: Bailer ( ) Bladder Pump (✓)
Peristaltic Pump ( ) Submersible Pump ( ) Other/Specify (-)
Pump Type: Compressor / controller
Samples collected by same method as evacuation? (Y) N (specify)

Water Quality Meter Type(s) / Serial Numbers: YSI # 03M02-30

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	Sp. Cond. (mS/cm) [3%]*	Turbidity (NTU) [10% or 1 NTU]*	DO (mg/l) [10% or 0.1 mg/l]*	ORP (mV) [10 mV]*
15:00	320		15.85	9.53	6.45	1.837	16	3.23	154.0
15:05	320		15.86	9.97	6.68	1.937	31	1.44	90.8
15:10	320		15.86	10.09	6.69	1.948	13	2.10	76.7
15:15	320		15.86	10.18	6.69	1.953	9	1.85	61.6
15:20	320		15.86	10.23	6.70	1.958	7	1.57	54.0
15:25	320		15.86	10.05	6.71	1.965	7	2.18	46.9
15:30	320		15.86	10.13	6.72	1.964	5	1.73	40.6
15:35	320		15.86	10.30	6.68	1.970	4	1.00	38.5

*The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS

SAMPLE DESTINATION

Laboratory: STL
Delivered Via: ____
Airbill #: ____

Field Sampling Coordinator: Ed Camille

Well No. ~~GMA-7~~ GMA2-10

Site Name GMA2

Sampling Personnel EMC/TT

Date 12/18/07

Weather 10c Low 20's

WELL INFORMATION - See Page 1

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	Sp. Cond. (mS/cm) [3%]*	Turbidity (NTU) [10% or 1 NTU]*	DO (mg/l) [10% or 0.1 mg/l]*	ORP (mV) [10 mV]*
1540	320		15.86	10.24	6.68	1.985	5	.79	37.2
1545	320		15.86	10.33	6.67	1.981	4	.71	35.8
1550	320		15.86	10.35	6.65	1.982	4	.69	34.7

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS

GROUNDWATER SAMPLING LOG

Well No. J-1R
Key No. —
PID Background (ppm) —
Well Headspace (ppm) —

Site/GMA Name GMA-2
Sampling Personnel RKW/RAB
Date 11/09/07
Weather P. Cloudy

WELL INFORMATION

Reference Point Marked? (Y) N
Height of Reference Point ____ Meas. From ____
Well Diameter 2.00"
Screen Interval Depth 11.55 - 21.55 Meas. From Ground
Water Table Depth 14.93' Meas. From TIC
Well Depth 21.14' Meas. From TIC
Length of Water Column 6.11
Volume of Water in Well 2.45 gallons
Intake Depth of Pump/Tubing 18.00' Meas. From TIC

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Redevelop? Y (N)

Sample Time 1110
Sample ID J-1R
Duplicate ID ____
MS/MSD J-1R MS, J-1R MSD
Split Sample ID —

Required	Analytical Parameters:	Collected
( )	VOCs (Std. list)	( )
( )	VOCs (Exp. list)	( )
( )	SVOCs	( )
(X)	PCBs (Total)	(X)
( )	PCBs (Dissolved)	( )
( )	Metals/Inorganics (Total)	( )
( )	Metals/Inorganics (Dissolved)	( )
( )	EPA Cyanide (Dissolved)	( )
( )	PAC Cyanide (Dissolved)	( )
( )	PCDDs/PCDFs	( )
( )	Pesticides/Herbicides	( )
( )	Natural Attenuation	( )
( )	Other (Specify)	( )

EVACUATION INFORMATION

Pump Start Time 0942
Pump Stop Time 1130
Minutes of Pumping 108
Volume of Water Removed 5.75 gallons
Did Well Go Dry? Y (N)

Evacuation Method: Bailer ( ) Bladder Pump ( )
Peristaltic Pump (X) Submersible Pump ( ) Other/Specify ( )
Pump Type: Geopump. 2
Samples collected by same method as evacuation? (Y) N (specify)

Water Quality Meter Type(s) / Serial Numbers: YSI-556 MPS Hach 2100P Turbidimeter

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	Sp. Cond. (mS/cm) [3%]*	Turbidity (NTU) [10% or 1 NTU]*	DO (mg/l) [10% or 0.1 mg/l]*	ORP (mV) [10 mV]*
0945	150	0.12	14.93	—	—	—	152	—	—
0950	155	0.32	14.93	—	—	—	67	—	—
0955	200	0.58	14.95	—	—	—	55	—	—
1000	200	0.84	14.95	—	—	—	42	—	—
1005	200	1.10	14.95	10.88	8.74	1.762	25	1.59	161.7
1010	200	1.36	14.95	10.86	8.79	1.756	14	1.55	154.1
1015	200	1.62	14.95	10.70	8.42	1.753	10	1.40	146.8
1020	200	1.88	14.95	10.90	8.22	1.739	7	0.91	138.4

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS *IP: Water has slight brownish color, no odor; ~~Turbidity~~

~~Note: lock on~~

*IP = Initial Purge

SAMPLE DESTINATION

Laboratory: SGS
Delivered Via: UPS
Airbill #: —

Field Sampling Coordinator: [signature]

GROUNDWATER SAMPLING LOG

Well No. J-1R

Site/GMA Name GMA-2
Sampling Personnel RKW/RAB
Date 11/09/07
Weather P. Cloudy

WELL INFORMATION - See Page 1

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	Sp. Cond. (mS/cm) [3%]*	Turbidity (NTU) [10% or 1 NTU]*	DO (mg/l) [10% or 0.1 mg/l]*	ORP (mV) [10 mV]*
1025	200	2.14	14.95	10.82	7.98	1.732	5	0.92	131.8
1030	200	2.40	14.95	10.75	7.75	1.740	12	0.93	125.9
1035	200	2.66	14.95	10.74	7.51	1.727	8	0.68	121.8
1040	200	2.92	14.95	10.83	7.28	1.721	5	0.61	120.1
1045	200	3.18	14.95	10.85	6.99	1.721	3	0.58	119.0
1050	200	3.44	14.95	10.65	6.78	1.721	3	0.61	117.7
1055	200	3.70	14.95	10.66	5.20	1.719	2	0.70	124.7
1100	200	3.96	14.95	10.67	5.10	1.716	2	0.50	123.5
1105	200	4.22	14.95	10.67	5.05	1.717	3	0.52	121.8
1110	200	4.48	14.95	10.67	5.04	1.716	2	0.49	121.0
Sampled at 1110									

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS

GROUNDWATER SAMPLING LOG

Well No. OJ-~~10~~MW-2
Key No. —
PID Background (ppm) 0
Well Headspace (ppm) 0

Site/GMA Name GMA 2
Sampling Personnel RKU RAB
Date 11/5/07
Weather Rainy Mid 40s, Temp Dropping

WELL INFORMATION

Reference Point Marked? Y N
Height of Reference Point ____ Meas. From ____
Well Diameter 1"
Screen Interval Depth 8.56-18.56 Meas. From Ground
Water Table Depth 13.59 Meas. From TIC
Well Depth 16.69 Meas. From TIC
Length of Water Column 3.1'
Volume of Water in Well 0.13gallon
Intake Depth of Pump/Tubing 16 Meas. From TIC
14.5' after pumping well dry

Reference Point Identification:
TIC: Top of Inner (PVC) Casing
TOC: Top of Outer (Protective) Casing
Grade/BGS: Ground Surface

Redevelop? Y (N)

Sample Time 1225
Sample ID OJ-MW-2
Duplicate ID GMA 2 Dup 2
MS/MSD OJ-MW-2 MS, OJ-MW-2 MSD
Split Sample ID ____

Required	Analytical Parameters:	Collected
(X)	VOCs (Std. list)	(X)
( )	VOCs (Exp. list)	( )
( )	SVOCs	( )
( )	PCBs (Total)	( )
( )	PCBs (Dissolved)	( )
( )	Metals/Inorganics (Total)	( )
( )	Metals/Inorganics (Dissolved)	( )
( )	PCDDs/PCDFs	( )
( )	Pesticides/Herbicides	( )
( )	Natural Attenuation	( )
( )	Other (Specify)	( )

EVACUATION INFORMATION

Pump Start Time 1110 (see note below)
Pump Stop Time 1245
Minutes of Pumping 95
Volume of Water Removed 3.0gallons
Did Well Go Dry? (Y) N

Evacuation Method: Bailer ( ) Bladder Pump ( )
Peristaltic Pump (X) Submersible Pump ( ) Other/Specify ( )
Pump Type: Geo Pump 2
Samples collected by same method as evacuation? (Y) N (specify)

Water Quality Meter Type(s) / Serial Numbers: YSI-556 MPS

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	Sp. Cond. (mS/cm) [3%]*	Turbidity (NTU) [10% or 1 NTU]*	DO (mg/l) [10% or 0.1 mg/l]*	ORP (mV) [10 mV]*
1110	200	—	NA	—	—	—	38	—	—
1120	200	0.53		—	—	—		—	—
1130	100	0.79		—	—	—	59	—	—
1135	100	0.92		—	—	—	8	—	—
1145	150	1.12		13.16	6.38	1.010	3	2.29	210.9
1150	150	1.32		13.34	6.46	1.005	7	1.83	206.6
1155	150	1.52		13.18	6.52	1.013	4	1.70	203.5
1200	150	1.72		13.16	6.54	1.013	2	1.60	203.1
1205	100	1.85		13.13	6.54	1.011	1	1.46	202.2
1210	100	1.98		12.59	6.56	1.015	1	1.41	203.9
1215	100	2.11		12.82	6.56	1.010	1	1.26	201.8
1220	100	2.24		12.93	6.56	1.010	1	1.25	201.4

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS Set tubing @ 16' - too low pulled up to 14' feet water dark brown in color 1125 - appeared to be at bottom - rechecked DTW = 14.80 restarted pump very slow @ 1130 1135 connected YSI Water has light brown tint

SAMPLE DESTINATION

Laboratory: SGS
Delivered Via: UPS
Airbill #: —

Field Sampling Coordinator: [signature]

GROUNDWATER SAMPLING LOG

Well No. OJ-MW-2

Site/GMA Name GMA 2
Sampling Personnel RKL, RAB
Date 11/5/07
Weather Cloudy Rainy Mid 40s

WELL INFORMATION - See Page 1

Time	Pump Rate (L/min.)	Total Gallons Removed	Water Level (ft TIC)	Temp. (Celsius) [3%]*	pH [0.1 units]*	Sp. Cond. (mS/cm) [3%]*	Turbidity (NTU) [10% or 1 NTU]*	DO (mg/l) [10% or 0.1 mg/l]*	ORP (mV) [10 mV]*
1225	100	2.37	14.90	13.26	6.56	1.008	1	1.16	200.4

* The stabilization criteria for each field parameter (three consecutive readings collected at 3- to 5-minute intervals) is listed in each column heading.

OBSERVATIONS/SAMPLING METHOD DEVIATIONS

ARCADIS

Appendix B

Soil Boring Log

Date Start/Finish: 11/27/07
Drilling Company: Parratt-Wolff, Inc.
Driller's Name: Rick/Joe
Drilling Method: Hollow-Stem Auger
Auger Size 4.25"
Rig Type: CME-5

Northing: 534313.81
Easting: 135583.00
Casing Elevation: 990.03

Borehole Depth: 19'
Surface Elevation: 987.70

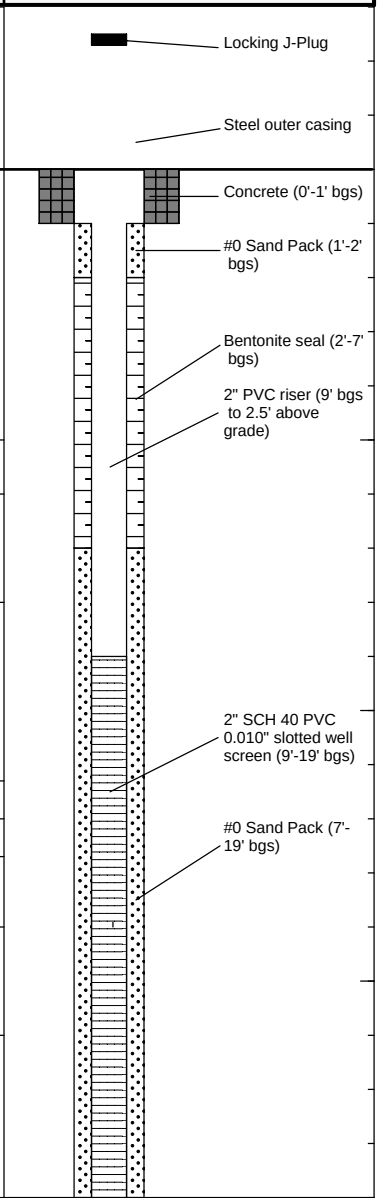
Descriptions By: Ray Stevenson

Well/Boring ID: **GMA2-10**

Client: General Electric Company

Location: GMA2-10
Pittsfield, Massachusetts

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
0	990			NA	NA				Dark grayish brown, damp, FILL MATERIAL (concrete, asphalt, steel) little fine sand, little cobbles, trace silt.
5	985	ss-1		0.3	4 6				SAA; rock fragment in tip of spoon.
		ss-2		1.0	11 18 12 12				Brown to light brown, damp, FINE SAND, trace gravel, trace cobbles, dense.
		ss-3		1.0	13 10 8 8				Brown, damp, FINE SAND, some silt, dense.
10	980	ss-4		1.5	4 4 2 2				
									Dark reddish brown, damp, FINE SAND, some silt, trace organic matter.
		ss-5		1.0	5 8 8 7				Brown, damp, FINE SAND, some silt, dense. Grayish brown, wet, FINE to MEDIUM SAND, dense.
15	975	ss-6		0.5	10 4 4 6				Brown to dark brown, saturated, FINE SAND and SILT, some wood.
		ss-7		1.2	5 5 7 8				Grayish brown, saturated, MEDIUM SAND, little fine sand, trace silt, trace wood.
									END OF BORING



Remarks: NA = not available; SAA = same as above; bgs = below ground surface; PVC = polyvinyl chloride; SCH = schedule; ppm = parts per million.

ARCADIS
Infrastructure, environment, facilities

ARCADIS

Appendix C

Validated Groundwater
Analytical Results – Fall 2007

Table C-1
Fall 2007 Groundwater Analytical Results

Groundwater Managment Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Date Collected:	GMA2-1 11/14/07	GMA2-2 11/14/07	GMA2-3 11/09/07	GMA2-4 11/14/07	GMA2-6 11/09/07
Volatile Organics					
1,1,1,2-Tetrachloroethane	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	NA	NA	NA	NA	NA
1,1-Dichloroethane	NA	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	NA	NA	NA	NA	NA
1,2-Dibromoethane	NA	NA	NA	NA	NA
1,2-Dichloroethane	NA	NA	NA	NA	NA
1,2-Dichloropropane	NA	NA	NA	NA	NA
1,4-Dioxane	NA	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA
2-Chloro-1,3-butadiene	NA	NA	NA	NA	NA
2-Chloroethylvinylether	NA	NA	NA	NA	NA
2-Hexanone	NA	NA	NA	NA	NA
3-Chloropropene	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	NA	NA	NA	NA	NA
Acetone	NA	NA	NA	NA	NA
Acetonitrile	NA	NA	NA	NA	NA
Acrolein	NA	NA	NA	NA	NA
Acrylonitrile	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA
Bromodichloromethane	NA	NA	NA	NA	NA
Bromoform	NA	NA	NA	NA	NA
Bromomethane	NA	NA	NA	NA	NA
Carbon Disulfide	NA	NA	NA	NA	NA
Carbon Tetrachloride	NA	NA	NA	NA	NA
Chlorobenzene	NA	NA	NA	NA	NA
Chloroethane	NA	NA	NA	NA	NA
Chloroform	NA	NA	NA	NA	NA
Chloromethane	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	NA	NA	NA	NA	NA
Dibromochloromethane	NA	NA	NA	NA	NA
Dibromomethane	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NA	NA	NA	NA	NA
Ethyl Methacrylate	NA	NA	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	NA
Iodomethane	NA	NA	NA	NA	NA
Isobutanol	NA	NA	NA	NA	NA
Methacrylonitrile	NA	NA	NA	NA	NA
Methyl Methacrylate	NA	NA	NA	NA	NA
Methylene Chloride	NA	NA	NA	NA	NA
Propionitrile	NA	NA	NA	NA	NA
Styrene	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	NA	NA	NA	NA	NA
Trichloroethene	NA	NA	NA	NA	NA
Trichlorofluoromethane	NA	NA	NA	NA	NA
Vinyl Acetate	NA	NA	NA	NA	NA
Vinyl Chloride	NA	NA	NA	NA	NA
Xylenes (total)	NA	NA	NA	NA	NA
Total VOCs	NA	NA	NA	NA	NA

Table C-1
Fall 2007 Groundwater Analytical Results

Groundwater Managment Area 2 Long-Term Monitoring Program
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General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Date Collected:	GMA2-1 11/14/07	GMA2-2 11/14/07	GMA2-3 11/09/07	GMA2-4 11/14/07	GMA2-6 11/09/07
PCBs-Filtered					
Aroclor-1016	ND(0.000065)	ND(0.000065)	ND(0.000065) J	ND(0.000065)	ND(0.000065) J
Aroclor-1221	ND(0.000065)	ND(0.000065)	ND(0.000065) J	ND(0.000065)	ND(0.000065) J
Aroclor-1232	ND(0.000065)	ND(0.000065)	ND(0.000065) J	ND(0.000065)	ND(0.000065) J
Aroclor-1242	ND(0.000065)	ND(0.000065)	ND(0.000065) J	ND(0.000065)	ND(0.000065) J
Aroclor-1248	ND(0.000065)	ND(0.000065)	ND(0.000065) J	ND(0.000065)	ND(0.000065) J
Aroclor-1254	ND(0.000065)	ND(0.000065)	ND(0.000065) J	ND(0.000065)	ND(0.000065) J
Aroclor-1260	ND(0.000065)	ND(0.000065)	ND(0.000065) J	ND(0.000065)	ND(0.000065) J
Total PCBs	ND(0.000065)	ND(0.000065)	ND(0.000065) J	ND(0.000065)	ND(0.000065) J

Table C-1
Fall 2007 Groundwater Analytical Results

Groundwater Managment Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Sample ID: / Parameter Date Collected:	GMA2-9 11/14/07	GMA2-10 12/18/07	J-1R 11/09/07	OJ-MW-2 11/15/07
Volatile Organics				
1,1,1,2-Tetrachloroethane	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
1,1,1-Trichloroethane	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
1,1,2,2-Tetrachloroethane	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
1,1,2-Trichloroethane	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
1,1-Dichloroethane	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
1,1-Dichloroethene	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
1,2,3-Trichloropropane	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
1,2-Dibromo-3-chloropropane	NA	ND(0.0050) J	NA	ND(0.0050) J [ND(0.0050) J]
1,2-Dibromoethane	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
1,2-Dichloroethane	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
1,2-Dichloropropane	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
1,4-Dioxane	NA	ND(0.10) J	NA	ND(0.10) J [ND(0.10) J]
2-Butanone	NA	ND(0.0050) J	NA	ND(0.0050) J [ND(0.0050) J]
2-Chloro-1,3-butadiene	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
2-Chloroethylvinylether	NA	ND(0.013) J	NA	R [ND(0.013) J]
2-Hexanone	NA	ND(0.0050)	NA	ND(0.0050) [ND(0.0050)]
3-Chloropropene	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
4-Methyl-2-pentanone	NA	ND(0.0050)	NA	ND(0.0050) J [ND(0.0050) J]
Acetone	NA	ND(0.0050) J	NA	ND(0.0050) J [ND(0.0050) J]
Acetonitrile	NA	ND(0.020) J	NA	ND(0.020) J [ND(0.020) J]
Acrolein	NA	ND(0.025) J	NA	ND(0.025) J [ND(0.025) J]
Acrylonitrile	NA	ND(0.025) J	NA	ND(0.025) J [ND(0.025) J]
Benzene	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
Bromodichloromethane	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
Bromoform	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
Bromomethane	NA	ND(0.0010)	NA	ND(0.0010) J [ND(0.0010) J]
Carbon Disulfide	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
Carbon Tetrachloride	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
Chlorobenzene	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
Chloroethane	NA	ND(0.0010) J	NA	ND(0.0010) [ND(0.0010)]
Chloroform	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
Chloromethane	NA	ND(0.0010) J	NA	ND(0.0010) [ND(0.0010)]
cis-1,3-Dichloropropene	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
Dibromochloromethane	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
Dibromomethane	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
Dichlorodifluoromethane	NA	ND(0.0010) J	NA	ND(0.0010) [ND(0.0010)]
Ethyl Methacrylate	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
Ethylbenzene	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
Iodomethane	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
Isobutanol	NA	ND(0.050) J	NA	ND(0.050) J [ND(0.050) J]
Methacrylonitrile	NA	ND(0.010)	NA	ND(0.010) J [ND(0.010) J]
Methyl Methacrylate	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
Methylene Chloride	NA	ND(0.0050)	NA	ND(0.0050) [ND(0.0050)]
Propionitrile	NA	ND(0.020) J	NA	ND(0.020) J [ND(0.020) J]
Styrene	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
Tetrachloroethene	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
Toluene	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
trans-1,2-Dichloroethene	NA	0.00034 J	NA	ND(0.0010) [ND(0.0010)]
trans-1,3-Dichloropropene	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
trans-1,4-Dichloro-2-butene	NA	ND(0.0050) J	NA	ND(0.0050) [ND(0.0050)]
Trichloroethene	NA	ND(0.0010)	NA	0.015 [0.015]
Trichlorofluoromethane	NA	ND(0.0010) J	NA	ND(0.0010) [ND(0.0010)]
Vinyl Acetate	NA	ND(0.0025) J	NA	ND(0.0025) [ND(0.0025)]
Vinyl Chloride	NA	0.00047 J	NA	ND(0.0010) [ND(0.0010)]
Xylenes (total)	NA	ND(0.0010)	NA	ND(0.0010) [ND(0.0010)]
Total VOCs	NA	0.00081 J	NA	0.015 [0.015]

Table C-1
Fall 2007 Groundwater Analytical Results

Groundwater Managment Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Date Collected:	GMA2-9 11/14/07	GMA2-10 12/18/07	J-1R 11/09/07	OJ-MW-2 11/15/07
PCBs-Filtered				
Aroclor-1016	ND(0.000065) [ND(0.000065)]	NA	ND(0.000065) J	NA
Aroclor-1221	ND(0.000065) [ND(0.000065)]	NA	ND(0.000065) J	NA
Aroclor-1232	ND(0.000065) [ND(0.000065)]	NA	ND(0.000065) J	NA
Aroclor-1242	ND(0.000065) [ND(0.000065)]	NA	ND(0.000065) J	NA
Aroclor-1248	ND(0.000065) [ND(0.000065)]	NA	ND(0.000065) J	NA
Aroclor-1254	ND(0.000065) [ND(0.000065)]	NA	ND(0.000065) J	NA
Aroclor-1260	ND(0.000065) [ND(0.000065)]	NA	ND(0.000065) J	NA
Total PCBs	ND(0.000065) [ND(0.000065)]	NA	ND(0.000065) J	NA

Notes:
1. Samples were collected by ARCADIS, and submitted to SGS Environmental Services, Inc. for analysis of volatiles and PCBs (filtered).
2. Samples have been validated as per Field Sampling Plan/Quality Assurance Project Plan (FSP/QAPP), General Electric Company, Pittsfield, Massachusetts, ARCADIS (approved March 15, 2007 and re-submitted March 30, 2007).
3. NA - Not Analyzed.
4. ND - Analyte was not detected. The number in parenthesis is the associated detection limit.
5. Field duplicate sample results are presented in brackets.

Data Qualifiers:

Organics (volatiles, PCBs)
J - Indicates that the associated numerical value is an estimated concentration.
R - Data was rejected due to a deficiency in the data generation process.

ARCADIS

Appendix D

Data Validation Report –
Fall 2007

Appendix D
Groundwater Sampling Data Validation Report

Groundwater Management Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts

1.0 General

This attachment summarizes the data validation review performed on behalf to the General Electric Company (GE) for groundwater samples collected between November and December 2007 as part of groundwater sampling activities conducted at Groundwater Management Area 2, located at the General Electric Company/Housatonic River Site in Pittsfield, Massachusetts. The samples were analyzed for polychlorinated biphenyls (PCBs) and/or various other constituents listed in Appendix IX of 40 CFR Part 264, plus one additional constituent -- 2-chloroethyl vinyl ether (hereafter referred to as Appendix IX+1) by SGS Environmental Services, Inc. (formerly Paradigm Analytical Labs, Inc.) of Wilmington, North Carolina. Data validation was performed for nine PCB samples and four volatile organic compound (VOC) samples.

2.0 Data Evaluation Procedures

This attachment outlines the applicable quality control criteria utilized during the data review process and any deviations from those criteria. The data review was conducted in accordance with the following documents:

- *Field Sampling Plan/Quality Assurance Project Plan (FSP/QAPP), General Electric Company, Pittsfield, Massachusetts,* ARCADIS BBL (submitted by GE on March 30, 2007 and approved by EPA on June 13, 2007)*;*
- *Region I Tiered Organic and Inorganic Data Validation Guidelines*, USEPA Region I (July 1, 1993); and
- *Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses*, USEPA Region I (Draft, December 1996).

The data were validated to either a Tier I or Tier II level, as described below. Any deviations from the applicable quality control criteria utilized during the data review process are identified below. A tabulated summary of the Tier I/Tier II data review is presented in Table D-1. Each sample subject to evaluation is listed in Table D-1 to document that data review was performed. Samples that required data qualification are listed separately.

The following data qualifiers were used in this data evaluation:

J The compound was positively identified, but the associated numerical value is an estimated concentration. This qualifier is used when the data evaluation procedure identifies a deficiency in the data generation process. This qualifier is also used when a compound is detected at an estimated concentration less than the corresponding practical quantitation limit (PQL).

U The compound was analyzed for, but was not detected. The sample quantitation limit is presented. Non-detect sample results are presented as ND(PQL) within this report for consistency with documents previously prepared for investigations conducted at the GE-Pittsfield/Housatonic River Site.

UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is estimated and may or may not represent the actual level of quantitation. Non-detect sample results that required qualification are presented as ND(PQL) J within this report for consistency with documents previously prepared for investigations conducted at the GE-Pittsfield/Housatonic River Site.

R Indicates that the previously reported detection limit or sample result has been rejected due to a major deficiency in the data generation procedure. The data should not be used for any qualitative or quantitative purpose.

3.0 Data Validation Procedures

Section 7.5 of the FSP/QAPP states that analytical data will be validated to a Tier I level following the procedures presented in the *Region I Tiered Organic and Inorganic Data Validation Guidelines* (EPA guidelines). The Tier I review consisted of a completeness evidence audit, as outlined in the *EPA Region I CSF Completeness Evidence Audit Program* (EPA Region I, July 31, 1991), to ensure that laboratory data and documentation were present. In the event data packages were determined to be incomplete, the missing information was requested from the laboratory. Upon completion of the Tier I review, the data packages complied with the EPA Region I Tier I data completeness requirements.

The Tier II data review consisted of a review of data package summary forms for identification of quality assurance/quality control (QA/QC) deviations and qualification of the data according to the Region I Data Validation Functional Guidelines. Additionally, field duplicates were examined for relative percent difference (RPD) compliance with the criteria specified in the FSP/QAPP.

A tabulated summary of the samples subject to Tier I and Tier II data review is presented in the following table.

Summary of Samples Subjected to Tier I and Tier II Data Validation

Parameter	Tier I Only			Tier I &Tier II			Total
	Samples	Duplicates	Blanks	Samples	Duplicates	Blanks	
PCBs	0	0	0	7	1	1	9
VOCs	0	0	0	2	1	1	4
Total	**0**	**0**	**0**	**9**	**2**	**2**	**13**

When qualification of the sample data was required, the sample results associated with a QA/QC parameter deviation were qualified in accordance with the procedures outlined in EPA Region I data validation guidance documents. When the data validation process identified several quality control deficiencies, the cumulative effect of the various deficiencies was employed in assigning the final data qualifier. A summary of the QA/QC parameter deviations that resulted in data qualification is presented in Section 4 below.

4.0 Summary of QA/QC Parameter Deviations Requiring Data Qualification

This section provides a summary of the deviations from the applicable QA/QC criteria that resulted in qualification of results.

The initial calibration criterion for organic analyses requires that the average relative response factor (RRF) has a value greater than 0.05. Sample results were qualified as estimated (J) when this criterion was not achieved. The compounds that did not achieve the initial calibration criterion and the number of samples qualified are presented in the following table.

Compounds Qualified Due to Initial Calibration Deviations (RRF)

Analysis	Compound	Number of Affected Samples	Qualification
VOCs	1,2-Dibromo-3-chloropropane	4	J
	1,4-Dioxane	4	J
	2-Butanone	4	J
	2-Chloroethylvinylether	3	J
	4-Methyl-2-pentanone	2	J
	Acetone	4	J
	Acetonitrile	4	J
	Acrolein	4	J
	Acrylonitrile	4	J
	Bromomethane	2	J
	Isobutanol	4	J
	Methacrylonitrile	2	J
	Propionitrile	4	J
	trans-1,4-Dichloro-2-butene	2	J

Several of the organic compounds (including the compounds presented in the above tables detailing RRF deviations) exhibit instrument response factors (RFs) below the USEPA Region I minimum value of 0.05, but meet the analytical method criterion, which does not specify minimum RFs for these compounds. These compounds were analyzed by the laboratory at a higher concentration than the compounds that normally exhibit RFs greater than the USEPA Region I minimum value of 0.05 in an effort to demonstrate acceptable response. USEPA Region I guidelines state that non-detect compound results associated with a RF less than the minimum value of 0.05 are to be rejected (R). However, in the case of these select organic compounds, the RF is an inherent problem with the current analytical methodology; therefore, the non-detect sample results were qualified as estimated (J).

The continuing calibration criterion requires that the percent difference (%D) between the initial calibration RRF and the continuing calibration RRF for VOCs be less than 25%. Sample data for detect and non-detect compounds with %D values that exceeded the continuing calibration criteria were qualified as estimated (J). A summary of the compounds that exceeded the continuing calibration criterion and the number of samples qualified due to those deviations are presented in the following table.

Compounds Qualified Due to Continuing Calibration of %D Values

Analysis	Compound	Number of Affected Samples	Qualification
VOCs	Acrylonitrile	1	J
	Bromomethane	2	J
	Chloroethane	1	J
	Chloromethane	1	J
	Dichlorodifluoromethane	1	J
	Isobutanol	1	J
	Trichlorofluoromethane	1	J
	Vinyl Acetate	1	J

Matrix spike/matrix spike duplicate (MS/MSD) sample analysis recovery criteria for organics require that the MS/MSD recovery be within the laboratory-generated QC control limits specified on the MS/MSD reporting form. Associated non-detect organic sample results that exhibited MS/MSD recoveries below 10% were qualified as rejected (R). The compound that did not meet MS/MSD recovery criteria and the number of samples qualified due to those deviations are presented in the following table.

Compound Qualified Due to MS/MSD RPD Deviations

Analysis	Compound	Number of Affected Samples	Qualification
VOCs	2-Chloroethylvinylether	1	R

MS/MSD sample analysis recovery criteria for organics require that the RPD between the MS and MSD recoveries be less than the laboratory-generated QC acceptance limits specified on the MS/MSD reporting form. The compounds that exceeded the RPD limit and the number of samples qualified due to deviations are presented in the following table.

Compounds Qualified Due to MS/MSD RPD Deviations

Analysis	Compound	Number of Affected Samples	Qualification
PCBs	All Aroclors	1	J

Laboratory control sample/laboratory control sample duplicate (LCS/LCSD) analysis recovery criteria for organics must be within the laboratory-generated QC acceptance limits specified on the LCS/LCSD reporting. Organic sample results associated with the LCS/LCSD that exceeded laboratory-generated QC acceptance limits were qualified as estimated (J). The compounds that did not meet LCS/LCSD recovery criteria and the number of samples qualified due to those deviations are presented in the following table.

Compounds Qualified Due to LCS Recovery Deviations

Analysis	Compound	Number of Affected Samples	Qualification
PCBs	All Aroclors	1	J

5.0 Overall Data Usability

This section summarizes the analytical data in terms of its completeness and usability. Data completeness is defined as the percentage of sample results that have been determined to be usable during the data validation process. The percent usability calculation included analyses evaluated under both the Tier I/II data validation reviews. The percent usability calculation also includes quality control samples (i.e., field/equipment blanks, trip blanks, and field duplicates) to aid in the evaluation of data usability. Data usability is summarized in the following table.

Data Usability

Parameter	Percent Usability	Rejected Data
PCBs	100	None
VOCs	99.6	A total of one sample result was rejected due to MS/MSD recovery deviations.

The data package completeness, as determined from the Tier I data review, was used in combination with the data quality deviations identified during the Tier II data review to determine overall data quality. As specified in the FSP/QAPP, the overall precision, accuracy, representativeness, comparability, and completeness (PARCC) parameters determined from the Tier I and Tier II data reviews were used as indicators of overall data quality. These parameters were assessed through an evaluation of the results of the field and laboratory QA/QC sample analyses to provide a measure of compliance of the analytical data with the Data Quality Objectives (DQOs) specified in the FSP/QAPP. Therefore, the following sections present summaries of the PARCC parameters assessment with regard to the DQOs specified in the FSP/QAPP.

5.1 Precision

Precision measures the reproducibility of measurements under a given set of conditions. Specifically, it is a quantitative measure of the variability of a group of measurements compared to their average value. For this investigation, precision was defined as the RPD between duplicate sample results. The duplicate samples used to evaluate precision included field duplicates, MS/MSD samples, and LCS/LCSD samples. For this analytical program, 2.7% of the data required qualification due to MS/MSD RPD deviations. None of the data required qualification due to field duplicate RPD deviations or LCS/LCSD RPD deviations.

5.2 Accuracy

Accuracy measures the bias in an analytical system or the degree of agreement of a measurement with a known reference value. For this investigation, accuracy was defined as the percent recovery of QA/QC samples that were spiked with a known concentration of an analyte or compound of interest. The QA/QC samples used to evaluate analytical accuracy included instrument calibration, LCS/LCSDs, MS/MSD samples, internal standards, and surrogate compound recoveries. For this analytical program, 18.9% of the data required qualification due to instrument calibration deviations 8.1% of the data required qualification due to LCS/LCSD recovery deviations, and 0.34% of the data required qualification due to MS/MSD recovery deviations. None of the data required qualification for internal standard or surrogate compound recovery deviations.

5.3 Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is a qualitative parameter, which is most concerned with the proper design of the sampling program. The representativeness criterion is best satisfied by making certain that sampling locations are selected properly and a sufficient number of samples are collected. This parameter has been addressed by collecting samples at locations specified in the EPA-approved work plans, and by following the procedures for sample collection/analyses that were described in the FSP/QAPP. Additionally, the analytical program used procedures consistent with EPA-approved analytical methodology. A QA/QC parameter that is an indicator of the representativeness of a sample is holding time. Holding time criteria are established to maintain the samples in a state that is representative of the in-situ field conditions before analysis. For this analytical data set, none of the data required qualification due to holding time deviations.

5.4 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. This goal was achieved through the use of the standardized techniques for sample collection and analysis presented in the FSP/QAPP. Specifically, all the groundwater samples collected between November and December 2007 were analyzed by EPA SW-846 method 8082 for PCBs and 8260 for VOCs.

5.5 Completeness

Completeness is defined as the percentage of measurements that are judged to be valid or usable to meet the prescribed DQOs. The completeness criterion is essentially the same for all data uses -- the generation of a sufficient amount of valid data. The actual completeness of this analytical data set ranged from 99.6% to 100% for individual analytical parameters and had an overall usability of 99.8%, which is greater than the minimum required usability of 90% as specified in the FSP/QAPP.

Table D-1
Analytical Data Validation Summary

Groundwater Managment Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Sample Delivery Group No.	Sample ID	Date Collected	Matrix	Validation Level	Qualification	Compound	QA/QC Parameter	Value	Control Limits	Qualified Result	Notes
PCBs											
G135-546	GMA2-3 (Filtered)	11/9/2007	Water	Tier II	Yes	Aroclor-1016	LCS %R	54.9%	70.0% to 130%	ND(0.000065) J	
						Aroclor-1221	LCS %R	54.9%	70.0% to 130%	ND(0.000065) J	
						Aroclor-1232	LCS %R	54.9%	70.0% to 130%	ND(0.000065) J	
						Aroclor-1242	LCS %R	54.9%	70.0% to 130%	ND(0.000065) J	
						Aroclor-1248	LCS %R	54.9%	70.0% to 130%	ND(0.000065) J	
						Aroclor-1254	LCS %R	54.9%	70.0% to 130%	ND(0.000065) J	
						Aroclor-1260	LCS %R	54.9%	70.0% to 130%	ND(0.000065) J	
						Total PCBs	LCS %R	54.9%	70.0% to 130%	ND(0.000065) J	
G135-546	GMA2-6 (Filtered)	11/9/2007	Water	Tier II	Yes	Aroclor-1016	LCS %R	54.9%	70.0% to 130%	ND(0.000065) J	
						Aroclor-1221	LCS %R	54.9%	70.0% to 130%	ND(0.000065) J	
						Aroclor-1232	LCS %R	54.9%	70.0% to 130%	ND(0.000065) J	
						Aroclor-1242	LCS %R	54.9%	70.0% to 130%	ND(0.000065) J	
						Aroclor-1248	LCS %R	54.9%	70.0% to 130%	ND(0.000065) J	
						Aroclor-1254	LCS %R	54.9%	70.0% to 130%	ND(0.000065) J	
						Aroclor-1260	LCS %R	54.9%	70.0% to 130%	ND(0.000065) J	
						Total PCBs	LCS %R	54.9%	70.0% to 130%	ND(0.000065) J	
G135-546	J-1R (Filtered)	11/9/2007	Water	Tier II	Yes	Aroclor-1016	LCS %R	54.9%	70.0% to 130%	ND(0.000065) J	
						Aroclor-1016	MS/MSD RPD	20.4%	<12%	ND(0.000065) J	
						Aroclor-1221	LCS %R	54.9%	70.0% to 130%	ND(0.000065) J	
						Aroclor-1221	MS/MSD RPD	20.4%	<12%	ND(0.000065) J	
						Aroclor-1232	LCS %R	54.9%	70.0% to 130%	ND(0.000065) J	
						Aroclor-1232	MS/MSD RPD	20.4%	<12%	ND(0.000065) J	
						Aroclor-1242	LCS %R	54.9%	70.0% to 130%	ND(0.000065) J	
						Aroclor-1242	MS/MSD RPD	20.4%	<12%	ND(0.000065) J	
						Aroclor-1248	LCS %R	54.9%	70.0% to 130%	ND(0.000065) J	
						Aroclor-1248	MS/MSD RPD	20.4%	<12%	ND(0.000065) J	
						Aroclor-1254	LCS %R	54.9%	70.0% to 130%	ND(0.000065) J	
						Aroclor-1254	MS/MSD RPD	20.4%	<12%	ND(0.000065) J	
						Aroclor-1260	LCS %R	54.9%	70.0% to 130%	ND(0.000065) J	
						Aroclor-1260	MS/MSD RPD	20.4%	<12%	ND(0.000065) J	
						Total PCBs	LCS %R	54.9%	70.0% to 130%	ND(0.000065) J	
						Total PCBs	MS/MSD RPD	20.4%	<12%	ND(0.000065) J	
G135-559	GMA2-1 (Filtered)	11/14/2007	Water	Tier II	No						
G135-559	GMA2-2 (Filtered)	11/14/2007	Water	Tier II	No						
G135-559	GMA2-4 (Filtered)	11/14/2007	Water	Tier II	No						
G135-559	GMA2-9 (Filtered)	11/14/2007	Water	Tier II	No						
G135-559	GMA2-DUP-1 (Filtered)	11/14/2007	Water	Tier II	No						Parent Sample GMA2-9 (Filtered)
G135-570	GMA-2-RB-1 (Filtered)	12/3/2007	Water	Tier II	No						
VOCs											
G135-561	GMA2-DUP-2	11/15/2007	Water	Tier II	Yes	1,2-Dibromo-3-chloropropane	ICAL RRF	0.014	>0.05	ND(0.0050) J	Parent Sample OJ-MW-2
						1,4-Dioxane	ICAL RRF	0.000	>0.05	ND(0.10) J	
						2-Butanone	ICAL RRF	0.019	>0.05	ND(0.0050) J	
						2-Chloroethylvinylether	ICAL RRF	0.012	>0.05	ND(0.013) J	
						4-Methyl-2-pentanone	ICAL RRF	0.043	>0.05	ND(0.0050) J	
						Acetone	ICAL RRF	0.013	>0.05	ND(0.0050) J	
						Acetonitrile	ICAL RRF	0.004	>0.05	ND(0.020) J	
						Acrolein	ICAL RRF	0.007	>0.05	ND(0.025) J	
						Acrylonitrile	ICAL RRF	0.013	>0.05	ND(0.025) J	
						Bromomethane	ICAL RRF	0.029	>0.05	ND(0.0010) J	
						Bromomethane	CCAL %D	62.6%	<25%	ND(0.0010) J	
						Isobutanol	ICAL RRF	0.002	>0.05	ND(0.050) J	
						Methacrylonitrile	ICAL RRF	0.034	>0.05	ND(0.010) J	
						Propionitrile	ICAL RRF	0.002	>0.05	ND(0.020) J	
G135-561	OJ-MW-2	11/15/2007	Water	Tier II	Yes	1,2-Dibromo-3-chloropropane	ICAL RRF	0.014	>0.05	ND(0.0050) J	
						1,4-Dioxane	ICAL RRF	0.000	>0.05	ND(0.10) J	
						2-Butanone	ICAL RRF	0.019	>0.05	ND(0.0050) J	
						2-Chloroethylvinylether	MS/MSD %R	0.0%, 0.0%	16.7% to 200%	R	
						4-Methyl-2-pentanone	ICAL RRF	0.043	>0.05	ND(0.0050) J	
						Acetone	ICAL RRF	0.013	>0.05	ND(0.0050) J	
						Acetonitrile	ICAL RRF	0.004	>0.05	ND(0.020) J	
						Acrolein	ICAL RRF	0.007	>0.05	ND(0.025) J	
						Acrylonitrile	ICAL RRF	0.013	>0.05	ND(0.025) J	
						Bromomethane	ICAL RRF	0.029	>0.05	ND(0.0010) J	
						Bromomethane	CCAL %D	62.6%	<25%	ND(0.0010) J	
						Isobutanol	ICAL RRF	0.002	>0.05	ND(0.050) J	
						Methacrylonitrile	ICAL RRF	0.034	>0.05	ND(0.010) J	
						Propionitrile	ICAL RRF	0.002	>0.05	ND(0.020) J	

Table D-1
Analytical Data Validation Summary

Groundwater Managment Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Sample Delivery Group No.	Sample ID	Date Collected	Matrix	Validation Level	Qualification	Compound	QA/QC Parameter	Value	Control Limits	Qualified Result	Notes
VOCs (continued)											
G135-570	GMA-2-RB-1	12/3/2007	Water	Tier II	Yes	1,2-Dibromo-3-chloropropane	ICAL RRF	0.013	>0.05	ND(0.0050) J	
						1,4-Dioxane	ICAL RRF	0.000	>0.05	ND(0.10) J	
						2-Butanone	ICAL RRF	0.039	>0.05	ND(0.0050) J	
						2-Chloroethylvinylether	ICAL RRF	0.015	>0.05	ND(0.013) J	
						Acetone	ICAL RRF	0.022	>0.05	0.0016 J	
						Acetonitrile	ICAL RRF	0.008	>0.05	ND(0.020) J	
						Acrolein	ICAL RRF	0.015	>0.05	ND(0.025) J	
						Acrylonitrile	ICAL RRF	0.025	>0.05	ND(0.025) J	
						Isobutanol	ICAL RRF	0.003	>0.05	ND(0.050) J	
						Propionitrile	ICAL RRF	0.004	>0.05	ND(0.020) J	
						trans-1,4-Dichloro-2-butene	ICAL RRF	0.018	>0.05	ND(0.0050) J	
G135-582	GMA2-10	12/18/2007	Water	Tier II	Yes	1,2-Dibromo-3-chloropropane	ICAL RRF	0.013	>0.05	ND(0.0050) J	
						1,4-Dioxane	ICAL RRF	0.000	>0.05	ND(0.10) J	
						2-Butanone	ICAL RRF	0.039	>0.05	ND(0.0050) J	
						2-Chloroethylvinylether	ICAL RRF	0.015	>0.05	ND(0.013) J	
						Acetone	ICAL RRF	0.022	>0.05	ND(0.0050) J	
						Acetonitrile	ICAL RRF	0.008	>0.05	ND(0.020) J	
						Acrolein	ICAL RRF	0.015	>0.05	ND(0.025) J	
						Acrylonitrile	ICAL RRF	0.025	>0.05	ND(0.025) J	
						Acrylonitrile	CCAL %D	34.8%	<25%	ND(0.025) J	
						Chloroethane	CCAL %D	26.0%	<25%	ND(0.0010) J	
						Chloromethane	CCAL %D	44.3%	<25%	ND(0.0010) J	
						Dichlorodifluoromethane	CCAL %D	37.2%	<25%	ND(0.0010) J	
						Isobutanol	ICAL RRF	0.003	>0.05	ND(0.050) J	
						Isobutanol	CCAL %D	28.5%	<25%	ND(0.050) J	
						Propionitrile	ICAL RRF	0.004	>0.05	ND(0.020) J	
						trans-1,4-Dichloro-2-butene	ICAL RRF	0.018	>0.05	ND(0.0050) J	
						Trichlorofluoromethane	CCAL %D	31.8%	<25%	ND(0.0010) J	
						Vinyl Acetate	CCAL %D	26.7%	<25%	ND(0.0025) J	

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Appendix E

Historical Groundwater Data

Groundwater Elevation Monitoring
Data – Fall 2007

Table E-1
Groundwater Elevation Monitoring Data

Groundwater Managment Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts

Well Name	Measuring Point Elev (Ft.)	Date	Depth to Water (feet BMP)	Corrected Water Elev. (feet)
Former Oxbow Area J				
GMA2-1	991.36	11/1/2007	15.51	975.85
GMA2-1	991.36	11/14/2007	15.58	975.78
GMA2-2	991.19	11/1/2007	17.60	973.59
GMA2-2	991.19	11/14/2007	17.57	973.62
GMA2-3	991.48	11/1/2007	15.35	976.13
GMA2-3	991.48	11/9/2007	15.38	976.10
GMA2-6	989.73	11/1/2007	15.37	974.36
GMA2-6	989.73	11/9/2007	15.33	974.40
GMA2-7	989.64	11/1/2007	15.21	974.43
GMA2-10	990.03	12/18/2007	15.85	974.18
J-1R	988.25	11/1/2007	14.95	973.30
J-1R	988.25	11/9/2007	14.93	973.32
MW-1	994.47	11/1/2007	12.78	981.69
MW-2	991.64	11/2/2007	13.42	978.22
MW-2	991.64	11/15/2007	13.04	978.60
Former Oxbow Area K				
GMA2-4	983.41	11/1/2007	9.31	974.10
GMA2-4	983.41	11/14/2007	9.30	974.11
GMA2-5	985.85	11/1/2007	10.25	975.60
GMA2-8	982.30	11/1/2007	8.56	973.74
GMA2-9	981.29	11/1/2007	7.88	973.41
GMA2-9	981.29	11/14/2007	7.85	973.44
Housatonic River (Foot Bridge)				
GMA2-SG-1	989.82	7/30/2007	17.72	972.10
GMA2-SG-1	989.82	8/27/07	17.30	972.52
GMA2-SG-1	989.82	9/27/2007	17.28	972.54
GMA2-SG-1	989.82	11/2/2007	17.05	972.77
GMA2-SG-1	989.82	11/28/2007	16.58	973.24
GMA2-SG-1	989.82	12/19/2007	16.98	972.84

Notes:
1. ft BMP - feet Below Measuring Point.
2. A survey reference point was established on the Oxbow J & K foot bridge for staff gauge GMA2-SG-1. The "Depth to Water" value(s) provided in the above table refer to the vertical distance from the surveyed reference point to the water surface.

Summary of Historical Groundwater Analytical Results – Selected Wells

Table E-2
Comparison of Fall 2007 Sampling Result to Prior Monitoring Event Results

Groundwater Management Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Date Collected:	GMA2-1 11/07/06	GMA2-1 11/14/07	GMA2-2 10/27/03	GMA2-2 11/14/07	GMA2-3 10/23/03	GMA2-3 11/09/07	GMA2-6 10/27/03	GMA2-6 11/09/07
Volatile Organics								
2-Chloroethylvinylether	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	NA	NA	NA	NA	NA	NA	NA	NA
Total VOCs	NA	NA	NA	NA	NA	NA	NA	NA
PCBs-Unfiltered								
Aroclor-1254	NA	NA	0.00025	NA	0.0010	NA	0.00022	NA
Total PCBs	NA	NA	0.00025	NA	0.0010	NA	0.00022	NA
PCBs-Filtered								
Aroclor-1254	ND(0.00011) J [ND(0.00011) J]	ND(0.000065)	0.00018	ND(0.000065)	0.00071	ND(0.000065) J	0.00015	ND(0.000065) J
Total PCBs	ND(0.00011) J [ND(0.00011) J]	ND(0.000065)	0.00018	ND(0.000065)	0.00071	ND(0.000065) J	0.00015	ND(0.000065) J

Table E-2
Comparison of Fall 2007 Sampling Result to Prior Monitoring Event Results

Groundwater Management Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Date Collected:	GMA2-9 11/03/05	GMA2-9 11/14/07	J-1R 10/24/03	J-1R 11/09/07	OJ-MW-2 10/23/03	OJ-MW-2 11/15/07
Volatile Organics						
2-Chloroethylvinylether	NA	NA	NA	NA	ND(0.0050)	R [ND(0.013) J]
Trichloroethene	NA	NA	NA	NA	0.015	0.015 [0.015]
Total VOCs	NA	NA	NA	NA	0.015	0.015 [0.015]
PCBs-Unfiltered						
Aroclor-1254	NA	NA	0.00036	NA	ND(0.000065)	NA
Total PCBs	NA	NA	0.00036	NA	ND(0.000065)	NA
PCBs-Filtered						
Aroclor-1254	0.00038 J [0.00063 J]	ND(0.000065) [ND(0.000065)]	0.00022	ND(0.000065) J	ND(0.000065)	NA
Total PCBs	0.00038 J [0.00063 J]	ND(0.000065) [ND(0.000065)]	0.00022	ND(0.000065) J	ND(0.000065)	NA

Notes:

1. Samples were collected by ARCADIS, and submitted to SGS Environmental Services, Inc. for analysis of PCBs (filtered and unfiltered) and volatiles.
2. Analytical results have been validated as per GE's approved Field Sampling Plan/Quality Assurance Project Plan.
3. NA - Not Analyzed.
4. ND - Analyte was not detected. The number in parenthesis is the associated detection limit.
5. Only those constituents detected in one or more samples are summarized.
6. Field duplicate sample results are presented in brackets.

Data Qualifiers:

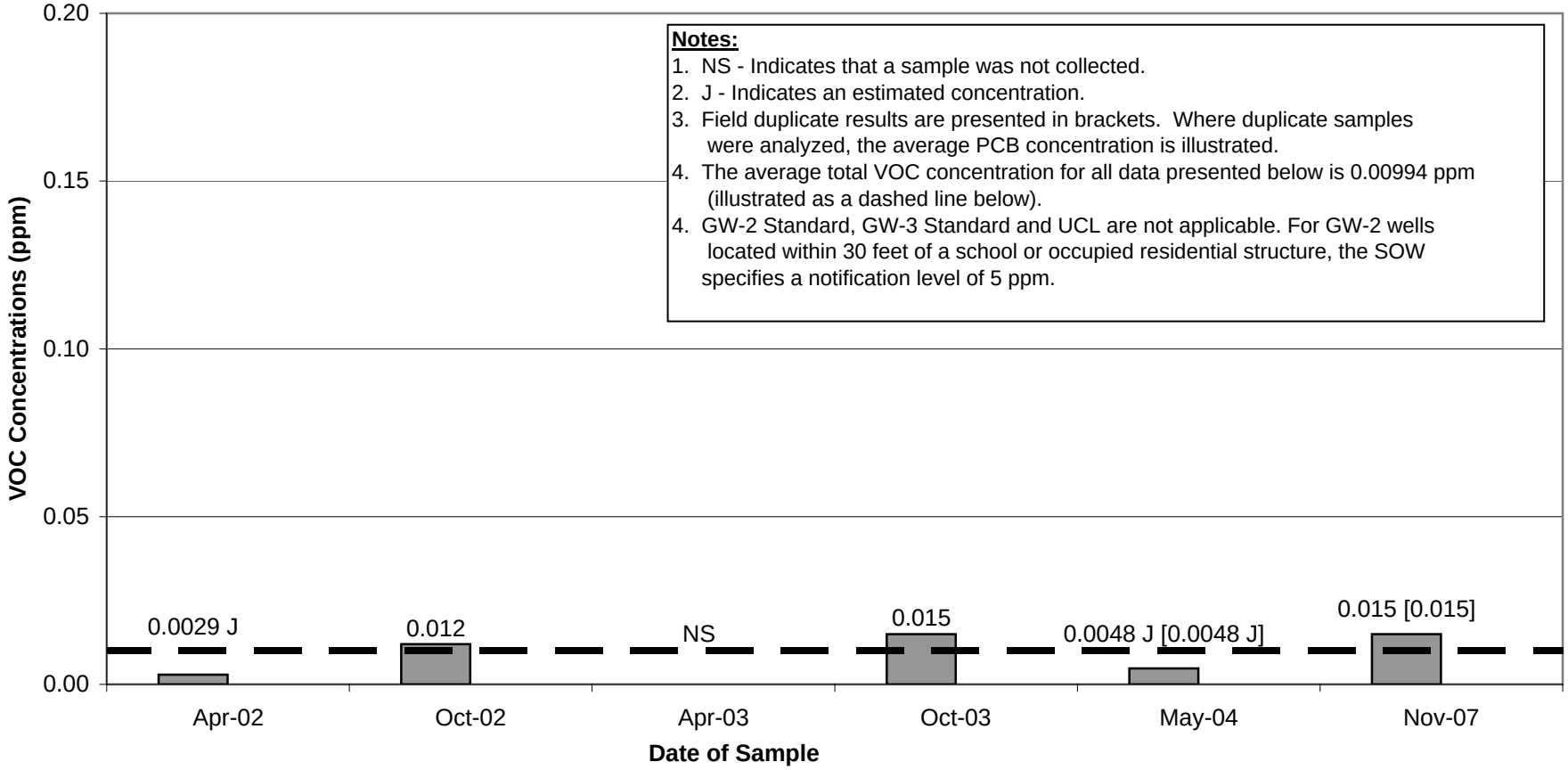
Organics (volatiles, PCBs)

J - Indicates that the associated numerical value is an estimated concentration.
R - Data was rejected due to a deficiency in the data generation process.

Total VOC Concentrations –
OJ-MW-2

Appendix E
Well OJ-MW-2 Historical Total VOC Concentrations

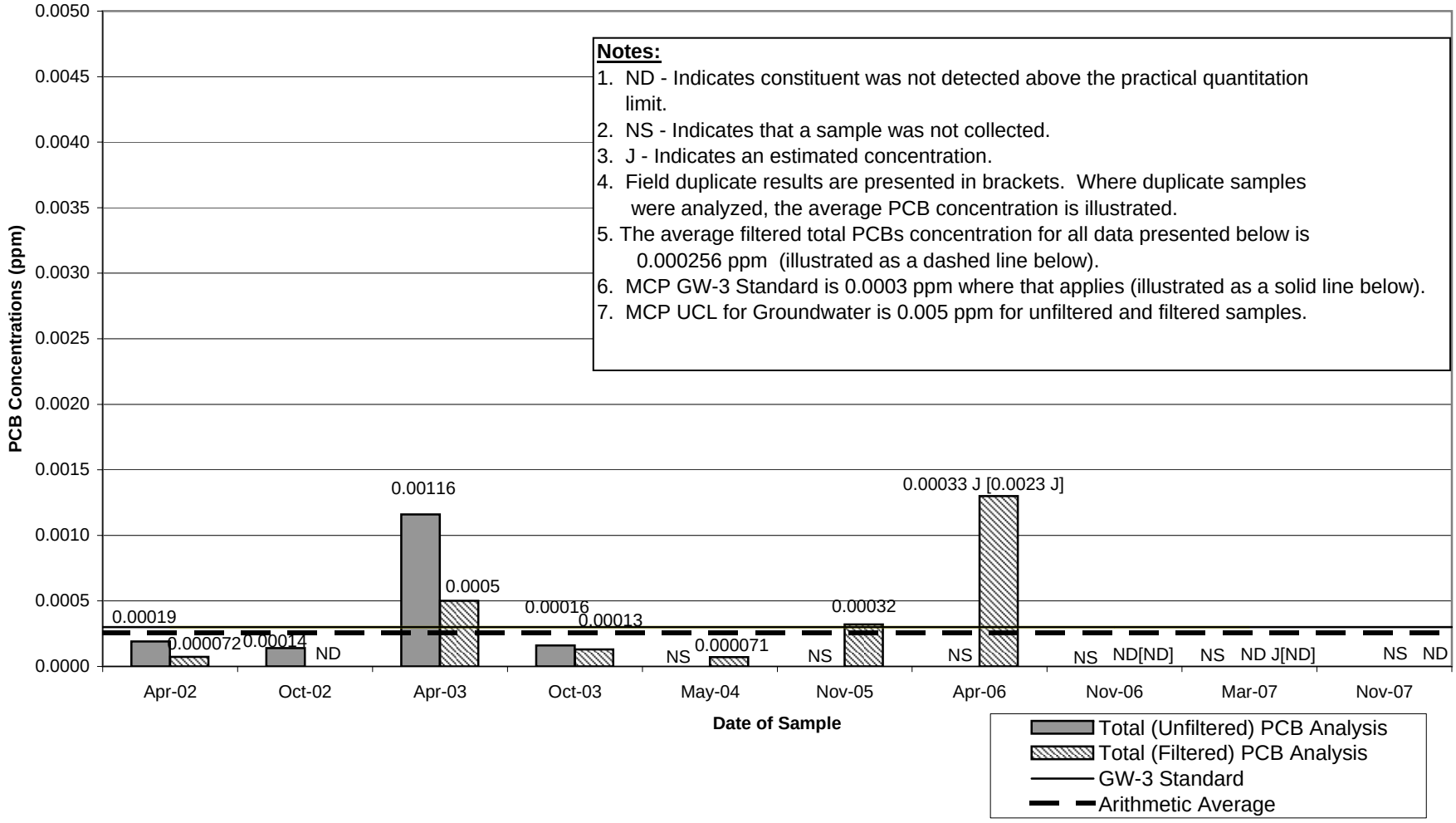
Groundwater Management Area 2
General Electric Company - Pittsfield, Massachusetts



Total PCB Concentrations –
Selected Wells

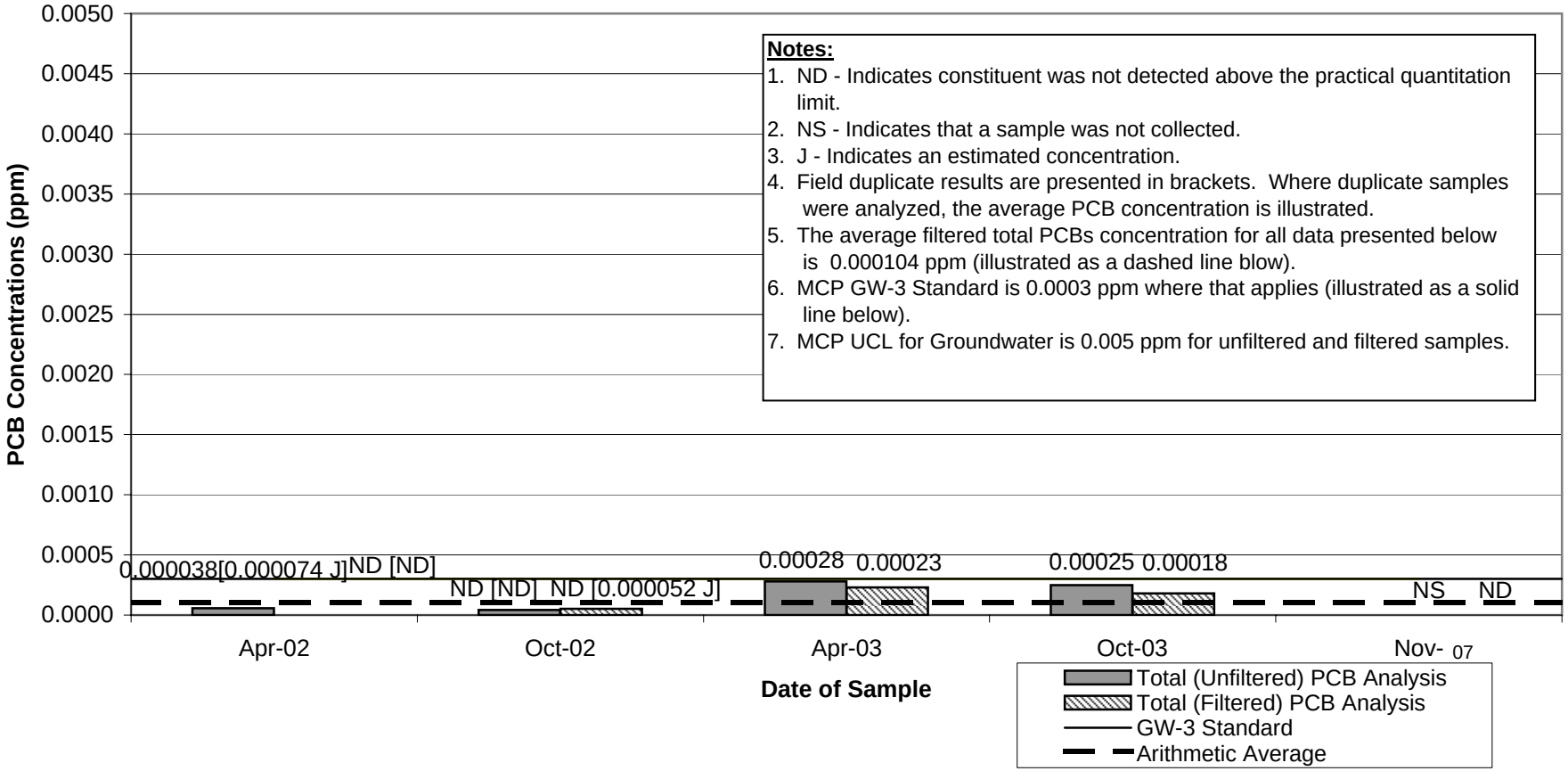
Appendix E
Well GMA2-1 Historical PCB Concentrations

Groundwater Management Area 2
General Electric Company - Pittsfield, Massachusetts



Appendix E
Well GMA2-2 Historical PCB Concentrations

Groundwater Management Area 2
General Electric Company - Pittsfield, Massachusetts



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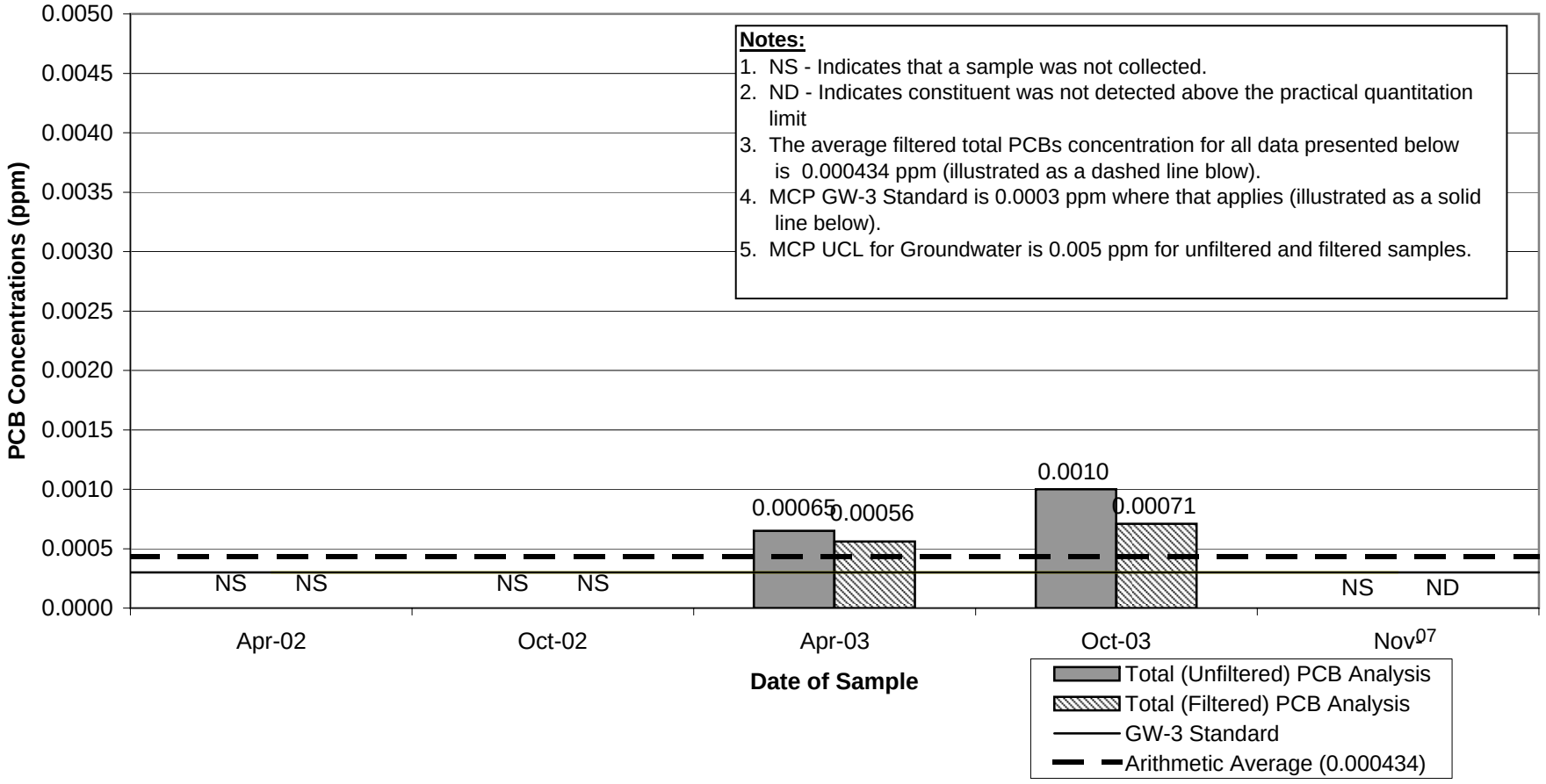
087811324AppxE_PCB.xlsGMA2-2

3/21/2008

Appendix E
Well GMA2-3 Historical PCB Concentrations

Groundwater Management Area 2
General Electric Company - Pittsfield, Massachusetts



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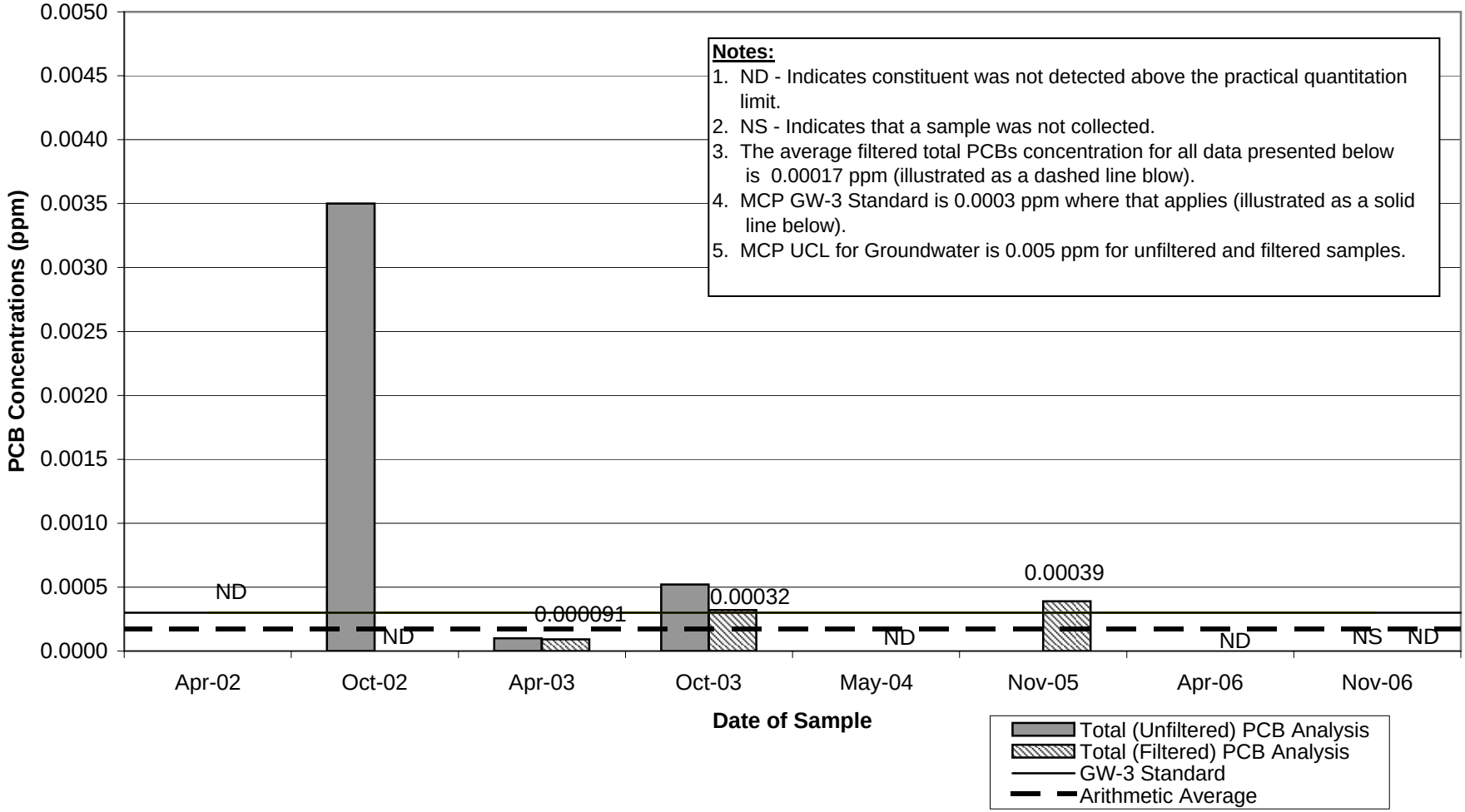
087811324AppxE_PCB.xlsGMA2-3

3/21/2008

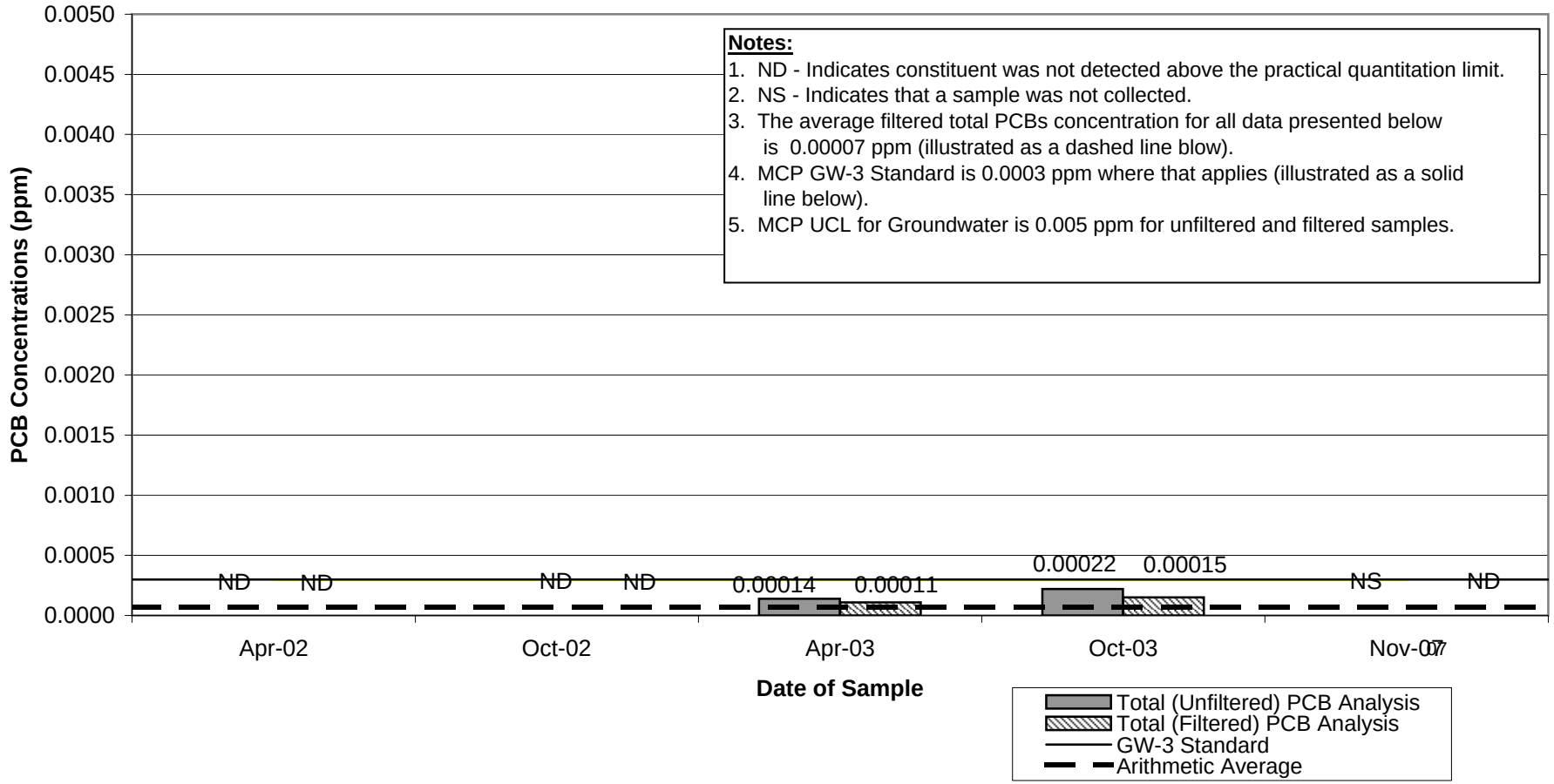
Appendix E
Well GMA2-4 Historical PCB Concentrations

Groundwater Management Area 2
General Electric Company - Pittsfield, Massachusetts



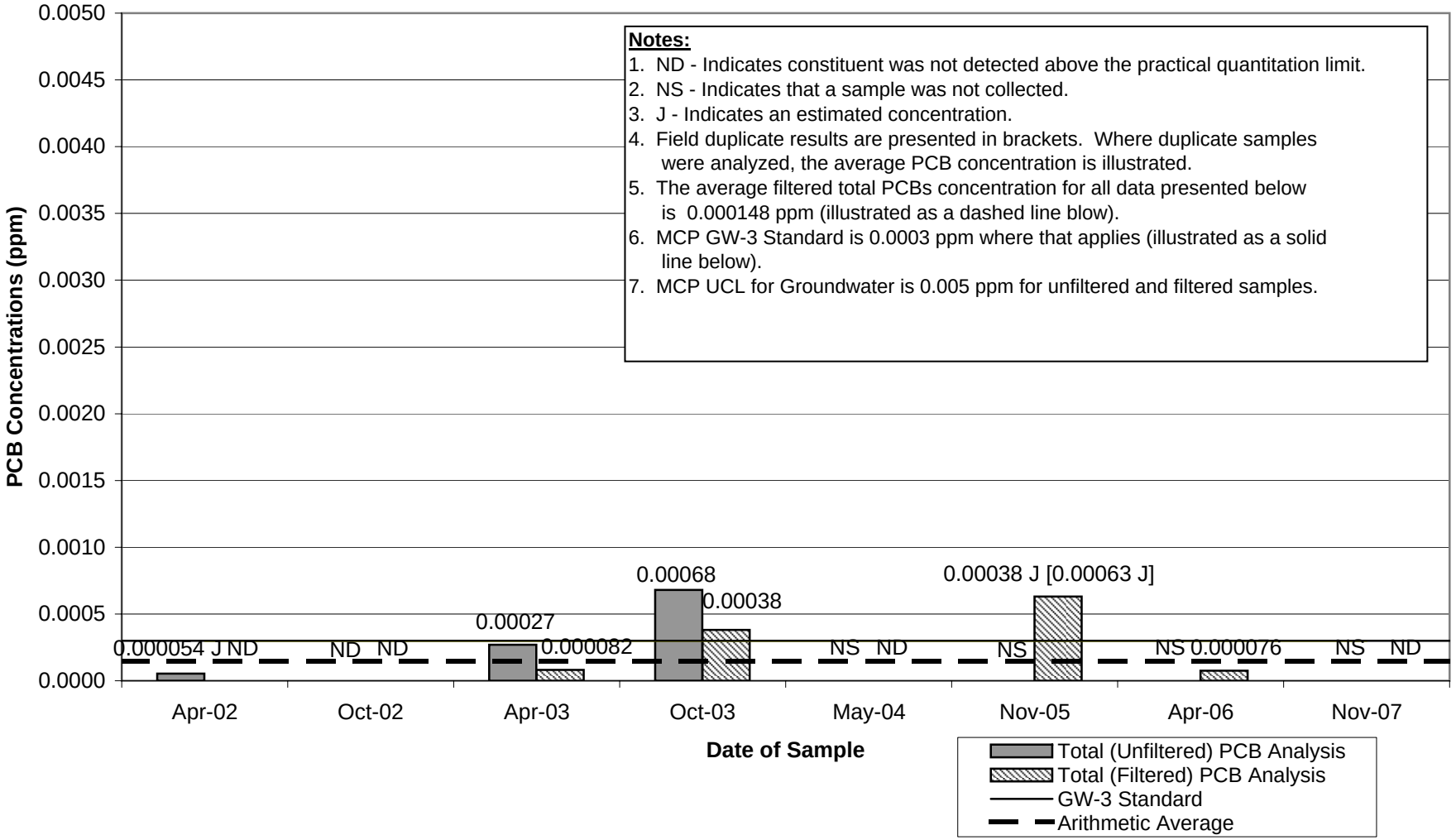
Appendix E
Well GMA2-6 Historical PCB Concentrations

Groundwater Management Area 2
General Electric Company - Pittsfield, Massachusetts



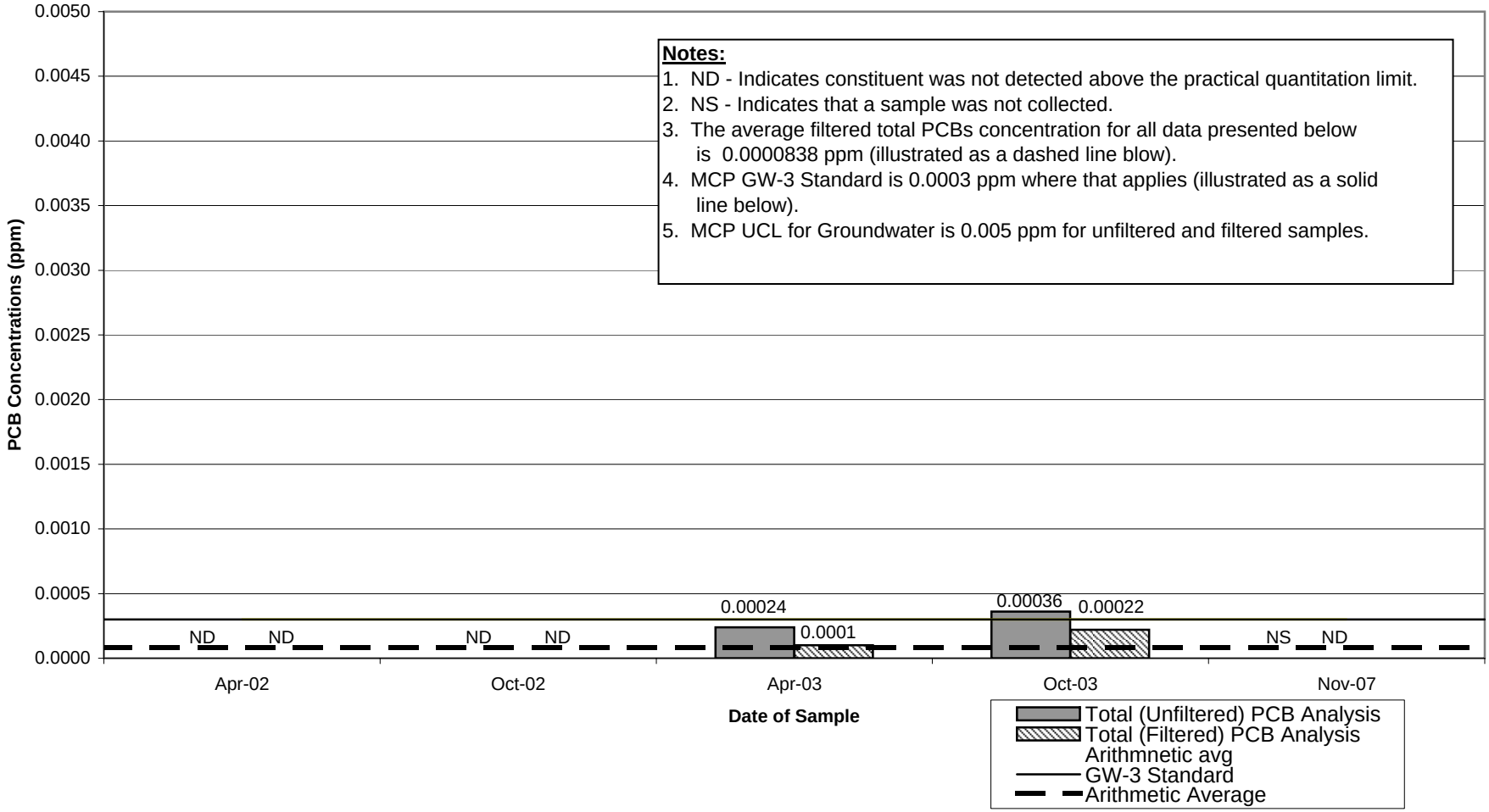
Appendix E
Well GMA2-9 Historical PCB Concentrations

Groundwater Management Area 2
General Electric Company - Pittsfield, Massachusetts



Appendix E
Well J-1R Historical PCB Concentrations

Groundwater Management Area 2
General Electric Company - Pittsfield, Massachusetts



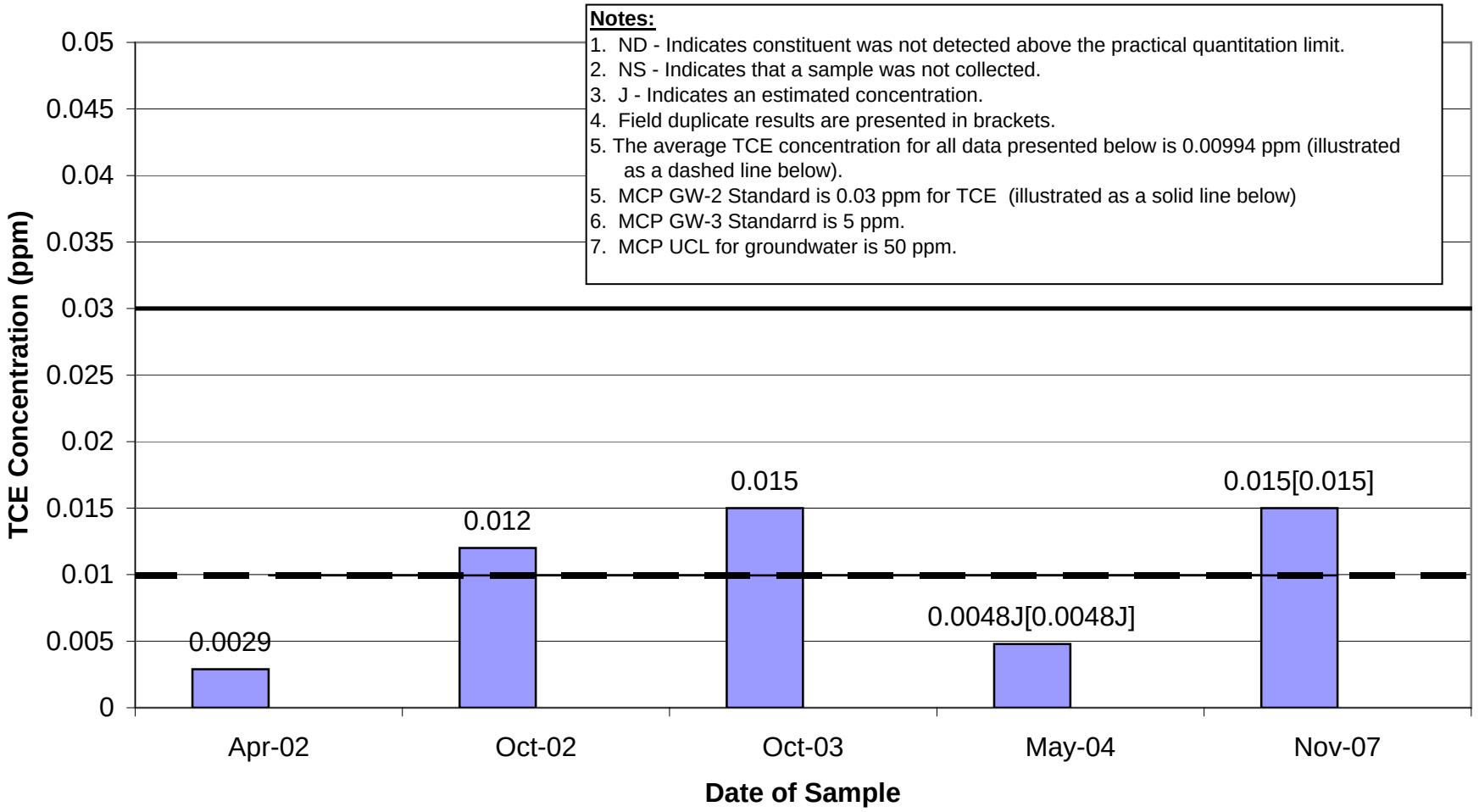
G:\GE\GE_Pittsfield_CD_GMA_2\Reports and Presentations\GW Qual Rpt Fall 2007\
087811324AppxE_PCB.xlsJ-1R

3/21/2008

Trichloroethene Concentrations –
Well OJ-MW-2

Appendix E
Well OJ-MW-2 Historical TCE Concentrations

Groundwater Management Area 2
General Electric Company - Pittsfield, Massachusetts



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Appendix F

Results of Statistical Data Assessment

Table F-1
Summary Of Historical Groundwater Analytical Results - Well GMA2-1

Groundwater Management Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Sample ID: Parameter Date Collected:	Method 1 GW-3 Standards	MCP UCL for Groundwater	Detection Frequency	Minimum Detect	Maximum Detect	Minimum Non-Detect	Maximum Non-Detect	Median Value	Arithmetic Average	Geometric Mean	Standard Deviation	Fall 2007 Results GMA2-1 11/14/07
PCBs-Filtered												
Aroclor-1254	Not Listed	Not Listed	6/10	0.000071	0.0016	0.000065	0.00011	0.0000715	0.000223	0.000112	0.000304	ND(0.000065)
Aroclor-1260	Not Listed	Not Listed	1/10	0.0007	0.0007	0.000065	0.00011	0.0000330	0.0000706	0.0000461	0.000106	ND(0.000065)
Total PCBs	0.0003	0.005	6/10	0.000071	0.0023	0.000065	0.00011	0.0000715	0.000256	0.000115	0.000397	ND(0.000065)

Notes:
1. Samples were collected by ARCADIS between 2002 and 2007 and submitted to SGS Environmental Services, Inc. for analysis.
2. Analytical results have been validated as per GE's approved Field Sampling Plan/Quality Assurance Project Plan.
3. ND - Analyte was not detected. The number in parenthesis is the associated detection limit.
4. Only constituents which were detected during at least one prior sampling event and were analyzed for during the fall 2007 sampling event are summarized.

Table F-2
Summary Of Historical Groundwater Analytical Results - Well GMA2-2

Groundwater Management Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Date Collected:	Method 1 GW-3 Standards	MCP UCL for Groundwater	Detection Frequency	Minimum Detect	Maximum Detect	Minimum Non-Detect	Maximum Non-Detect	Median Value	Arithmetic Average	Geometric Mean	Standard Deviation	Fall 2007 Results GMA2-2 11/14/07
PCBs-Filtered												
Aroclor-1254	Not Listed	Not Listed	3/5	0.00018	0.00023	0.000065	0.000065	0.0000420	0.000104	0.0000717	0.0000943	ND(0.000065)
Total PCBs	0.0003	0.005	3/5	0.00018	0.00023	0.000065	0.000065	0.0000420	0.000104	0.0000717	0.0000943	ND(0.000065)

Notes:
1. Samples were collected by ARCADIS between 2002 and 2007 and submitted to SGS Environmental Services, Inc. for analysis.
2. Analytical results have been validated as per GE's approved Field Sampling Plan/Quality Assurance Project Plan
3. N/A- Not Applicable
4. ND - Analyte was not detected. The number in parenthesis is the associated detection limit.
5. Only constituents which were detected during at least one prior sampling event and were analyzed for during the fall 2007 sampling event are summarized.

Table F-3
Summary Of Historical Groundwater Analytical Results - Well GMA2-3

Groundwater Management Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Sample ID: Parameter Date Collected:	Method 1 GW-3 Standards	MCP UCL for Groundwater	Detection Frequency	Minimum Detect	Maximum Detect	Minimum Non-Detect	Maximum Non-Detect	Median Value	Arithmetic Average	Geometric Mean	Standard Deviation	Fall 2007 Results GMA2-3 11/09/07
PCBs-Filtered												
Aroclor-1254	Not Listed	Not Listed	2/3	0.00056	0.00071	0.000065	0.000065	0.000560	0.000434	0.000236	0.000356	ND(0.000065) J
Total PCBs	0.0003	0.005	2/3	0.00056	0.00071	0.000065	0.000065	0.000560	0.000434	0.000236	0.000356	ND(0.000065) J

Notes:
1. Samples were collected by ARCADIS between 2002 and 2007 and submitted to SGS Environmental Services, Inc. for analysis.
2. Analytical results have been validated as per GE's approved Field Sampling Plan/Quality Assurance Project Plan.
3. ND - Analyte was not detected. The number in parenthesis is the associated detection limit.
4. Only constituents which were detected during at least one prior sampling event and were analyzed for during the fall 2007 sampling event are summarized.

Data Qualifiers:

Organics (volatiles, PCBs)

J - Indicates that the associated numerical value is an estimated concentration.

Table F-4
Summary Of Historical Groundwater Analytical Results - Well GMA2-4

Groundwater Management Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Date Collected:	Method 1 GW-3 Standards	MCP UCL for Groundwater	Detection Frequency	Minimum Detect	Maximum Detect	Minimum Non-Detect	Maximum Non-Detect	Median Value	Arithmetic Average	Geometric Mean	Standard Deviation	Fall 2007 Results GMA2-4 11/14/07
PCBs-Filtered												
Aroclor-1254	Not Listed	Not Listed	3/8	9.1E-05	0.00039	0.000065	0.00085	0.0000620	0.000170	0.0000934	0.000177	ND(0.000065)
Total PCBs	0.0003	0.005	3/8	9.1E-05	0.00039	0.000065	0.00085	0.0000620	0.000170	0.0000934	0.000177	ND(0.000065)

Notes:
1. Samples were collected by ARCADIS between 2002 and 2007 and submitted to SGS Environmental Services, Inc. for analysis.
2. Analytical results have been validated as per GE's approved Field Sampling Plan/Quality Assurance Project Plan.
3. ND - Analyte was not detected. The number in parenthesis is the associated detection limit.
4. Only constituents which were detected during at least one prior sampling event and were analyzed for during the fall 2007 sampling event are summarized.

Table F-5
Summary Of Historical Groundwater Analytical Results - Well GMA2-6

Groundwater Management Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Date Collected:	Method 1 GW-3 Standards	MCP UCL for Groundwater	Detection Frequency	Minimum Detect	Maximum Detect	Minimum Non-Detect	Maximum Non-Detect	Median Value	Arithmetic Average	Geometric Mean	Standard Deviation	Fall 2007 Results GMA2-6 11/09/07
PCBs-Filtered												
Aroclor-1254	Not Listed	Not Listed	2/5	0.00011	0.00015	0.000065	0.000065	0.0000330	0.0000718	0.0000568	0.0000550	ND(0.000065) J
Total PCBs	0.0003	0.005	2/5	0.00011	0.00015	0.000065	0.000065	0.0000330	0.0000718	0.0000568	0.0000550	ND(0.000065) J

Notes:
1. Samples were collected by ARCADIS between 2002 and 2007 and submitted to SGS Environmental Services, Inc. for analysis.
2. Analytical results have been validated as per GE's approved Field Sampling Plan/Quality Assurance Project Plan
3. ND - Analyte was not detected. The number in parenthesis is the associated detection limit.
4. Only constituents which were detected during at least one prior sampling event and were analyzed for during the fall 2007 sampling event are summarized.

Data Qualifiers:

Organics (volatiles, PCBs)

J - Indicates that the associated numerical value is an estimated concentration.

Table F-6
Summary Of Historical Groundwater Analytical Results - Well GMA2-9

Groundwater Management Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Parameter / Sample ID: Date Collected:	Method 1 GW-3 Standards	MCP UCL for Groundwater	Detection Frequency	Minimum Detect	Maximum Detect	Minimum Non-Detect	Maximum Non-Detect	Median Value	Arithmetic Average	Geometric Mean	Standard Deviation	Fall 2007 Results GMA2-9 11/14/07
PCBs-Filtered												
Aroclor-1254	Not Listed	Not Listed	4/8	0.000076	0.00063	0.000065	0.000065	0.0000545	0.000148	0.0000784	0.000188	ND(0.000065) [ND(0.000065)]
Total PCBs	0.0003	0.005	4/8	0.000076	0.00063	0.000065	0.000065	0.0000545	0.000148	0.0000784	0.000188	ND(0.000065) [ND(0.000065)]

Notes:
1. Samples were collected by ARCADIS between 2002 and 2007 and submitted to SGS Environmental Services, Inc. for analysis.
2. Analytical results have been validated as per GE's approved Field Sampling Plan/Quality Assurance Project Plan
3. ND - Analyte was not detected. The number in parenthesis is the associated detection limit.
4. Only constituents which were detected during at least one prior sampling event and were analyzed for during the fall 2007 sampling event are summarized.

Table F-7
Summary Of Historical Groundwater Analytical Results - Well GMA2-10

Groundwater Management Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Date Collected:	Method 1 GW-2 Standards	Method 1 GW-3 Standards	MCP UCL for Groundwater	Detection Frequency	Minimum Detect	Maximum Detect	Minimum Non-Detect	Maximum Non-Detect	Median Value	Arithmetic Average	Geometric Mean	Standard Deviation	Fall 2007 Results GMA2-10 12/18/07
Volatile Organics													
trans-1,2-Dichloroethene	0.09	50	100	1/1	0.00034	0.00034	N/A	N/A	0.000340	0.000340	0.000340	N/A	0.00034 J
Vinyl Chloride	0.002	50	100	1/1	0.00047	0.00047	N/A	N/A	0.000470	0.000470	0.000470	N/A	0.00047 J
Total VOCs	5	Not Listed	Not Listed	1/1	0.00081	0.00081	N/A	N/A	0.000810	0.000810	0.000810	N/A	0.00081 J

Notes:
1. Samples were collected by ARCADIS in fall 2007 and submitted to SGS Environmental Services, Inc. for analysis.
2. Analytical results have been validated as per GE's approved Field Sampling Plan/Quality Assurance Project Plan
3. N/A- Not Applicable
4. Only constituents which were detected during at least one prior sampling event and were analyzed for during the fall 2007 sampling event are summarized.
5. Total VOCs are being compared to the notification level in the SOW of 5 ppm, as there is no GW-2 standard for Total VOCs.

Data Qualifiers:

Organics (volatiles)

J - Indicates that the associated numerical value is an estimated concentration.

Table F-8
Summary Of Historical Groundwater Analytical Results - Well J-1R

Groundwater Management Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Date Collected:	Method 1 GW-3 Standards	MCP UCL for GroundWater	Detection Frequency	Minimum Detect	Maximum Detect	Minimum Non-Detect	Maximum Non-Detect	Median Value	Arithmetic Average	Geometric Mean	Standard Deviation	Fall 2007 Results J-1R 11/09/07
PCBs-Filtered												
Aroclor-1254	Not Listed	Not Listed	2/5	0.0001	0.00022	0.000065	0.000065	0.0000330	0.0000838	0.0000602	0.0000815	ND(0.000065) J
Total PCBs	0.0003	0.005	2/5	0.0001	0.00022	0.000065	0.000065	0.0000330	0.0000838	0.0000602	0.0000815	ND(0.000065) J

Notes:
1. Samples were collected by ARCADIS between 2002 and 2007 and submitted to SGS Environmental Services, Inc. for analysis.
2. Analytical results have been validated as per GE's approved Field Sampling Plan/Quality Assurance Project Plan
3. ND - Analyte was not detected. The number in parenthesis is the associated detection limit.
4. Only constituents which were detected during at least one prior sampling event and were analyzed for during the fall 2007 sampling event are summarized.

Data Qualifiers:

Organics (volatiles, PCBs)
J - Indicates that the associated numerical value is an estimated concentration.

Table F-9
Summary Of Historical Groundwater Analytical Results - Well OJ-MW-2

Groundwater Management Area 2 Long-Term Monitoring Program
Monitoring Event Evaluation Report for Fall 2007
General Electric Company - Pittsfield, Massachusetts
(Results are presented in parts per million, ppm)

Parameter / Sample ID: / Date Collected:	Method 1 GW-2 Standards	Method 1 GW-3 Standards	MCP UCL for GroundWater	Detection Frequency	Minimum Detect	Maximum Detect	Minimum Non-Detect	Maximum Non-Detect	Median Value	Arithmetic Average	Geometric Mean	Standard Deviation	Fall 2007 Results OJ-MW-2 11/15/07
Volatile Organics													
Trichloroethene	0.03	5	50	5/5	0.0029	0.015	N/A	N/A	0.0120	0.00994	0.00822	0.00573	0.015 [0.015]
Total VOCs	5	Not Listed	Not Listed	5/5	0.0029	0.015	N/A	N/A	0.0120	0.00994	0.00822	0.00573	0.015 [0.015]

Notes:
1. Samples were collected by ARCADIS between 2002 and 2007 and submitted to SGS Environmental Services, Inc. for analysis.
2. Analytical results have been validated as per GE's approved Field Sampling Plan/Quality Assurance Project Plan
3. N/A- Not Applicable
4. Only constituents which were detected during at least one prior sampling event and were analyzed for during the fall 2007 sampling event are summarized.
5. Total VOCs are being compared to the notification level in the SOW of 5 ppm, as there is no GW-2 standard for Total VOCs.
6. Field duplicate sample results are presented in brackets.

ARCADIS

Appendix G

Derivation of Guidance Values for Cobalt and Copper

Appendix G
Derivation of Guidance Values for Cobalt and Copper

Groundwater Management Area 2
General Electric Company - Pittsfield, Massachusetts

1. Introduction

For constituents that are detected in groundwater during the baseline monitoring programs at the GE Pittsfield Groundwater Management Areas for which Method 1 standards do not exist, Attachment H to the SOW states that GE must propose to develop Method 2 standards using the MCP procedures or alternate procedures approved by EPA, or provide a rationale for why such standards need not be developed. EPA's October 9, 2007 conditional approval letter requires GE to discuss the baseline analytical results at GMA 2 for cobalt and copper (for which Method 1 GW-3 standards do not exist) and either to develop Method 2 standards using the MCP procedures or alternate procedures approved by EPA, or to provide a rationale for why such standards need not be developed.

This appendix summarizes the procedures performed by GE to determine appropriate Method 2 standards for cobalt and copper. As discussed below, since certain information required to develop Method 2 standards is not available for cobalt and copper, GE has instead calculated low-, mid-, high-range guidance values for copper and cobalt to approximate the ranges of Method 2 GW-3 standards that could potentially apply these substances.

2. Procedures Utilized to Derive Guidance Values

GE utilized the procedures provided in the MCP (310 CMR 40.0983(4)) to derive low-, mid-, and high-range guidance values reflecting the possible range of Method 2 GW-3 standards for cobalt and copper in groundwater. As described in 310 CMR 40.0983(4), the following information is required to calculate Method 2 GW-3 Standards:

- Ecologically-based Water Quality Criterion for the constituent (i.e., the Fresh Water Chronic Criterion, the Fresh Water Acute Criterion, the Marine Chronic Criterion, and the Marine Acute Criterion); and

- The Soil Organic Carbon-Water Partitioning Coefficient (Koc) for the constituent.

After this information is compiled, the lowest ecologically-based Water Quality Criterion is multiplied by a factor of 10 and then multiplied by:

- A factor of 2.5, if the Koc value for the constituent is less than 1,000;

- A factor of 25, if the Koc value for the constituent is greater than or equal to 1,000, but less than 100,000; or

- A factor of 100, if the Koc value for the constituent is greater than 100,000.

If the resulting concentration is less than or equal to 50 ppm, it represents the MCP Method 2 GW-3 Standard. Otherwise, the standard is adjusted to the ceiling concentration of 50 ppm.

EPA (http://www.epa.gov/waterscience/criteria/wqcriteria.html) has established an acute freshwater water quality criterion of 0.013 ppm and a chronic freshwater water quality criterion of 0.009 ppm for copper. While there are no ambient water quality criteria available for cobalt, EPA's Office of Solid Waste and Emergency Response (OSWER) did derive a secondary chronic value for cobalt using the Agency's Tier II methodology. That value is 0.003 ppm (EPA, 1996). While a number of additional ecological toxicity benchmarks are provided in the Oak Ridge National Laboratory's Risk Assessment Information System (RAIS) database (http://rais.ornl.gov/homepage/benchmark.shtml), this is the most stringent of the values provided there and therefore provides a conservative starting point for the derivation of a Method 2 GW-3 standard for that metal.

The second step in the prescribed methodology, which is discussed above, is to multiply the selected benchmark by a factor of 10. This calculation results in a value of 0.09 ppm for copper (using the more conservative of the available freshwater criteria) and 0.03 ppm for cobalt.

Finally, the MCP methodology indicates that the value derived in the second step should be multiplied by an additional factor, depending upon the Koc value for the constituent. Koc is the measure of the degree that a particular compound will partition from organic carbon and water when at equilibrium. In general, Koc values are not available for metals. However, EPA (2002) guidance does provide Kd values that can be used to estimate Koc values for the constituents of interest.

Kd is the measure of the likelihood that a chemical will bind to soil or sediment rather than remain in water. The higher the Kd value, the more likely it is that the chemical will bind to soil (EPA, 1989). According to EPA (2002; p. 4-28), the Kd for organic materials is derived by multiplying the Koc value by the fraction of organic carbon in the soil (foc). In that guidance it is recommend that when site-specific data are not available for estimating migration to groundwater it is reasonable to use the assumption that foc is equal to 0.002 or 0.2%.

Thus, if this same relationship holds true for metals and one uses the assumption that foc = 0.002, it is possible to estimate a Koc value for any constituent for which a Kd value is available. According to EPA guidance (EPA, 2002), Kd is highly dependent upon the pH of the water. When the pH is not known, it is recommended that the Kd value that is based on a pH of 6.8 be selected as a default.

EPA (2002) does not provide Kd values for either cobalt or copper. However, for the 12 metals for which that document does provide Kd values at a pH of 6.8, the Kd values range from 5 to 750 L/kg (EPA, 2002; p. C-7). (For one constituent, chromium III, the Kd value is considerably higher at 1,800,000 L/kg than those Kd values reported for other metals and thus has not been considered likely to be relevant to the constituents of interest.) For the metals that appear closest to cobalt and copper in the periodic table (arsenic, nickel, silver and zinc), the reported Kd values are within one order of magnitude (8 to 75 L/kg). Given that the range for these four metals is more limited and lower than the range for all of the metals; it provides a reasonable and conservative starting point for calculating a Koc for the metals of interest.

If Kd = Koc * foc, then it is possible to estimate a Koc value for metals using the default foc of 0.002. Using that default value, the range of Koc values that results is 4,000 to 37,500.

According the MCP methodology, if the Koc is between 1,000 and 100,000, it is appropriate to multiply the value derived in Step 2 by a factor of 25. The range of Koc values derived above falls into the 1,000 to 100,000 range and thus a factor of 25 can be used to derive estimated GW-3 standards for the two metals of interest.

Constituent	**Step 1** Selected Criterion	**Step 2** Criterion * 10	**Step 3** Step 2 * 25
Copper	0.009 ppm	0.09 ppm	2.25 ppm
Cobalt	0.003 ppm	0.03 ppm	0.75 ppm

3. Conclusions

It appears that, based on the above calculation, an estimated GW-3 standard of approximately 2.25 ppm may be appropriate for copper and an estimated GW-3 standard of 0.75 ppm may be appropriate for cobalt. Given the lack of Kd or Koc information associated with these two metals, however, the exact magnitude of the most appropriate Method 2 GW-3 standard cannot be determined. Given this uncertainty, GE has utilized the methodology described above to calculate low-, mid-, and high-range guidance values to approximate a range in possible Method 2 GW-3 standards for each substance based on the possible Kocs:

Constituent	**Koc<1,000** (Step 2*2.5)	**Koc Between 1,000 and 100,000** (Step 2*25)	**Koc>100,000** (Step 2*100)
Copper	0.225 ppm	2.25 ppm	9 ppm
Cobalt	0.075 ppm	0.75 ppm	3 ppm

Thus, the guidance value GE has developed for copper ranges from 0.225 ppm to 9 ppm, with a mid-range estimate of 2.25 ppm. For cobalt, the guidance value ranges from 0.075 ppm to 3 ppm, with a mid-range estimate of 0.75 ppm.

4. References

EPA. 1989. Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A); Interim Final. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response. EPA/540/1-88/002. December.

EPA. 1996. ECO Update; Ecotox Thresholds. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. EPA 540/F-95/038. January.

EPA. 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. OSWER 9355.4-24. December.