March 31, 2010

Mr. Salvatore Priore, P.E.
NYS Department of Environmental Conservation
625 Broadway
Albany, New York 12233-7013

RE: RG&E – Phase 2 Data Summary Package – Assessment of MGP-Related NAPL Residual in Sediments in the Genesee River Project Area

Dear Mr. Priore:

Attached is a report entitled *Phase 2 Data Summary Package, Assessment of MGP-Related NAPL Residuals in Sediments in the Genesee River Project Area* dated March 31, 2010 prepared by GEI Consultants (Phase 2 Data Report). The report summarizes data collected during implementation of the Phase 2 field work completed September 9, 2009 through October 3, 2009. The Phase 2 scope was presented to the Department in a scope-of-work prepared by GEI dated September 8, 2009 and approved by the NYSDEC on September 15, 2009.

The Phase 2 work was a continuation of Phase 1completed in 2008 and consisted of the following:

- mapping and probing in portions of the Project Area which were inaccessible in 2008;
- refinement of areas in which sheens and/or NAPL were observed in Phase 1;
- mapping and probing in the expanded area of the Project Area (between Seth Green Island and Veterans Memorial Bridge); and,
- collection of sediment samples in "ambient" locations and around areas of NAPL observed along the East and West Station former MGPs.

With the exception of obtaining access in the Project Area identified as Area B (between the Middle Falls dam and Lower Falls) and the areas immediately upstream of the Middle Falls dam and the base of the Lower Falls, the Phase 2 work was successfully implemented. Access to the noted areas were not obtained due to safety considerations associated with RG&E's hydro-station maintenance and the inability to control water flow in those areas.

The combination of the Phase 1 and Phase 2 investigations have provided observations and field data which help to establish the overall condition of the Genesee River within the study area with respect to MGP NAPL, and which shows the extent of NAPL impacts in sediments along East and West Station former MGPs. It is our opinion that the next phase of investigation should be to integrate this data into the RI's currently being performed at the East and West Station former MGP sites and then evaluate what data gaps exists.

As committed in the initial project Work Plan (Work Plan dated August 22, 2008), Area B, the north end of Area A adjacent to the middle falls dam , and Area C near the base of the Lower Falls will be assessed, if still required, subsequent to the repairs (possibly 2011) to the RG&E hydro-station. This will allow for increased safety since water can be controlled by the dam and diverted to the hydro-station.

As indicated in the initial project Work Plan dated August 22, 2008, the scope-of-work for Phase 3, if warranted, would be determined in discussions with the NYSDEC subsequent to a Phase 2 Data review meeting with the NYSDEC. As such, after you have reviewed the Data Package, please contact me so we can schedule a meeting to review the findings and discuss activities for the next phase.

In the mean time, if you have any questions, please contact me at (585) 771-4556.

Sincerely,

Steven Mullin
Lead Analyst
RG&E Environmental Compliance

Enclosure

c: David Crosby, P.E. – NYSDEC
Joespeh Simone, P.E. – Manager of Environmental Compliance (w/o enclosure)

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Geotechnical
Environmental
Water Resources
Ecological

Phase 2 Data Summary Package Assessment of MGP-Related NAPL Residuals in Sediments in the Genesee River Project Area

Submitted to:
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Rochester, New York

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March 31, 2010
Project #091980-1004

Bruce Coulombe, P.G.
Project Manager

Table of Contents

Table of Contents (cont.)

Tables

Figures

Plates

Appendices

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Executive Summary

This Data Package was prepared in accordance with a Work Plan dated August 22, 2008, and a Phase 2 Investigation Work Plan dated September 8, 2009, which were reviewed and approved by the New York State Department of Environmental Conservation (NYSDEC). The Work Plan describes a phased approach to assess manufactured gas plant (MGP)-related non-aqueous phase liquid (NAPL) residuals in sediments in a stretch of the Genesee River located in the City of Rochester, New York. The Work Plan was prepared in response to a request which the NYSDEC made during a meeting with Rochester Gas and Electric Company (RG&E) in March 2007. During that meeting the NYSDEC conveyed the concept of a phased approach to assess sediments in the Genesee River in proximity to RG&E's former MGP sites. For the purposes of this Work Plan, the Genesee River Project Area (Project Area) was defined to extend from the base of the Upper Falls to the northern limits of Seth Green Island, just north of the Lower Falls. The Phase 2 Work Plan expanded the northern boundary of the Project Area from the northern end of Seth Green Island to the Veterans Bridge (New York State Route 104). The Project Area now encompasses an approximate 2.6 river mile reach of the river.

As a brief summary, Phase 1 of this investigation was performed from September 23 through October 10, 2008. This was a reconnaissance-level survey, performed in order to assess the physical condition of the river in this area, and to assess whether visible coal tar impacts were present in the sediment. The scope of work performed during the Phase 1 included:

- A bathymetric survey of the river;
- Identification and mapping of features along the gorge and shoreline;
- Mapping of outfall pipes observed;
- Probing of sediments to assess the sediment type and thickness;
- Probing to assess the presence and intensity of a coal tar sheen associated with the river sediments; and
- Trial vibracoring.

Phase 2 of this investigation was performed from September 9 through October 3, 2009. The Phase 2 investigation conducted mapping and probing in certain portions of the Project Area which were inaccessible in 2008, refinement of areas in which sheens and/or NAPL were observed in Phase 1, and in the expanded area at the downstream end of the Project Area. Phase 2 also included coring in ambient sediment locations and at locations of NAPL at West and East Stations. Twenty-seven sediment samples from the sediment cores were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs), organic carbon, and grain size.

Some portions of the Project Area were not investigated during the Phase 1 or Phase 2 mobilizations due to access issues related to the construction work occurring at RG&E's hydrostation located between the Middle Falls Dam and the base of the Lower Falls. The construction activities required the dam to continuously divert the river through Area B which resulted in uncontrolled flow and unsafe conditions to perform the work in that area. This also resulted in full river flow over the Lower Falls, which prevented access to the upper (southern) portion of Area C.

Both the Phase 1 and Phase 2 investigations found that the river sediments are generally reflective of a high-energy environment, with blocky and cobbley materials dominating the river bottom and shoreline. Fine-grained sediments (sand and silt) were found in the pool area behind the Middle Falls Dam, along sheltered shorelines away from direct river flow, and in small protected pockets between boulders. They were also found at the northern end of the Project Area, north of Seth Green Island where the river widens slightly. Bedrock was found to be exposed at the river bottom in Area A offshore of both West Station and East Station. Where fine-grained sediments were found, probing could penetrate up to 20 feet deep. However, most locations were dominated by cobbley materials which limited penetration to less than 10 feet. The full thickness of sediment above bedrock could be mapped in locations where the sediment cover was relatively thin and could be penetrated before reaching refusal (such as offshore of West and East Stations).

The Phase 1 and Phase 2 investigations did not detect widespread visual areas of sheens and/or coal tar NAPL. NAPL or heavy sheen was detected at three small locations adjacent to West Station, with a limited surrounding area of sediments with slight sheen. One location with NAPL was detected and mapped during the Phase 2 investigation at East Station. In general, the sediments downstream from the locations where NAPL was observed showed rapidly declining degrees of impact. Other scattered locations in Area A (upstream and downstream of the MGPs) showed slight sheens in the 2008 Phase 1 investigation. Most of these sheens that were located away from the NAPL areas could not be reproduced during the Phase 2 investigation. In Area C, a slight sheen may have been observed at a point near Station 5, however, the suspect sheen could not be reproduced during Phase 2 and it is not known if the slight reflection observed on the water was a sheen or not. Two probes located near Veterans Bridge during the Phase 2 investigation also generated slight sheens.

During the Phase 2 investigation coring and sediment sampling was performed at the NAPL source areas identified by the probing studies. The NAPL-impacted sediments were found to be highly localized, and confined to thin sediment deposits located on top of bedrock. Sediment samples from the NAPL zones were found to contain maximum total PAH concentrations in the range of 487 to 771 ppm, and BTEX concentrations up to 120 ppm.

The Conceptual Site Model (CSM) for the river which was outlined in the Work Plan was found to continue to be broadly applicable. As noted in the CSM, the history and current conditions along the river indicate that along with coal tar associated with MGPs, other potential sources of impact to the River are present. Site figures prepared for the Phase 1 and Phase 2 reports show the locations of known waste sites along the river within the Project Area, and show modern and historic outfalls which were either observed directly in the field or mapped to have been present historically.

1. Introduction

1.1 Project Background

This report presents the results of Phase 2 of a phased approach to assess manufactured gas plant (MGP)-related non-aqueous phase liquid (NAPL) residuals in sediments in a stretch of the Genesee River located in the City of Rochester, Monroe County, New York. This work was performed at the request of the New York State Department of Environmental Conservation (NYSDEC). The objective of the work is to assess MGP-related NAPL impacts to sediments in the Genesee River in proximity to Rochester Gas and Electric Company's (RG&E's) former MGP sites.

Phase 1 of this project was performed in 2008, and included a field investigation conducted from September 23 to October 10, 2008. The findings of the field and background investigation was presented in the report *Phase 1 Data Summary Package, Assessment of MGP-Related NAPL Residuals in Sediments in the Genesee River Project Area* (AECOM, 2009).

For the purposes of this investigation, the Genesee River Project Area (Project Area) was originally defined to extend from the base of the Upper (High) Falls to the northern limits of Seth Green Island, just north of the Lower Falls. For Phase 2 of the investigation, this area was extended downstream to the Veterans (New York State Route 104) Bridge. The Project Area encompasses an approximate 2.6 river mile reach of the Genesee River (Figure 1-1). The investigation was performed pursuant to the document *Work Plan for a Phased Approach to Assess MGP-Related NAPL Residuals in Sediments in the Genesee River, Rochester, New York* (Work Plan) that was prepared by ENSR Corporation (now AECOM Environment) dated August 22, 2008 on behalf of RG&E (ENSR, 2008). The Work Plan was submitted to NYSDEC for review, and was approved on September 9, 2008. In accordance with Section 3.3 of the Work Plan, a scope-of-work for refining Phase 2 activities, based on findings from Phase 1, was submitted to the NYSDEC on September 8, 2009 and approved by the NYSDEC on September 15, 2009 (GEI, 2009a). The approach presented in the Work Plan was designed to be comprehensive, flexible, and consistent with the general guidelines of the NYSDEC document *Draft DER-10 Technical Guidance Document for Site Investigations and Remediation* (NYSDEC, 2002). The physical complexity of the Project Area required that an adaptive investigation management strategy be evaluated and developed throughout the implementation of the phases of work.

1.2 Objectives and Project Organization

The overall objective of this investigation project is to assess the presence of coal tar NAPL impacts in the sediments of the Genesee River. To accomplish the object, the Work Plan is based on a phased approach and includes the following features:

- A phased field assessment that recognizes that the river is part of a dynamic environment;
- An investigation strategy designed around capturing physical and visual data and then refining potential areas of concern; and
- Incorporation of a number of decision points throughout the process to clarify and direct subsequent phases.

To accomplish this it was expected that there would be at least two separate field data collection efforts (Phases 1 and 2). The scheduling of these efforts was dependent upon several factors including completion of preliminary data collection tasks, approval of Work Plans, and targeting access to the river when flows are typically low and more conducive to getting the information desired as effectively and safely as possible. The phases identified in the Work Plan included:

- A Phase 1 evaluation which focused on physical and visual sediment characterization throughout the Project Area. The scope of work included determining bathymetry, aggressive probing for observing visual sheen and NAPL, and attempting to determine sediment thickness.
- A Phase 2 evaluation which is designed to refine physical and visual characterization of areas of potential concern (i.e., extent of NAPL containing sediments) determined through the Phase 1 evaluation. A higher resolution probing and characterization of the areal and vertical extent of sediment impact would be conducted in this phase with collection of sediment samples for grain size and chemical analysis. The sampling approach for Phase 2 is intended to help gather information for refining and determining the type of sampling equipment and resources needed for subsequent phases.
- On completion of Phases 1 and 2, the approaches for subsequent phases, if needed, will be described in a separate Work Plan(s) to be prepared after the review of Phase 1 and Phase 2 data and submitted for concurrence by the NYSDEC.

1.3 Project Study Area

Within the Project Area, specific physical features, both natural and man-made, inhibit access to the Genesee River and define three distinct Project Sub-Areas, which are shown on Figure 1-1. These areas are defined as follows:

- Area A is defined as the region between the base of the Upper Falls to the Middle Falls Dam, which represents approximately 1.4 river miles;
- Area B is defined as the region between Middle Falls Dam and the Lower Falls, which represents approximately 0.2 river miles; and
- Area C is defined as the region between the Lower Falls and the Veterans Bridge, which represents approximately 1.0 river miles. (Note that this area was expanded for the Phase 2 investigation to add the area between the Bridge and Seth Green Island.)

Note that Figure 1-1 shows additional subdivisions within Areas A and C, with each of these large river segments divided into upper, middle, and lower segments or reaches.

The waterfalls and Seth Green Island are the primary natural physical features within the Project Area. Other landmarks include the four bridges which span the gorge within the Project Area, including from south to north (upstream to downstream) the Platt Street Pedestrian Bridge, the Bausch Street Bridge, the abandoned railroad bridge, and the Avenue E (Driving Park) Bridge (see Figure 1-1). These features are also shown in a series of oblique aerial photographs which are presented in Appendix A of the Phase 1 Report (AECOM, 2009). These photographs are arranged in two sets, showing the western side of the gorge and river from upstream (Area A) to downstream (Area C), and then the eastern side from downstream to upstream.

Man-made structures within the gorge are principally those associated with the current hydro-electric generating system owned and operated by RG&E, and the shut-down RG&E Beebee electric generating station. Elements of the hydro-electric system include the Station 2 generation building near the base of the Upper Falls, the Middle Falls or Brewer Street Dam at the Middle Falls, and the Station 5 generating building near the base of the Lower Falls (see Figure 1-1).

1.4 Report Organization

The intent of this report is to provide a data package which presents the combined results of the Phase 1 and 2 field surveys of the Project Area. Information on the history of the Genesee River and on RG&E's activities associated with its former MGP sites are presented in the Work Plan. Details on the work performed and the results of Phase 1 of the river investigation are found in the Phase 1 report. This report of Phase 2 activities is organized as follows:

- Section 2 of the report provides background on the Genesee River and known sources of coal tar NAPL.

- Section 3 describes the specific methodologies employed during the Phase 1 and Phase 2 investigations.
- Section 4 provides the results of the field observations from all work performed to date.
- Section 5 summarizes the results, and presents a revised preliminary Conceptual Site Model (CSM) for the Project Area which builds upon the framework developed in the Work Plan with the results of the Phase 1 and Phase 2 field programs.
- Section 6 lists the references cited in the report.
- Appendix A is a set of data tables which present the coordinates and sediment observations for each probing point in Phase 1 and Phase 2, along with a set of location maps.
- Appendix B provides the core logs for the sediment coring performed during the Phase 2 investigation.
- Appendix C provides the data usability summary reports (DUSRs) for the laboratory analysis of sediment samples from Phase 2.
- Appendix D (provided on the attached CD-ROM) provides the laboratory data packages for the analysis of sediments in Phase 2.

2. Site Background

This section presents a brief overview of the industrial history of the Genesee River, and a summary of the types of potential sources of environmental impact which will be considered during the course of the investigation of the Project Area. Detailed information on the history and use of the river gorge is included in the Work Plan (ENSR, 2008).

2.1 Historical Review

The Genesee River in Rochester has a long tradition of industrialization extending back to the early 1800s. Industry grew up around the river to take advantage of the river for mechanical hydropower for driving mills. Over time, industry shifted to electricity and fossil fuels in the 1900s as the mills were replaced by other manufacturing (Bailey, 1984). As steam and electricity replaced water power at the mill level, the river was harnessed for electric generation, with power plants in operation beneath the Upper and Lower Falls. Industrial uses along the river declined in the later part of the 20th Century, such that a few industrial facilities and activities have current operations along the river gorge within the study area.

Although industry along the river has declined, discharges to the river from land use in the perimeter areas continue today with flows from combined sewer overflows (CSOs), storm sewer outfalls (SSOs), and discharges from some remaining industrial facilities. The gorge also acts as a drain for surface water and groundwater from the surrounding area. The capture zone for groundwater varies, based on the orientation of the river with respect to the regional direction of groundwater flow, and the geology of the surrounding bedrock. Groundwater within this capture zone may be conveyed to the gorge and ultimately to the river.

As noted above, the Genesee River has a long history of industrial use, which mirrors the development of the City of Rochester. Consequently, there are a number of historic and modern potential sources of impact to the river which must be considered during this investigation. A discussion of these sources is presented in Section 2.2 of the Work Plan.

2.2 Conceptual Site Model

Section 2 of the Work Plan outlined a preliminary CSM for the Project Area of the Genesee River which identified the historical and current uses of the river. None of the assumptions and observations outlined in the CSM presented in the Work Plan were found to be unfounded or incorrect during the Phase 1 or Phase 2 investigations. The CSM included in this report therefore confirms and amplifies what was presented in the Work Plan. However,

it should be noted that there are observations presented in this report which are not related to the RG&E sites and the sources of coal tar. These are presented in order to support the development of the overall CSM for the river. Observations of non-MGP sources and impacts do not at this time directly bear on the investigation of coal tar sources and impacts, but as noted above and in the Work Plan, may become relevant if overlapping impacts are found. If later phases of this work find impacts at the RG&E sites not associated with MGP sources, or that the MGP impacts are influenced by other sources, then RG&E will discuss these conditions with the NYSDEC in order to establish the appropriate scopes-of-work for continued investigation.

3. Phase 2 Investigation Field Summary

This section describes the field investigation activities which were performed during the Phase 1 and Phase 2 investigation, and the field methods which were used. The Phase 1 field work was designed to broadly assess the nature and extent of coal tar NAPL distribution (presence) in sediments within the Project Area, and to collect sufficient physical data of the Genesee River to formulate a workable CSM upon which additional evaluations may be built. The Phase 2 investigation was designed to map in more detail the NAPL and associated sheens found in the river sediments, as well as to fill in data gaps from the Phase 1 investigation. The objectives of the Phase 2 field program are summarized as follows:

- Reconnaissance – Continue to identify upland sources of contaminants discharge (e.g., outfalls, seeps, CSOs, and SSOs) to the river;
- Bathymetry – Determine the bathymetry of the Genesee River within the Project Area in locations which were inaccessible in 2008 or which were added to the Study Area for 2009;
- Hydrodynamics – Broadly understand the river flow characteristics within the Project Area;
- Sediment thickness – Determine the depth to bedrock and sediment thickness within the Project Area at locations of interest;
- Visible coal tar NAPL – Delineate the nature and extent of visible coal tar NAPL and associated sheens in sediments within the Project Area; and
- Analysis of sediments – Perform laboratory analysis of sediments containing MGP impacts and sediments from ambient depositional areas outside of the MGP sites.

3.1 Field Schedule and Staffing

The Phase 2 field work occurred between September 9 and October 3, 2009, and was led by geologists from the Ithaca, NY office of GEI Consultants, Inc. (GEI). The marine and surveying services were provided by TG&B Marine Services, Inc. of North Falmouth, Massachusetts (TG&B), which were subcontracted by GEI.

3.2 Exceptions to the Project Area Access

The field investigations were only able to be performed in Project Areas A and C due to construction work occurring at RG&E's hydrostation located between the Middle Falls Dam and the base of the Lower Falls. The construction activities required the dam to continuously divert the river through the section of the river referred to as Area B which resulted in uncontrolled flow and unsafe conditions to perform the work in that area. An additional consequence of this river flow condition was that all water had to flow over the Lower Falls.

This resulted in the entire face of the falls being washed with water, and high spray conditions at the base. This prevented access and observations of the face of the falls or the old sewer tunnel outfall.

For the Phase 2 field investigation, the water level behind the Middle Falls (Brewer Street) Dam was several feet higher than it was in 2008. This submerged shoreline areas which were exposed in 2008, but it allowed for boat access all the way up to the weir upstream of the former West Station MGP. Access to the pool area immediately upstream of the Middle Falls Dam was again restricted in 2009 for safety reasons.

3.3 Health and Safety Protocols

The physical setting of the Project Area, which includes two waterfalls and a hydroelectric facility, posed unique health and safety challenges to the sediment assessment. All fieldwork was performed under a site-specific health and safety plan (HASP) [GEI, 2009b]. This HASP addressed both possible chemical exposures (such as from coal tar), and physical hazards (water work and working near the dam). The lead staff member in the field from GEI acted as the site health and safety officer each day.

A key element to the HASP and the safety program was compliance with RG&E's Hydro Administration River Communication Protocol. This protocol required regular communications each day with RG&E and New York State Canal Corporation (NYSCC) operators responsible for operation of river control structures and monitoring of emergency conditions. The goal was to ensure a constant line of communication when work was occurring along or within the river so notification could take place in the event of an unexpected release at a dam and/or if river flow conditions changed that could endanger the survey crew.

A health and safety orientation and kick-off meeting was held with representatives of the RG&E Hydro group and with the RG&E project manager on September 9, 2009. At that time, the communications protocols for entering and leaving the river were reviewed, and other operational aspects for accessing the river were finalized.

Prior to mobilization to the river, Dig Safely New York was contacted to locate any subsurface utility crossings in the Project Area. In 2008 no active utility lines were identified within the Project Area. In 2009, however, the City of Rochester identified a water line crossing the river immediately downstream of the Bausch Street Bridge. The markings for this pipe crossing were observed in the field and noted for future reference.

3.4 Project Area Access

Access to the Project Sub-Areas A and C were made at several points. For access to Area A, the survey boat was launched from the RG&E Brewer Street property adjacent to the Middle Falls Dam. The area is designated as an emergency boat launch area and was truck and trailer accessible. A second access point was established in Area A between the West Station Park site and the High Falls; however, it was not necessary to use this area in 2009 as the primary survey boat could reach the channel island. Personnel and equipment were also moved in and out of the river at West Station, utilizing a set of stairs down the bank to the river shoreline. For Area C, the survey boat was launched and moored at a marina near the mouth of the river, and a transit to the Project Area was made each day. Field staff were able to meet the boat at an access point just north of the Avenue E Bridge, accessible from the driveway to RG&E Station 5.

3.5 Project Area Surveying and Reconnaissance Observations

The purpose of the reconnaissance was to document the physical characteristics of the Project Area shoreline and to identify upland sources (e.g., outfalls, seeps, CSOs, and SSOs) to the river as well as help identify the type of equipment and resources needed in conducting work in subsequent phases. The observations also were performed to supplement the existing databases which document features along the river. The key features located within the Project Area are shown on Figures 3-1 (Area A), Figure 3-2 (Area B), and Figure 3-3 (Area C).

Field locating of points within the Project Area was performed principally by use of a differential global positioning system (DGPS), corrected using a real-time kinematic (RTK) system to local benchmarks within the gorge, which allowed greater precision in measurements. Surveyed benchmarks were located at the east side of the Middle Falls Dam, and at a point located in the West Station Park Area near RG&E Station 2. For work in the expanded survey area north of Seth Green Island, it was necessary to establish a temporary benchmark location for the RTK base-station, located on the Avenue E Bridge.

The location of each probe point and the elevation of the water surface were measured in two different ways. For boat-based probing, the DGPS antenna was mounted on top of the hoisting frame and the distance between the antenna and the waterline was measured. The depth to the sediment bottom was then directly measured by a graduated probe rod (marked in 1-foot intervals). For probes obtained along the shore or on emergent areas, the survey rod equipped with the GPS antenna was placed directly at the sediment or ground surface where the probe was obtained. In two areas GPS coverage could not be obtained. In these areas the location and spacing of the probe points were established by using a tape to establish 50-foot spacing, and the locations were subsequently marked on the site imagery. These locations are identified in Appendix A as being approximated from the field measurements.

The benchmark elevations were provided in RG&E Plant Datum (at West Station Park) or Barge Canal Datum (at the Middle Falls Dam), and converted to Barge Canal Datum (BCD) and National Geodetic Vertical Datum of 1929 (NGVD29) as necessary. The relationship between the three different datums used for the river is defined as follows:

- RG&E Plant Datum (the reference datum for all of the company hydropower facilities). Plant datum is 1.71 feet lower than NGVD29, and 0.63 feet lower than BCD.
- NYSCC Barge Canal Datum. BCD is 0.63 feet higher than Plant Datum, and 1.08 feet lower than NGVD29.
- United States Coast and Geodetic Survey (USCGS) National Geodetic Vertical Datum of 1929 (NGVD29). NGVD29 is 1.71 feet higher than Plant Datum, and 1.08 feet higher than BCD.

All elevations provided in this study are referenced to NGVD29, so that all field data can be georeferenced to other data sources such as aerial imagery, surface and groundwater data, topographic surveys, etc. Horizontal locations were referenced to North American Datum 1983 (NAD83), New York State Plane West (transition).

The use of the RTK-DGPS system was limited in some areas of the gorge where there was difficulty in receiving signals from enough GPS satellites to accurately establish the location and elevation of the point being measured. One limiting factor was the height of the gorge walls and the narrow gorge opening, which allowed only a limited view of the sky for the GPS antenna. Along many of the shorelines tree cover also blocked satellite reception, further reducing the number of satellites which could be received. The result of this was an increase in time needed for the DGPS to acquire sufficient satellite signal to accurately position some survey points, especially with respect to elevation. The minimum number of satellites deemed necessary for surveying in this work was four. In areas of poor satellite coverage, the vertical precision was noted to be up to approximately +/- 2 feet. This differs from the target vertical accuracy of 0.1 foot. One area, a seasonal channel found along the eastern shore in the expanded Area C survey area was found to have no GPS coverage. The locations of the probing points along this channel were therefore estimated by using tape measurements. The locations of other probing and coring points were estimated at certain locations due to lack of GPS coverage. The data table in Appendix A notes which stations have estimated locations.

Features of interest observed during the shoreline reconnaissance were located with DGPS. Observations made during the reconnaissance included looking for features such as the locations of outfalls and their conditions and flow (if any), overland flow, seeps from rock walls or unconsolidated banks, erosional and depositional areas, hydrocarbon staining or

seeps, and other points of interest. Field notes of observations and locations were maintained in a bound field book as the reconnaissance was performed. In addition, digital photographs were taken to document observations.

3.6 Mapping

Following the completion of the Phase 1 report the locations of the current and historic sewer outfalls were revised based on the mapping information received from the Monroe County Sewer District. GIS data files showing the locations were plotted on the project base maps and compared to older mapping and field observations. Additional information from the Monroe County GIS Services Division on stormwater outfalls was used to update the base maps (Monroe County, 2010). The mapped locations of the active and historic or abandoned storm sewer and sanitary sewer outfalls is based on this current information. Note that the locations of the outfalls on the maps in this report have been adjusted in some cases to reflect our field observations of their locations.

3.7 Hydrography

Measurements of the river discharge through the Project Area were obtained from United States Geological Survey (USGS) river gauging station #04231600, located 400 feet upstream of the Ford Street Bridge (4,600 feet upstream of the High Falls). River discharge during the course of the Phase 2 work ranged from a daily average flow of approximately 110 cubic feet per second (ft^3/s) to 850 ft^3/s. Note that this flow range is lower than average, and lower than that which was encountered during the 2008 field investigation (Figure 3-4). The river flows during both study periods were near the annual minimum levels. Figure 3-5 shows the daily average river discharge for September 6 through November 6, 2009. This figure is based on the preliminary gauge record and has not been corrected by the USGS to remove artifacts such as flow reversals which may be associated with canal diversions.

3.8 Bathymetric Survey

The purpose of the bathymetric survey was to document the geometry and elevations of the river bottom within the Project Area. This information will be used for various purposes during the Program, including refining the CSM, evaluating sediment transport and deposition area and mechanisms, and selecting sampling locations for future investigations.

The bathymetric survey was performed from both the survey boat and a small inflatable boat. Due to the narrow width of the river and the rocky shoreline it was found that the inflatable boat was easier to maneuver for the transect lines, and less likely to be damaged by running into the rocky shoreline or submerged boulders.

The bathymetric survey was conducted in general conformance with a U.S. Army Corps of Engineers (USACE) Manual No. 1110-2-1003 for hydrographic surveying (USACE, 2002). As noted above, the results were reported referenced to NGVD29, and the horizontal datum reference to North American NAD83, New York State Plane West. The bathymetric and sub-bottom surveys were conducted by TG&B. TG&B used a survey-grade precision fathometer (Odom Hydrotrack™ fathometer) to collect continuous water depth data along a series of track lines established from bank-to-bank across the river, and tie lines run in a perpendicular orientation along the river, with continuous logging of their geographic position (X-Y location) using DGPS. Depth and geographic location were sent to the survey computer using the Hypack™ Integrated Survey Software package. Some of the bathymetric data, especially those obtained in the vicinity of the High Falls, required editing to remove acoustic "noise" due to turbulence (e.g., bubbles) in the measurements.

In areas which were inaccessible for the survey boats, the bottom elevation measurements were made by wading and directly measuring the bottom with the survey rod.

As noted above, access to Area B and the Lower Falls portion of Area C was not allowed during both the Phase 1 and Phase 2 due to the shut-down of RG&E's hydrostation and its inability to control water flow between the Middle Falls and Lower Falls. The survey in this area will be completed in a future phase of work once normal river control is restored or at the time when the area can be accessed safely.

3.9 Sub-Bottom Survey

Sub-bottom surveying was not performed during the Phase 2 investigation. During Phase 1 it was found that there was insufficient signal penetration to record sub-bottom sediment thickness or features due to the dominance of the sediment make-up by gravel and cobbles. The presence of hidden obstructions in portions of the river (such as boulders) also presented a serious risk of damage to the survey equipment.

3.10 Sediment Probing

Sediment probing was conducted in accessible parts of the Project Area to assess the surface and subsurface sediment which comprised the river sediment system, to assess the thickness of the sediment deposits, and to provide qualitative observations regarding the presence or absence of coal tar NAPL (and their relative abundance) within the sediment. During Phase 1, probing was performed by driving the probe rods by hand and by using an electric hammer. These methods were again used during the Phase 2 investigation, but with the addition of a pneumatic hammer drill system for driving probe points in locations with shallow refusal. (This drilling equipment is described in Section 3.12 below.) Although not classified in this report as probes, the field observations from the sediment coring attempts

were also included with the probing data, as each deployment of the vibracore system allowed observations to be made of the sediment and sheen conditions.

During Phase 1, probes advanced from the boat could penetrate a combined total of about 20 feet of sediment and overlying water. During Phase 2 additional probe rods were on-hand to allow probing to greater depths; however, this was only required near one of the abutments for the abandoned railroad bridge where the water depth required extra rods to reach the sediment surface. (At this location, probing found that the sediment was scoured-away around the abutment, exposing bedrock.)

During Phase 2, most probing was performed using the electric hammer system. In most of Area A and C, this probing was performed from the survey boat. In areas which were not navigable, the probing equipment and the electric generator were carried along the shoreline to perform the probing. Hand-carrying the probing gear was performed at locations in Area A around the shoreline of the channel island below the High Falls, and along the shoreline in front of the West Station Park property. Hand-carrying of the equipment was performed in the upper reach of Area C along both the western and eastern shorelines in the area which was probed only by hand during the Phase 1 investigation.

Hand probing without power tooling was performed principally in only one location, in a narrow seasonal channel between shoreline and a wooded bar or island along the eastern shore of the lower reach of Area C (points HP1-17). The sediments in this channel consisted of fine-grained materials which could be probed up to 4 feet deep by hand.

In the Phase 1 investigation, a total of 518 probe locations were attempted, of which 242 recorded probes were advanced by hand, and 276 probes were advanced using the electric hammer. During Phase 2, a total of 206 probes were performed, with 16 by hand, 152 by electric hammer, and 38 performed using the rock drill. As noted above, the sediment condition observations from the vibracore deployments were also included in the probing observation list. The locations of the probes, drilled probes, and cores are shown on the figures and tables in Appendix A. Table A-1 provides a listing of the probe points and observations from the Phase 1 investigation. Table A-2 lists this data for Phase 2, along with additional information obtained from the advancement and logging of the sediment cores.

The Work Plan called for biased, variable-spaced grids of probing points, with tight grid spacing adjacent to known potential sources of MGP coal tar (e.g., West Station and East Station), and any additional areas identified during the reconnaissance. The initial grid spacing was conceptualized to be on 50-foot centers for areas adjacent to potential sources, and then transitioned into 100- and 200-foot centers at distance. Actual spacing for probes generally followed this plan, but because some areas could not be accessed for probing due to the river conditions (i.e., low water and/or turbulent/high velocity flow) the standard spacing

for probes defaulted to 50 foot spacing performed in many areas, especially where access and sediment conditions allowed for fast and easy work.

During Phase 2, probing was performed in a tighter pattern in order to investigate and delineate NAPL and sheens observed during Phase 1. Probing transects were performed from onshore to offshore through the areas of previously observed impacts, and parallel to shore to establish the up- and down-stream limits of the sheens.

Field notes of the probing were maintained which recorded the following types of information:

- Date and time of probing collection;
- Water depth;
- Visual evidence of sheen or NAPL (as described below);
- Sediment type, color, and odor; if available or obtained;
- Sediment depth; and
- Digital photographs.

The presence or absence of visible sheen was characterized according to four rank levels:

- 1 = No sheen;
- 2 = Trace sheen;
- 3 = Moderate-heavy sheen; and
- 4 = Visible NAPL.

The presence or absence of sheen (rankings 1 through 3) was evaluated by observing the water column and the probe rod after probing. The presence or absence of visible NAPL was made by direct observation of the probing tool or the sediment (where directly visible), or was inferred from the observed amount of sheen produced by sediment disturbance. The presence of NAPL-like blebs on the probing tool was considered to represent visible NAPL, and the location was coded as a rank of 4 (visible NAPL). This ordinal sheen ranking characterization provided a semi-quantitative measure that could be easily mapped and converted into interpolations about areas of sheen and/or NAPL. Each probe location and associated observations are listed on a table in Appendix A. The location and ID for each point is shown on the figures in Appendix A.

3.11 Sediment Coring

The Phase 2 investigation included collecting sediment cores from both the NAPL source areas and from locations outside of the MGP sites which were considered to be representative of ambient sediment conditions.

The primary method used to attempt cores was vibracoring. The vibracore used a pneumatically-actuated vibrating head attached to a steel core barrel. The core barrel was equipped with a hard plastic (Lexan) liner with a drive shoe and core catcher. Coring was completed using both 10- and 20-foot core barrels. Twenty-foot core barrels were found to be effective in the areas of "soft" sediment, such as in areas of ambient core locations C1, C2, and C3 where the river bed was dominated by fine-grained and fairly thick sediment. In areas of thinner sediment deposits and coarse-grained sediment, the 10-foot core barrel was used due to the limited penetration achieved using the 20-foot barrel.

For the ambient core locations, core penetration ranged from 5 to 11 feet at ambient locations C1, C2, and C3. The core liner at each of these locations was capped and delivered to the Brewer Street staging area for cutting, logging, and sampling. At all other locations (ambient cores C4 and C5, and all but one core at East and one at West Stations), the core recovery was generally about 1 foot. Sediments from these cores were not retained in the plastic liner; rather, upon opening of the core barrel they were placed in plastic bags for logging and sampling. These samples were delivered to a staging area setup at West Station.

Sediment samples, whether in core liners or plastic bags, were processed by a GEI geologist who:

- Split the cores longitudinally using a circular saw to cut the opposite sides of the core liner, and a wire line to split the sediments along the cuts;
- Logged the sediments in the cores and in the bagged samples according to the Unified Soil Classification System (USCS);
- Scanned the headspace of the sediments in the split cores and in the sample bags for volatile organic compounds using a field photoionization detector (PID); and
- Placed selected sediment sub-samples from the cores and selected bag samples into laboratory-supplied sample jars and prepared them for shipping.

The descriptions of the samples, PID readings, and other observations are summarized in the comments section of Table A-2 in Appendix A. The geologic logs for sediment cores C1 through C3 are found in Appendix B.

3.11.1 Ambient Cores

Sediment coring was performed at five ambient locations, as specified by the 2009 Work Plan. Locations C1, C2, and C3 are downstream of East and West Stations. These three locations were selected based on probing results from 2008 and the morphology of the river as places where a significant thickness of sediments was expected. Two coring attempts were made at location C1, with the second core (C1A) achieving greater recovery than the

first core attempt. Vibracore penetration ranged from 5 feet (location C3) to 11 feet (location C2). Core recoveries were from 75 to 100 percent.

Locations C4 and C5 were located upstream of East and West Stations. These locations were selected to be outside of the potential influence of the most upstream observance of NAPL at West Station, in locations where sediment which might be amenable to coring would be deposited, and which could be accessed with coring tools. At location C4, multiple attempts at positioning the survey boat and taking cores were made (C4, C4A, and C4B). In the end, three discrete coring attempts were made at this location, with only two cores achieving any penetration. The maximum penetration was only 2.6 feet, and the maximum recovery was 1.1 feet. The sediments from the two successful cores were composited to form the laboratory sample. Location C5 was located upstream of the zone in Area A which was directly accessible by the survey boat, therefore hand-tooling was carried to the core location. This core was advanced by a combination of digging and advancing a core barrel to 3.5 feet, with the recovered sediment composited to form the lab sample from this location.

3.12 Drilled Probes

In locations where sediment probing and coring tools could not penetrate the sediment, a rock drill was used in order to obtain probe information at greater depths. The drill system consisted of a pneumatic hammer drill driving a carbide-tipped bit with spiral flutes. The bit was attached to a series of rods with a small hollow center. Compressed air from the hammer flowed down the rods and out through holes in the bit to clear debris from the drill. This air also helped to force water from the boring up along the rods so that the presence of NAPL or a sheen could be detected at the surface during drilling. The thickness of sediment penetrated by the rock drill and the sheen classification was entered into the probing database and the results are presented in the figure showing the probing and coring results.

3.13 Sediment Analysis

A number of sediment samples obtained from coring activities during the Phase 2 of the investigation were analyzed by the following methods:

- Benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8260B;
- Polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C;
- Grain-size analysis by ASTM Method D422; and
- Carbon analysis for “soft” carbon by the Lloyd Kahn Method, and for soot carbon using the Gustafson Method.

A total of 27 sediment samples (five more than proposed in the Work Plan) were analyzed. Eight samples were obtained from ambient core locations (five surface samples, three

subsurface samples). The 19 other samples were from locations in and around the areas of observed impact at the East and West Station sites.

Sediment samples were shipped to Test America's Amherst, NY laboratory. The samples were sent as two sample delivery groups (SDGs). Samples for BTEX and PAH analysis were forwarded to Test America's Knoxville, TN laboratory for analysis. Samples analyzed for grain size and carbon were forwarded to Test America's Burlington, VT laboratory.

The samples were analyzed according to New York State Department of Health (NYSDOH) ASP protocols, and NYSDEC ASP Category B data packages were prepared by the laboratory. These data packages were used to validate the testing results. Validation was performed by New Environmental Horizons, Inc. (NEH) of Arlington, MA. NEH prepared a DUSR for each SDG. A copy of the DUSRs are attached as Appendix C, with the laboratory data packages provided on an attached CD-ROM as Appendix D. All data were found to be usable, with some minor qualification. The validated data were entered into an EQUiS 5 database, and data summary tables were prepared as Tables 1 through 3. The analytical results were compared to NYSDEC sediment quality guidelines (NYSDEC, 1993 with updates). Results which exceeded the Effects Range – Low (ERL) and Effects Range – Moderate (ERM) are shaded in the tables. Note that this comparison is made for screening and information purposes only. ERL and ERM values are determined for salt/brackish water receptors, and are used here in lieu of freshwater or site-specific screening guidance.

4. Observations and Findings

This section presents the findings of the Phase 1 and 2 field investigations. General observations regarding the morphology of the river and the gorge are described below. The specific results of the hydrographic and probing investigations are presented in a series of attached figures.

4.1 General Geomorphic Conditions

The morphology of the Genesee River gorge in the Project Area is the result of a mix of natural and man-made conditions. The natural morphology of the river is the result of the last 10,000 years of river erosion, since the end of the last glacial period. Man-made modifications to the gorge have been since the mid-1800s when industrial development began along the banks of the gorge and the river, and the river began to be used for hydropower and fill areas.

4.1.1 Gorge Morphology

The gorge within the Project Area is dominated by vertical rock walls, faced in some places by steep alluvial or fill banks. Where bends in the river direct flow against one of the walls, the alluvium is not present and the rock wall extends directly to the water. In some locations, the rock gorge wall is fronted by a narrow shoreline composed of boulders and cobbles. These rock walls dominate the three Project Sub-Areas, though there are some small areas where more gentle slopes are present, due to either natural conditions or man-made filling. Notable areas where more gentle gorge walls or slopes are present include the area at West Station (dominated by filling and constructed land), East Station, the Brewer Street area, and the former mill area on the west side of Area B (now the site of the Lower Falls Park).

The river gorge widens downstream of the Lower Falls and the Avenue E Bridge. In this northernmost portion of the Project Area, only small exposed bedrock faces are present at the top of the gorge, and the slopes below consist of steep soil banks. As the gorge extends further northward towards Lake Ontario it widens further, with occasional bedrock faces where resistant rock units form the walls of the gorge.

Although the river is well-confined within the gorge, there is room at the base of the gorge for the river to make small bends from one bank to the other. Where the river impinges against the wall of the gorge, the soil and loose rock at the base of the slope is eroded, resulting in a bare vertical rock face. This rock face is resistant to rapid erosion, and tends to then direct flow back across the gorge to the opposite wall. Deposition zones then form on the inside of these small bends. The locations with wide, thick sediment deposits are the

result of being on the inside of these bends where the river energy is directed against rock walls on the opposite side of the gorge. For example, the inner bend depositional areas at East Station and Brewer Street are paired with vertical rock walls directly across the river.

Evidence of filling was observed at some locations at the base of the gorge walls and along the shoreline along both shores of Area A. Fill materials observed included junk cars and car parts, empty 55-gallon steel drums, municipal trash, glass chunks and pieces, brick and concrete, and various types of scrap metal. Dumping of debris and material from the top of the gorge appears to have occurred primarily along the west side of Area A, with glass products found along the eastern shore north and south of the Bausch Street Bridge. Brick and concrete (construction and demolition debris types of materials) appeared distributed throughout many areas of the river, but with the majority of this material found in Area A.

4.1.2 Shoreline Morphology

Shorelines along the river exhibited varying conditions which are reflective of the erosion or depositional conditions. No beach or shoreline is present in high-energy locations where the river flow was directed against a rock face. Sandy shores and wider floodplain deposits are located in low-energy locations at the inside of bends or where deposition occurred during flood events. However, the majority of shorelines are dominated by boulders and cobbles, indicating high-energy sediment transport conditions prevailed in those areas. These conditions dominate from the High Falls to the Bausch Street Bridge and through all of Areas B and C to the south end of Seth Green Island. From the south end of Seth Green Island to the Veterans Bridge, the western shore of the river is blocky and steep, while the eastern shore is sandy and has a flatter slope up to the base of the gorge wall. This is reflective of the river current being directed towards the western shore in this section of the river, with erosion to the west and deposition on the east.

The shoreline conditions in Area A are in part the result of man-made modifications to the river. Historic photographs show the West Station, West Station Park, and Beebee Station area to be a low, flat floodplain prior to construction of retaining walls and raising the land surface for construction of these facilities. The effect of this change was to prevent the river from widening during flood conditions, and to confine the erosion and transport energy to river channel. It is likely that historic filling to widen the low margin areas at East Station and along the west side of Area B has also had this effect.

It is important to note that the shoreline conditions observed during the 2008 field investigation in Area A were the result of non-typical river elevations. Due to the ongoing repairs of the hydrostation between the Middle Falls Dam and Lower Falls, the water level in Area A behind the dam had been lowered in order facilitate construction activities at the hydrostation. The lowering of the “pool” behind the Middle Falls Dam by approximately 5 feet resulted in the emergence of the shorelines from the dam to the upstream end of West

Station. This lowering of the water level throughout almost all of Area A allowed direct observations of shoreline conditions which are typically submerged, but it also limited access for probing and the hydrographic survey in the upper portion of the river. In 2009, the water level behind the dam had been raised, restoring the shoreline closer to its typical position. This allowed for greater boat access into the upper part of Area A for completing the survey in this area.

4.1.3 River Bottom Conditions

River bottom conditions ranged from exposure of bare bedrock, to blocks and cobbles, to sand and silt. The bottom sediment conditions at any given location are a direct reflection of the river energy at that point. Areas where bare rock is exposed, such as at East Station, are associated with narrower channel conditions along straight, high-velocity flow paths. Boulders and cobbles predominate downstream of the plunge pool below the waterfalls in Areas A and C. Sand and silt deposition in the river bottom is limited to bars or shorelines on the inside of river bends, in the pool area behind the Middle Falls Dam, and in the wider portion of the river immediately upstream of the Veterans Bridge. Further delineation of river bottom and shoreline conditions is presented below with the discussion of the sediment probing results.

4.2 Bathymetry

The Phase 2 investigation was able to complete the bathymetric survey in Area A, while the area immediately adjacent to the Middle Falls Dam was still not surveyed due to safety concerns. The raising of the pool elevation at the Middle Falls Dam resulted in the river water level being raised all the way up to the weir at West Station. During the Phase 2 investigation the river in front (east) of the former West Station was surveyed up to the near the weir and to the Platt Street Bridge.

The expanded portion of Area C (the north end of Seth Green Island to the Veterans Memorial Bridge) was also surveyed, as well as the backwater area behind Seth Green Island. Figures 4-1a-c and 4-2a-b present the results of the updated survey. In these figures, the river bottom elevation (reference to NGVD29) is presented, and the relative water depth is presented by shading. Note that on Figure 4-2b where the 2008 and 2009 surveys overlap just north of Seth Green Island, there may be a slight discontinuity reflective of merging the two data sets obtained a year apart. This discontinuity may be reflective of the dynamic sediment deposits which are present at the north end of Seth Green Island.

Area A

The results of the bathymetric survey of Area A are found in Figures 4-1a, -b, and -c. The survey results and observations are discussed below, from upstream to downstream. The

area in the vicinity of the High Falls shows a typical plunge pool, with uniform shallowing from the center of the pool to the mid-river island. The island splits the flow, with a portion of the flow against a rock face on the east side, and the other portion along the front of the West Station Park area. The eastern channel consists of a series of rapids, while the western channel has flat-water flow to a weir, constructed between the island and the upstream end of the West Station Plant Area MGP site. Note that the western side of the channel island was stabilized by sheet piles, in order to create a stable channel feature to supply river water to the now inactive RG&E Beebee Electric Generating Station facilities. The river bottom along West Station was found to be generally flat, with a shoal area extending out from the western shore along the downstream portion of West Station. A blocky, irregular channel, reflective of a bedrock bottom created by the erosion jointed blocks of rock, is present along this area towards the east side of the river.

From the north end of West Station to the middle of East Station the river shows a discontinuous thalweg (the line of maximum water depth). This is likely due to the blocky, jointed nature of the bedrock which make up the river bottom. At the middle of East Station, a more continuous thalweg is observed. At the north end of East Station, the thalweg is along the west side of the river, against the base of a rock face, while the inner bend of the river shows the development of a shallow depositional bar. This bar extends along the Bausch and Lomb property, and ends just upstream of the abandoned railroad bridge. At this point, the river bends back to the east and flow is directed against the western shore. Two deep holes are evident near the railroad bridge, which are likely due to localized narrowing of flow and scouring of sediments between bridge supports. The deepest hole extends approximately 16 feet deeper than the surrounding river bottom. These scours appear to extend to the top of bedrock, as probing confirmed a rock surface at their base. Note that NAPL or sheens were not observed at these locations.

Downstream of the railroad bridge the river bends again to the west, with flow against a rock face on the east side, and a large deposition area on the inside of the bend along the west side. Historic aerial photographs which were reviewed also show that this deposition area may have collected fill from the top of the gorge. A cobbley bar is present at the start of this deposition area, transitioning to more fine-grained materials downstream. The area behind the shore is a vegetated floodplain, characterized by sandy soils.

As the river approaches the Middle Falls Dam, flow is again directed against the western shore and a vertical rock face. Deposition occurs along the east side at the Brewer Street area, and in the pool which forms behind the dam. The bathymetry in the immediate area of the dam could not be surveyed for safety reasons, but observations from previous work at Brewer Street showed that a large sand bar builds from the eastern shore into the river behind the east side of the dam. This deposit is likely to be modified by dam operations, which limit how far downstream it can build.

Area C

During the Phase 1 investigation it was found that the bathymetric survey in Area C (Figures 4-2a and –b) could only be conducted upstream to within about 300 feet north of the Avenue E Bridge. Upstream of this point the river bottom was extremely bouldery and the currents swift, making navigation and wading unsafe. Based on remote observations, it is likely that a plunge pool is present at the base of the falls. The river bottom ramps-up to a shallower depth opposite the Station 5 building, and then falls again to flat water conditions downstream of the Avenue E Bridge. A pool is also present at the tailrace for Station 5. During the Phase 2 investigation, the expanded work area from the north end of Seth Green Island to the Veterans Bridge was successfully surveyed.

Within the area surveyed, the thalweg begins along the east side of the river. The shoreline here is bouldery, while a narrow sandy shore is found on the opposite shore. The river then begins a wide bend to the east, and the thalweg is found along the outside of the bend. The inside of the bend however does not accumulate fine-grained sediment. During the Phase 1 investigation a bar consisting of cobbles was observed which extended from the eastern shore to Seth Green Island, closing-off the eastern channel around the island. This bar was also present during the Phase 2 investigation. The presence of this cobble bar (rather than a sand or gravel bar) is likely due to the widening of the river from a narrow point just downstream of the Avenue E Bridge to the upstream end of Seth Green Island. This widening allows the river to drop cobble-sized bedload on the inside of the bend.

Downstream of Seth Green Island a bar consisting of fine-grained sediments extends north of the island and to the east to the eastern shore of the river. The backwater along the east side of Seth Green Island has no river flow except during river flood events which overtop the gravel bar at its south end. This backwater therefore collects fine-grained suspended sediments during normal river flow conditions. It is likely that the bar and backwater are eroded during times of high flow conditions, and re-established by deposition once this channel is again cut-off by falling water levels. Note that the base photo used in this report (such as in Figure 4-2b) shows the river during spring flood flow conditions. At this time, river flow is occurring through this backwater channel.

Downstream of Seth Green Island the thalweg is found along the east side of the river. A low, broad shallow area is found towards the western side of the river just upstream of the Veterans Bridge. This mound is likely to be a depositional area which formed due to the widening of the river just downstream of Seth Green Island.

4.3 Sediment Probing

The results of the sediment probing are displayed in Figures 4-3 through 4-6. The observations of sediment types and thickness are grouped together, followed by the observations of sheens and sediment quality. As noted in Section 3, the thickness of the sediment was to be assessed both by direct probing and by sub-bottom profiling. The sub-bottom profiling was not successful, therefore, the observations presented here are limited to those made during probing.

In most areas, the full thickness of sediments above bedrock could not be measured or confirmed. This is due to the river bottom being dominated by cobbles and boulders which limits the depth of penetration by probing. The presence of boulders also make the probing results difficult to interpret, as hard refusal at depth on a boulder cannot be distinguished from refusal on bedrock. During the Phase 2 investigation, a rock drill was used in locations of interest where the powered probes hit refusal at depths which appeared to be above bedrock. This allowed for obtaining observations of sediment thickness and sheen presence. The observations obtained from the drilled probes are included on the figures along with the results from the hand and hammer probes.

During Phase 1, in areas where fine-grained sediments were present, penetration to bedrock was limited when the combined thickness of water and sediment exceeded the probe length (20 feet). During the Phase 2 investigation additional probe rods were used to ensure that probing could be extended to refusal.

4.3.1 Sediment Type and Thickness

Observations from probing of the sediment type at the river bottom and of the probed thickness of sediment are presented in Figures 4-3 through 4-6.

Area A

The probing results for sediment type and thickness for Area A are presented in Figures 4-3 and 4-4. Based on the probing results this portion of the river can be divided into three general areas or reaches, based on sediment type and thickness (see Figure 1-1):

- The most upstream portion of the investigation area, from the High Falls to just south of the Bausch Street Bridge. This area includes the shoreline fronting West Station.
- The middle portion of Area A, from Bausch Street Bridge to the north side of the abandoned railroad bridge. This area incorporates the shoreline fronting East Station.
- The lower portion of Area A, from the downstream side of the abandoned railroad bridge to the Middle Falls Dam.

The upstream portion consists of a cobbley, blocky bottom and shoreline. The sediment thickness could not be probed to more than 5 feet of penetration. This measured thickness is reflective of the difficulty in penetrating the coarse material, and is not likely a measure of the true thickness of sediment above bedrock. Comparing the river bottom elevations at the base of the High Falls with elevations downstream in front of the West Station Park property, it can be seen that the sediment surface drops by 20 feet or more towards the base of the High Falls. This hole in the sediment is a plunge pool from the falls, and may represent removal of the sediment or of the bedrock, or a combination of both. It is possible that the river bottom immediately downstream of the plunge pool could be filled from the base of the pool to the upper surface of the mid-channel island here by coarse sediment.

The area offshore of West Station which could not be surveyed during Phase 1 was found during Phase 2 to consist primarily of exposed bedrock. The thickness of sediments found along the shoreline of West Station generally thin towards the center of the river and then disappear before reaching the channel. Upstream of the weir at West Station the cobbley sediments form a continuous cover over the river bottom, with no exposed bedrock. It is likely that the transition from an area with deposition to erosion occurs below the weir area, where the river narrows and the two channels around the central island merge back into one channel.

In the middle third of Area A, from the Bausch Street Bridge to downstream of the abandoned railroad bridge, the probes could be advanced to generally less than 2 feet below the sediment surface, and areas of exposed bedrock in the river bottom in the channel area were widely encountered. Sediments were found to consist of sand and gravel, with boulders and cobbles present more along the shorelines than in the channel. Note that an area along the upstream portion of East Station where NAPL was observed was also the location where sandier sediments were present, and where sediment thickness ranged up to about 4 feet. Most other areas along East Station were found to be dominated by cobbles and to have a thinner layer of sediment over bedrock.

The downstream third of Area A is dominated by fine-grained sediments. This area had the thickest sediment deposits probed during the investigation, with depths up to 10 feet measured in multiple locations. At core location C2, penetration of 11 feet was achieved before reaching refusal. This deposition is primarily the result of the increased water depths and lower river energy behind the Middle Falls Dam, which allows the sand- and silt-sized particles to be deposited under typical flow conditions.

The area immediately adjacent to the dam was not surveyed during Phase 1 or Phase 2. Extensive coring was performed in this area as part of the investigation of the Brewer Street site remediation. A comparison of the sediment distribution at Brewer Street before remediation and with the results of the Phase 1 probing shows that the distribution of

sediments has changed somewhat along the front of this area. This is likely to be due to not only the removal of soil and sediments along the river, but also due to periodic deposition and erosion of sediments near the dam as a result of changes in flows related to dam operations and maintenance. It is expected that the sediments in this area will periodically be built-up and eroded as a normal process. Note, however, that no impacts were observed in the sediments fronting the Brewer Street Site.

Area C

The probing results for sediment type and thickness for Area C are presented in Figures 4-5 and 4-6. Based on the river bottom conditions, Area C can be divided into three major segments:

- The upstream segment of Area C extends from the base of the Lower Falls to the Avenue E Bridge.
- The middle segment of Area C is from the Avenue E Bridge to the north end of Seth Green Island.
- The downstream portion of Area C is from the north end of Seth Green Island to the end of the survey area at the Veterans Bridge.

The upper area is dominated by bouldery bottom conditions and fast-moving water. The gorge is at its narrowest point at the bridge, with exposed rock walls on both sides. The middle segment is downstream of the bridge to the northern end of Seth Green Island, where the gorge and the river itself widen, creating flat-water conditions and somewhat more uniform river bottom conditions. The lower segment is from Seth Green Island to the Veterans Bridge, where the river widens further and forms a straight channel. An additional river environment is found to the east of Seth Green Island, where a backwater channel is found between the island and the eastern shore of the river. This backwater branch of the river is cut-off from flow by a gravel bar across its mouth except during flood events.

The up-stream and middle portions of Area C are dominated by bouldery and cobbley sediments along both the shore and bottom, except in small depositional areas where sand and silt deposits were found: a narrow beach just north of the Avenue E Bridge on the western shore, a point-bar at the north end of Seth Green Island, and some backwater deposits on the east side of Seth Green Island. Although sand-size sediment was found along the shores of Seth Green Island, these deposits formed only a thin layer over coarse materials. The surface of Seth Green Island itself was found to be composed of sand and silt-size sediment, deposited during flood conditions. No probing was conducted over the surface of the island. At the north end of Seth Green Island, sand and silt form a deposit in the main river and across the mouth of the backwater. Downstream of this location the

bottom becomes cobbley again, before the river widens and the bottom is dominated by the presence of sand.

The probed thickness of sediments was generally less than 2 feet in the upper and middle portions of Area C, with probes exceeding 5 feet below the sediment surface in only three locations, including the location at the northern tip of the point bar at Seth Green Island where a trial vibracore was obtained. Bedrock was not found to be exposed in riverbed in this Area. Locations where bedrock could be expected to be exposed (the tailrace for Station 5 and the plunge pool for the Lower Falls) could not be accessed during the Phase 1 or 2 surveys. Downstream of Seth Green Island the probing depths increased considerably due to the presence of fine-grained sediment. The probing depth varied widely in this area, but at some locations the probing reached almost 20 feet below the sediment surface. This thick sequence of fine-grained sediment is likely due to the widening of the river in this area which allows the river current to fall and deposit the finer-grained sediments.

4.3.2 Sediment Visual Assessment

Observations from the Phase 1 and Phase 2 investigations are presented below for Area A (Figure 4-7a-c) and Area C (Figure 4-8a-b). The combined observations from the entire Project Area are also shown on Plate 1. Throughout the Project Area, very few locations were observed to display evidence of coal tar NAPL impacts at the shoreline, at the sediment surface, or in subsurface sediments. Sheens which were observed were often (though not always) spatially correlated with potential areas of coal tar NAPL at West and East Stations. Detailed figures showing the observations of NAPL and sheen, along with a summary of the analytical results, are provided as Figures 4-9 (West Station) and 4-10 (East Station).

Area A

During the Phase 1 investigation in Area A (Figure 4-7 a-b), sheens were observed along the shoreline in front of RG&E's former West Station MGP, with the most intense sheen observed to the north of the intake/screen house of the now retired Beebee Electrical Generation facility. This is the same area noted in the 2004 West Station Riverbank Survey observation report by Ish, Inc. (Ish, 2004). From this location northward (downstream), trace sheens (rank = 2) were intermittently observed to just upstream of the former City of Rochester waste incineration facility. A layer of hardened, asphaltic tar was observed during Phase 1 along the shoreline and over shore sediments in front of West Station. However, this material was well-weathered and inert, and did not produce a sheen and is normally submerged. Three random probe locations around the eastern side of the island below the High Falls also showed slight sheens, as well as a location on the eastern shore across from West Station. However, at least one of the sheens on the eastern side appeared to be natural and not coal tar-related. The other two slight sheens were too faint to assess their potential sources.

The Phase 2 investigation conducted additional probing to further delineate the NAPL and sheens observed previously. On the mid-channel island, sheens could not be found at any of the three locations where a trace sheen was detected in 2008. Three locations in the vicinity of the Platt Street Bridge along the West Station shoreline were also re-assessed. Sheens were not found at any of the three locations; however, the shoreline sediments near a former water intake structure above the Beebee Station weir exhibited a faint fuel oil-like odor.

NAPL and heavy sheen was found in three locations in front of the former West Station MGP (Figures 4-7a, 4-7b and 4-9. As observed in the Phase 1 investigation, the coarse-grained sediments just below the weir and above ground oil tanks currently used for the electric generating peaking turbine at the southern portion of West Station produced strong sheens due to NAPL. This is a location with very high river flow and water agitation, therefore, the nature of the sheens and NAPL are difficult to characterize further. Probing and attempted coring in this area showed this impact to be highly localized. Moving downstream, a zone of heavy sheen was found below the former water treatment building at West Station. Sheens were observed from less than half of the probe and core locations in this area, with only one core generating a moderate sheen. Further downstream, NAPL was observed near the shoreline at a location south of the Building 18 on the former West Station property. One core (09WSC2) showed the presence of NAPL. A number of cores and probes downstream of the NAPL showed only a trace sheen. The impacts appear to extend downstream to the end of the RG&E property, with random trace sheens observed north of that during the Phase 1 investigation. Sheens in offshore sediments were restricted to a zone roughly 40 feet wide, with the sediment deposits extending only slightly further towards the river channel before bedrock is exposed.

Further downstream, a heavy sheen and NAPL was observed in probes and associated with a trial vibracore along the shore of East Station during the Phase 1 investigation. The impacts at this location, at the upstream shoreline near the Bausch Street Bridge, were further delineated during Phase 2 by probing, coring, and advancing drilled probes. Figure 4-7b and 4-10 shows that the heavily impacted sediments are found within a small area close to the shoreline. These sediments disappear towards the river channel, where bedrock is exposed. The thickness of the impacted sediment is limited by the shallow bedrock, with a maximum core or drill penetration of 4 to 6 feet. Note that in this area the drilled probes had the greatest penetration, but it is likely that some of them penetrated the top of bedrock, resulting in a slight overestimate of the sediment thickness.

Downstream of this NAPL area the Phase 1 investigation found scattered locations with trace to moderate sheens, and one additional NAPL location. These probing results could not be repeated during the Phase 2 investigation. This may be the result of the construction of the on-site slurry wall at East Station, coupled with the erosion and loss of the impacted

sediments in the river. (With the slurry wall in place, there may be no way for NAPL to reach the river at this location to re-contaminate the sediments.)

Trace sheens were detected during the Phase 1 investigation just downstream of the boundary between the East Station property and the adjacent Bausch and Lomb property. An outfall which falls at the boundary between these two properties is present at this location which was observed to be active in historic aerial photographs of the site. Drilled probes at this location were unable to replicate the sheens observed in the 2008 investigation.

No sheens were observed north of the abandoned railroad bridge at the north end of the Bausch and Lomb property, including the probing of thick sediments along the Brewer Street property.

During the Phase 1 investigation, an area of discolored dark sediment was observed along the shoreline and over an emerged bar immediately downstream of the actively-used CSO on the west side of the river north of the railroad bridge. This dark sediment did not display any odors or sheen. It is likely that this material is black due to high organic carbon content, and that the sediment was potentially discharged from the CSO. Historic aerial photographs of this area of the river also indicate that there has been a long history of dumping from the top of the gorge north of the railroad bridge. The dark sediment could be associated with the erosion and re-deposition of fill soils in this area.

Area C

In Area C (Figure 4-8 a-b), only four probe points generated sheens during the Phase 1 and Phase 2 investigations. In 2008 the southern-most probe point along the eastern shore at Station 5 developed a faint, trace sheen. This hand probe was made at the limit of access immediately adjacent to the Station 5 tailrace and could not be duplicated by repeated probing at that time. (This point is shown as non-sheen producing in the 2009 report.) In 2009, probes in the expanded investigation area showed trace sheens along the western shore just upstream of the Veterans Bridge and one along the eastern shore. Note that probing could not be conducted along the western shore in the immediate area of the Lower Falls due to the heavy spray conditions which were present. This area can only be probed during low flow conditions, when significant river flow is diverted through the hydrostation.

4.4 Sediment Analysis

Sediment samples were obtained from ambient core locations away from possible areas of NAPL, and from locations offshore of East and West Stations where NAPL or sheen was observed in the sediments.

The results of the analyses are presented in Tables 1 through 3, with the laboratory data packages and Data Usability Summary Reports (DUSRs) attached on CD-ROM as Appendix C. The total BTEX and PAH results for the samples are also shown on the figures for Section 4 which present the sheen observations, and on Plate 1.

4.4.1 Ambient Core Locations

The results of sediment samples obtained from ambient core locations are presented in Table 1, with the total BTEX and PAH concentrations shown on Figures 4-7a and 4-7c.

BTEX was not detected at any of the ambient core locations, and only seven of 17 PAHs were detected, with total PAH concentrations all below 1 ppm.

Cores C1, C2, and C3 recovered sufficient core lengths that laboratory samples could be obtained from the surface sediment layer from each core and from a subsurface layer. The layers containing the greatest amount of silt were found to have the highest concentration of total organic carbon (TOC). TOC in the siltier layers was slightly more than 1 percent, while in the layers predominated by fine sand the TOC was approximately half a percent. Cores C4 and C5, obtained upstream of West Station, contained very little silt but had TOC concentrations of 1.4 and 2.4 percent, respectively. These TOC concentrations are most likely reflective of the heterogeneous nature of the sediment due to mixing in a high-energy environment. The downstream samples, obtained from more quiescent river depositional areas, reflect a winnowing of the sediments to separate organic matter from heavier sediment grains.

4.4.2 West Station

Figure 4-9 presents a view of the sheen observation and sediment analysis results at West Station. The results of the sediment testing for West Station are presented in Table 2. Core attempts at West Station resulted in only one core with sufficient penetration and recovery to obtain a surface and subsurface sample (core 09WSC2). This core was obtained from the center of the downstream NAPL impact location. All other samples from cores in this area recovered only half a foot of surface sediment.

BTEX was only detected in core 09WSC2, at a concentration slightly above 4 ppm in both the surface and subsurface samples. The highest PAH concentrations of samples collected along the West Station area were also found in core 09WSC2 with PAH concentrations of 487 and 373 ppm in the surface and subsurface samples, respectively. PAHs measured in the other samples from along West Station ranged from 60 ppm to non-detect. Samples obtained from two upstream locations that exhibited heavy sheen (core 09WSC7) and NAPL (core 09WSC1) had PAH concentrations of 23 and 17 ppm. It is likely that these low concentrations are a result of the coarse sediment grain size at these locations.

4.4.3 East Station

Figure 4-10 presents a view of the sheen observation and sediment analysis results along East Station. The results of the sediment testing for East Station are presented in Table 3.

At East Station only one core was able to recover a core long enough to allow surface and subsurface sediments to be analyzed (09ESC1). As described above (Section 4.3), this is because the sediments form a wedge of material on top of bedrock along the shoreline, which rapidly thins and disappears off-shore in this area. Core 09ESC1 was obtained from the most impacted location, and had BTEX concentrations of 96 and 42 ppm in the surface and subsurface sediments, respectively. BTEX was measured to be 120 ppm at nearby core 09ESC2, though this location had a slightly lower PAH concentration than at 09ESC1. Trace amounts of BTEX (0.01 to 11.8 ppm) were detected at other core locations in this area. BTEX measurements in a separate downstream sheen area found BTEX to be at or below the detection limits.

PAHs were highest in cores 09ESC1 and 09ESC2, ranging from 270 to 772 ppm. These cores were obtained in the area of observed NAPL. PAH concentrations dropped-off rapidly away from the NAPL location. Sediments obtained from the edge of the sheen-producing zone had PAH concentrations of 4 to 38 ppm. The downstream sediment area which showed sheens only (no NAPL) had a PAH concentration of 6 ppm.

5. Summary and Revised Conceptual Site Model

This section summarizes the findings of work performed as part of the Phase 1 and Phase 2 investigations. Section 5.1 summarizes the results of the fieldwork which was performed, and Section 5.2 brings all of the currently known information together to create a revised CSM for the Project Area.

5.1 Summary of Phase 1 and 2 Findings

5.1.1 Area A (Base of Upper Falls to Middle Falls)

- NAPL impacts were not observed in either sediments or at the shoreline near the Upper Falls area. The survey of the mid-river island just north of the Upper Falls showed three locations that produced a trace sheen (rank = 2) in 2008. However, there was no apparent pattern found to the distribution of sheen-producing sediments in this area (i.e. there was no correlation with potential sources, and these locations were not spatially linked with other points of observed sheen) and these sheens could not be repeated in 2009.
- The shoreline in front of the West Station Park area found three locations with a trace sheen (rank = 2) in 2008; these sheens could not be repeated in 2009. One location, near a former water intake above the weir, had sediments which exhibited a slight fuel-oil like odor.
- NAPL (rank = 4) was found in sediment at the south end of the former West Station Plant site, below the weir associated with a water intake/discharge structure for the abandoned Beebee Electric generating station). NAPL was also found downstream below a former large oil tank location. Moderate sheens (rank = 3) were observed below the former water treatment building. Areas of light sheen were found to be associated with all three of these locations. The NAPL or heavy sheen at each location was limited to only one or two probe locations.
- Solidified, asphalt-like material was found to be present over shoreline sediments at some locations in front of West Station. Probing through this material could not be performed during Phase 1 or 2. NAPL or sheens were not produced from probing in these materials.
- At East Station a narrow wedge of highly impacted sediment containing NAPL was found immediately along the shoreline at the southern portion of the RG&E property. The thickness of the sediment thinned towards the center of the river, where an exposed rock bottom was found in most areas in front of the site. The area of NAPL and sheen was limited to a zone approximately 200 feet long by 40 feet wide. Downstream of the NAPL location, trace to moderate sheens were found at two probe

locations in 2008, and trace sheens in several more locations. None of these sheens could be repeated during the Phase 2 investigation in 2009.

- An area of trace sheen was found in front of the neighboring Bausch and Lomb site in 2008. These sheens could not be repeated in 2009.
- The sediments at the Middle Falls Dam / Brewer Street Area showed no sheens or any other indications of impact. The area immediately behind the dam was not accessible due to construction and river control limitations, but remediation of sediments along the western shore was previously performed as part of the Brewer Street project, therefore, sediment impacts are unlikely.

5.1.2 Area B (Middle Falls to top of Lower Falls)

- No fieldwork was performed in this area in 2008 or 2009 due to construction work at the hydrostation. RG&E cannot regulate flow in this area, therefore, as a safety concern access is prohibited until construction work is completed. Based on current work schedules, full access to this area may not be achieved until 2011.

5.1.3 Area C (Base of Lower Falls to Veterans Memorial Bridge)

- No fieldwork was performed at RG&E Station 5, and at the face of the Lower Falls and the shoreline near the base of the falls due to construction work at the hydrostation. RG&E cannot regulate flow over the Lower Falls, therefore, access is prohibited until construction work is completed. Based on current work schedules, full access to this area may not be achieved until 2011.
- The shoreline and river bottom in Area C that was surveyed was predominantly cobbley and bouldery at Seth Green Island and to the south, with fine-grained sediments found in two narrow beach areas. Downstream of Seth Green Island the expanded investigation area shows larger areas dominated by sand deposits.
- No NAPL or sheen was seen at the surface in any portion of Area C, including the shorelines and the surface of Seth Green Island. Subsurface impacts observed were limited to trace sheen at three probe points along the shoreline (one immediately adjacent to Station 5, and two along the western shore just upstream of Veterans Bridge). A slight hydrocarbon odor was detected in a test core obtained from the north end of Seth Green Island during the Phase 1 investigation; however, no sheens were found in this location.

5.2 Conceptual Site Model

The Genesee River is approximately 157 miles long, and includes a watershed of 2,500 square miles. The river begins near Genesee, PA and travels north until it discharges into Lake Ontario in the City of Rochester, Monroe County, NY (Figure 1-1 insert). The Lower Basin, which extends from the New York State Barge Canal (Barge Canal) and the river

mouth, is approximately 12 miles long with a drainage area of 27.7 square miles (MCDOH, 1986; RCSI, 2005).

5.2.1 Geology

The Genesee River cuts a gorge within the Project Area, exposing relatively flat-lying sedimentary rocks of Ordovician and Silurian age. The regional bedrock strike is generally east-west, in the direction N75ºE, and the dip is to the south at approximately 55 feet per mile, in the direction S15ºE. Bedrock is exposed in numerous locations along both walls of the gorge within the Project Area, and the more resistant layers form the caprock for the three waterfalls. However, bedrock is generally buried beneath sediments at the base of the Genesee River except in the area fronting the West Station MGP site, and fronting the East Station MGP site and the neighboring Bausch and Lomb property. The type and thickness of the alluvial deposits within the river and along the shore vary, depending on the river energy regime. Most of the study area shoreline and river bottom consists of very coarse materials (cobbles and boulders), with fine-grained sediments (sand and silt) restricted to the inner banks of river bends, the pool area behind the Middle Falls Dam, and the area from Seth Green Island to the Veterans Bridge. The observed depths to bedrock and sediment thickness within the Project Area vary from 0 to approximately 20 feet.

5.2.2 Surface Water Movement

Average surface water flow of the Genesee River within the Project Area range from a low of approximately 700 cubic feet per second (cfs) from August through October to a high of nearly 7,000 cfs in late March and April. The average flow rate is 2,800 cfs (USGS, 2008). Based on the flow readings from just upstream of the Project Area, both the Phase 1 and Phase 2 fieldwork was performed during times of lower than average flow (see Figures 3-1 and 3-2), typical of baseflow conditions.

Several CSOs and State Pollution Discharge Elimination System (SPDES) outfalls discharge surface water within the Project Area. In addition, the Barge Canal water mixes with the Genesee River upstream of the Project Area (MCDOH, 1986). There are no major surface water tributaries to the river within the Project Area.

Precipitation runoff which flows over the edge of the gorge appears to flow over the face of the gorge and then infiltrate through the coarse deposits at the base of the face or slope. From there, water moves through the subsurface until it reaches the water table or bedrock, and then moves through the gorge to the north.

5.2.3 Groundwater Movement

Regionally, groundwater flows north-northeast to Lake Ontario. However, the river gorge acts to drain local groundwater in its vicinity, both from overburden soils and bedrock. A

figure of region-wide groundwater elevations (Morrison-Knudsen, 1986) showed that groundwater flows towards the gorge in the Project Area from a narrow margin to the east, but a wide area to the west. The capture zone to the east of the gorge is at least 400 to 660 feet wide. The west side of the gorge appears to partially intercept the regional groundwater flow system, resulting in a wider groundwater capture zone. Local capture along the upstream portion of Area A extends at least 800 to 1,200 feet wide. From the middle of Area A to the Lower Falls a capture zone extends out to at least 3,200 feet or more, possibly due to a localized bedrock fracture zone.

5.2.4 Sediment Transport and Deposition

The predominance of large sediment along the bottom and the margins of the river is a reflection of the river flow and transport mechanisms which dominate the system. As noted above, the river is subject to great variation in flow; however, it is the high flow events which are responsible for the morphology and sediments which are present. Fine-grained sediment generally move through the Project Area during flood events and high flow conditions, with long-term deposition occurring only in small low-energy areas inside of river bends, or in small marginal floodplains. Small amounts of sand temporarily accumulate around larger blocks and cobbles, in the pool area upstream of the Middle Falls Dam, and just upstream of the Veterans Bridge where the river energy is reduced by the increased water depth and width.

The downriver transport of sediment within the Project Area is controlled in large part by the physical shape of the river, water depths, hydrodynamic conditions, and sediment physical properties. The narrow gorge limits the ability of the river to adjust to increases in flow conditions or sediment loads, therefore, sediment delivered to the gorge is generally transported downstream until the river widens sufficiently to reduce the flow rate and allow deposition in marginal bank or flood plain deposits. Sediment deposited in the few marginal deposition areas within the Project Area may be stable over a long period of time if heavy enough or if deposited away from the usual river course. These possible deposition areas include the lowlands at East Station and the Bausch and Lomb property, the western shore area north of the active county CSO, and the Brewer Street area. The two islands within the Project Area are subject to overtopping during floods, but would be able to capture cobbley sediment (if deeply flooded and subject to bed-load transport) or fine-grained sediment (if the overtopping water only carries suspended sediment). The expanded portion of the Project Area in Area C appears to be a zone which allows sand-sized sediment to deposit, due to the widening of the river north of Seth Green Island and lower river velocity through this area.

5.2.5 Potential Sources of Other Contaminants

The Genesee River system has the capacity to capture many other sources of contamination, both historic and ongoing, which would contribute to the chemical loading in both the

sediments and water column. These impacts would be from a variety of point and nonpoint discharges or releases. These potential sources may include:

- Historic deposition and/or placement of urban fill materials in the river bed;
- Historic fill areas/sites such as the Deep Hollow Ravine;
- Historic and ongoing direct discharges of sanitary sewage;
- Historic and potentially ongoing industrial discharges (treated and untreated) from industries along the banks and within the watershed;
- Incidental release or placement of chemicals (including industrial raw materials, industrial wastes, and municipal refuse);
- Historic and ongoing releases of stormwater flows into the river;
- Historic and ongoing discharges of groundwater to the river;
- Historic and ongoing aerial deposition; and
- Listed, known, and/or unknown environmental sites.

The path that any contaminants would take once reaching the river would depend on their chemical and physical properties. Except in small deposition or fill areas above the flood level of the river, all solids and liquids within the gorge are in migration northwards.

5.3 Phase 2 Data Gaps and Work Plan Deviations

Certain portions of the Phase 1 and 2 Work Plan could not be implemented during the field investigation in 2008 and 2009 due to river conditions and/or safety concerns. These gaps are identified and discussed below.

Area B. No access was made to any part of Area B during the 2008 or 2009 investigations due to safety concerns. The observations presented regarding Area B in this report come from the review of aerial photographs, historical records, and distant direct observations of conditions in the segment of the river. The shoreline reconnaissance, bathymetric survey, and sediment probing will be done when RG&E determines that the shoreline and the water can be accessed safely.

Bathymetry. Area A was more fully accessible for the Phase 2 investigation as a result of the pool level behind the Middle Falls Dam being raised by approximately 5 feet over the level during the 2008 investigation. In 2008 the shorelines and shallow bar areas which are normally submerged were above-water from the Middle Falls Dam to approximately the weir at West Station. The shoreline areas that were exposed in 2008 were once again submerged in 2009. In the area of the Middle Falls Dam itself, the river bottom was not surveyed for safety reasons during Phase 1 or Phase 2, as normal river and gate controls at the dam could not be put into operation due to the protection needed for the hydrostation construction work. The bathymetric survey in front of West Station was successfully performed during the Phase

2 investigation due to the higher water level. This survey extended to the weir area; above that location the eastern channel cannot be safely accessed due to the high river velocity and shallow water conditions.

Sub-Bottom Profiling. Sub-bottom sediment profiling was not performed during Phase 2 of this program due to its lack of success during the 2008 survey. Sub-bottom profiling was not successful because the hard cobble and boulder sediments in the river did not allow signal penetration. Additionally, the presence of boulders (and the inability to spot them visually below the water surface due to high water turbidity) in some areas made the risk of damage to the equipment unacceptable.

Sediment Probing. Those areas which were not accessible by boat for the bathymetric survey were also not accessible for probing due to the river conditions (high water velocity, limited water depth for navigation, obstructing boulders). An attempt to probe in some of these areas can be made after the construction activities at the RG&E hydrostation are complete, and when the significant portion of the river flow is diverted to the hydrostation and not over the Lower Falls. Probing in the vicinity of the Lower Falls could not be conducted as all of the river flow was being directed over the falls due to the closure of Station 5 for tunnel repair. Note, however, that boat access upstream to the Avenue E Bridge and to the Lower Falls will still not be possible once hydroelectric operations resume, as the total flow and river water level will be unchanged in this area. Access to the pool area below the Lower Falls may be possible once water is diverted through the Station 5 if a small boat can be launched by hand at this location.

5.4 Recommendations for the Additional Investigations

The Phase 1 and Phase 2 investigations have provided observations and field data which help to establish the overall condition of the Genesee River within the study area with respect to MGP NAPL, and which shows the extent of NAPL impacts in shallow sediments along East and West Station former MGPs. The next phase of investigation should be to integrate this data into the RI's currently being performed at the East and West Station former MGP sites and then evaluate what data gaps exist. This work will require sediment coring to bedrock in most locations, and possibly into bedrock, as well as delineation of constituents of concern to their background concentrations. However, this work should not be performed until further work is performed on-shore at both East and West Stations, in order to firmly establish the locations of NAPL source areas, and to identify possible migration pathways to the sediments or bedrock in the river.

As committed in the initial Work Plan, Area B, the north end of Area A adjacent to the Middle Falls Dam, and Area C near the base of the Lower Falls will be assessed, if still required, subsequent to the repairs to the RG&E hydrostation. This will allow for increased safety since water can be controlled by the dam and diverted to the hydrostation.

6. References

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Tables

Table 1
Ambient Core Location Analytical Results
Genesee River Investigation
Rochester, New York

			Location Name:		C1A		C1A		C2		C2		C3		C3		C4		C5	
			Sample Name:		091980-C1A (0-37)		091980-C1A (37-52)		091980-C2 (0-20)		091980-C2 (20-51)		091980-C3 (0-7)		091980-C3 (7-27)		091980-COMP-C4/C4A		091980-C5	
			Sample Date:		09/29/2009		09/29/2009		09/29/2009		09/29/2009		09/30/2009		09/30/2009		09/30/2009		10/01/2009	
Analyte	**Method**	**Units**	**ERL**	**ERM**																
BTEX																				
Benzene	SW 8260B	ug/kg	340	NE	6.5	U	6.3	U	6.6	U	7.6	U	6.8	U	6.6	U	5.5	U	5.3	U
Ethylbenzene	SW 8260B	ug/kg	1400	NE	6.5	U	6.3	U	6.6	U	7.6	U	6.8	U	6.6	U	5.5	U	5.3	U
Toluene	SW 8260B	ug/kg	2500	NE	6.5	U	1.4	J	6.6	U	7.6	U	6.8	U	6.6	U	5.5	U	5.3	U
m,p-Xylene	SW 8260B	ug/kg	NE	NE	13	U	13	U	13	U	15	U	14	U	13	U	11	U	11	U
o-Xylene	SW 8260B	ug/kg	NE	NE	6.5	U	6.3	U	6.6	U	7.6	U	6.8	U	6.6	U	5.5	U	5.3	U
Total Xylene	SW 8260B	ug/kg	120	NE	13	U	13	U	13	U	15	U	14	U	13	U	11	U	11	U
Total BTEX	-	ug/kg	NE	NE	ND		1.4		ND		ND		ND		ND		ND		ND	
PAHs																				
Acenaphthene	SW 8270C	ug/kg	16	500	110	U	22	U	110	U	130	U	120	U	110	U	95	U	92	U
Acenaphthylene	SW 8270C	ug/kg	44	640	110	U	22	U	110	U	130	U	120	U	110	U	95	U	92	U
Anthracene	SW 8270C	ug/kg	85	1100	110	U	22	U	110	U	130	U	120	U	110	U	95	U	92	U
Benz[a]anthracene	SW 8270C	ug/kg	261	1600	110	U	22	U	83	J	130	U	68	J	110	U	95	U	100	
Benzo[a]pyrene	SW 8270C	ug/kg	430	1600	110	U	22	U	110	U	130	U	120	U	110	U	95	U	92	U
Benzo[b]fluoranthene	SW 8270C	ug/kg	NE	1800	110	U	22	U	110	U	130	U	120	U	110	U	95	U	97	
Benzo[g,h,i]perylene	SW 8270C	ug/kg	170	NE	110	U	22	U	110	U	130	U	120	U	110	U	95	U	92	U
Benzo[k]fluoranthene	SW 8270C	ug/kg	240	NE	110	U	22	U	110	U	130	U	120	U	110	U	95	U	92	U
Chrysene	SW 8270C	ug/kg	384	2800	110	U	22	U	72	J	130	U	120	U	110	U	95	U	79	J
Dibenz[a,h]anthracene	SW 8270C	ug/kg	63	260	110	U	22	U	110	U	130	U	120	U	110	U	95	U	92	U
Fluoranthene	SW 8270C	ug/kg	600	5100	110	U	22	U	170		130	U	91	J	110	U	95	U	190	
Fluorene	SW 8270C	ug/kg	19	540	110	U	22	U	110	U	130	U	120	U	110	U	95	U	92	U
Indeno[1,2,3-cd]pyrene	SW 8270C	ug/kg	200	NE	110	U	22	U	110	U	130	U	120	U	110	U	95	U	92	U
2-Methylnapthalene	SW 8270C	ug/kg	70	670	110	U	22	U	110	U	130	U	120	U	110	U	95	U	92	U
Naphthalene	SW 8270C	ug/kg	160	2100	110	U	22	U	110	U	130	U	120	U	110	U	95	U	92	U
Phenanthrene	SW 8270C	ug/kg	240	1500	110	U	22	U	150		130	U	120	U	110	U	95	U	140	
Pyrene	SW 8270C	ug/kg	665	2600	110	U	22	U	120		88	J	78	J	110	U	95	U	170	
Total PAHs	-	ug/kg	4022	44792	ND		ND		595		88		237		ND		ND		776	
Other SVOCs																				
Dibenzofuran	SW 8270C	ug/kg	NE	NE	110	U	22	U	110	U	130	U	120	U	110	U	95	U	92	U
Other																				
Percent Solids	Dry Weight	%	NE	NE	74		78		75		66		72		74		88		91	
Black Carbon	Lloyd Kahn	mg/kg	NE	NE	3350		1300		2110		3690		4010		1360		10700		13000	
Total Organic Carbon	Lloyd Kahn	mg/kg	NE	NE	10100		2600		5380		12700		10700		3800		13600		24300	
Grain Size																				
Clay	ASTM D422	%			11.3		3.9		5.9		14.2		8.8		2.9		2.1		5.7	
Coarse Sand	ASTM D422	%			0.0		0.0		0.0		0.0		1.1		0.0		7.4		3.6	
Fine Sand	ASTM D422	%			24.1		77.5		52.0		9.4		37.4		55.8		7.7		3.1	
Gravel	ASTM D422	%			0.0		0.0		0.0		0.0		0.0		0.0		68.2		81.5	
Medium Sand	ASTM D422	%			0.7		0.7		0.5		0.8		1.8		0.6		10.8		2.7	
Silt	ASTM D422	%			63.9		18.0		41.6		75.6		50.9		40.7		3.8		3.4	

Notes:
U = The material was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
J = The associated numerical value is an estimated quantity.
NA = Not Applicable
NL = Not Listed
(Note 2) - Sum of SVOC compounds includes PAH compounds.
(Note 1) - NYSDEC Technical Guidance for Screening Contaminated Sediments, Division of Fish, Wildlife and Marine Resources [NYSDEC, Jan. 1999].
ERL = Effect Range-Low [NYSDEC, 1999].
ERM = Effect Range-Moderate [NYSDEC, 1999].
NE = No Entry

Table 2
West Station Analytical Results
Genesee River Investigation
Rochester, New York

			Location Name:		09WSC1		09WSC2		09WSC2		09WSC3		09WSC4		09WSC5		09WSC6		09WSC7		09WSC8	
			Sample Name:		091980-09WS1		091980-09WS2 (0-16)		091980-09WS2 (16-32)		091980-09WS3		091980-09WS4		091980-09WS5		09WS C6		09WS C7		09WS C8	
			Sample Date:		09/30/2009		09/30/2009		09/30/2009		09/30/2009		09/30/2009		09/30/2009		10/01/2009		10/01/2009		10/01/2009	
Analyte	**Method**	**Units**	**ERL**	**ERM**																		
BTEX																						
Benzene	SW 8260B	ug/kg	340	NE	1.4	J	110	U	94	J	5.4	U	5.4	U	6.6	U	5.5	U	5.5	U	5.9	U
Ethylbenzene	SW 8260B	ug/kg	1400	NE	28		1200		1100		5.4	U	5.4	U	6.6	U	5.5	U	5.5	U	5.9	U
Toluene	SW 8260B	ug/kg	2500	NE	1.2	J	57	J	280		5.4	U	5.4	U	6.6	U	5.5	U	5.5	U	5.9	U
m,p-Xylene	SW 8260B	ug/kg	NE	NE	4.6	J	610		840		11	U	11	U	13	U	11	U	11	U	12	U
o-Xylene	SW 8260B	ug/kg	NE	NE	10		920		790		5.4	U	5.4	U	6.6	U	5.5	U	5.5	U	5.9	U
Total Xylene	SW 8260B	ug/kg	120	NE	15		1500		1600		11	U	11	U	13	U	11	U	11	U	12	U
Total BTEX	-	ug/kg	NE	NE	60.2		4287		4704		ND		ND		ND		ND		ND		ND	
PAHs																						
Acenaphthene	SW 8270C	ug/kg	16	500	1300		67000		50000		110		380	U	120	J	1000		900		130	
Acenaphthylene	SW 8270C	ug/kg	44	640	390		16000		12000		94	U	380	U	230	U	230		420		380	
Anthracene	SW 8270C	ug/kg	85	1100	1300		38000		30000		200		1700		330		320		1900		510	
Benz[a]anthracene	SW 8270C	ug/kg	261	1600	880		21000		16000		350		5900		800		450		290		650	
Benzo[a]pyrene	SW 8270C	ug/kg	430	1600	950		16000		13000		450		6400		1100		530		300		720	
Benzo[b]fluoranthene	SW 8270C	ug/kg	NE	1800	600		14000		10000		370		6700		850		440		220		620	
Benzo[g,h,i]perylene	SW 8270C	ug/kg	170	NE	270		6300		5400		160		3200		360		220		94	U	290	
Benzo[k]fluoranthene	SW 8270C	ug/kg	240	NE	230		3900		4200		140		3100		340		170		50	J	270	
Chrysene	SW 8270C	ug/kg	384	2800	870		18000		15000		350		5700		680		370		220		540	
Dibenz[a,h]anthracene	SW 8270C	ug/kg	63	260	190	U	2600		2300		94	U	1800		230	U	94	U	94	U	100	U
Fluoranthene	SW 8270C	ug/kg	600	5100	2000		42000		33000		910		13000		1800		2400		4200		1600	
Fluorene	SW 8270C	ug/kg	19	540	1200		40000		30000		180		74	J	67	J	150		1800		610	
Indeno[1,2,3-cd]pyrene	SW 8270C	ug/kg	200	NE	230		4900		4000		150		3300		370		210		64	J	270	
2-Methylnapthalene	SW 8270C	ug/kg	70	670	44	J	11000		6700		26	J	380	U	230	U	100		370		260	
Naphthalene	SW 8270C	ug/kg	160	2100	190	U	23000		12000		94	U	380	U	230	U	580		850		600	
Phenanthrene	SW 8270C	ug/kg	240	1500	4000		110000		86000		1000		860		600		390		8400		2000	
Pyrene	SW 8270C	ug/kg	665	2600	2200		53000		43000		620		8600		1300		1800		2900		1200	
Total PAHs	-	ug/kg	4022	44792	16464		486700		372600		5016		60334		8717		9360		22884		10650	
Other SVOCs																						
Dibenzofuran	SW 8270C	ug/kg	NE	NE	250		4900		3800		80	J	380	U	230	U	200		1100		430	
Other																						
Percent Solids	Dry Weight	%	NE	NE	90		88		90		89		89		74		90		88		82	
Black Carbon	Lloyd Kahn	mg/kg	NE	NE	14000		29600		32600		24100		52700		10000		15500		22000		19500	
Total Organic Carbon	Lloyd Kahn	mg/kg	NE	NE	22100		43800		57500		27200		74400		8690		24700		22300		33300	
Grain Size																						
Clay	ASTM D422	%			-		0.6		0.5		1.4		0.5		4.3		1.3		1.0		0.4	
Coarse Sand	ASTM D422	%			-		18.2		11.8		5.8		0.3		7.9		10.8		16.4		19.5	
Fine Sand	ASTM D422	%			-		8.2		4.0		5.7		1.7		46.2		9.7		20.1		13.6	
Gravel	ASTM D422	%			-		48.4		67.1		75.5		96.2		13.7		53.0		35.0		40.8	
Medium Sand	ASTM D422	%			-		20.9		11.1		7.2		0.9		19.8		14.6		18.5		18.6	
Silt	ASTM D422	%			-		3.7		5.5		4.4		0.4		8.3		10.6		9.0		7.1	

Notes:

U = The material was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.

J = The associated numerical value is an estimated quantity.

NA = Not Applicable

NL = Not Listed

(Note 2) - Sum of SVOC compounds includes PAH compounds.

(Note 1) - NYSDEC Technical Guidance for Screening Contaminated Sediments, Division of Fish, Wildlife and Marine Resources [NYSDEC, Jan. 1999].

ERL = Effect Range-Low [NYSDEC, 1999].

ERM = Effect Range-Moderate [NYSDEC, 1999].

NE = No Entry

Table 3
East Station Analytical Results
Genesee River Investigation
Rochester, New York

			Location Name:		09ESC1		09ESC1		09ESC2		09ESC4		09ESC6		09ESC7		09ESC9		09ESC12		09ESC13		09ESC14	
			Sample Name:		091980-09ES1 (0-14)		091980-09ES1 (14-23)		091980-09ES2		091980-09ES4		091980-09ES6		091980-09ES7		091980-09ES9		091980-09ES12		09ES C13		09ES C14	
			Sample Date:		10/01/2009		10/01/2009		10/01/2009		10/01/2009		10/01/2009		10/01/2009		10/01/2009		10/01/2009		10/01/2009		10/01/2009	
Analyte	**Method**	**Units**	**ERL**	**ERM**																				
BTEX																								
Benzene	SW 8260B	ug/kg	340	NE	16000	J	2300		3800		79		150		120		270		6	U	3.1	J	5.6	U
Ethylbenzene	SW 8260B	ug/kg	1400	NE	30000		14000		32000		83		49		140		2700		2.3	J	5.5	U	5.6	U
Toluene	SW 8260B	ug/kg	2500	NE	1900	J	48	J	270	J	1.7	J	1.4	J	2.3	J	15		6	U	5.5	U	5.6	U
m,p-Xylene	SW 8260B	ug/kg	NE	NE	13000		7100		27000		19		8.5	J	53		2700		2.1	J	11	U	11	U
o-Xylene	SW 8260B	ug/kg	NE	NE	11000		5800		15000		10		5.2	J	42		1700		1.3	J	5.5	U	5.6	U
Total Xylene	SW 8260B	ug/kg	120	NE	24000		13000		42000		29		14		95		4400		3.4	J	11	U	11	U
Total BTEX	-	ug/kg	NE	NE	95900		42248		120070		221.7		228.1		452.3		11785		9.1		3.1		ND	
PAHs																								
Acenaphthene	SW 8270C	ug/kg	16	500	59000		51000		30000		1500		1200		1500		6900		210	U	300		160	
Acenaphthylene	SW 8270C	ug/kg	44	640	7400		4700		4000		760		210		700		840		210	U	94	U	95	U
Anthracene	SW 8270C	ug/kg	85	1100	26000		18000		14000		1600		410		880		3300		140	J	70	J	320	
Benz[a]anthracene	SW 8270C	ug/kg	261	1600	17000		9700		7500		2300		390		1700		1800		270		190		390	
Benzo[a]pyrene	SW 8270C	ug/kg	430	1600	17000		8300		6000		2400		810		2400		1900		640		330		480	
Benzo[b]fluoranthene	SW 8270C	ug/kg	NE	1800	15000		7300		5900		2400		310		2300		1300		460		180		370	
Benzo[g,h,i]perylene	SW 8270C	ug/kg	170	NE	12000		5000		2700		1300		250		1700		820		180	J	94	U	220	
Benzo[k]fluoranthene	SW 8270C	ug/kg	240	NE	4500		2200		210	U	1000		200		870		530		210	U	68	J	150	
Chrysene	SW 8270C	ug/kg	384	2800	15000		8700		6500		2100		280		1700		1700		310		160		360	
Dibenz[a,h]anthracene	SW 8270C	ug/kg	63	260	3400		1500		1200		790		200	U	830		640		210	U	94	U	95	U
Fluoranthene	SW 8270C	ug/kg	600	5100	34000		21000		14000		5600		970		3400		4300		940		550		1000	
Fluorene	SW 8270C	ug/kg	19	540	31000		24000		17000		2000		730		830		3900		210	U	33	J	180	
Indeno[1,2,3-cd]pyrene	SW 8270C	ug/kg	200	NE	9100		3600		1900		1200		210		1400		690		210	U	84	J	180	
2-Methylnapthalene	SW 8270C	ug/kg	70	670	130000		120000		52000		350		510		1600		8500		210	U	94	U	39	J
Naphthalene	SW 8270C	ug/kg	160	2100	260000		190000		38000		2000		690		2500		12000		210	U	94	U	95	U
Phenanthrene	SW 8270C	ug/kg	240	1500	86000		62000		48000		6400		2200		2700		12000		600		120		1100	
Pyrene	SW 8270C	ug/kg	665	2600	45000		30000		21000		4700		1100		3400		5300		710		530		860	
Total PAHs	-	ug/kg	4022	44792	771400		567000		269700		38400		10470		30410		66420		4250		2615		5809	
Other SVOCs																								
Dibenzofuran	SW 8270C	ug/kg	NE	NE	5000		3400		2200		1000		280		210		810		210	U	94	U	120	
Other																								
Percent Solids	Dry Weight	%	NE	NE	70		95		81		84		82		80		80		82		89		89	
Black Carbon	Lloyd Kahn	mg/kg	NE	NE	13900		25600		8860		18400		16000		20400		30200		28700		13700		33000	
Total Organic Carbon	Lloyd Kahn	mg/kg	NE	NE	17600		38300		11100		24000		15800		25000		39400		33300		16400		38500	
Grain Size																								
Clay	ASTM D422	%			1.6		1.0		6.6		0.5		0.8		0.1		-0.6		1.2		1.4		-	
Coarse Sand	ASTM D422	%			1.6		20.9		6.0		8.4		3.2		8.9		22.6		19.9		20.2		-	
Fine Sand	ASTM D422	%			71.4		2.7		25.0		41.2		5.9		27.2		25.0		21.2		17.7		-	
Gravel	ASTM D422	%			1.4		56.2		39.5		22.9		84.0		46.7		7.8		13.3		20.3		-	
Medium Sand	ASTM D422	%			15.9		16.2		9.9		22.2		4.1		14.4		41.4		41.4		31.0		-	
Silt	ASTM D422	%			8.2		3.1		13.0		4.7		2.0		2.7		3.8		2.9		9.4		-	

Notes:
U = The material was analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
J = The associated numerical value is an estimated quantity.
NA = Not Applicable
NL = Not Listed
(Note 2) - Sum of SVOC compounds includes PAH compounds.
(Note 1) - NYSDEC Technical Guidance for Screening Contaminated Sediments, Division of Fish, Wildlife and Marine Resources [NYSDEC, Jan. 1999].
ERL = Effect Range-Low [NYSDEC, 1999].
ERM = Effect Range-Moderate [NYSDEC, 1999].
NE = No Entry

Figures

VETERANS BRIDGE

LOWER

SETH GREEN ISLAND

MIDDLE

KODAK HAWKEYE PLANT

AVENUE E BRIDGE

UPPER

STA. 5 POWERHOUSE

LOWER FALLS

FORMER DEEP HOLLOW RAVINE

MIDDLE FALLS DAM

MONROE COUNTY AND RG&E BREWER STREET SITE REMEDIATION 2003-2006 VCA INDEX # B8-0547-98-12; SITE # V00214-8

LOWER

PROPERTY 29

ABANDONED RAILROAD BRIDGE

FORMER BAUSCH AND LOMB MANUFACTURING FACILITY

RG&E EAST STATION MGP SITE VCA INDEX # B8-0547-98-12; SITE # V00358-8

RAECO PRODUCTS INACTIVE HAZ WASTE DISPOSAL SITE

MIDDLE

ROCHESTER METAL ETCHING CO. INACTIVE HAZ WASTE DISPOSAL SITE

BAUSCH BRIDGE

HIGH FALLS BREWING CO.

FORMER CITY OF ROCHESTER INCINERATOR FACILITY

UPPER

PLATT STREET BRIDGE

RG&E WEST STATION MGP SITE VCA INDEX # B8-0547-98-12; SITE # V00593-8

FORMER RG&E BEEBEE STATION

UPPER FALLS

RG&E FRONT STREET MGP SITE VCA INDEX # B8-0547-98-12; SITE # V00073-8

RG&E WEST STATION PARK AREA MGP SITE REMEDIATED IN 1997 IN ACCORDANCE WITH A NYSDEC VOLUNTARY CLEANUP AGREEMENT Index # D8-0001-95-10

LAKE ONTARIO

GENESEE RIVER

PROJECT EXTENT

ROCHESTER

N

LEGEND

RG&E BUILDINGS

RG&E MGP SITES

PROJECT SUB-AREAS

Area A, Sub-Area

Area B, Sub-Area

Area C, Sub-Area

SOURCE:
1. ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm), IMAGE DATE: APRIL 2005.

0 495 990 1,980

SCALE, FEET

PHASE 2 ASSESSEMENT
GENESEE RIVER
ROCHESTER, NEW YORK

ROCHESTER GAS & ELECTRIC COMPANY
ROCHESTER, NEW YORK

GEI Consultants

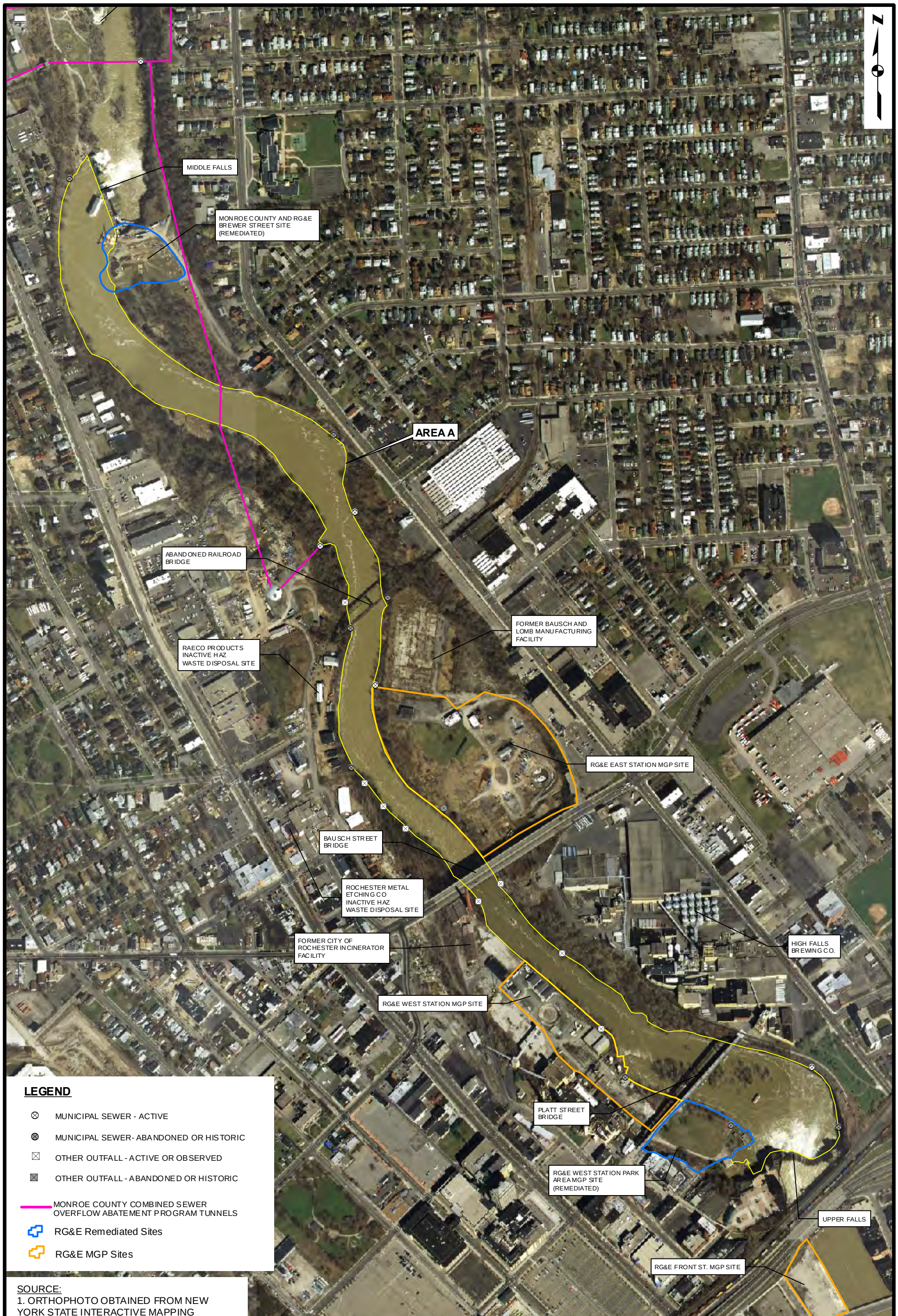
Project 091980

March 2010

GENESEE RIVER PROJECT AREA

Figure 1-1

J:\Projects\RG&E_GeneseeR\2009_Figure_1-1.mxd



PHASE 2 ASSESSMENT
GENESEE RIVER
ROCHESTER, NEW YORK

ROCHESTER GAS & ELECTRIC COMPANY
ROCHESTER, NEW YORK

GEI Consultants

PROJECT AREA A

Project 091980 | March 2010 | Figure 3-1

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PHASE 2 ASSESSMENT
GENESEE RIVER
ROCHESTER, NEW YORK

ROCHESTER GAS & ELECTRIC COMPANY
ROCHESTER, NEW YORK

GEI Consultants

PROJECT AREA B

Project 091980 | March 2010 | Figure 3-2

J:\Projects\RG&E_GeneseeR\2009_Site_Map_locus2_3-2.mxd

LEGEND

- MUNICIPAL SEWER - ACTIVE
- MUNICIPAL SEWER- ABANDONED OR HISTORIC
- OTHER OUTFALL - ACTIVE OR OBSERVED
- OTHER OUTFALL - ABANDONED OR HISTORIC
- MONROE COUNTY COMBINED SEWER OVERFLOW ABATEMENT PROGRAM TUNNELS
- RG&E Remediated Sites
- RG&E MGP Sites

VETERANS BRIDGE

SETH GREEN ISLAND

AREA C

KODAK HAWKEYE PLANT

AVENUE E BRIDGE

LOWER FALLS

N

SOURCE:
1. ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm), IMAGE DATE: APRIL 2005.

0 200 400 800

SCALE, FEET

PHASE 2 ASSESSMENT
GENESEE RIVER
ROCHESTER, NEW YORK

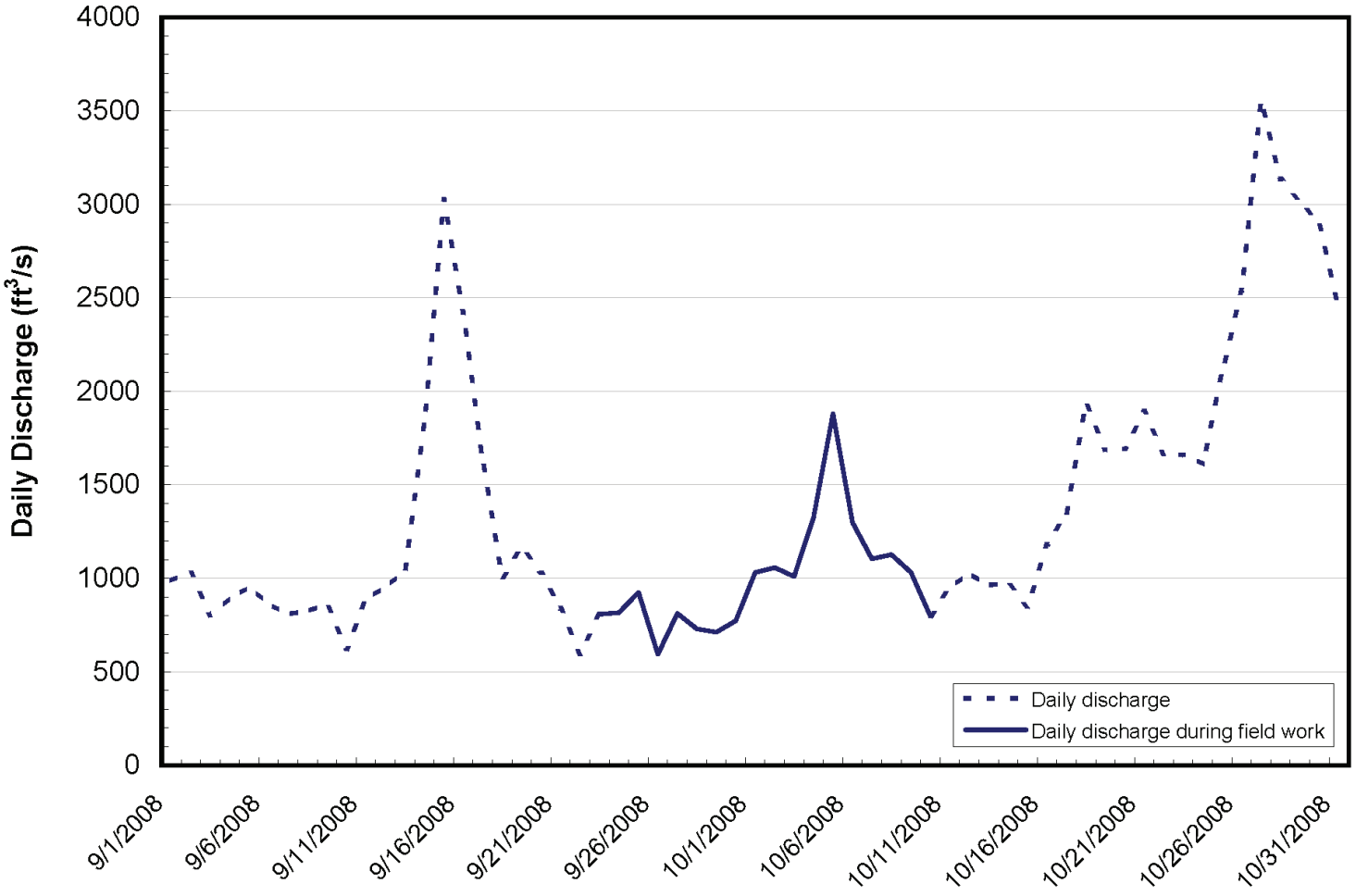
ROCHESTER GAS & ELECTRIC COMPANY
ROCHESTER, NEW YORK

GEI Consultants

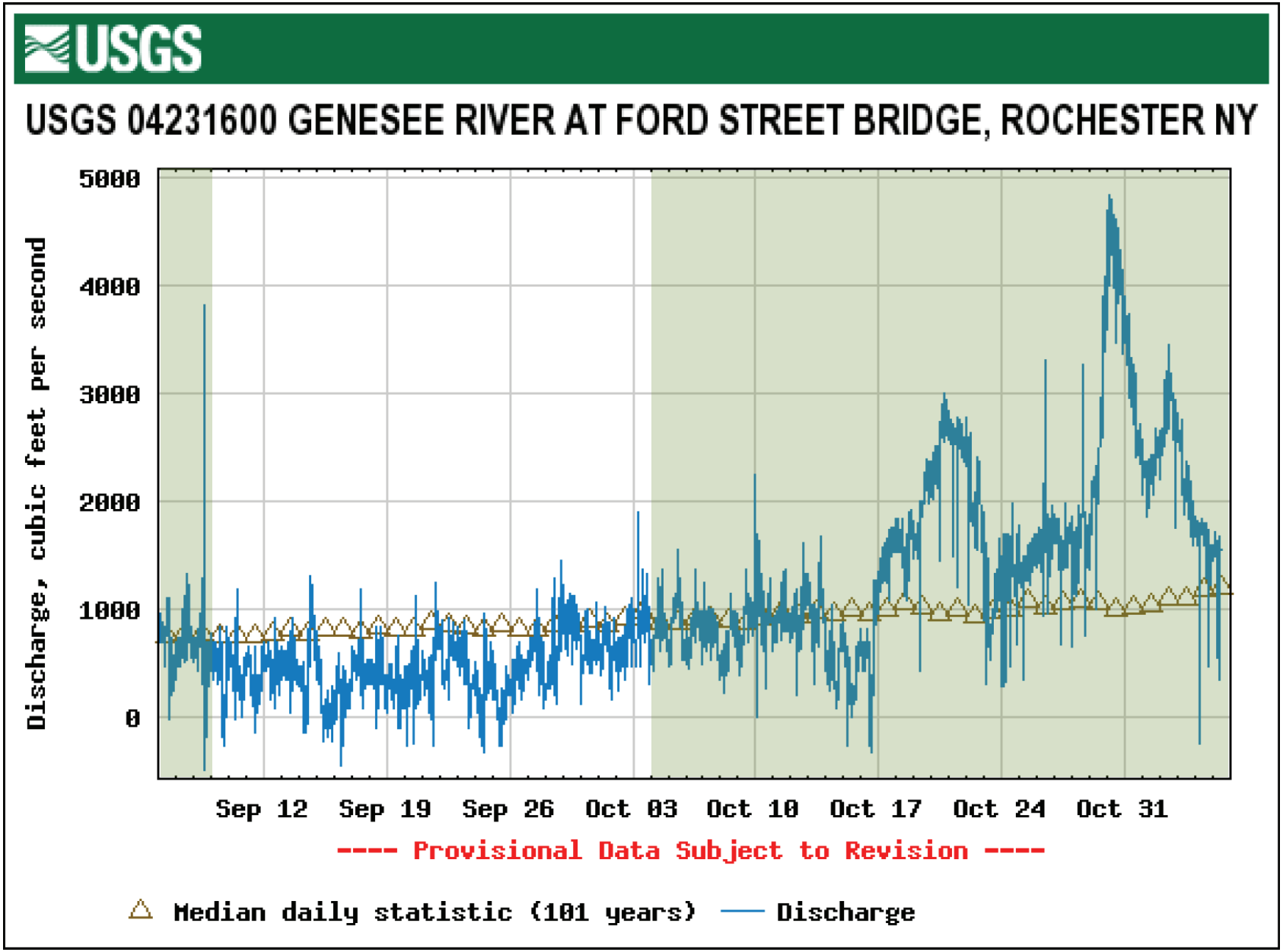
PROJECT AREA C

Project 091980 | March 2010 | Figure 3-3

J:\Projects\RG&E_GeneseeR\2009_Site_Map_locus2_3-3.mxd



GENESEE RIVER INVESTIGATION ROCHESTER GAS & ELECTRIC COMPANY ROCHESTER, NEW YORK	GEI Consultants Project 091980	**Daily Average River Flow (cubic feet per second)** **Genesee River at Ford Street, Rochester, NY** **USGS Station 04231600** **September 1 – October 31, 2008** March 2010 Figure 3-4



Indicates period where no fieldwork being conducted

GENESEE RIVER INVESTIGATION	GEI Consultants	**Genesee River Discharge Levels, September 6-November 5, 2009**	
ROCHESTER GAS & ELECTRIC COMPANY ROCHESTER, NEW YORK	Project 091980	March 2010	Figure 3-5

HIGH FALLS BREWING CO.

RG&E WEST STATION MGP SITE

PLATT STREET BRIDGE

RG&E WEST STATION PARK AREA MGP SITE (REMEDIATED)

UPPER FALLS

RG&E FRONT ST. MGP SITE

N

LEGEND

- MUNICIPAL SEWER - ACTIVE
- MUNICIPAL SEWER- ABANDONED OR HISTORIC
- OTHER OUTFALL - ACTIVE OR OBSERVED
- OTHER OUTFALL - ABANDONED OR HISTORIC
- MONROE COUNTY COMBINED SEWER OVERFLOW ABATEMENT PROGRAM TUNNELS
- RG&E Remediated Sites
- RG&E MGP Sites

*Elevation referenced to NGVD 29

Feet

356.7 - 358
358.1 - 360
360.1 - 362
362.1 - 364
364.1 - 366
366.1 - 368
368.1 - 370
370.1 - 372
372.1 - 374
374.1 - 376
376.1 - 378
378.1 - 380
380.1 - 382
382.1 - 384
384.1 - 386
386.1 - 388
388.1 - 390
390.1 - 391.4

SOURCE:
1. ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm), IMAGE DATE: APRIL 2005.

0 100 200 400

SCALE, FEET

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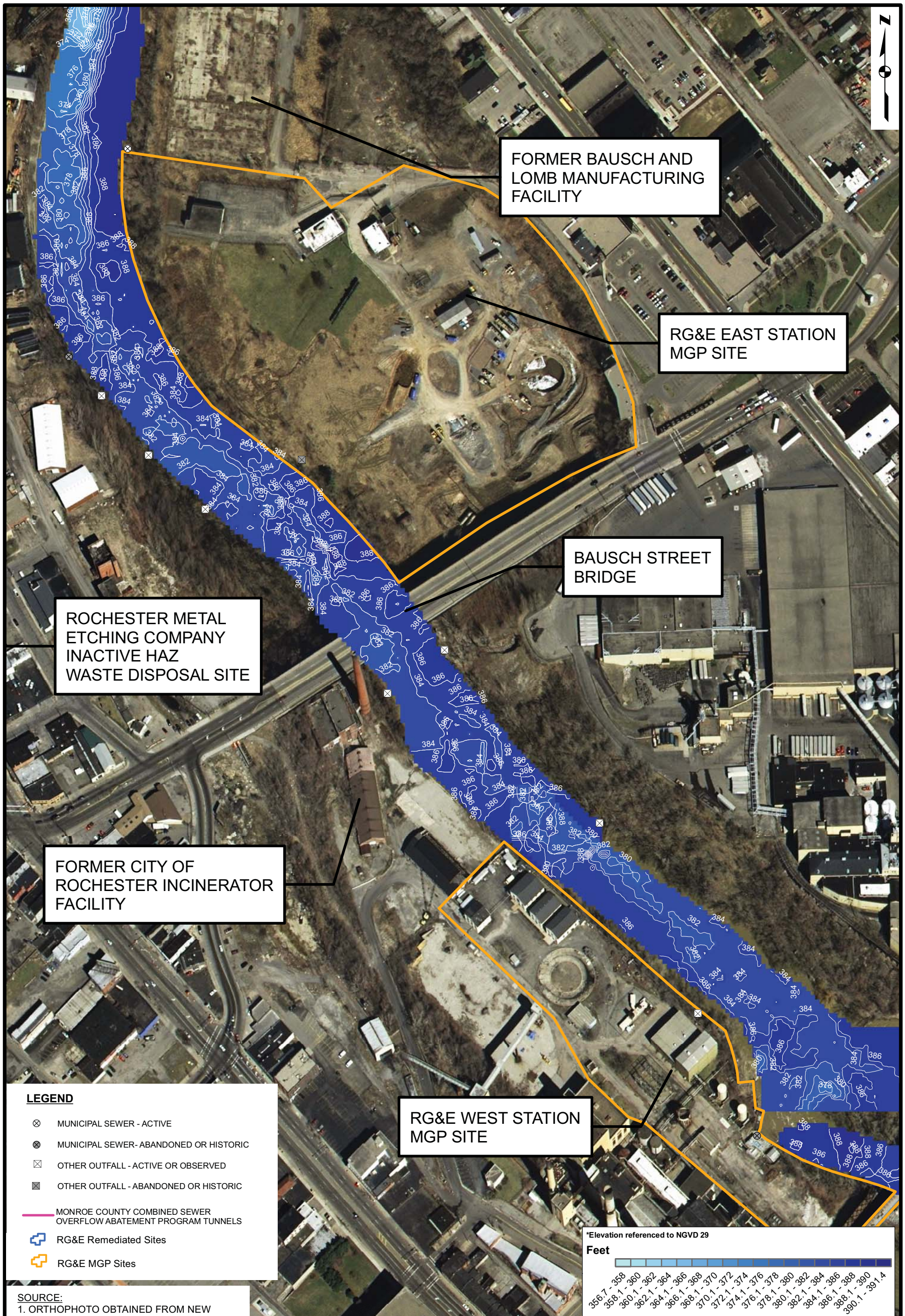
BATHYMETRIC SURVEY AREA A

March 2010 Figure 4-1a

J:\Projects\RG&E_GeneseeR\2009_Bathy_Area_A_F_4-1a.mxd



SOURCE:
1. ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm), IMAGE DATE: APRIL 2005.

0 100 200 400
SCALE, FEET

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BATHYMETRIC SURVEY AREA A

March 2010 Figure 4-1b

J:\Projects\RG&E_GeneseeR\2009_Bathy_Area_A_F_4-1b.mxd

MIDDLE FALLS

AREA NOT SURVEYED/
INACCESSIBLE

MONROE COUNTY AND RG&E
BREWER STREET SITE
(REMEDIATED)

ABANDONED RAILROAD
BRIDGE

RAECO PRODUCTS
INACTIVE HAZ
WASTE DISPOSAL SITE

N

LEGEND

- MUNICIPAL SEWER - ACTIVE
- MUNICIPAL SEWER- ABANDONED OR HISTORIC
- OTHER OUTFALL - ACTIVE OR OBSERVED
- OTHER OUTFALL - ABANDONED OR HISTORIC
- MONROE COUNTY COMBINED SEWER OVERFLOW ABATEMENT PROGRAM TUNNELS
- RG&E Remediated Sites
- RG&E MGP Sites

*Elevation referenced to NGVD 29

Feet

356.7 - 358
358.1 - 360
360.1 - 362
362.1 - 364
364.1 - 366
366.1 - 368
368.1 - 370
370.1 - 372
372.1 - 374
374.1 - 376
376.1 - 378
378.1 - 380
380.1 - 382
382.1 - 384
384.1 - 386
386.1 - 388
388.1 - 390
390.1 - 391.4

SOURCE:
1. ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm), IMAGE DATE: APRIL 2005.

0 100 200 400

SCALE, FEET

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**BATHYMETRIC SURVEY
AREA A**

March 2010 Figure 4-1c

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LEGEND

- MUNICIPAL SEWER - ACTIVE
- MUNICIPAL SEWER- ABANDONED OR HISTORIC
- OTHER OUTFALL - ACTIVE OR OBSERVED
- OTHER OUTFALL - ABANDONED OR HISTORIC
- MONROE COUNTY COMBINED SEWER OVERFLOW ABATEMENT PROGRAM TUNNELS
- RG&E Remediated Sites
- RG&E MGP Sites

N

KODAK HAWKEYE PLANT

AVENUE E BRIDGE

AREA NOT SURVEYED/ INACCESSIBLE

FORMER DEEP HOLLOW RAVINE

LOWER FALLS

*Elevation referenced to NGVD 29

Feet

237.2 - 238 | 238.1 - 239 | 239.1 - 240 | 240.1 - 241 | 241.1 - 242 | 242.1 - 243 | 243.1 - 244 | 244.1 - 245 | 245.1 - 246 | 246.1 - 246.9 | 247 - 248 | 248.1 - 248.1

SOURCE:
1. ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm), IMAGE DATE: APRIL 2005.

0 100 200 400

SCALE, FEET

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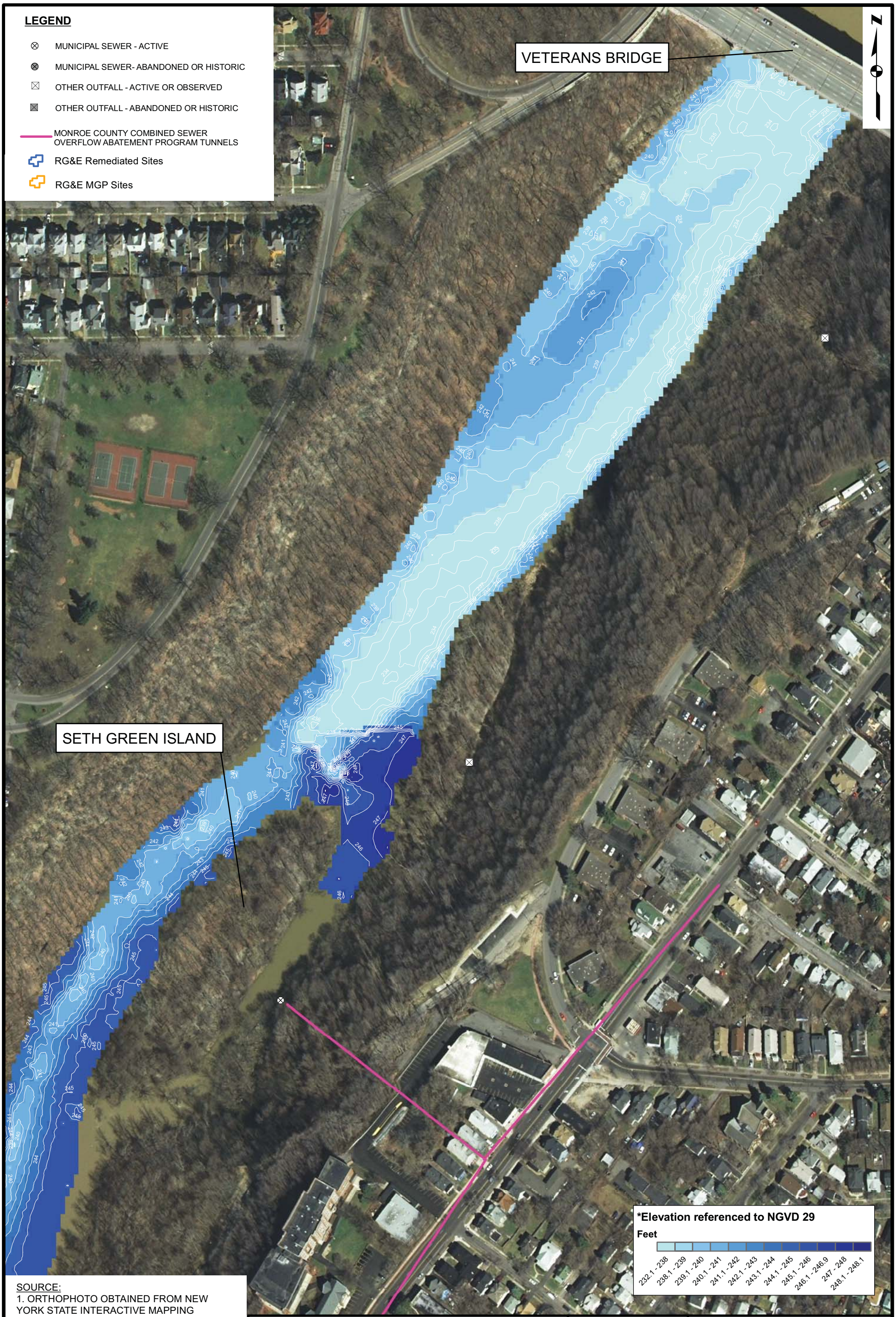
BATHYMETRIC SURVEY AREA C

Project 091980 | March 2010 | Figure 4-2a

J:\Projects\RG&E_GeneseeR\2009_Bathy_Area_A_F_4-2a.mxd



SOURCE:
1. ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm), IMAGE DATE: APRIL 2005.

0 100 200 400
SCALE, FEET

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BATHYMETRIC SURVEY AREA C

Project 091980 | March 2010 | Figure 4-2b

J:\Projects\RG&E_GeneseeR\2009_Bathy_Area_A_F_4-2b.mxd

HIGH FALLS BREWING CO.

RG&E WEST STATION MGP SITE

PLATT STREET BRIDGE

RG&E WEST STATION PARK AREA MGP SITE (REMEDIATED)

UPPER FALLS

RG&E FRONT ST. MGP SITE

LEGEND

- MUNICIPAL SEWER - ACTIVE
- MUNICIPAL SEWER- ABANDONED OR HISTORIC
- OTHER OUTFALL - ACTIVE OR OBSERVED
- OTHER OUTFALL - ABANDONED OR HISTORIC
- MONROE COUNTY COMBINED SEWER OVERFLOW ABATEMENT PROGRAM TUNNELS
- RG&E Remediated Sites
- RG&E MGP Sites

BOTTOM TYPE

- BEDROCK BOTTOM
- COBBLEY BOTTOM
- SAND AND GRAVEL
- SANDY BOTTOM
- SILTY BOTTOM

- 2008 VIBRACORE
- DRILLED PROBE
- CORE
- PROBE

SOURCE:
1. ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm), IMAGE DATE: APRIL 2005.

0 100 200 400
SCALE, FEET

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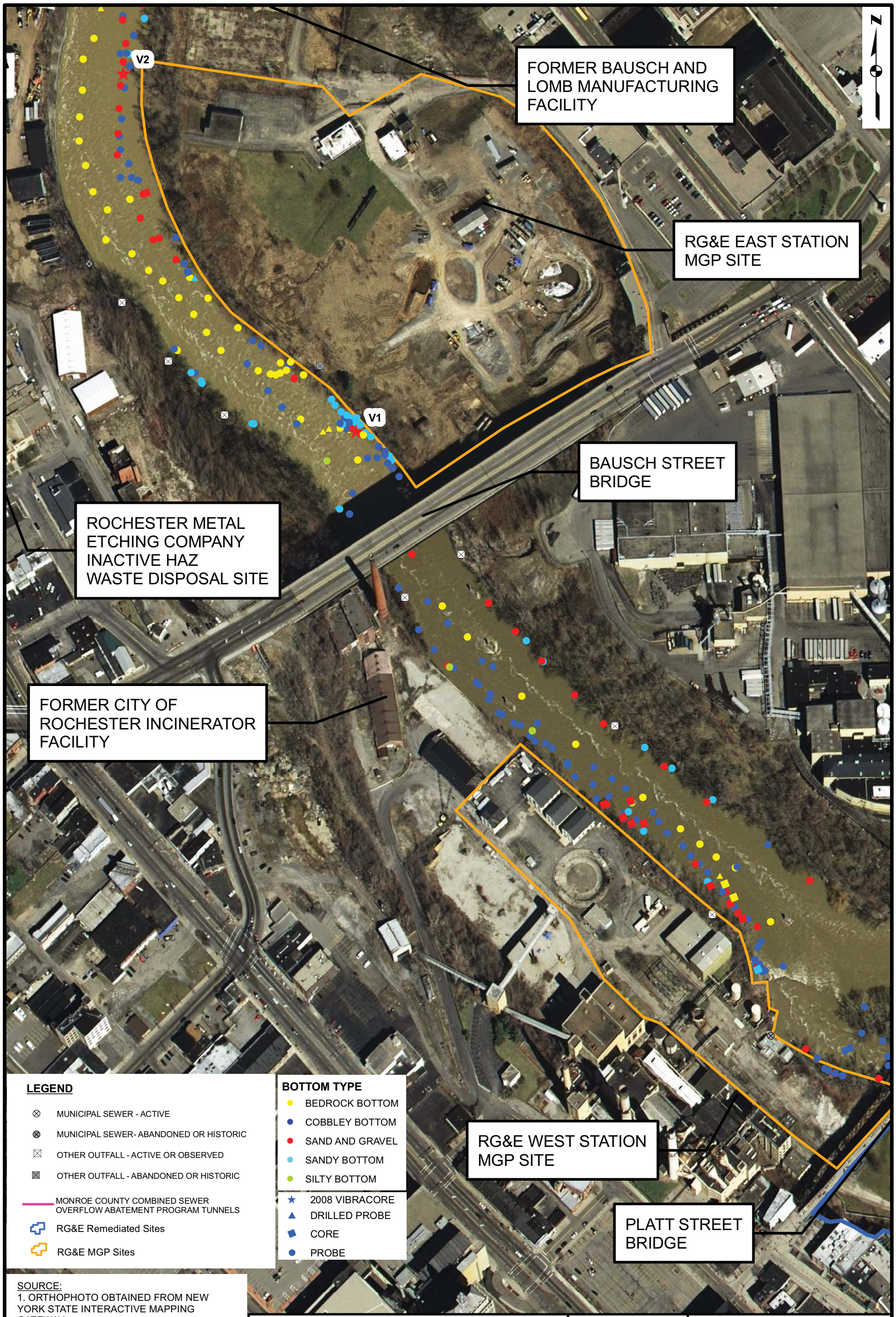
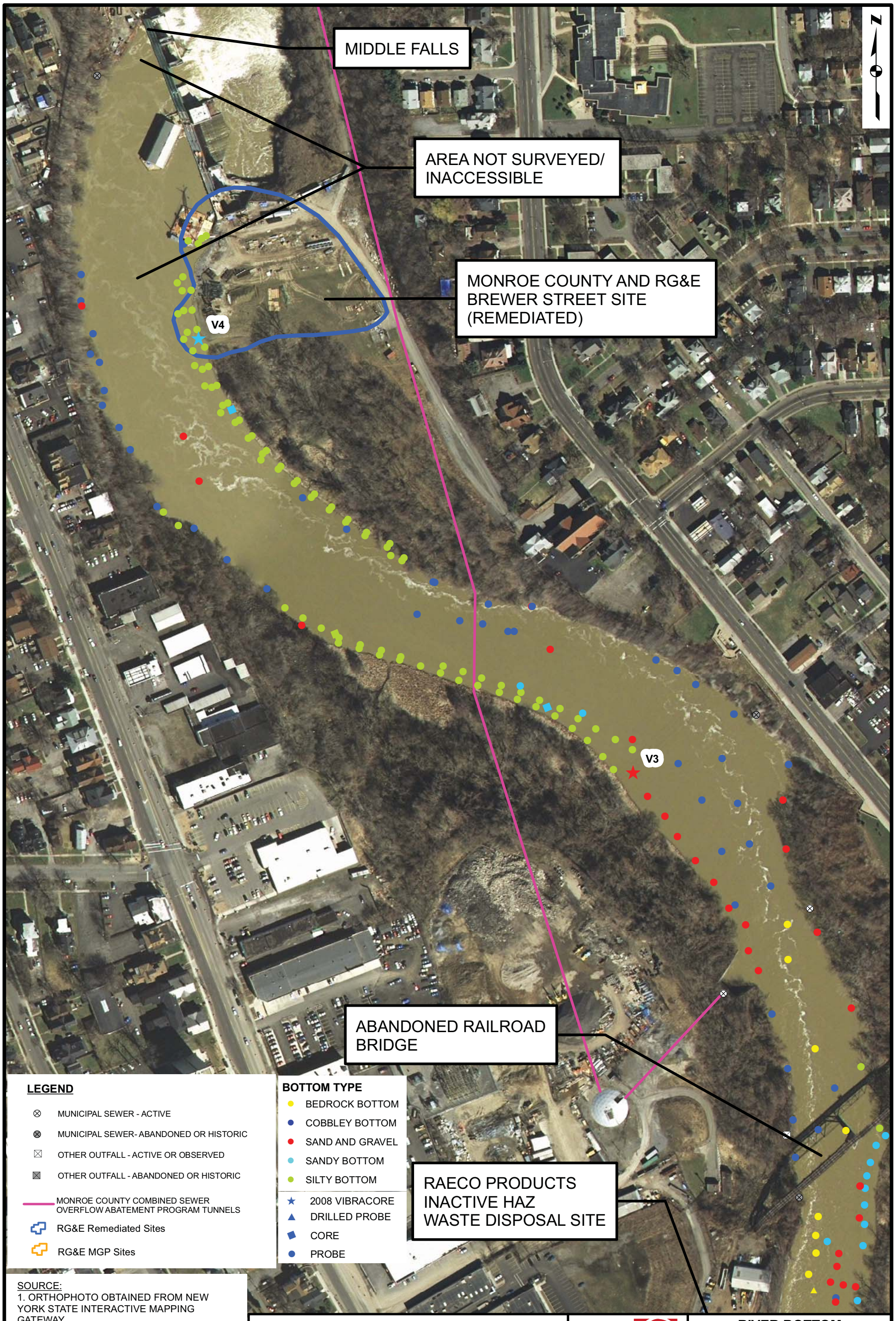
RIVER BOTTOM SEDIMENT TYPE 2008 & 2009 RESULTS AREA A

March 2010 Figure 4-3a

J:\Projects\RG&E_Genesee\2009_BT_probes_A_4-3a.mxd



J:\Projects\RG&E_GeneseeR\2009_BT_Probes_A_4-3b.mxd



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RIVER BOTTOM SEDIMENT TYPE 2008 & 2009 RESULTS AREA A

March 2010 Figure 4-3c

J:\Projects\RG&E_GeneseeR\2009_BT_probes_A_4-3c.mxd

HIGH FALLS BREWING CO.

RG&E WEST STATION MGP SITE

PLATT STREET BRIDGE

RG&E WEST STATION PARK AREA MGP SITE (REMEDIATED)

UPPER FALLS

RG&E FRONT ST. MGP SITE

N

LEGEND

- MUNICIPAL SEWER - ACTIVE
- MUNICIPAL SEWER- ABANDONED OR HISTORIC
- OTHER OUTFALL - ACTIVE OR OBSERVED
- OTHER OUTFALL - ABANDONED OR HISTORIC
- MONROE COUNTY COMBINED SEWER OVERFLOW ABATEMENT PROGRAM TUNNELS
- RG&E Remediated Sites
- RG&E MGP Sites

PROBING DEPTH (FT)

- 0.0 - 0.5
- 0.6 - 2.0
- 2.1 - 4.0
- 4.1 - 6.0
- 6.1 - 8.0
- 8.1 - 10.0
- 10.1 - 15.0
- 15.1 - 20.0

- 2008 VIBRACORE
- DRILLED PROBE
- CORE
- PROBE

SOURCE:
1. ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm), IMAGE DATE: APRIL 2005.

0 100 200 400
SCALE, FEET

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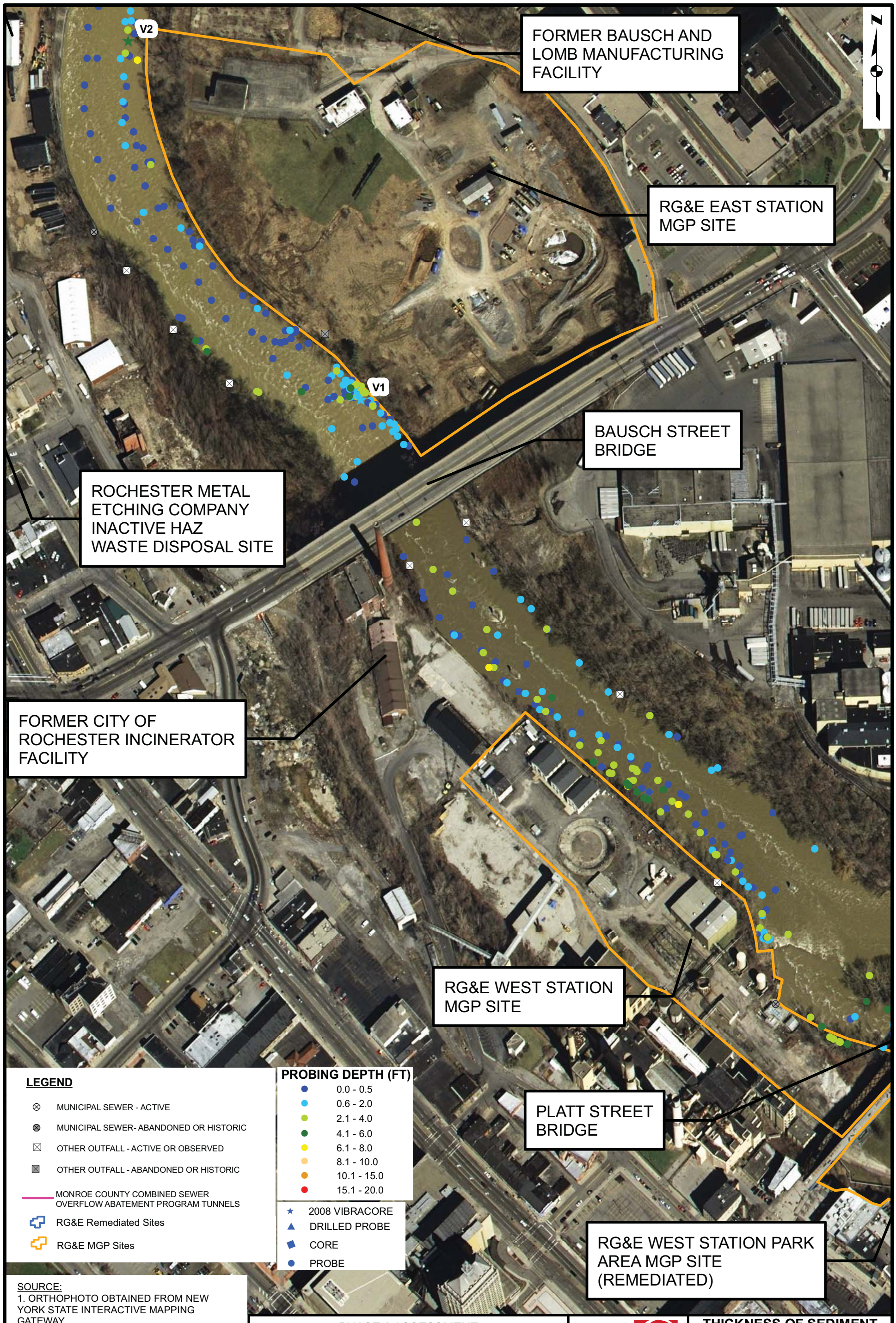
THICKNESS OF SEDIMENT PENETRATED BY PROBING 2008 & 2009 RESULTS AREA A

March 2010 Figure 4-4a

J:\Projects\RG&E_GeneseeR\2009_Thickness_probes_A_050809_4-4a.mxd



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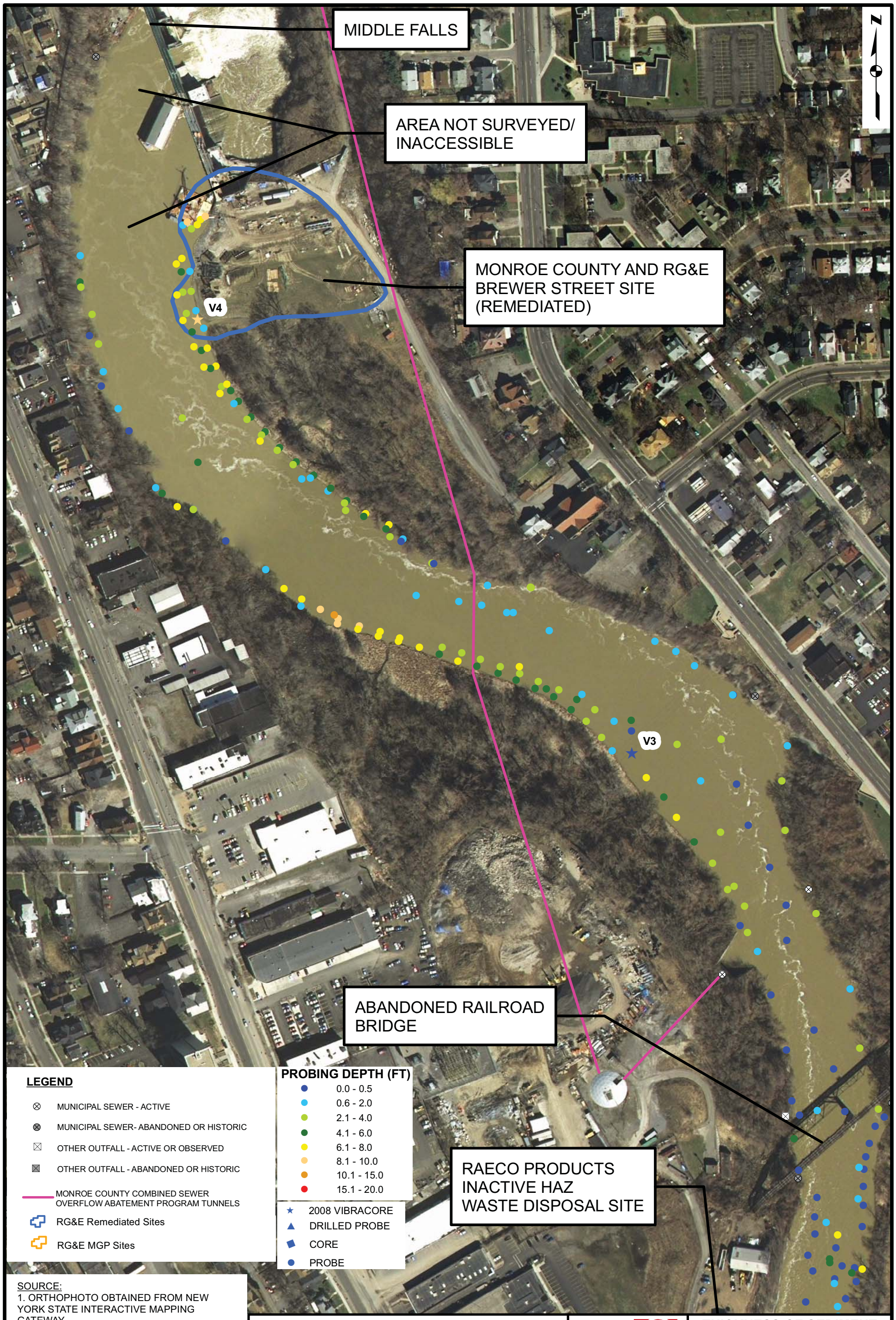
THICKNESS OF SEDIMENT PENETRATED BY PROBING 2008 & 2009 RESULTS AREA A

Project 091980 | March 2010 | Figure 4-4b

J:\Projects\RG&E_GeneseeR\2009_Thickness_probes_A_050809_4-4b.mxd



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THICKNESS OF SEDIMENT PENETRATED BY PROBING 2008 & 2009 RESULTS AREA A

Project 091980 | March 2010 | Figure 4-4c

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LEGEND

- MUNICIPAL SEWER - ACTIVE
- MUNICIPAL SEWER- ABANDONED OR HISTORIC
- OTHER OUTFALL - ACTIVE OR OBSERVED
- OTHER OUTFALL - ABANDONED OR HISTORIC
- MONROE COUNTY COMBINED SEWER OVERFLOW ABATEMENT PROGRAM TUNNELS
- RG&E Remediated Sites
- RG&E MGP Sites

BOTTOM TYPE

- BEDROCK BOTTOM
- COBBLEY BOTTOM
- SAND AND GRAVEL
- SANDY BOTTOM
- SILTY BOTTOM

- 2008 VIBRACORE
- DRILLED PROBE
- CORE
- PROBE

V5

KODAK HAWKEYE PLANT

AVENUE E BRIDGE

AREA NOT SURVEYED/ INACCESSIBLE

FORMER DEEP HOLLOW RAVINE

LOWER FALLS

SOURCE:
1. ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm), IMAGE DATE: APRIL 2005.

0 100 200 400
SCALE, FEET

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RIVER BOTTOM SEDIMENT TYPE 2008 & 2009 RESULTS AREA C

March 2010 Figure 4-5a

J:\Projects\RG&E_GeneseeR\2009_BT_probes_C_4-5a.mxd

LEGEND

- MUNICIPAL SEWER - ACTIVE
- MUNICIPAL SEWER- ABANDONED OR HISTORIC
- OTHER OUTFALL - ACTIVE OR OBSERVED
- OTHER OUTFALL - ABANDONED OR HISTORIC
- MONROE COUNTY COMBINED SEWER OVERFLOW ABATEMENT PROGRAM TUNNELS
- RG&E Remediated Sites
- RG&E MGP Sites

BOTTOM TYPE

- BEDROCK BOTTOM
- COBBLEY BOTTOM
- SAND AND GRAVEL
- SANDY BOTTOM
- SILTY BOTTOM

- 2008 VIBRACORE
- DRILLED PROBE
- CORE
- PROBE

VETERANS BRIDGE

SETH GREEN ISLAND

V6

N

SOURCE:
1. ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm), IMAGE DATE: APRIL 2005.

0 100 200 400

SCALE, FEET

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RIVER BOTTOM SEDIMENT TYPE 2008 & 2009 RESULTS AREA C

March 2010 Figure 4-5b

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LEGEND

- MUNICIPAL SEWER - ACTIVE
- MUNICIPAL SEWER- ABANDONED OR HISTORIC
- OTHER OUTFALL - ACTIVE OR OBSERVED
- OTHER OUTFALL - ABANDONED OR HISTORIC
- MONROE COUNTY COMBINED SEWER OVERFLOW ABATEMENT PROGRAM TUNNELS
- RG&E Remediated Sites
- RG&E MGP Sites

PROBING DEPTH (FT)

- 0.0 - 0.5
- 0.6 - 2.0
- 2.1 - 4.0
- 4.1 - 6.0
- 6.1 - 8.0
- 8.1 - 10.0
- 10.1 - 15.0
- 15.1 - 20.0

- 2008 VIBRACORE
- DRILLED PROBE
- CORE
- PROBE

N

V5

KODAK HAWKEYE PLANT

AVENUE E BRIDGE

AREA NOT SURVEYED/ INACCESSIBLE

FORMER DEEP HOLLOW RAVINE

LOWER FALLS

SOURCE:
1. ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm), IMAGE DATE: APRIL 2005.

0 100 200 400

SCALE, FEET

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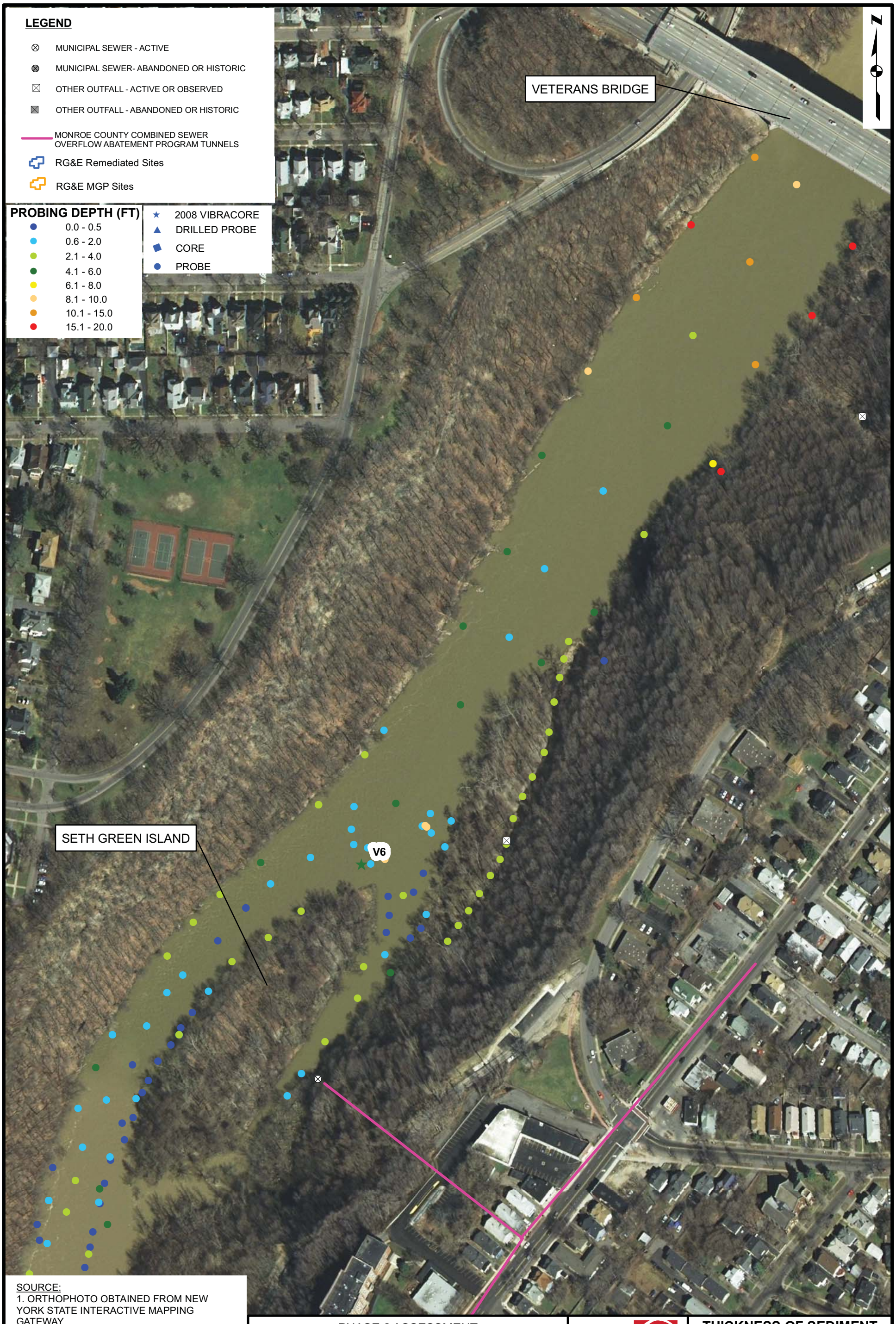
THICKNESS OF SEDIMENT PENETRATED BY PROBING 2008 & 2009 RESULTS AREA C

March 2010 Figure 4-6a

J:\Projects\RG&E_GeneseeR\2009_Thickness_probes_C_050809_4-6a.mxd



SOURCE:
1. ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm), IMAGE DATE: APRIL 2005.

0 100 200 400

SCALE, FEET

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THICKNESS OF SEDIMENT PENETRATED BY PROBING 2008 & 2009 RESULTS AREA C

March 2010 Figure 4-6b

J:\Projects\RG&E_GeneseeR\2009_Thickness_probes_C_050809_4-6b.mxd

BAUSCH STREET BRIDGE

HIGH FALLS BREWING CO.

SAMPLE ID	C4
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	ND
TOTAL BTEX (mg/kg)	ND

SAMPLE ID	C5
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	0.8
TOTAL BTEX (mg/kg)	ND

RG&E WEST STATION MGP SITE

PLATT STREET BRIDGE

RG&E WEST STATION PARK AREA MGP SITE (REMEDIATED)

UPPER FALLS

RG&E FRONT ST. MGP SITE

LEGEND

- MUNICIPAL SEWER - ACTIVE
- MUNICIPAL SEWER- ABANDONED OR HISTORIC
- OTHER OUTFALL - ACTIVE OR OBSERVED
- OTHER OUTFALL - ABANDONED OR HISTORIC
- MONROE COUNTY COMBINED SEWER OVERFLOW ABATEMENT PROGRAM TUNNELS
- RG&E Remediated Sites
- RG&E MGP Sites

SHEEN OBSERVATIONS

- 1 (NO SHEEN)
- 2 (TRACE SHEEN)
- 3 (MODERATE TO HEAVY SHEEN)
- 4 (NAPL)
- 2008 VIBRACORE LOCATIONS
- PROBE
- CORE
- DRILLED PROBE

SOURCE:
1. ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm), IMAGE DATE: APRIL 2005.

0 100 200 400
SCALE, FEET

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2008 & 2009 SEDIMENT SHEEN OBSERVATIONS AND AMBIENT CORE ANALYTICAL RESULTS AREA A

March 2010 Figure 4-7a

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FORMER BAUSCH AND LOMB MANUFACTURING FACILITY

RG&E EAST STATION MGP SITE

BAUSCH STREET BRIDGE

ROCHESTER METAL ETCHING COMPANY INACTIVE HAZ WASTE DISPOSAL SITE

FORMER CITY OF ROCHESTER INCINERATOR FACILITY

RG&E WEST STATION MGP SITE

PLATT STREET BRIDGE

RG&E WEST STATION PARK AREA MGP SITE (REMEDIATED)

V1

V2

N

LEGEND

- MUNICIPAL SEWER - ACTIVE
- MUNICIPAL SEWER- ABANDONED OR HISTORIC
- OTHER OUTFALL - ACTIVE OR OBSERVED
- OTHER OUTFALL - ABANDONED OR HISTORIC
- MONROE COUNTY COMBINED SEWER OVERFLOW ABATEMENT PROGRAM TUNNELS
- RG&E Remediated Sites
- RG&E MGP Sites

SHEEN OBSERVATIONS

- 1 (NO SHEEN)
- 2 (TRACE SHEEN)
- 3 (MODERATE TO HEAVY SHEEN)
- 4 (NAPL)
- 2008 VIBRACORE LOCATIONS
- PROBE
- CORE
- DRILLED PROBE

SOURCE:
1. ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm), IMAGE DATE: APRIL 2005.

0 100 200 400

SCALE, FEET

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2008 & 2009 SEDIMENT PROBING SHEEN OBSERVATIONS AREA A

March 2010 Figure 4-7b

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MIDDLE FALLS

AREA NOT SURVEYED/
INACCESSIBLE

MONROE COUNTY AND RG&E
BREWER STREET SITE
(REMEDIATED)

ABANDONED RAILROAD
BRIDGE

RAECO PRODUCTS
INACTIVE HAZ
WASTE DISPOSAL SITE

V4

V3

SAMPLE ID	C1A	
DEPTH (ft)	0-3.1	3.1-4.3
TOTAL PAHs (mg/kg)	ND	ND
TOTAL BTEX (mg/kg)	ND	0.001

SAMPLE ID	C2	
DEPTH (ft)	0-1.6	1.6-4.3
TOTAL PAHs (mg/kg)	0.6	0.1
TOTAL BTEX (mg/kg)	ND	ND

SAMPLE ID	C3	
DEPTH (ft)	0-0.6	0.6-2.3
TOTAL PAHs (mg/kg)	0.2	ND
TOTAL BTEX (mg/kg)	ND	ND

LEGEND

- MUNICIPAL SEWER - ACTIVE
- MUNICIPAL SEWER- ABANDONED OR HISTORIC
- OTHER OUTFALL - ACTIVE OR OBSERVED
- OTHER OUTFALL - ABANDONED OR HISTORIC
- MONROE COUNTY COMBINED SEWER OVERFLOW ABATEMENT PROGRAM TUNNELS
- RG&E Remediated Sites
- RG&E MGP Sites

SHEEN OBSERVATIONS

- 1 (NO SHEEN)
- 2 (TRACE SHEEN)
- 3 (MODERATE TO HEAVY SHEEN)
- 4 (NAPL)
- 2008 VIBRACORE LOCATIONS
- PROBE
- CORE
- DRILLED PROBE

SOURCE:
1. ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm), IMAGE DATE: APRIL 2005.

0 100 200 400
SCALE, FEET

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**2008 & 2009
SEDIMENT SHEEN OBSERVATIONS
AND AMBIENT CORE
ANALYTICAL RESULTS
AREA A**

March 2010 Figure 4-7c

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LEGEND

- MUNICIPAL SEWER - ACTIVE
- MUNICIPAL SEWER- ABANDONED OR HISTORIC
- OTHER OUTFALL - ACTIVE OR OBSERVED
- OTHER OUTFALL - ABANDONED OR HISTORIC
- MONROE COUNTY COMBINED SEWER OVERFLOW ABATEMENT PROGRAM TUNNELS
- RG&E Remediated Sites
- RG&E MGP Sites

SHEEN OBSERVATIONS

- 1 (NO SHEEN)
- 2 (TRACE SHEEN)
- 3 (MODERATE TO HEAVY SHEEN)
- 4 (NAPL)
- 2008 VIBRACORE LOCATIONS
- PROBE
- CORE
- DRILLED PROBE

N

V5

KODAK HAWKEYE PLANT

AVENUE E BRIDGE

AREA NOT SURVEYED/ INACCESSIBLE

FORMER DEEP HOLLOW RAVINE

LOWER FALLS

SOURCE:
1. ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm), IMAGE DATE: APRIL 2005.

0 100 200 400

SCALE, FEET

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2008 & 2009 SEDIMENT PROBING SHEEN OBSERVATIONS AREA C

March 2010 Figure 4-8a

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LEGEND

- MUNICIPAL SEWER - ACTIVE
- MUNICIPAL SEWER- ABANDONED OR HISTORIC
- OTHER OUTFALL - ACTIVE OR OBSERVED
- OTHER OUTFALL - ABANDONED OR HISTORIC
- MONROE COUNTY COMBINED SEWER OVERFLOW ABATEMENT PROGRAM TUNNELS
- RG&E Remediated Sites
- RG&E MGP Sites

SHEEN OBSERVATIONS

- 1 (NO SHEEN)
- 2 (TRACE SHEEN)
- 3 (MODERATE TO HEAVY SHEEN)
- 4 (NAPL)
- 2008 VIBRACORE LOCATIONS
- PROBE
- CORE
- DRILLED PROBE

VETERANS BRIDGE

SETH GREEN ISLAND

V6

SOURCE:
1. ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm), IMAGE DATE: APRIL 2005.

0 100 200 400
SCALE, FEET

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ROCHESTER, NEW YORK

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2008 & 2009 SEDIMENT PROBING SHEEN OBSERVATIONS AREA C

March 2010 Figure 4-8b

J:\Projects\RG&E_GeneseeR\2009_Sheen_probes_C_050809_4-8b.mxd

BAUSCH STREET BRIDGE

SAMPLE ID	09WSC1
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	16.5
TOTAL BTEX (mg/kg)	0.1

SAMPLE ID	C4
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	ND
TOTAL BTEX (mg/kg)	ND

SAMPLE ID	09WSC3
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	5.0
TOTAL BTEX (mg/kg)	ND

SAMPLE ID	09WSC7
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	22.9
TOTAL BTEX (mg/kg)	ND

SAMPLE ID	09WSC5
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	8.7
TOTAL BTEX (mg/kg)	ND

SAMPLE ID	09WSC6
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	9.4
TOTAL BTEX (mg/kg)	ND

SAMPLE ID	09WSC2	
DEPTH (ft)	0-1.3	1.3-2.6
TOTAL PAHs (mg/kg)	486.7	372.6
TOTAL BTEX (mg/kg)	4.3	4.7

SAMPLE ID	09WSC4
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	60.3
TOTAL BTEX (mg/kg)	ND

SAMPLE ID	09WSC8
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	10.7
TOTAL BTEX (mg/kg)	ND

LEGEND

- MUNICIPAL SEWER - ACTIVE
- MUNICIPAL SEWER- ABANDONED OR HISTORIC
- OTHER OUTFALL - ACTIVE OR OBSERVED
- OTHER OUTFALL - ABANDONED OR HISTORIC
- MONROE COUNTY COMBINED SEWER OVERFLOW ABATEMENT PROGRAM TUNNELS
- RG&E Remediated Sites
- RG&E MGP Sites

SHEEN OBSERVATIONS

- 1 (NO SHEEN)
- 2 (TRACE SHEEN)
- 3 (MODERATE TO HEAVY SHEEN)
- 4 (NAPL)
- 2008 VIBRACORE LOCATIONS
- PROBE
- CORE
- DRILLED PROBE
- OBSERVED NAPL EXTENT
- OBSERVED SHEEN EXTENT

SOURCE:
1. ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm), IMAGE DATE: APRIL 2005.

0 50 100 200
SCALE, FEET

PHASE 2 ASSESSMENT
GENESEE RIVER
ROCHESTER, NEW YORK

ROCHESTER GAS & ELECTRIC COMPANY
ROCHESTER, NEW YORK

GEI Consultants

Project 091980

2008 & 2009 SEDIMENT SHEEN OBSERVATIONS AND ANALYTICAL RESULTS WEST STATION AREA

March 2010 Figure 4-9

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ABANDONED RAILROAD BRIDGE

SAMPLE ID	09ESC14
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	5.8
TOTAL BTEX (mg/kg)	ND

SAMPLE ID	09ESC13
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	2.6
TOTAL BTEX (mg/kg)	0.003

SAMPLE ID	09ESC9
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	66.4
TOTAL BTEX (mg/kg)	11.8

SAMPLE ID	09ESC4
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	38.4
TOTAL BTEX (mg/kg)	0.2

SAMPLE ID	09ESC2
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	269.7
TOTAL BTEX (mg/kg)	120.1

SAMPLE ID	09ESC6
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	10.5
TOTAL BTEX (mg/kg)	0.2

V2

V1

SAMPLE ID	09ESC12
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	4.3
TOTAL BTEX (mg/kg)	0.01

SAMPLE ID	09ESC7
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	30.4
TOTAL BTEX (mg/kg)	0.5

SAMPLE ID	09ESC1	
DEPTH (ft)	0-1.2	1.2-1.9
TOTAL PAHs (mg/kg)	771.4	567.0
TOTAL BTEX (mg/kg)	95.9	42.2

BAUSCH STREET BRIDGE

LEGEND

- MUNICIPAL SEWER - ACTIVE
- MUNICIPAL SEWER- ABANDONED OR HISTORIC
- OTHER OUTFALL - ACTIVE OR OBSERVED
- OTHER OUTFALL - ABANDONED OR HISTORIC
- MONROE COUNTY COMBINED SEWER OVERFLOW ABATEMENT PROGRAM TUNNELS
- RG&E Remediated Sites
- RG&E MGP Sites

SHEEN OBSERVATIONS

- 1 (NO SHEEN)
- 2 (TRACE SHEEN)
- 3 (MODERATE TO HEAVY SHEEN)
- 4 (NAPL)
- 2008 VIBRACORE LOCATIONS
- PROBE
- CORE
- DRILLED PROBE
- OBSERVED NAPL EXTENT
- OBSERVED SHEEN EXTENT

SOURCE:
1. ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm), IMAGE DATE: APRIL 2005.

0 50 100 200
SCALE, FEET

PHASE 2 ASSESSMENT
GENESEE RIVER
ROCHESTER, NEW YORK

ROCHESTER GAS & ELECTRIC COMPANY
ROCHESTER, NEW YORK

GEI Consultants

2008 & 2009 SEDIMENT SHEEN OBSERVATIONS AND ANALYTICAL RESULTS EAST STATION AREA

Project 091980 | March 2010 | Figure 4-10

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Plates

VETERANS BRIDGE

SETH GREEN ISLAND

V6

V5

KODAK HAWKEYE PLANT

AVENUE E BRIDGE

AREA NOT SURVEYED/ INACCESSIBLE

LOWER FALLS

FORMER DEEP HOLLOW RAVINE

MIDDLE FALLS

AREA NOT SURVEYED/ INACCESSIBLE

MONROE COUNTY AND RG&E BREWER STREET SITE (REMEDIATED)

V4

SAMPLE ID	C1A	
DEPTH (ft)	0-3.1	3.1-4.3
TOTAL PAHs (mg/kg)	ND	ND
TOTAL BTEX (mg/kg)	ND	0.001

SAMPLE ID	C2	
DEPTH (ft)	0-1.6	1.6-4.3
TOTAL PAHs (mg/kg)	0.6	0.1
TOTAL BTEX (mg/kg)	ND	ND

V3

SAMPLE ID	C3	
DEPTH (ft)	0-0.6	0.6-2.3
TOTAL PAHs (mg/kg)	0.2	ND
TOTAL BTEX (mg/kg)	ND	ND

ABANDONED RAILROAD BRIDGE

RAECO PRODUCTS INACTIVE HAZ WASTE DISPOSAL SITE

V2

ROCHESTER METAL ETCHING COMPANY INACTIVE HAZ WASTE DISPOSAL SITE

SAMPLE ID	09ESC12
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	4.3
TOTAL BTEX (mg/kg)	0.01

SAMPLE ID	09ESC7
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	30.4
TOTAL BTEX (mg/kg)	0.5

SAMPLE ID	09ESC1	
DEPTH (ft)	0-1.2	1.2-1.9
TOTAL PAHs (mg/kg)	771.4	567.0
TOTAL BTEX (mg/kg)	95.9	42.2

BAUSCH ST BRIDGE

FORMER CITY OF ROCHESTER INCINERATOR FACILITY

SAMPLE ID	09WSC2	
DEPTH (ft)	0-1.3	1.3-2.5
TOTAL PAHs (mg/kg)	486.7	372.6
TOTAL BTEX (mg/kg)	4.3	4.7

SAMPLE ID	09WSC4
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	60.3
TOTAL BTEX (mg/kg)	ND

SAMPLE ID	09WSC6
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	9.4
TOTAL BTEX (mg/kg)	ND

SAMPLE ID	09ESC14
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	5.8
TOTAL BTEX (mg/kg)	ND

SAMPLE ID	09ESC13
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	2.6
TOTAL BTEX (mg/kg)	0.003

FORMER BAUSCH AND LOMB MANUFACTURING FACILITY

SAMPLE ID	09ESC4
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	38.4
TOTAL BTEX (mg/kg)	0.2

RG&E EAST STATION MGP SITE

SAMPLE ID	09ESC9
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	66.4
TOTAL BTEX (mg/kg)	11.8

SAMPLE ID	09ESC2
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	269.7
TOTAL BTEX (mg/kg)	120.1

SAMPLE ID	09ESC6
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	10.5
TOTAL BTEX (mg/kg)	0.2

SAMPLE ID	09WSC5
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	8.7
TOTAL BTEX (mg/kg)	ND

SAMPLE ID	09WSC3
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	5.0
TOTAL BTEX (mg/kg)	ND

SAMPLE ID	09WSC7
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	22.9
TOTAL BTEX (mg/kg)	ND

SAMPLE ID	09WSC1
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	16.5
TOTAL BTEX (mg/kg)	0.1

HIGH FALLS BREWING COMPANY

SAMPLE ID	C4
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	ND
TOTAL BTEX (mg/kg)	ND

SAMPLE ID	C5
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	0.8
TOTAL BTEX (mg/kg)	ND

RG&E WEST STATION MGP SITE

SAMPLE ID	09WSC8
DEPTH (ft)	0-0.5
TOTAL PAHs (mg/kg)	10.7
TOTAL BTEX (mg/kg)	ND

PLATT ST BRIDGE

RG&E WEST STATION PARK AREA MGP SITE (REMEDIATED)

Upper Falls

RG&E FRONT ST. MGP SITE

Area C

Area B

Area A

LEGEND

- RG&E MGP SITES
- RG&E REMEDIATED SITES
- MUNICIPAL SEWER -ACTIVE
- MUNICIPAL SEWER - ABANDONED OR HISTORIC
- OTHER OUTFALL - ACTIVE OR OBSERVED
- OTHER OUTFALL - ABANDONED OR HISTORIC
- AREA A, SUB-AREA
- AREA B, SUB-AREA
- AREA C, SUB-AREA
- RIVER FLOW DIRECTION

SHEEN OBSERVATIONS

- 1 (NO SHEEN)
- 2 (TRACE SHEEN)
- 3 (MODERATE TO HEAVY SHEEN)
- 4 (NAPL)
- 2008 VIBRACORE LOCATIONS
- PROBE
- CORE
- DRILLED PROBE
- OBSERVED NAPL EXTENT
- OBSERVED SHEEN EXTENT

SOURCE:
1. ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm), IMAGE DATE: APRIL 2005.

0 250 500 1,000
SCALE, FEET

PHASE 2 ASSESSMENT
GENESEE RIVER
ROCHESTER, NEW YORK

ROCHESTER GAS & ELECTRIC COMPANY
ROCHESTER, NEW YORK

Project 091980

GEI Consultants
455 WINDING BROOK DRIVE
SUITE 201
GLASTONBURY, CONNECTICUT 06033

2008 & 2009 SHEEN OBSERVATIONS AND ANALYTICAL RESULTS

March 2010 Plate 1

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Appendix A

Sediment Probing and Coring Data

Table A-1
2008 Data (Phase 1)
Genesee River Investigation
Rochester, New York

Project Area	Station ID	NORTHING	EASTING	Elevation	Sediment Thickness (feet)	Sediment Type Code	Sheen Code	Core? 1=yes 0= no	Drilled Probe? 1=yes 0=no	Recovery (feet)	COMMENTS
C	R1	1162614.49	1403429.47	245	0	1	1	0	0	NA	
C	R2	1162641.45	1403443.36	243.9	0	1	1	0	0	NA	
C	R3	1162685.51	1403464.92	244.4	0	1	1	0	0	NA	
C	R4	1162721.01	1403494.44	243.4	0.2	2	1	0	0	NA	
C	R5	1162760.83	1403516.2	243.8	0.2	1	1	0	0	NA	
C	R6	1162794.4	1403542.31	245.3	0.2	3	1	0	0	NA	
C	R7	1162558.59	1403408.68	244.5	0	1	1	0	0	NA	
C	R8	1162508.25	1403389.7	244.9	0	1	1	0	0	NA	
C	R9	1162462.78	1403358.44	244.6	0	1	1	0	0	NA	
C	R10	1162409.67	1403345.01	244.2	0	1	1	0	0	NA	
C	R11	1162364.94	1403333.95	244.6	0	1	1	0	0	NA	
C	R12	1162301.6	1403318.43	244.6	0	1	1	0	0	NA	
C	R13	1162266.46	1403311.92	244.5	0	1	1	0	0	NA	
C	R14	1162221.1	1403300.13	244.6	0	1	1	0	0	NA	
C	R15	1162173.2	1403283.24	244.3	0	1	1	0	0	NA	
C	R16	1162118.73	1403265.04	244.4	0	1	1	0	0	NA	
C	R17	1162113.54	1403289.97	245.2	0	1	1	0	0	NA	
C	R18	1162104.57	1403314.66	245.6	0	1	1	0	0	NA	
C	R19	1162099.38	1403334.86	245.6	0	1	1	0	0	NA	
C	R20	1162094.2	1403349.02	245.4	0	1	1	0	0	NA	
C	R23	1162098.69	1403338.24	245.6	0	1	1	0	0	NA	
C	R25	1162105.18	1403261.27	244.7	0	1	1	0	0	NA	
C	R26	1162057.45	1403264.27	244.7	0	1	1	0	0	NA	
C	R30	1161985.65	1403324.41	246.3	0	1	1	0	0	NA	
C	R31	1162015.33	1403248.04	244.3	0	1	1	0	0	NA	
C	R32	1161979.68	1403234.75	244.5	0	1	1	0	0	NA	
C	R33	1161916.65	1403249.51	244.4	0	1	1	0	0	NA	
C	R34	1161907.01	1403244.35	244.3	0	1	1	0	0	NA	
C	R40	1161528.28	1403231.61	236.3	0	1	1	0	0	NA	
C	R41	1161275.58	1403200.15	246.7	0	0	0	0	0	NA	
C	R42	1161092.03	1403194.8	246.5	0	1	1	0	0	NA	
C	R43	1161025.84	1403166.29	246.7	0	1	1	0	0	NA	
C	R44	1160930.09	1403137.54	246.9	0	1	1	0	0	NA	
C	R45	1161607.64	1403056.6	246.4	1	2	1	0	0	NA	
C	R46	1161665.64	1403054	246.4	1	2	1	0	0	NA	
C	R47	1161722.58	1403049.85	246.6	1	2	1	0	0	NA	
C	R48	1161723.92	1403032.34	249.6	1	2	1	0	0	NA	
C	R49	1161750.14	1403033.71	250	1	2	1	0	0	NA	

Table A-1
2008 Data (Phase 1)
Genesee River Investigation
Rochester, New York

Project Area	Station ID	NORTHING	EASTING	Elevation	Sediment Thickness (feet)	Sediment Type Code	Sheen Code	Core? 1=yes 0= no	Drilled Probe? 1=yes 0=no	Recovery (feet)	COMMENTS
C	R50	1161761.19	1403049.85	248.2	1	2	1	0	0	NA	
C	R51	1161808.38	1403057.52	247.7	0.5	1	1	0	0	NA	
C	R52	1161863.62	1403076.87	257.6	0.1	1	1	0	0	NA	
C	R53	1161932.61	1403074.35	246.4	0.1	1	1	0	0	NA	
C	R54	1162000.55	1403090.42	250.2	0.1	1	1	0	0	NA	
C	R55	1162076.05	1403109.12	249.8	0.1	1	1	0	0	NA	
C	R56	1162154.58	1403141.79	247.6	0	1	1	0	0	NA	
C	R57	1162318.17	1403193.05	246	0	1	1	0	0	NA	
C	R58	1162445.45	1403228.48	246.3	0	1	1	0	0	NA	
C	R69	1161459.71	1403065.23	248.5	0	1	1	0	0	NA	
C	R70	1161457.6	1403086	244.5	0	1	1	0	0	NA	
C	R71	1161402.73	1403086.07	244.7	0	1	1	0	0	NA	
C	R72	1161337.46	1403083.67	244.4	0	1	1	0	0	NA	
C	R73	1161283.25	1403083.86	244.6	0	2	1	0	0	NA	
C	R152	1163055.88	1403982.64	244.4	0.5	3	1	0	0	NA	
C	R153	1163013.36	1403985.46	244.6	0.5	3	1	0	0	NA	
C	R154	1162974.67	1403978.71	244	0.5	3	1	0	0	NA	
C	R155	1162962.15	1404033.14	244.4	0.5	3	1	0	0	NA	
C	R156	1162984.25	1404056.92	246.3	0.5	3	1	0	0	NA	
C	R157	1163015.68	1404068.95	246.2	1	3	1	0	0	NA	
C	R159	1163066.07	1404040.4	244.8	0.1	5	1	0	0	NA	
C	R160	1163108.32	1404062.16	245.1	0	1	1	0	0	NA	
C	R161	1163167.29	1404110.54	246.1	1	2	1	0	0	NA	
C	R162	1163198.82	1404080.35	245.4	1	1	1	0	0	NA	
C	R163	1163214.9	1404059.34	244.1	1	1	1	0	0	NA	
C	R164	1163242.8	1404077.97	244.1	1	1	1	0	0	NA	
C	R165	1163226.12	1404125.16	246	1.2	2	1	0	0	NA	
C	R166	1161726.58	1403056.94	245.8	1	3	1	0	0	NA	
C	R167	1161743.01	1403151.29	247.7	0	4	1	0	0	NA	
C	R168	1161714.02	1403223.42	273.6	0	4	1	0	0	NA	
C	R169	1161610.1	1403071.5	247.5	0.2	3	1	0	0	NA	
C	R170	1161634.97	1403146.3	245.1	0	1	1	0	0	NA	
C	R171	1161614.51	1403218.19	247.6	0	1	1	0	0	NA	
C	R172	1161851.36	1403085.99	243.7	0.2	1	1	0	0	NA	
C	R173	1161853.51	1403173.45	244.8	0.2	1	1	0	0	NA	
C	R174	1161846.8	1403182.89	247.4	0.2	1	1	0	0	NA	
C	R175	1161967.23	1403091.96	251.6	0.2	3	1	0	0	NA	
C	R176	1161998.11	1403167	232.5	0.2	5	1	0	0	NA	

Table A-1
2008 Data (Phase 1)
Genesee River Investigation
Rochester, New York

Project Area	Station ID	NORTHING	EASTING	Elevation	Sediment Thickness (feet)	Sediment Type Code	Sheen Code	Core? 1=yes 0= no	Drilled Probe? 1=yes 0=no	Recovery (feet)	COMMENTS
C	R177	1161975.25	1403206.84	247.4	0.2	5	1	0	0	NA	
C	R178	1161897.72	1403080.01	251.3	0.2	5	1	0	0	NA	
C	R179	1161950.36	1403157.75	247.8	0.1	5	1	0	0	NA	
C	R180	1161943.08	1403203.03	247.3	0.1	5	1	0	0	NA	
C	R181	1163166.18	1403936.8	246.3	2	2	1	0	0	NA	
C	R182	1163146.85	1403960.16	246.4	1.2	5	1	0	0	NA	
C	R183	1163147.05	1403959.25	246.2	1.3	5	1	0	0	NA	
C	R184	1163139.81	1403975.35	246.1	8.5	2	1	0	0	NA	
C	R185	1163129.21	1403943.35	246.4	2	5	1	0	0	NA	
C	R186	1163172.52	1403905.35	246.2	0.6	5	1	0	0	NA	
C	R187	1163207.54	1403899.93	246	2	5	1	0	0	NA	
A	R189	1156947.19	1404397.49	386.1	0	0	0	0	0	NA	outfall pipe
A	R191	1156519.76	1404531.44	391	0	0	0	0	0	NA	outfall discharge point
A	R192	1156396.34	1404529.41	380.6	0	0	0	0	0	NA	seep
A	R193	1155636.34	1404645.88	385.3	1.5	0	1	0	0	NA	tunnel in rock
A	R194	1155570.1	1404775.89	467.5	0	0	3	0	0	NA	outfall pipe near ISS area
A	R195	1155436.69	1404893.71	385.5	0	0	1	0	0	NA	outfall pipe near ISS area
A	R196	1155367.02	1404988.27	386.7	0	0	4	0	0	NA	outfall pipe near ISS area
A	R197	1155235.75	1405135.09	385.9	0	0	1	0	0	NA	drainage ditch north of ISS
A	R198	1154780.74	1405274.18	385.9	0	0	1	0	0	NA	outfall pipe
A	R199	1154898.84	1405373.79	386.7	0	0	1	0	0	NA	outfall pipe
A	R201	1154442.57	1405630.68	386.5	0	0	1	0	0	NA	SPDES discharge point Beebe station
A	R202	1154457.11	1405689.16	385.3	0	0	0	0	0	NA	outfall adjacent to Beebe station
A	R203	1154438.01	1405715.62	385.6	0	0	0	0	0	NA	outfall adjacent to Beebe station
A	R204	1154410.45	1405743.62	385.7	0	0	0	0	0	NA	outfall adjacent to Beebe station
A	R205	1154380.12	1405777.75	385.4	0	0	0	0	0	NA	outfall adjacent to Beebe station
A	R206	1154346.47	1405828.84	385.6	0	0	0	0	0	NA	outfall adjacent to Beebe station
A	R207	1154326.42	1405856.41	385.7	0	0	0	0	0	NA	outfall adjacent to Beebe station
A	R208	1154293.11	1405823.79	387.3	0	0	0	0	0	NA	outfall adjacent to Beebe station
A	R210	1154257.76	1405890.32	386.4	0.3	1	2	0	0	NA	
A	R211	1154240.36	1405910.49	385.6	0	1	1	0	0	NA	
A	R212	1154220.45	1405928.79	385.8	0	1	1	0	0	NA	
A	R213	1154198.68	1405933.16	386.2	0	1	2	0	0	NA	
A	R214	1154182.65	1405964.5	386	0	1	2	0	0	NA	
A	R215	1154143.81	1405989.42	386.1	0	1	2	0	0	NA	
A	R216	1154115.51	1406019.57	386.1	0	1	1	0	0	NA	
A	R218	1154064.98	1406049.39	387.3	0	1	1	0	0	NA	
A	R222	1154011.55	1406037.8	388.5	0	1	4	0	0	NA	

Table A-1
2008 Data (Phase 1)
Genesee River Investigation
Rochester, New York

Project Area	Station ID	NORTHING	EASTING	Elevation	Sediment Thickness (feet)	Sediment Type Code	Sheen Code	Core? 1=yes 0= no	Drilled Probe? 1=yes 0=no	Recovery (feet)	COMMENTS
A	R224	1154128.91	1405996.42	386.8	0	1	1	0	0	NA	
A	R229	1154338.61	1405769.2	385.9	0	1	1	0	0	NA	
A	R230	1154386.72	1405678.31	387.2	0	1	1	0	0	NA	hardened tar weep
A	R232	1154467.43	1405611.36	386.5	0.5	1	1	0	0	NA	
A	R233	1154511.64	1405563.48	385.7	0.5	1	1	0	0	NA	
A	R234	1154527.73	1405528.58	385.2	0.5	1	2	0	0	NA	
A	R235	1154555.96	1405491.34	386.8	0.5	1	1	0	0	NA	flowing seep on shore
A	R236	1154580.07	1405456.86	386.2	0.5	1	1	0	0	NA	
A	R237	1154622.51	1405439.09	385	0.5	1	1	0	0	NA	
A	R238	1154649.45	1405407.65	385.5	0.5	1	1	0	0	NA	
A	R239	1154681.19	1405356.31	385.8	0.5	1	1	0	0	NA	
A	R240	1154686.55	1405342.89	385.8	0.5	5	2	0	0	NA	
A	R241	1154723.42	1405312.25	385.9	0.5	1	1	0	0	NA	
A	R242	1154767.01	1405277.15	379.2	0.5	1	2	0	0	NA	
A	R243	1154861.14	1405231.98	380.4	0.5	1	1	0	0	NA	
A	R244	1155028.23	1405121.96	406.4	0.5	1	1	0	0	NA	
A	R245	1155231.15	1404905.74	386.4	3	2	1	0	0	NA	large sand bar
A	R246	1155328.42	1404787.36	386.5	3	2	1	0	0	NA	large sand bar
A	R247	1155396.54	1404733	341.1	0	4	1	0	0	NA	
A	R248	1155346.21	1404773.83	397.8	0.5	1	1	0	0	NA	
A	R249	1155399.75	1404725.51	340.3	0.5	1	1	0	0	NA	outfall pipe
A	R251	1155748.18	1404656.41	385.4	0	5	3	0	0	NA	
A	R253	1155649.86	1404692.77	384.7	0	5	2	0	0	NA	
A	R256	1155592.26	1404748.85	384	0	1	2	0	0	NA	
A	R259	1155651.08	1404729.85	385.2	0	1	2	0	0	NA	
A	R263	1155780.79	1404645.09	385.4	0	1	1	0	0	NA	
A	R266	1155786.43	1404630.77	384.9	0	1	2	0	0	NA	
A	R267	1155816.83	1404624.07	385.3	0	1	1	0	0	NA	
A	R268	1155848.93	1404605.15	384.6	0	1	1	0	0	NA	
A	R269	1155879.25	1404602.93	384.1	0	1	1	0	0	NA	
A	R270	1155918.88	1404607.61	384.2	0	1	1	0	0	NA	
A	R273	1155988.3	1404614.54	384.9	0	1	1	0	0	NA	
A	R274	1156037.44	1404626.48	385.9	0	1	1	0	0	NA	seep
A	R275	1156064.33	1404625.68	385.3	0	2	2	0	0	NA	
A	R276	1156106.24	1404635.01	385.5	0	1	1	0	0	NA	
A	R283	1156151.36	1404610.51	384.7	0	1	1	0	0	NA	
A	R284	1156145.04	1404659.13	385.9	0	2	2	0	0	NA	
A	R288	1156175.91	1404655.14	385	0	5	2	0	0	NA	

Table A-1
2008 Data (Phase 1)
Genesee River Investigation
Rochester, New York

Project Area	Station ID	NORTHING	EASTING	Elevation	Sediment Thickness (feet)	Sediment Type Code	Sheen Code	Core? 1=yes 0= no	Drilled Probe? 1=yes 0=no	Recovery (feet)	COMMENTS
A	R290	1156180.21	1404627.43	385.9	0	5	2	0	0	NA	
A	R292	1156221.57	1404613.21	384.3	0	5	1	0	0	NA	
A	R300	1156269.08	1404672.21	386.1	0	2	1	0	0	NA	
A	R301	1156316.79	1404675.23	386.2	0	2	1	0	0	NA	
A	R304	1156360.32	1404675.11	386	0	2	1	0	0	NA	
A	R305	1156398.34	1404676.5	386.1	0	2	1	0	0	NA	
A	R308	1156426.01	1404680.78	386.3	0	2	1	0	0	NA	
A	R309	1156455.79	1404688.28	386.1	0	2	1	0	0	NA	
A	R312	1156495.05	1404701.6	385.8	0	2	1	0	0	NA	
A	R314	1156516.16	1404722.82	385.9	0	2	1	0	0	NA	
A	438	1158451.12	1403139.17	385.6	6.2	3	1	0	0	NA	
A	439	1158524.98	1403141.14	385.6	0.8	1	1	0	0	NA	
A	440	1158532.93	1403151.04	385.5	8.8	3	1	0	0	NA	
A	441	1158517.16	1403160.49	385.5	3.8	0	0	0	0	NA	
A	442	1158526.14	1403173.55	385.5	7.2	3	1	0	0	NA	
A	443	1158537.82	1403181.38	385.4	7.2	3	1	0	0	NA	
A	444	1158544.68	1403191.84	385.7	8.5	3	1	0	0	NA	
A	421	1158420.2	1403137.7	385.6	4.5	3	1	0	0	NA	
A	421a	1158421.74	1403157.4	389	1	3	1	0	0	NA	
A	422a	1158376.62	1403159.63	388.7	2.5	3	1	0	0	NA	
A	422	1158375.11	1403141	385.5	2.1	3	1	0	0	NA	
A	423	1158327.01	1403148.99	385.4	3.8	3	1	0	0	NA	
A	423a	1158332.33	1403170.7	388.6	1	3	1	0	0	NA	
A	423b	1158284.99	1403161.71	385.1	5.3	3	1	0	0	NA	
A	423c	1158293.51	1403188.36	388.6	1.7	3	1	0	0	NA	
A	424	1158242.84	1403182.82	385.4	4.9	3	1	0	0	NA	
A	424a	1158248.78	1403196.73	388.5	7.3	3	1	0	0	NA	
A	425a	1158207.18	1403215.56	388.4	6.9	3	1	0	0	NA	
A	425	1158202.81	1403204.03	385.4	4.9	3	1	0	0	NA	
A	426	1158161.8	1403228.63	385.3	3.7	3	1	0	0	NA	
A	426a	1158167.64	1403240.27	389.1	6.4	3	1	0	0	NA	
A	427a	1158128.8	1403266.17	388.8	4.9	3	1	0	0	NA	
A	427	1158122.82	1403256.62	385.1	1.6	3	1	0	0	NA	
A	428a	1158093.11	1403294.52	388.3	4.3	3	1	0	0	NA	
A	428	1158087.69	1403285.9	385.5	2.3	3	1	0	0	NA	
A	429a	1158059.98	1403326.63	388.9	5.1	3	1	0	0	NA	
A	429	1158052.74	1403318.4	385.6	2.8	3	1	0	0	NA	
A	430a	1158024.18	1403359.4	388.2	4.6	3	1	0	0	NA	

Table A-1
2008 Data (Phase 1)
Genesee River Investigation
Rochester, New York

Project Area	Station ID	NORTHING	EASTING	Elevation	Sediment Thickness (feet)	Sediment Type Code	Sheen Code	Core? 1=yes 0= no	Drilled Probe? 1=yes 0=no	Recovery (feet)	COMMENTS
A	430	1158018.2	1403353.83	385.6	2.5	3	1	0	0	NA	
A	431a	1157992.17	1403396.76	388.3	4.5	3	1	0	0	NA	
A	431	1157985.69	1403389.9	385.5	2.6	3	1	0	0	NA	
A	432a	1157962.42	1403435.58	388.7	4.5	3	1	0	0	NA	
A	432	1157955.28	1403428.45	385.5	1.7	3	1	0	0	NA	
A	433	1157926.73	1403468.59	385.4	2	3	1	0	0	NA	
A	433a	1157932.82	1403474.31	389	4.7	3	1	0	0	NA	
A	434a	1157904.44	1403510.7	389	6	3	1	0	0	NA	
A	434	1157898.5	1403505.89	385.5	3.6	3	1	0	0	NA	
A	435a	1157875.56	1403553.06	389.2	7.4	3	1	0	0	NA	
A	435	1157868.78	1403549.33	385.5	4.1	3	1	0	0	NA	
A	436a	1157850.73	1403605.46	389.2	7.2	3	1	0	0	NA	
A	436	1157841.7	1403599.4	385.6	5.5	3	1	0	0	NA	
A	437a	1157817.84	1403637.23	389.3	1	3	1	0	0	NA	
A	437	1157812.72	1403632.82	385.5	0.1	3	1	0	0	NA	
A	406	1157921.48	1403094.72	379.9	6	3	1	0	0	NA	
A	405	1157891.37	1403128.65	390.2	6.2	3	1	0	0	NA	
A	403	1157705.78	1403369.12	383.2	6.7	3	1	0	0	NA	
A	402	1157682.9	1403409.4	379.8	7	3	1	0	0	NA	
A	401	1157660.35	1403451.1	374.7	10	3	1	0	0	NA	
A	400a	1157627.24	1403489.53	388	9.5	3	1	0	0	NA	
A	400	1157638.63	1403491.12	385.9	9.1	3	1	0	0	NA	
A	407	1157622.37	1403539.04	385.5	10	3	1	0	0	NA	
A	407a	1157614.83	1403535.81	387.9	8	3	1	0	0	NA	
A	408	1157610.25	1403585.91	385.8	7.6	3	1	0	0	NA	
A	408a	1157599.55	1403581.97	388.9	6.1	3	1	0	0	NA	
A	408b	1157595.31	1403629.88	385.5	7	3	1	0	0	NA	
A	408c	1157587.79	1403627.4	388.4	7	3	1	0	0	NA	
A	409a	1157574.38	1403674.57	388.6	6.8	3	1	0	0	NA	
A	410	1157574.39	1403725.75	385.6	4	3	1	0	0	NA	
A	410b	1157558.42	1403719.16	388.5	5	3	1	0	0	NA	
A	411	1157562.02	1403770.02	385.8	4	3	1	0	0	NA	
A	411a	1157542.77	1403761	388.8	6.1	3	1	0	0	NA	
A	412	1157547.22	1403811.77	385.7	3.7	3	1	0	0	NA	
A	412a	1157531.45	1403803.75	388.6	5.9	3	1	0	0	NA	
A	413a	1157515.29	1403851.87	388.9	6	3	1	0	0	NA	
A	413	1157530.95	1403856.78	385.7	3.3	3	1	0	0	NA	
A	414	1157514.94	1403900.53	385.7	3	3	1	0	0	NA	

Table A-1
2008 Data (Phase 1)
Genesee River Investigation
Rochester, New York

Project Area	Station ID	NORTHING	EASTING	Elevation	Sediment Thickness (feet)	Sediment Type Code	Sheen Code	Core? 1=yes 0= no	Drilled Probe? 1=yes 0=no	Recovery (feet)	COMMENTS
A	414a	1157499.82	1403892.62	388.7	6	3	1	0	0	NA	
A	415	1157497.38	1403942.52	385.6	3	3	1	0	0	NA	
A	415a	1157482.37	1403934.85	388	4.3	3	1	0	0	NA	
A	416	1157479.01	1403988.41	384	3.3	3	1	0	0	NA	
A	416a	1157462.58	1403977.43	383.7	5.5	3	1	0	0	NA	
A	417	1157456.14	1404029.25	386.2	4.8	3	1	0	0	NA	
A	417a	1157433.61	1404016.56	388.9	4.5	3	1	0	0	NA	
A	418	1157433.46	1404069.7	385.9	2.1	3	1	0	0	NA	
A	418a	1157407.54	1404050.55	388.4	3.8	3	1	0	0	NA	
A	419	1157408.34	1404113.29	385.6	0.7	3	1	0	0	NA	
A	419a	1157370.81	1404085.32	389	2.2	3	1	0	0	NA	
A	420a	1157341.28	1404109.35	386	2	3	1	0	0	NA	
A	420	1157386.17	1404152.25	385.6	0.4	3	1	0	0	NA	
A	456	1155110.17	1405243.61	387.3	0	0	0	0	0	NA	septic seep
A	457	1155149.01	1405215.73	386.3	1	2	2	0	0	NA	
A	458	1155159.14	1405210.86	386.8	1	2	3	0	0	NA	
A	459	1155169.54	1405201.67	386.2	0.1	1	1	0	0	NA	
A	460	1155180.71	1405186.67	386.4	0.1	1	1	0	0	NA	
A	461	1155202.4	1405169.93	386	0.1	2	1	0	0	NA	
A	462	1155211.71	1405157	386.3	0.6	2	1	0	0	NA	
A	463	1155229.43	1405146.52	386.1	2.6	2	1	0	0	NA	
A	464	1155244.5	1405137.4	385.7	3.6	2	1	0	0	NA	
A	465	1155257.32	1405115.75	386.1	0	0	0	0	0	NA	
A	466	1155272.66	1405089.37	386.1	0.8	2	1	0	0	NA	
A	467	1155286.57	1405080.86	385.5	2	2	1	0	0	NA	
A	468	1155322.78	1404788.97	386.3	5.4	2	1	0	0	NA	
A	469	1155347.04	1404764.13	385.7	5.7	2	1	0	0	NA	
A	473	1155232.81	1404901.98	385.6	4	2	1	0	0	NA	
A	476	1155039.9	1405098.77	392.8	1	2	1	0	0	NA	
A	479	1154683.25	1405346.75	386.7	2	3	1	0	0	NA	
A	485	1154743.17	1405519.61	390.9	1	2	1	0	0	NA	
A	486	1154696.2	1405557.85	386.2	0.5	2	1	0	0	NA	
A	489	1154502.46	1405786.94	391.3	2.5	2	1	0	0	NA	
A	490	1154455.07	1405848.53	386.7	0.5	2	1	0	0	NA	
A	491	1154385	1405940.13	378	1	2	2	0	0	NA	
A	503	1154063.78	1406577.22	390.4	0.1	4	1	0	0	NA	
A	504	1154015.25	1406696.19	390.7	0.1	4	1	0	0	NA	
A	505	1154012.83	1406762.14	391.2	0.1	4	1	0	0	NA	

Table A-1
2008 Data (Phase 1)
Genesee River Investigation
Rochester, New York

Project Area	Station ID	NORTHING	EASTING	Elevation	Sediment Thickness (feet)	Sediment Type Code	Sheen Code	Core? 1=yes 0= no	Drilled Probe? 1=yes 0=no	Recovery (feet)	COMMENTS
C	1	1161785.52	1403254.07	0	1.5	1	1	0	0	NA	Near Seth Green Island
C	2	1161688.79	1403233.37	0	3	1	1	0	0	NA	
C	3	1161592.46	1403221.81	0	1.1	1	1	0	0	NA	
C	4	1161592.46	1403221.81	0	1.1	1	1	0	0	NA	
C	5	1161883.22	1403281.77	0	2	5	1	0	0	NA	
C	6	1161607.98	1403151.75	0	4.2	1	1	0	0	NA	
C	7	1161474.28	1403147.22	0	1.8	1	1	0	0	NA	
C	8	1161331.72	1403129.79	0	2.1	1	1	0	0	NA	
C	9	1161132.8	1403186.7	0	1	1	1	0	0	NA	
C	10	1161025.68	1403154.95	0	0.9	1	1	0	0	NA	
C	11	1161025.74	1403155.03	0	3	5	1	0	0	NA	
C	12	1162026	1403110.52	0	1	5	1	0	0	NA	
C	13	1161912.35	1403087.66	0	2.4	5	1	0	0	NA	
C	14	1161793.18	1403069.84	0	0.9	1	1	0	0	NA	
C	15	1162230.66	1402831.21	0	1.4	5	1	0	0	NA	red clay on rod
C	16	1162206.45	1403175.34	0	2.3	5	1	0	0	NA	red clay on rod
C	17	1162282.53	1403198.29	0	0.4	1	1	0	0	NA	
C	18	1162372.09	1403218.94	0	1.6	5	1	0	0	NA	
C	19	1162372.09	1403218.94	0	1.8	1	1	0	0	NA	
C	20	1162579.62	1403284.61	0	0.8	1	1	0	0	NA	
C	21	1162670.7	1403324.92	0	4.5	5	1	0	0	NA	clay on rod
C	22	1162744.56	1403362.48	0	0.6	5	1	0	0	NA	
C	23	1162744.56	1403362.48	0	1.2	5	1	0	0	NA	clay on rod
C	24	1162921.9	1403485.25	0	2.1	1	1	0	0	NA	
C	25	1162998.23	1403544.46	0	2.2	1	1	0	0	NA	
C	26	1163059.94	1403605.07	0	3	1	1	0	0	NA	
C	27	1163132.12	1403696.22	0	5.7	5	1	0	0	NA	clay on rod
C	28	1163262.66	1403826.23	0	2.8	5	1	0	0	NA	clay on rod
C	29	1163262.66	1403826.23	0	3.9	3	1	0	0	NA	
C	30	1163430.01	1403973.37	0	1.8	3	1	0	0	NA	
C	31	1163058.46	1404016.65	0	3	5	1	0	0	NA	
C	32	1162884.72	1403987.99	0	4.3	2	1	0	0	NA	
C	33	1162897.75	1403927.56	0	2.9	5	1	0	0	NA	
C	34	1163023.4	1403787.07	0	3.9	5	1	0	0	NA	
C	35	1162963.51	1403712.54	0	2.8	5	1	0	0	NA	
C	36	1162909.16	1403631.69	0	2.5	1	1	0	0	NA	
C	37	1162842.77	1403578.46	0	1.4	1	1	0	0	NA	
C	38	1162744.58	1403511.84	0	1.3	1	1	0	0	NA	

Table A-1
2008 Data (Phase 1)
Genesee River Investigation
Rochester, New York

Project Area	Station ID	NORTHING	EASTING	Elevation	Sediment Thickness (feet)	Sediment Type Code	Sheen Code	Core? 1=yes 0= no	Drilled Probe? 1=yes 0=no	Recovery (feet)	COMMENTS
C	39	1162744.58	1403511.84	0	2.8	1	1	0	0	NA	
C	40	1162069.29	1403234.88	0	1.3	1	1	0	0	NA	
C	41	1162251.44	1403308.91	0	2.5	1	1	0	0	NA	
C	42	1162368.27	1403331.72	0	1.4	1	1	0	0	NA	
C	43	1162469.7	1403356.58	0	1.4	1	1	0	0	NA	
C	44	1162546.08	1403383.87	0	0.5	1	1	0	0	NA	
C	45	1162600.86	1403415.72	0	0.8	1	1	0	0	NA	
C	46	1162033.59	1403148.19	0	1	5	1	0	0	NA	
C	47	1161976.51	1403135.19	0	1.5	5	1	0	0	NA	
C	48	1161903.51	1403124.68	0	1.9	5	1	0	0	NA	
C	49	1161827.51	1403123.25	0	1.5	5	1	0	0	NA	
C	50	1161735.52	1403119.18	0	0.6	5	1	0	0	NA	
C	51	1161630.04	1403134.9	0	2.3	5	1	0	0	NA	
C	52	1161546.29	1403143.54	0	1	5	1	0	0	NA	
C	53	1161546.29	1403143.54	0	1	5	1	0	0	NA	
C	54	1162274.6	1403215.38	0	0.8	5	1	0	0	NA	
C	55	1162114.71	1403178.04	0	1.5	5	1	0	0	NA	
C	56	1162114.71	1403178.04	0	1.4	5	1	0	0	NA	
C	57	1162151.46	1403243.76	0	3.3	5	1	0	0	NA	
C	58	1162491.18	1403294.74	0	1.2	5	1	0	0	NA	
C	59	1162416.84	1403278.52	0	2.2	5	1	0	0	NA	
C	60	1162345	1403258.92	0	2.3	5	1	0	0	NA	
C	61	1163143.05	1403808.14	0	0.8	1	1	0	0	NA	
C	62	1163084.63	1403718.28	0	0.7	1	1	0	0	NA	
C	63	1163030.32	1403662.97	0	0.5	1	1	0	0	NA	
C	64	1163030.32	1403662.97	0	0.2	1	1	0	0	NA	
C	65	1162956.93	1403599.81	0	0.2	1	1	0	0	NA	
C	66	1162879.15	1403521.03	0	1.1	1	1	0	0	NA	
C	67	1162839.59	1403484.53	0	1	1	1	0	0	NA	
C	68	1162763.89	1403439.44	0	0.7	1	1	0	0	NA	
C	69	1162677.29	1403407.75	0	0.3	1	1	0	0	NA	
C	70	1162597.8	1403348.5	0	0.9	1	1	0	0	NA	
A	71	1155332.99	1404996.68	0	0.3	5	2	0	0	NA	
A	72	1155243.93	1405109.62	0	0.6	1	1	0	0	NA	
A	73	1155341.13	1405017.44	0	0	4	1	0	0	NA	
A	74	1155341.13	1405017.44	0	0	4	1	0	0	NA	
A	75	1155369.08	1404965.7	0	0.6	5	1	0	0	NA	
A	76	1155369.08	1404965.7	0	0	4	1	0	0	NA	

Table A-1
2008 Data (Phase 1)
Genesee River Investigation
Rochester, New York

Project Area	Station ID	NORTHING	EASTING	Elevation	Sediment Thickness (feet)	Sediment Type Code	Sheen Code	Core? 1=yes 0= no	Drilled Probe? 1=yes 0=no	Recovery (feet)	COMMENTS
A	77	1155448.16	1404869.77	0	0	4	1	0	0	NA	
A	78	1155514.63	1404802.51	0	0	4	1	0	0	NA	
A	79	1155560.97	1404761.03	0	0	4	1	0	0	NA	
A	80	1155600.44	1404730.62	0	1.2	5	1	0	0	NA	
A	81	1155645.56	1404679.16	0	0	5	1	0	0	NA	
A	82	1155695.13	1404649.5	0	0.4	5	1	0	0	NA	
A	83	1155737.26	1404626.42	0	0.1	4	1	0	0	NA	
A	84	1155786.3	1404605.27	0	0.8	1	1	0	0	NA	
A	85	1155837.91	1404598.11	0	0.6	5	2	0	0	NA	
A	86	1155884.84	1404599.79	0	1	5	1	0	0	NA	
A	87	1155941.46	1404601.75	0	1.9	5	1	0	0	NA	
A	88	1155993.97	1404605.45	0	3	5	1	0	0	NA	
A	89	1156046.35	1404610.91	0	3.8	5	1	0	0	NA	
A	90	1156088.69	1404617.16	0	0.7	5	1	0	0	NA	
A	91	1156141.5	1404609.69	0	0.8	5	1	0	0	NA	
A	92	1156187.09	1404598.85	0	5.9	5	1	0	0	NA	
A	93	1156250.75	1404617.44	0	6.4	5	1	0	0	NA	
A	94	1156331.46	1404663.16	0	1	5	1	0	0	NA	
A	95	1156402.45	1404665.51	0	2.1	5	1	0	0	NA	
A	96	1156402.45	1404665.51	0	0.9	5	1	0	0	NA	
A	97	1156533.59	1404709.34	0	3.7	3	1	0	0	NA	
A	98	1156671.1	1404667.28	0	3.8	3	1	0	0	NA	
A	99	1156804.03	1404645.51	0	0	0	0	0	0	NA	
A	100	1156804.03	1404645.51	0	1.6	5	1	0	0	NA	
A	101	1156974.78	1404568.31	0	3.7	5	1	0	0	NA	
A	102	1157162.01	1404498.78	0	2.6	5	1	0	0	NA	
A	103	1157272.8	1404491.21	0	2.4	5	1	0	0	NA	
A	104	1157352.25	1404503.93	0	1.8	1	1	0	0	NA	
A	105	1157466.49	1404381.55	0	0.3	1	1	0	0	NA	
A	106	1157564.72	1404252.53	0	0.9	1	1	0	0	NA	
A	107	1157709.48	1403924.53	0	3.9	5	1	0	0	NA	
A	108	1157764.21	1403702.61	0	3.2	1	1	0	0	NA	
A	109	1157823.4	1403607.49	0	2.3	3	1	0	0	NA	
A	110	1157882.76	1403508.04	0	2.9	1	1	0	0	NA	
A	111	1157953.5	1403408.84	0	1.7	1	1	0	0	NA	
A	112	1158038.86	1403315.09	0	7.2	3	1	0	0	NA	
A	113	1158146.1	1403224.23	0	7.3	3	1	0	0	NA	
A	114	1158205.67	1403188.36	0	6.3	3	1	0	0	NA	

Table A-1
2008 Data (Phase 1)
Genesee River Investigation
Rochester, New York

Project Area	Station ID	NORTHING	EASTING	Elevation	Sediment Thickness (feet)	Sediment Type Code	Sheen Code	Core? 1=yes 0= no	Drilled Probe? 1=yes 0=no	Recovery (feet)	COMMENTS
A	115	1158251.7	1403165.64	0	8	3	1	0	0	NA	
A	116	1158311.14	1403140.83	0	7.3	3	1	0	0	NA	
A	117	1158368	1403127.56	0	7.6	3	1	0	0	NA	
A	118	1158438.25	1403126.26	0	7.2	3	1	0	0	NA	
A	119	1155241.74	1405011.4	0	0	4	1	0	0	NA	
A	120	1155269.3	1404969.57	0	0.6	1	1	0	0	NA	
A	121	1155306.56	1404937.9	0	0	1	1	0	0	NA	
A	122	1155351.15	1404915.65	0	0	4	1	0	0	NA	
A	123	1155366.36	1404890.67	0	0.1	1	1	0	0	NA	
A	124	1155397.09	1404832.02	0	0	4	1	0	0	NA	
A	125	1155437.33	1404799.05	0	0	4	1	0	0	NA	
A	126	1155478.76	1404770.38	0	0	4	1	0	0	NA	
A	127	1155515.14	1404736.2	0	0	4	1	0	0	NA	
A	128	1155552.93	1404700.39	0	0	4	1	0	0	NA	
A	129	1155576.55	1404668.76	0	0	4	1	0	0	NA	
A	130	1155614.81	1404630.82	0	0	4	1	0	0	NA	
A	131	1155645.81	1404572.55	0	0	4	1	0	0	NA	
A	132	1155754.29	1404542.86	0	0	4	1	0	0	NA	
A	133	1155713.08	1404575.76	0	0	4	1	0	0	NA	
A	134	1156053.02	1404521.13	0	0	4	1	0	0	NA	
A	135	1155982.88	1404519.35	0	0	4	1	0	0	NA	
A	136	1155922.93	1404513.28	0	0.1	4	1	0	0	NA	
A	137	1155869.05	1404512.14	0	0	4	1	0	0	NA	
A	138	1155813.22	1404526.56	0	0	4	1	0	0	NA	
A	139	1156099.56	1404545.01	0	0	4	1	0	0	NA	
A	140	1156204.07	1404549.6	0	0	4	1	0	0	NA	
A	141	1156252.3	1404566.1	0	0	4	1	0	0	NA	
A	142	1156291.59	1404565.23	0	0	4	1	0	0	NA	
A	143	1156277.78	1404591.28	0	0.6	2	1	0	0	NA	
A	144	1156334.9	1404570.7	0	0	4	1	0	0	NA	
A	145	1156529.91	1404570.94	0	1.1	1	1	0	0	NA	
A	146	1156624.13	1404608.18	0	0	1	1	0	0	NA	
A	147	1156712.29	1404563.85	0	0	4	1	0	0	NA	
A	148	1156913.43	1404502.83	0	0	4	1	0	0	NA	
A	149	1157035.78	1404383.65	0	3	1	1	0	0	NA	
A	150	1157157.17	1404353.18	0	2.8	1	1	0	0	NA	
A	151	1157272.77	1404308.49	0	1	1	1	0	0	NA	
A	152	1157355.34	1404255.17	0	2.9	1	1	0	0	NA	

Table A-1
2008 Data (Phase 1)
Genesee River Investigation
Rochester, New York

Project Area	Station ID	NORTHING	EASTING	Elevation	Sediment Thickness (feet)	Sediment Type Code	Sheen Code	Core? 1=yes 0= no	Drilled Probe? 1=yes 0=no	Recovery (feet)	COMMENTS
A	153	1157409.39	1404151.78	0	4.6	5	1	0	0	NA	
A	154	1157468.35	1404040.3	0	1.4	2	1	0	0	NA	
A	155	1157530.12	1403899.48	0	6.1	2	1	0	0	NA	
A	156	1158456.38	1402909.44	0	0.8	1	1	0	0	NA	
A	157	1158396.96	1402909.14	0	4.8	1	1	0	0	NA	
A	158	1158323.86	1402936.18	0	3	1	1	0	0	NA	
A	159	1158258.2	1402951.04	0	3	1	1	0	0	NA	
A	160	1158195.79	1402961.54	0	1	1	1	0	0	NA	
A	161	1158112.46	1402994.81	0	1.4	1	1	0	0	NA	
A	162	1157762.86	1403706.74	0	0.2	1	1	0	0	NA	
A	163	1157714.2	1403827.74	0	1.2	1	1	0	0	NA	
A	164	1157708.69	1403926.2	0	2.8	1	1	0	0	NA	
A	165	1157588.26	1404205.32	0	1.4	1	1	0	0	NA	
A	166	1157532.74	1404294.73	0	1.1	1	1	0	0	NA	
A	167	1157466.69	1404380.41	0	2	1	1	0	0	NA	
A	168	1154696.56	1405419.95	0	2.8	1	1	0	0	NA	
A	169	1154782.8	1405342.58	0	3.5	1	1	0	0	NA	
A	170	1154831.19	1405298.47	0	3.1	1	1	0	0	NA	
A	171	1154938.19	1405261.45	0	3	5	1	0	0	NA	
A	172	1155074.76	1405128.1	0	1	1	1	0	0	NA	
A	173	1155148.14	1405070.44	0	1.2	3	1	0	0	NA	
A	174	1155231.26	1405002.25	0	5.6	1	1	0	0	NA	
A	175	1156992.73	1404500.99	0	0.1	4	1	0	0	NA	
A	176	1157078.74	1404463.83	0	0.5	1	1	0	0	NA	
A	177	1157173.04	1404416.01	0	0.3	1	1	0	0	NA	
A	178	1157265.32	1404389.45	0	0.5	1	1	0	0	NA	
A	179	1157366.77	1404354.3	0	2.3	1	1	0	0	NA	
A	180	1157652.84	1403871.33	0	1.1	1	1	0	0	NA	
A	181	1157677.17	1403763	0	1.3	1	1	0	0	NA	
A	182	1157691.12	1403666.92	0	1.6	1	1	0	0	NA	
A	183	1157669.22	1403814.75	0	1.4	1	1	0	0	NA	
A	184	1157652.86	1403885.56	0	0.7	1	1	0	0	NA	
A	185	1157612.27	1403967.01	0	1.4	5	1	0	0	NA	
A	186	1158091.52	1403139.98	0	4	5	1	0	0	NA	
A	187	1157991.09	1403175.25	0	6	5	1	0	0	NA	
A	188	1163257.7	1403906.02	0	0.7	5	1	0	0	NA	
A	189	1158385.94	1402911.02	0	2.5	5	1	0	0	NA	
A	190	1158276.96	1402930.09	0	0.4	1	1	0	0	NA	

Table A-1
2008 Data (Phase 1)
Genesee River Investigation
Rochester, New York

Project Area	Station ID	NORTHING	EASTING	Elevation	Sediment Thickness (feet)	Sediment Type Code	Sheen Code	Core? 1=yes 0= no	Drilled Probe? 1=yes 0=no	Recovery (feet)	COMMENTS
A	191	1158162.54	1402957.34	0	0.2	1	1	0	0	NA	
A	192	1158061.75	1403019.99	0	0.5	1	1	0	0	NA	
A	193	1157933.7	1403079.93	0	1.1	1	1	0	0	NA	
A	194	1157884.67	1403164.38	0	2.2	1	1	0	0	NA	
A	195	1157813.83	1403237.94	0	0.5	1	1	0	0	NA	
A	196	1157748.45	1403327.84	0	1	1	1	0	0	NA	
A	197	1157666.72	1403406.84	0	1.6	5	1	0	0	NA	
A	198	1153746.59	1406629.5	392.2	0.3	1	1	0	0	NA	
A	199	1153743.35	1406581.5	392.3	0.2	1	1	0	0	NA	
A	200	1153736.44	1406670.68	392	3	1	1	0	0	NA	
A	201	1153706.16	1406701.92	392	3.5	1	1	0	0	NA	
A	202	1153680.97	1406747.8	392.4	3.5	1	1	0	0	NA	
A	204	1153655.93	1406787.28	392.5	3.5	1	1	0	0	NA	
A	206	1153691.93	1406821.89	392.5	2.3	1	1	0	0	NA	
A	207	1153744.44	1406891.83	392.6	1	1	1	0	0	NA	
A	208	1153789.37	1406926.71	392.5	3.5	1	1	0	0	NA	
A	209	1153816.79	1406966.31	392.2	1	1	1	0	0	NA	
A	210	1153861.34	1406969.39	391.7	2.5	1	1	0	0	NA	
A	211	1153889.94	1406916.26	391.4	2.3	1	1	0	0	NA	
A	212	1153922.84	1406830.03	391.3	2	1	1	0	0	NA	
A	213	1153932.9	1406747.74	392	3	1	2	0	0	NA	
A	214	1153755.13	1406533.88	392.2	0	1	1	0	0	NA	
A	215	1153764.77	1406502.93	392.3	0.8	1	1	0	0	NA	
A	216	1153783.18	1406447.93	392.5	0.7	1	1	0	0	NA	
A	217	1153809.14	1406410.43	396.9	3.7	1	1	0	0	NA	
A	218	1153840.51	1406323.21	391.3	4.5	1	1	0	0	NA	
A	219	1153858.66	1406275.3	412.6	4.4	1	2	0	0	NA	
A	220	1153917.51	1406281.89	389.3	3.1	1	1	0	0	NA	
A	222	1153908.5	1406376.69	389	2.1	1	2	0	0	NA	
A	223	1153903.23	1406471.02	390.2	2	1	1	0	0	NA	
A	224	1153876.38	1406469.7	391.3	2	1	1	0	0	NA	
A	225	1153898.7	1406567.46	390.2	2	1	1	0	0	NA	
A	226	1153918.49	1406653.96	391.7	3.5	1	1	0	0	NA	
A	227	1153819.62	1406238.53	390.5	0	1	1	0	0	NA	
A	228	1153824.81	1406249.38	390.9	1.2	1	1	0	0	NA	
A	229	1153785.85	1406335.8	402.3	0	1	1	0	0	NA	
A	230	1153807.09	1406335.05	391.1	1.3	1	1	0	0	NA	
A	231	1153770.05	1406403.91	384.1	3.5	1	1	0	0	NA	

Table A-1
2008 Data (Phase 1)
Genesee River Investigation
Rochester, New York

Project Area	Station ID	NORTHING	EASTING	Elevation	Sediment Thickness (feet)	Sediment Type Code	Sheen Code	Core? 1=yes 0= no	Drilled Probe? 1=yes 0=no	Recovery (feet)	COMMENTS
A	232	1153744.95	1406425.28	380.5	2.2	1	1	0	0	NA	
A	233	1153728.62	1406488.55	392.2	2.9	1	1	0	0	NA	
A	234	1153694.64	1406616.6	382.3	1.4	1	1	0	0	NA	
A	235	1153622.75	1406702.53	388.2	0.6	1	1	0	0	NA	
A	236	1153611.35	1406723.51	386.5	1.4	1	1	0	0	NA	
A	237	1153493.22	1406798.66	391.6	2.4	1	1	0	0	NA	
A	238	1153576.77	1406824.16	384.7	2.6	5	1	0	0	NA	
A	239	1153610.81	1406848.01	378.1	3	5	1	0	0	NA	
A	240	1153618.39	1406929.26	395.5	1.6	5	1	0	0	NA	
A	241	1153659.57	1406954.14	386.8	1.4	5	1	0	0	NA	
A	242	1153714.59	1407003.98	374.2	0.5	5	1	0	0	NA	
A	243	1153707.65	1407014.31	390.4	0	0	0	0	0	NA	
A	244	1153448.49	1406737.53	392.1	0	1	1	0	0	NA	
A	245	1153443.09	1406713.54	392.6	0.2	1	1	0	0	NA	
A	246	1153611.62	1406697.06	391.9	1	1	1	0	0	NA	
A	247	1153578.75	1406725.41	391.8	1	1	1	0	0	NA	
A	248	1153632.98	1406663.81	391.6	3.1	1	1	0	0	NA	
A	249	1153666.09	1406603.27	391.7	3.3	1	1	0	0	NA	
A	250	1153678.29	1406570.59	396.5	2.5	1	2	0	0	NA	
A	251	1153704.56	1406482.31	392	1.5	1	1	0	0	NA	
A	252	1153723.67	1406416.99	393.4	3	1	2	0	0	NA	
A	253	1153756.1	1406313.32	399.7	2	5	1	0	0	NA	
A	254	1153768.32	1406214.08	388.5	3	5	1	0	0	NA	
A	255	1153823.51	1406149.53	0	3	5	2	0	0	NA	
A	256	1153407.87	1406859.72	391.6	2	5	1	0	0	NA	
A	257	1153398.52	1406808.69	391.6	2.5	5	1	0	0	NA	
A	258	1154176.75	1405970.58	386.6	1.5	5	1	0	0	NA	
A	259	1154129.22	1405996.38	386.7	1.1	5	1	0	0	NA	
A	260	1154098.11	1406040.15	386.5	1	5	1	0	0	NA	
A	261	1154008.93	1406040.06	387.9	0.5	5	3	0	0	NA	
A	262	1153997.25	1406052.35	387.7	0.7	1	4	0	0	NA	
A	263	1154024.33	1406035.1	387.6	3.5	1	1	0	0	NA	
A	264	1154199.74	1405928	386.8	0.8	2	1	0	0	NA	
A	265	1154239.56	1405900.83	386.6	2.9	5	1	0	0	NA	
A	266	1154280.81	1405873.72	386.6	3	1	1	0	0	NA	
A	267	1154310.14	1405837.33	386.5	2.6	1	1	0	0	NA	
A	268	1154356.6	1405804.9	386.4	2.9	1	1	0	0	NA	
A	269	1154330.48	1405785.56	386.2	3	1	2	0	0	NA	

Table A-1
2008 Data (Phase 1)
Genesee River Investigation
Rochester, New York

Project Area	Station ID	NORTHING	EASTING	Elevation	Sediment Thickness (feet)	Sediment Type Code	Sheen Code	Core? 1=yes 0= no	Drilled Probe? 1=yes 0=no	Recovery (feet)	COMMENTS
A	270	1154354.05	1405741.17	386.3	3	1	1	0	0	NA	
A	271	1154391.15	1405705.77	386.2	3	1	2	0	0	NA	
A	272	1154418.56	1405670.19	386.4	3	1	2	0	0	NA	
A	273	1154436.22	1405629.29	386.7	2.7	1	1	0	0	NA	
A	274	1154462.23	1405613.47	386.2	1.5	1	2	0	0	NA	
A	275	1154499.77	1405578.23	386	0.8	1	1	0	0	NA	
A	276	1154515.95	1405539.37	385.9	1.5	1	1	0	0	NA	
A	277	1154552.81	1405506.6	385.7	2	1	1	0	0	NA	
A	278	1154576.07	1405465.38	385.7	0.8	1	1	0	0	NA	
A	279	1154610.65	1405435.56	385.4	2.7	1	1	0	0	NA	
A	280	1154643.89	1405411.54	386.3	2.5	1	1	0	0	NA	
A	281	NR	NR	NR	2.6	1	1	0	0	NA	
A	V1	1155214.271	1405135.824		1	5	4	1	0	1	coarse gravel with NAPL
A	V2	1156021.253	1404611.979		5	5	1	1	0	1	gravel and sand
A	V3	1157335.817	1404153.123		NR	5	1	1	0	1	sand and gravel with shell fragments - near combined sewer outfall
A	V4	1158312.765	1403174.126		10	2	1	1	0		dark grey fine sand
C	V5	1161972.403	1403226.973		1.7	3	1	1	0	NR	black silt over gravel (refusal on gravel and cobbles)
C	V6	1163128.818	1403922.53		5	2	1	1	0	NR	dark brown sand with some gravel

NOTES:

V = Vibracore
NR = Not recorded
Shaded lines are sediment probes advanced with an electric hammer
All other sediment probes were advanced by hand.

Horizontal positioning is reported in North American Datum 1983 (NAD83), New York State Plane West
Elevation is referenced to RG&E Plant Datum
Add 0.63 feet to convert to New York State Barge Canal Datum
Add 1.71 feet to convert to NVGD 29

Table A-2
2009 Data (Phase 2)
Genesee River Investigation
Rochester, New York

Project Area	Station ID	NORTHING	EASTING	Elevation	Sediment Thickness [penetration] (feet)	Sediment Type Code	Sheen Code	Core? 1=yes 0= no	Drilled Probe? 1=yes 0=no	Recovery (feet)	Comments	PID (ppm)	Sediment Description
C	09 ep 01	1163695.77	1404447.06	0	5	1	1	0	0	NA			
C	09 ep 02	1163793.95	1404335.21	0	1.8	1	1	0	0	NA			
C	09 ep 03	1163832.94	1404250.76	0	5.9	1	1	0	0	NA			
C	09 ep 04	1163664.59	1404151.45	0	4.7	1	1	0	0	NA			
C	09 ep 05	1163639.55	1404255.39	0	1.7	5	1	0	0	NA			
C	09 ep 06	0	0	0	8.5	5	1	0	0	NA	Coordinate not recorded, location is north of Seth Green Island		
C	09 ep 07	1163582.13	1404327.84	0	5.6	1	1	0	0	NA			
C	09 ep 08	0	0	0	1	5	1	0	0	NA	Coordinate not recorded, location is north of Seth Green Island		
C	09 ep 09	1163487.43	1404145.48	0	5.9	1	1	0	0	NA			
C	09 ep 10	1163870.46	1404558.7	0	2.8	1	1	0	0	NA			
C	09 ep11	1163968.62	1404466.84	0	1.4	1	1	0	0	NA			
C	09 ep 12	1164049.07	1404328.69	0	5	5	1	0	0	NA			
C	09 ep 13	1164238.2	1404432.98	0	9.2	2	1	0	0	NA			
C	09 ep 14	1164115.25	1404611.5	0	5.1	5	1	0	0	NA			
C	09 ep 15	1164030.08	1404714.53	0	7.5	5	2	0	0	NA			
C	ep 09 16	1164253.4	1404809.61	0	13.2	2	1	0	0	NA			
C	09 ep 17	1164318.68	1404668.93	0	3.6	5	1	0	0	NA			
C	09 ep 18	1164403.97	1404541.79	0	11.9	2	2	0	0	NA			Soft from 0-9.1 feet
C	09 ep 19	1164567.62	1404664.67	0	19.6	2	2	0	0	NA			
C	09 ep 20	1164484.8	1404797.15	0	13.3	5	1	0	0	NA			
C	09 ep 21	1164363.54	1404937.08	0	15.8	2	1	0	0	NA			
C	09 ep 22	1164519.98	1405028.5	0	17.5	2	1	0	0	NA			
C	09 ep 23	1164658.04	1404902.44	0	8.7	2	1	0	0	NA			
C	09 ep 24	1164720.39	1404807.98	0	14.5	2	1	0	0	NA			
C	09 ep 25	1163374.52	1403930.47	0	2.3	1	1	0	0	NA			
C	09 ep 26	1163265.08	1404000.28	0	5.2	1	1	0	0	NA			
C	09 ep 27	1163211.84	1404069.47	0	8.5	1	1	0	0	NA			
C	09 ep 28	1162925.52	1403975.5	0	1	1	1	0	0	NA			
C	09 ep 29	1162826.69	1403914.4	0	2.9	1	1	0	0	NA			
C	09 ep 30	1162729.26	1403840.53	0	2.2	1	1	0	0	NA			
C	09 ep 31	1162657.21	1403787.83	0	2	1	1	0	0	NA			
C	09 ep 32	1162606.38	1403755.33	0	1	1	1	0	0	NA			
C	09 rd 1	1163215.64	1404066.51	0	10	5	1	0	1	NA			
C	09 rd 2	1162398.011	1403333.762	0	5.5	0	1	0	1	NA	Location shown is approximate, possible sheen from drilling tools		
C	09 rd 03	1162317.02	1403351.79	0	5.5	0	1	0	1	NA	Possible sheen from drilling tools		
C	09 rd 04	1164011.8	1404731.99	0	16.5	0	1	0	1	NA			
C	09ep33	1161055.401	1403026.169	0	1	1	1	0	0	NA	Location shown is approximate, based on taped point spacing		
C	09ep34	1161028.931	1403011.137	0	2.5	1	1	0	0	NA	Location shown is approximate, based on taped point spacing		
C	09ep35	1160935.284	1402990.779	0	2	1	1	0	0	NA	Location shown is approximate, based on taped point spacing		
C	09ep36	1160837.565	1402971.778	0	1.8	1	1	0	0	NA	Location shown is approximate, based on taped point spacing		
C	09ep37	1160712.723	1402961.013	0	1.3	1	1	0	0	NA	Location shown is approximate, based on taped point spacing		
C	09ep38	1160647.557	1402952.778	0	2.3	1	1	0	0	NA	Location shown is approximate, based on taped point spacing		
C	09ep39	1160546.833	1402954.011	0	1.8	1	1	0	0	NA	Location shown is approximate, based on taped point spacing		
C	09ep40	1160443.976	1402955.492	0	4	1	1	0	0	NA	Location shown is approximate, based on taped point spacing		
C	09ep41	1160343.543	1402954.135	0	1.3	1	1	0	0	NA	Location shown is approximate, based on taped point spacing		

Table A-2
2009 Data (Phase 2)
Genesee River Investigation
Rochester, New York

Project Area	Station ID	NORTHING	EASTING	Elevation	Sediment Thickness [penetration] (feet)	Sediment Type Code	Sheen Code	Core? 1=yes 0= no	Drilled Probe? 1=yes 0=no	Recovery (feet)	Comments	PID (ppm)	Sediment Description
C	09ep42	1160251.253	1402931.062	0	1.2	1	1	0	0	NA	Location shown is approximate, based on taped point spacing		
C	09ep43	1160885.067	1403138.715	0	2	1	1	0	0	NA	Location shown is approximate, based on taped point spacing		
C	09ep44	1160798.206	1403123.785	0	0.9	1	1	0	0	NA	Location shown is approximate, based on taped point spacing		
C	09ep45	1160695.059	1403114.285	0	4.5	1	1	0	0	NA	Location shown is approximate, based on taped point spacing		
C	09ep46	1160610.912	1403104.784	0	1.8	1	1	0	0	NA	Location shown is approximate, based on taped point spacing		
C	09ep47	1160519.979	1403133.286	0	1.6	1	1	0	0	NA	Location shown is approximate, based on taped point spacing		
C	09ep48	1160427.689	1403171.288	0	2.7	1	1	0	0	NA	Location shown is approximate, based on taped point spacing		
C	09ep49	1160362.544	1403213.361	0	0	0	1	0	0	NA	Location shown is approximate, based on taped point spacing		
A	09 ep 50	1153931.58	1406468.22	0	3.3	1	1	0	0	NA			
A	09 ep 51	1153917.34	1406458.28	0	2.5	1	1	0	0	NA			
A	09 ep 52	1153931.73	1406426.53	0	6	1	1	0	0	NA			
A	09 ep 53	1154009.75	1406098.64	0	3	1	1	0	0	NA			
A	09 ep 54	1154110.28	1406069.91	0	0	4	1	0	0	NA			
A	09 ep 55	1154231.24	1405990.74	0	0	4	1	0	0	NA			
A	09 ep 56	1154404.42	1405744.71	0	0	0	0	0	0	NA			
A	09 ep 57	1155206.56	1405152.41	0	0	4	1	0	0	NA			
A	09 ep 58	1155218.54	1405120.01	0	0.3	4	1	0	0	NA			trace gravel on bedrock
A	09 ep 59	1155202.11	1405162.16	0	0.9	0	1	0	0	NA			
A	09 ep 60	1155230.93	1405141.74	0	3	2	4	0	0	NA			NAPL in sand
A	09 ep 61	1155225.58	1405134.59	0	1.2	2	1	0	0	NA			
A	09 ep 62	1155221.27	1405125.6	0	2.8	5	1	0	0	NA			
A	09 ep 63	1155220.07	1405113.96	0	1.2	1	1	0	0	NA			
A	09 ep 64	1155222.09	1405100.26	0	0.2	4	1	0	0	NA			
A	09 ep 65	1155240.56	1405132.51	0	4	2	4	0	0	NA			NAPL in sand
A	09 ep 66	1155245.6	1405124.36	0	1	2	3	0	0	NA			
A	09 ep 67	1155251.37	1405115.28	0	1	2	2	0	0	NA			sand over bedrock
A	09 ep 68	1155257.98	1405102.27	0	0.9	2	2	0	0	NA			sand over bedrock
A	09 ep 69	1155233.69	1405120.7	0	1	1	1	0	0	NA			
A	09 ep 70	1155229.67	1405110.86	0	0	0	0	0	0	NA	No field observations recorded		
A	09 ep 71	1155230.999	1405105.063	0	0.3	2	1	0	0	NA			sand over bedrock
A	09 ep 72	1155232.63	1405099.96	0	0.1	1	1	0	0	NA			cobbles over bedrock
A	09 ep 73	1155364.67	1404984.09	0	0.2	1	1	0	0	NA			
A	09 ep 74	1155370.65	1404988.34	0	0	4	1	0	0	NA			
A	09 ep 75	1155351.56	1404978.77	0	0	4	1	0	0	NA			
A	09 ep 76	1155345.61	1404965.27	0	0	4	1	0	0	NA			
A	09 ep 77	1155342.19	1404955.08	0	0	4	1	0	0	NA			
A	09 ep 78	1155344.05	1404942.78	0	0	4	1	0	0	NA			
A	09 ep 79	1155408.61	1404921.55	0	0.2	1	1	0	0	NA			
A	09 ep 80	1155419.18	1404902.62	0	1.2	1	2	0	0	NA			silt and cobbles
A	09 ep 80	1155162.15	1405201.03	0	1.2	1	2	0	0	NA			
A	09 ep 81	1155154.96	1405183.94	0	1.2	1	1	0	0	NA			
A	09 ep 82	1155154.67	1405161.75	0	0.3	1	1	0	0	NA			
A	09 ep 83	1155149.86	1405139.75	0	0.2	4	1	0	0	NA			cobbles over bedrock
A	09 ep 84	1155142.38	1405207.57	0	1.2	1	1	0	0	NA			
A	09 ep 85	1155131.57	1405218.59	0	1.4	1	1	0	0	NA			
A	09 ep 86	1155112.63	1405232.77	0	1.2	1	1	0	0	NA			
A	09 ep 87	1156065.32	1404604.28	0	1.2	1	1	0	0	NA			
A	09 ep 88	1156066.76	1404618.69	0	0.8	1	1	0	0	NA			

Table A-2
2009 Data (Phase 2)
Genesee River Investigation
Rochester, New York

Project Area	Station ID	NORTHING	EASTING	Elevation	Sediment Thickness [penetration] (feet)	Sediment Type Code	Sheen Code	Core? 1=yes 0= no	Drilled Probe? 1=yes 0=no	Recovery (feet)	Comments	PID (ppm)	Sediment Description
A	WATER LINE	1154894.915	1405173.386	411.349	NA	NA	NA	NA	NA	NA	Elevation taken on water surface		
A	09EP89	1153999.263	1406057.417	392.428	0.8	1	1	0	0	NA			
A	09EP90	1154002.69	1406051.941	392.634	0.8	1	2	0	0	NA			
A	09EP91	1154007.677	1406045.824	392.619	1.5	1	2	0	0	NA			
A	09EP92	1154014.223	1406044.724	392.133	1.5	1	2	0	0	NA			
A	09EP93	1154052.38	1406040.804	392.539	2	1	1	0	0	NA			
A	09EP94	1154176.211	1405961.79	392.549	0.3	1	1	0	0	NA			sand over cobbles
A	09EP95	1154233.505	1405995.115	392.532	0.5	1	1	0	0	NA			sand over cobbles
A	09EP96	1154283.718	1406064.129	392.287	0.2	1	1	0	0	NA			sand over cobbles
A	09EP97	1154255.282	1405947.723	392.531	0	4	1	0	0	NA			
A	09EP98	1154284.18	1405910.754	392.475	0	4	1	0	0	NA			
A	09EP99	1154319.438	1405867.136	392.448	0	4	1	0	0	NA			sand and gravel over bedrock
A	09EP100	1154335.786	1405817.375	392.395	4.2	1	1	0	0	NA			
A	09EP101	1154390.214	1405781.974	392.269	0	4	1	0	0	NA			
A	09EP102	1154409.763	1405743.693	392.363	1.5	1	1	0	0	NA			
A	09EP103	1154431.134	1405713.712	392.443	1.2	1	1	0	0	NA			grey mud at bottom of probe
A	09EP104	1154458.783	1405671.792	392.494	1.8	1	1	0	0	NA			
A	09EP105	1154509.131	1405630.883	392.223	0	4	1	0	0	NA			
A	09EP106	1154556.528	1405544.646	391.962	1.5	1	1	0	0	NA			
A	09EP107	1154617.875	1405509.338	392.332	0.1	4	1	0	0	NA			sand and gravel over bedrock
A	09EP108	1154684.134	1405444.103	392.207	1	1	1	0	0	NA			sand and gravel over bedrock
A	09EP109	1154751.505	1405387.177	392.316	0	4	1	0	0	NA			
A	09EP110	1154820.441	1405330.35	392.431	0	4	1	0	0	NA			
A	09EP111	1154827.185	1405434.429	392.698	0.2	5	1	0	0	NA			sand and gravel over cobbles
A	09EP112	1154763.941	1405495.794	392.112	0.8	5	1	0	0	NA			sand and gravel over cobbles
A	09EP113	1154697.454	1405554.345	396.048	4	5	1	0	0	NA			1.5 gravel over 2.5 sand and silt
A	09EP114	1154620.725	1405628.079	392.389	2	5	1	0	0	NA			0.5 grey mud at bottom of probe
A	09EP115	1154555.568	1405693.342	397.193	1.5	5	1	0	0	NA			0.4 grey mud at bottom of probe
A	09EP116	1154459.929	1405829.973	392.379	1	5	1	0	0	NA			trace silt at bottom of probe
A	09EP117	1154379.144	1405926.055	392.449	0.9	5	1	0	0	NA			trace red silt at bottom
A	09EP118	1154202.512	1406158.465	393.552	1.5	5	1	0	0	NA			sand and gravel over cobbles
A	09EP119	0	0	0	4.5	5	1	0	0	NA	Survey location not recorded.		
A	09EP120	1154372.415	1405701.2	392.321	4	5	1	0	0	NA			1-2 feet of silt below sand and gravel
A	09EP121	1154343.974	1405737.492	392.547	7.1	5	2	0	0	NA			0.2 grey mud at tip w/ HC odor
A	09EP122	1154376.48	1405757.746	392.321	2.4	3	1	0	0	NA			grey silt in probe
A	09EP123	1154357.063	1405749.816	392.444	3	2	1	0	0	NA			2.5 grey sand and silt w/ tr. HC odor
A	09EP124	1154313.594	1405784.056	395.91	4.5	2	1	0	0	NA			trace grey silt
A	09EP125	1154539.798	1405532.847	400.392	4	3	1	0	0	NA			brown and black silt, top 1' soft
A	09EP126	1157280.659	1404185.942	392.225	8	5	1	0	0	NA			bottom 3 feet brown sand
A	09EP127	1157236.471	1404225.365	392.131	5.2	5	1	0	0	NA			
A	09EP128	1157190.709	1404253.61	392.176	7	5	1	0	0	NA			
A	09EP129	1157135.695	1404293.685	392.199	5.2	5	1	0	0	NA			soft zone at 3-4 feet below surface
A	09EP130	1157087.238	1404335.298	392.28	2.4	5	1	0	0	NA			
A	09EP131	1157028.47	1404369.027	392.287	2.9	5	1	0	0	NA			
A	09EP132	1156991.018	1404407.026	392.262	3.5	5	1	0	0	NA			
A	09EP133	1156932.359	1404413.641	393.717	2.2	5	1	0	0	NA			
A	09EP134	1156888.756	1404436.235	392.192	1.9	5	1	0	0	NA			
A	09EP135	1156790.817	1404466.34	395.109	0.2	1	1	0	0	NA			
A	09EP136	1156667.188	1404502.022	394.372	0	1	1	0	0	NA			
A	09EP137	1156552.066	1404514.011	395.723	0.5	1	1	0	0	NA			
A	09EP138	1156467.645	1404519.172	392.389	5	1	1	0	0	NA			
A	09WSC1	1154001.693	1406042.514	389.701	1	2	2	1	0	0.2	Sheen in water, no impact in sample	3.4	brown sand, some gravel and silt
A	09WSC2	1154344.515	1405738.386	388.722	5.2	5	4	1	0	2.5	NAPL in water and sediment in bottom of core	24.3	dark grey and brown, gravel, some sand, trace silt. Brick and metal fragments present. NAPL blebs and sheen.
A	09WSC3	1154381.924	1405754.849	389.344	2.6	5	1	1	0	1	Slight HC odor	21.3	brown gravel, some sand, trace silt

Table A-2
2009 Data (Phase 2)
Genesee River Investigation
Rochester, New York

Project Area	Station ID	NORTHING	EASTING	Elevation	Sediment Thickness [penetration] (feet)	Sediment Type Code	Sheen Code	Core? 1=yes 0= no	Drilled Probe? 1=yes 0=no	Recovery (feet)	Comments	PID (ppm)	Sediment Description
A	09WSC4	1154330.925	1405757.526	396.573	5	5	2	1	0	0.8	Trace sheen in water, possible asphaltic material at bottom of 2nd core attempt (not saved)	2.2	light brown gravel, little sand, trace silt
A	09WSC5	1154373.59	1405695.813	388.948	3.5	5	2	1	0	1.1	Sheen in water during coring	3	brown sand and gravel, trace silt. A few pieces of wood and shells.
A	09WSC6	1154190.319	1405935.402	389.152	2.4	5	1	1	0	1.1		4	brown gravel and sand, trace silt. Shell fragments present.
A	09WSC7	1154150.874	1405979.815	389.476	3	5	3	1	0	1	Trace sheen in water and NAPL in water. Slight hydrocarbon odor and spotty sheen in sediment.	6.8	dark brown sand and gravel, trace fines and shell fragments. Slight HD odor and spotty sheen in sample.
A	09WSC8	1154116.711	1406008.35	389.573	2	5	2	1	0	1	Spotty trace sheen in water	3.2	brown sand and gravel, trace silt. Few brick, asphalt-like pieces, and shell fragments.
A	09WSC9	1154163.919	1405988.367	389.305	0	4	1	1	0	0			no recovery - on bedrock
A	09WSC10	1154194.802	1405968.317	389.317	0	4	1	1	0	0			no recovery - on bedrock
A	09WSC11	1154330.48	1405785.56	386.2	0.5	5	1	1	0	0.5	at 2008 location 269, trace HC odor		coarse sand and gravel
A	09WSRD1	1154316.779	1405774.016	388.855	5.1	0	1	0	1	NA			
A	09WSRD2	1154384.419	1405747.918	390.704	3.7	0	1	0	1	NA			
A	09WSRD3	1154349.962	1405734.572	390.347	4.6	0	2	0	1	NA	Slight sheen at 3 feet		
A	09WSRD4	1154345.218	1405739.61	390.965	5	0	2	0	1	NA			
A	09WSRD5	1154003.7	1406049.519	390.778	0.1	0	3	0	1	NA	Significant sheen generated by boat-locating spud in the sediment		
A	09WSRD6	1154003.683	1406051.768	390.563	3.3	0	2	0	1	NA			
A	09WSRD7	1154056.879	1406040.035	390.464	2.9	0	1	0	1	NA			
A	09WSRD8	1154188.829	1405937.764	390.15	3	0	1	0	1	NA			
A	09WSRD9	1154213.669	1405956.137	390.656	0	4	1	0	1	NA			
A	09WSRD10	1154282.393	1405812.209	0	3.6	0	1	0	1	NA	Location shown is approximate		
A	09WSRD11	1154302.058	1405851.567	390.718	6.7	0	1	0	1	NA			
A	09WSRD12	1154398.948	1405659.852	390.27	4.3	0	2	0	1	NA			
A	09WSRD13	1154446.303	1405677.279	390.943	3.8	0	2	0	1	NA	Possible trace sheet		
A	09WSRD14	1154511.966	1405552.823	389.496	3.6	0	2	0	1	NA			
A	09WSRD15	1154543.724	1405566.383	389.194	4.1	0	1	0	1	NA	Slight HC odor at tip of drill		
A	09WSRD16	1154610.616	1405424.79	390.72	6.7	0	1	0	1	NA			
A	09ESC1	1155229.75	1405141.679	389.178	2.2	0	3	1	0	1.8	Sheen and strong HC odor during coring	463	0-14 inches: Well-graded black sand, trace fine sand, trace gravel.
A												265	14-23 inches: Poorly graded black gravel and sand, trace silt. Strong HC odors and staining from 0-23 inches.
A	09ESC2	1155246.747	1405124.176	389.452	2.8	0	3	1	0	1	Strong hydrocarbon odor and sheen	329	Black Sand, some gravel, some silt. NAPL throughout sample.
A	09ESC3	1155257.543	1405101.493	389.189	1.5	0	3	1	0	1	Strong hydrocarbon odor, sheen on water	232	widely graded sand with gravel, trace fines, black
A	09ESC4	1155278.486	1405081.016	389.254	2.5	0	1	1	0	1.2	Moderate hydrocarbon odor	21.7	widely graded sand with gravel, trace fines, black
A	09ESC5	1155199.753	1405163.246	389.1	3	0	3	1	0	0.8	Sheen during coring, trace NAPL in core, strong hydrocarbon odor	321	widely graded gravel with sand, trace fines, black
A	09ESC6	1155183.697	1405180.596	389.102	1.5	0	2	1	0	1.1	Moderate hydrocarbon odor	41.5	widely graded gravel with sand, trace fines, black. Pieces of glass, wood, brick.
A	09ESC7	1155223.791	1405130.969	389.013	2	0	1	1	0	0.8	Live crayfish in sample. Slight hydrocarbon odor	33	widely graded sand with gravel, trace fines, brown. Pieces of shells, brick, metal present.
A	09ESC8	1155237.551	1405110.983	389.313	1.5	0	2	1	0	0.6	Sheen observed during coring, no NAPL in the recovered sediment	17.3	widely graded sand with gravel, trace fines, brown. Pieces of glass and brick.
A	09ESC9	1155252.019	1405108.557	389.266	1.2	0	3	1	0	1.2	Rainbow sheen, strong HC odor	342	narrowly graded sand with gravel, trace fines, black. Pieces of shell, brick, and glass.
A	09ESC10	1155247.648	1405096.579	389.318	2	0	3	1	0	1.2	Rainbow sheen	93.7	widely graded sand with gravel, trace fines, black. Pieces of shell and ceramic.

Table A-2
2009 Data (Phase 2)
Genesee River Investigation
Rochester, New York

Project Area	Station ID	NORTHING	EASTING	Elevation	Sediment Thickness [penetration] (feet)	Sediment Type Code	Sheen Code	Core? 1=yes 0= no	Drilled Probe? 1=yes 0=no	Recovery (feet)	Comments	PID (ppm)	Sediment Description
A	09ESC11	1155266.859	1405069.654	389.009	1	0	2	1	0	0.8		18.1	widely graded sand with gravel, trace fines, brown. Large amount of shell fragments.
A	09ESC12	1155257.528	1405062.568	389.122	1	0	1	1	0	0.8	Slight hyrocarbon odor, penetration is estimated	13	widely graded sand with gravel, trace fines, brown. Large amounts of shell fragments.
A	09ESC13	1155573.647	1404757.522	391.043	2	1	1	1	0	2	Slight hydrocarbon odor, hard and blocky bottom - penetration is estimated	3.8	widely graded sand with gravel, trace fines, brown. Few brick and shell fragments.
A	09ESC14	1155751.084	1404663.742	389.139	0	5	1	1	0	0.5	None	5	widely graded gravel with sand, trace fines, brown
A	09ESRD1	1155978.824	1404632.564	390.768	7	0	2	0	1	NA	Couple of spots of sheen when pulling drill tip from water, may have driven 3 ft into bedrock beyond depth cited		
A	09ESRD2	1155982.503	1404594.704	390.59	2	0	1	0	1	NA	Trace hydrocarbon odor in drill tip		
A	09ESRD3	1155982.64	1404541.765	390.523	0	4	1	0	1	NA			
A	09ESRD4	1156173.067	1404672.53	390.19	7.1	0	1	0	1	NA	Trace hydrocarbon odor in drill tip. Sheen at bow spud		
A	09ESRD5	1156164.678	1404649.144	390.434	6	0	1	0	1	NA	May have penetrated bedrock		
A	09ESRD6	1156195.704	1404598.915	390.365	5.6	0	1	0	1	NA	Soft at 2-4 ft below sediment surface		
A	09ESRD7	1156168.589	1404560.927	390.708	0	4	1	0	1	NA	Outer edge of sediment		
A	09ESRD8	1155742.909	1404662.536	390.541	2.5	0	2	0	1	NA	Trace sheet at 1 ft		
A	09ESRD9	1155559.637	1404772.589	390.669	1.2	2	1	0	1	NA	Grey sand in front of rip-rap along shore		
A	09ESRD10	1155370.428	1404976.274	390.436	1.8	0	1	0	1	NA	Hydrocarbon odor at tip of drill		
A	09ESRD12	1155229.75	1405141.679	0	2.9	0	3	0	1	NA	At 09ESC1 location		
A	09ESRD13	1155240.187	1405112.854	390.547	5.3	0	2	0	1	NA			
A	09ESRD14	1155220.743	1405109.693	390.835	5.7	0	3	0	1	NA	Heavy sheen at 1.6 below sediment surface, possible NAPL		
A	09ESRD15	1155214.305	1405088.838	390.736	2.4	0	1	0	1	NA	Boat drifted 7 feet west		
A	09ESRD16	1155217.049	1405067.092	390.565	1.8	0	2	0	1	NA	0		
A	09ESRD17	1155213.616	1405061.817	390.615	0	4	1	0	1	NA	0		
A	09ESRD18	1155220.819	1405074.97	390.651	0	4	1	0	1	NA	Sediment/bedrock edge		
A	C1									2.5	None	3.6	0-4 inches: narrowly graded sand, trace gravel and fines, brown
												4.4	4-11 inches: silt, trace sand and gravel, grey
												4.9	11-24 inches: narrowly graded sand, trace gravel and fines, brown
												3.1	24-30 inches: widely graded gravel with sand, trace fines, light brown
A	C1A	1158151.846	1403249.304	392.512	5.8	2	1	1	0	4.3		5.4	0-37 inches: silt, trace gravel and sand, grey
												5.1	37-52 inches: narrowly graded sand, trace gravel and fines, light brown
A	C2	1157646.664	1403482.563	0	11	3	1	1	0	8.4	Slight hydrocarbon odor	3.8	0-20 inches: narrowly graded fine sand, trace gravel and fines, dark grey
											Slight hydrocarbon odor	5.9	20-51 inches: silt, trace sand and gravel
											None	5.1	51-90 inches: narrowly graded fine sand, trace gravel and fines, dark grey
											Slight hydrocarbon odor	3.8	90-101 inches: narrowly graded fine sand, trace gravel and fines, dark grey
A	C3	1157480.896	1403960.741	392.165	5	2	1	1	0	3		0	0-7 inches: silty sand, trace gravel, light brown
												0	7-27 inches: narrowly graded sand, trace gravel, light brown
												0	27-36 inches: silty sand, trace gravel (up to 3/4 inch dia.), leaves, light brown
												0	36-40 inches: narrowly graded sand, trace gravel, grey

Table A-2
2009 Data (Phase 2)
Genesee River Investigation
Rochester, New York

Project Area	Station ID	NORTHING	EASTING	Elevation	Sediment Thickness [penetration] (feet)	Sediment Type Code	Sheen Code	Core? 1=yes 0= no	Drilled Probe? 1=yes 0=no	Recovery (feet)	Comments	PID (ppm)	Sediment Description
A	C4	1153970.106	1406416.158	389.242	2.6	5	1	1	0	0.9	First attempt	0	GW - widely graded gravel with sand, light brown
A	C4A									0	Second attempt		
A	C4B									1.1	Third attempt - All sediments combined to form a composite sample	0.8	widely graded gravel and sand, light brown
A	C5	1153796.455	1406933.858	392.437	3.5	5	1	1	0	3.5	Core obtained by hand-driving the sampler	5.8	widely graded gravel with sand, light brown
A	RR BRIDGE SCOUR	1156527.821	1404633.192	390.723	0	4	1	0	0	NA			probe hit on bedrock
A	RIVER EL	1161988.071	1403259.533	245.206	NA	NA	NA	NA	NA	NA	Elevation taken on water surface		
A	RIVER WL	1163032.29	1403573.563	246.116	NA	NA	NA	NA	NA	NA	Elevation taken on water surface		
A	09WSP1	1153668.176	1406586.688	398.178	5.5	1	1	0	0	NA			
A	09WSP2	1153671.184	1406595.385	388.654	5	1	1	0	0	NA			
A	09WSP3	1153673.908	1406568.726	400.384	4.5	1	2	0	0	NA	Trace sheen		
A	09WSP4	1153677.846	1406562.165	400.178	0	1	1	0	0	NA			
A	09WSP5	1153722.69	1406432.253	281.789	6	1	1	0	0	NA			
A	09WSP6	1153720.826	1406423.427	410.786	4	1	1	0	0	NA			
A	09WSP7	1153725.491	1406396.485	403.665	4	1	1	0	0	NA			
A	09WSP8	1153767.552	1406216.137	395.518	4	1	1	0	0	NA	oil-like odor		
A	09WSP9	1153762.721	1406232.097	399.849	5	1	1	0	0	NA			
A	09WSP10	1153774.176	1406200.268	417.805	4	1	1	0	0	NA	slight oil-like odor		
A	09WSP11	1153778.743	1406192.673	407.942	4	1	1	0	0	NA	oil-like odor		
A	09WSP12	1153802.371	1406174.669	394.906	5	1	1	0	0	NA	oil-like odor		
C	HP1	1163630.171	1404388.895	0	3.8	3	1	0	0	NA			
C	HP3	1163548.544	1404369.012	0	3.4	3	1	0	0	NA			
C	HP4	1163493.08	1404356.454	0	3.8	3	1	0	0	NA			
C	HP5	1163426.104	1404344.942	0	4	3	1	0	0	NA			
C	HP6	1163380.058	1404334.477	0	4	3	1	0	0	NA			
C	HP8	1163280.64	1404285.292	0	3.9	3	1	0	0	NA			
C	HP9	1163231.455	1404264.362	0	4	3	1	0	0	NA			
C	HP10	1163173.898	1404248.664	0	3.8	3	1	0	0	NA			
C	HP11	1163139.363	1404235.06	0	3.8	3	1	0	0	NA			
C	HP12	1163102.736	1404213.083	0	3.2	3	1	0	0	NA			
C	HP13	1163062.969	1404187.967	0	3.4	3	1	0	0	NA			
C	HP14	1163024.248	1404163.898	0	3.6	3	1	0	0	NA			
C	HP15	1162989.714	1404140.875	0	3.5	3	1	0	0	NA			
C	HP16	1162955.179	1404116.805	0	3.6	3	1	0	0	NA			
C	HP2	1163590.404	1404378.43	0	3.6	3	1	0	0	NA			
C	HP7	1163324.593	1404307.268	0	4	3	1	0	0	NA			

ES = East Station Area
WS = West Station Area
C = Cores (vibracores or push cores)
RD = Drilled probes (rock drill)
EP = Electric hammer probes
HP = Hand probe

Sediment Bottom Type
1 = cobbley bottom
2 = sandy bottom
3 = silty bottom
4 = bedrock bottom
5 = sand and gravel

Sediment Sheen Observations
1 = no sheen
2 = trace sheen
3 = moderate to heavy sheen
4 = visible NAPL

Horizontal positioning is reported in North American Datum 1983 (NAD83), New York State Plane West
Elevation is referenced to RG&E Plant Datum.
Add 0.63 feet to convert to New York State Barge Canal Datum
Add 1.71 feet to convert to NVGD 29
Elevations are of the sediment surface unless otherwise noted

BAUSCH STREET BRIDGE

HIGH FALLS BREWING CO.

RG&E WEST STATION MGP SITE

PLATT STREET BRIDGE

RG&E WEST STATION PARK AREA MGP SITE (REMEDIATED)

UPPER FALLS

RG&E FRONT ST. MGP SITE

N

LEGEND

- MUNICIPAL SEWER - ACTIVE
- MUNICIPAL SEWER- ABANDONED OR HISTORIC
- OTHER OUTFALL - ACTIVE OR OBSERVED
- OTHER OUTFALL - ABANDONED OR HISTORIC
- MONROE COUNTY COMBINED SEWER OVERFLOW ABATEMENT PROGRAM TUNNELS
- RG&E Remediated Sites
- RG&E MGP Sites
- 2008 INVESTIGATION
- 2009 INVESTIGATION
- VIBRACORE
- DRILLED PROBE
- CORE
- PROBE

SOURCE:
1. ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm), IMAGE DATE: APRIL 2005.

0 100 200 400

SCALE, FEET

PHASE 2 ASSESSMENT
GENESEE RIVER
ROCHESTER, NEW YORK

ROCHESTER GAS & ELECTRIC COMPANY
ROCHESTER, NEW YORK

GEI Consultants

SURVEY POINTS 2008 & 2009 RESULTS AREA A

Project 091980 | March 2010 | Figure 1

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PHASE 2 ASSESSMENT
GENESEE RIVER
ROCHESTER, NEW YORK

ROCHESTER GAS & ELECTRIC COMPANY
ROCHESTER, NEW YORK

GEI Consultants

SURVEY POINTS 2008 & 2009 RESULTS AREA A

Project 091980 | March 2010 | Figure 2

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MIDDLE FALLS

AREA NOT SURVEYED/
INACCESSIBLE

MONROE COUNTY AND RG&E
BREWER STREET SITE
(REMEDIATED)

ABANDONED RAILROAD
BRIDGE

RAECO PRODUCTS
INACTIVE HAZ
WASTE DISPOSAL SITE

N

LEGEND

- MUNICIPAL SEWER - ACTIVE
- MUNICIPAL SEWER- ABANDONED OR HISTORIC
- OTHER OUTFALL - ACTIVE OR OBSERVED
- OTHER OUTFALL - ABANDONED OR HISTORIC
- MONROE COUNTY COMBINED SEWER OVERFLOW ABATEMENT PROGRAM TUNNELS
- RG&E Remediated Sites
- RG&E MGP Sites
- 2008 INVESTIGATION
- 2009 INVESTIGATION
- VIBRACORE
- DRILLED PROBE
- CORE
- PROBE

SOURCE:
1. ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm), IMAGE DATE: APRIL 2005.

0 100 200 400
SCALE, FEET

PHASE 2 ASSESSMENT
GENESEE RIVER
ROCHESTER, NEW YORK

ROCHESTER GAS & ELECTRIC COMPANY
ROCHESTER, NEW YORK

GEI Consultants

Project 091980

**SURVEY POINTS
2008 & 2009 RESULTS
AREA A**

March 2010 Figure 3

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LEGEND

- MUNICIPAL SEWER - ACTIVE
- MUNICIPAL SEWER- ABANDONED OR HISTORIC
- OTHER OUTFALL - ACTIVE OR OBSERVED
- OTHER OUTFALL - ABANDONED OR HISTORIC
- MONROE COUNTY COMBINED SEWER OVERFLOW ABATEMENT PROGRAM TUNNELS
- RG&E Remediated Sites
- RG&E MGP Sites
- 2008 INVESTIGATION
- 2009 INVESTIGATION
- VIBRACORE
- DRILLED PROBE
- CORE
- PROBE

R8 58 R9 R58 43 59 R10 09 rd 2 18 19 42 R11 R57 60 09 rd 03 R12 54 17 R13 41 16 R14 R56 57 R15 15 55 R16 R17 R19 56 R25 R20 R55 40 R18 R23 R26 12 R176 R54 46 R177 R31 R30 R175 V5 RIVER EL 47 R33 R53 13 R179 R180 R178 48 5 R173 R34 R52 R172 R174 R51 14 49 1 R49 R50 50 R167 R48 R168 R47 R166 2 R46 51 R170 R45 R171 6 4 3 R169 52 R40 53 7 R69 R70 R71 R72 8 R41 R73 9 09ep33 R42 09ep34 10 R43 11 09ep35 R44 09ep43 09ep36 09ep44 09ep37 09ep45 09ep38 09ep46 09ep39 09ep47 09ep40 09ep48 09ep41 09ep49 09ep42

KODAK HAWKEYE PLANT

AVENUE E BRIDGE

FORMER DEEP HOLLOW RAVINE

LOWER FALLS

N

SOURCE:
1. ORTHOPHOTO OBTAINED FROM NEW YORK STATE INTERACTIVE MAPPING GATEWAY (http://www1.nysgis.state.ny.us/MainMap.cfm), IMAGE DATE: APRIL 2005.

0 100 200 400

SCALE, FEET

PHASE 2 ASSESSMENT
GENESEE RIVER
ROCHESTER, NEW YORK

ROCHESTER GAS & ELECTRIC COMPANY
ROCHESTER, NEW YORK

GEI Consultants

Project 091980

SURVEY POINTS 2008 & 2009 RESULTS AREA C

March 2010 Figure 4

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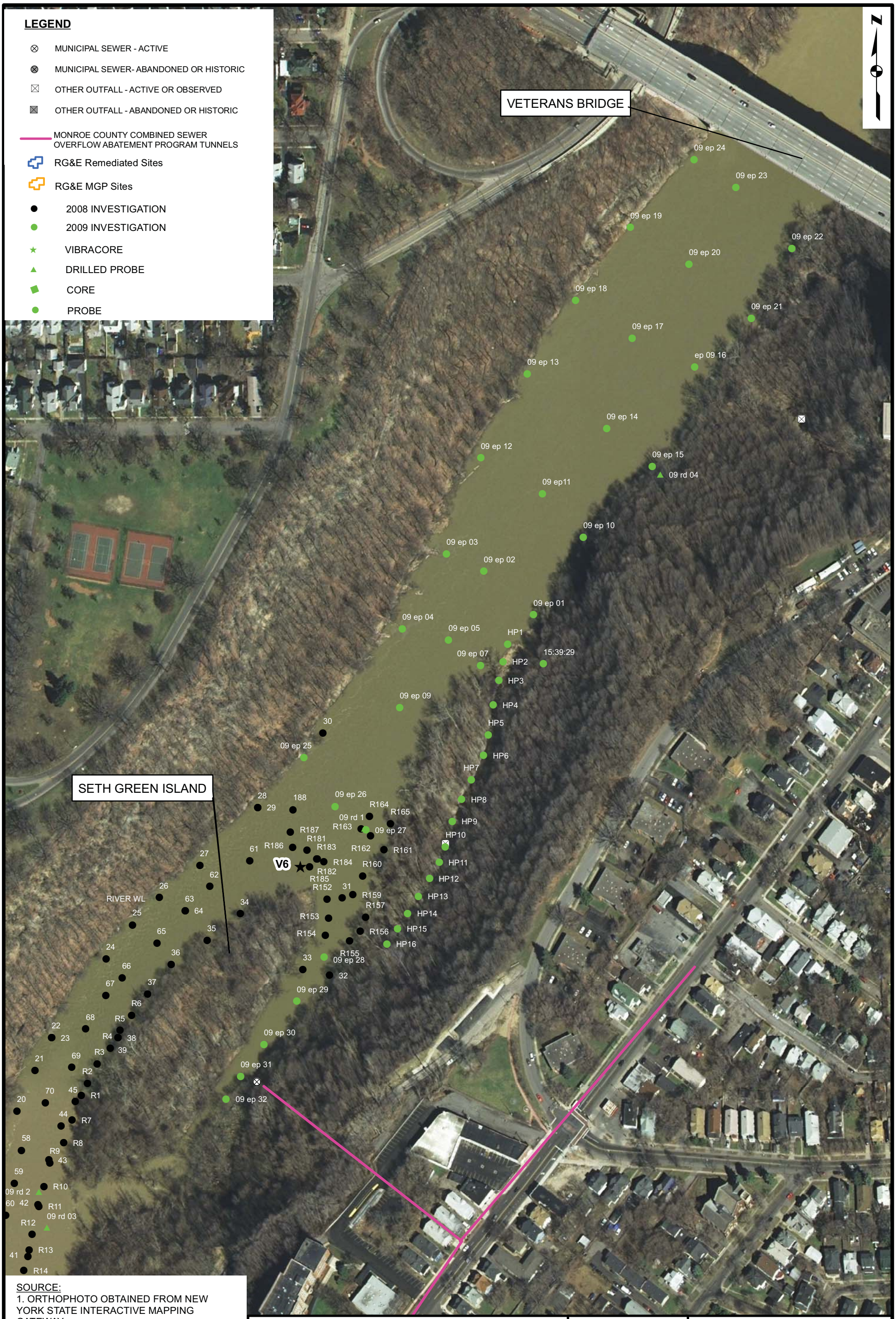

PHASE 2 ASSESSMENT
GENESEE RIVER
ROCHESTER, NEW YORK

ROCHESTER GAS & ELECTRIC COMPANY
ROCHESTER, NEW YORK

GEI Consultants

Project 091980

SURVEY POINTS
2008 & 2009 RESULTS
AREA C

March 2010 Figure 5

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Appendix B

Core Logs

GEI Consultants, Inc. 1301 Trumansburg Rd. Suite N Ithaca, NY 14850 (607) 216-8955	PROJECT NAME: Ph. 2 Assessment in Genesee River LOCATION: Rochester, New York CLIENT: Rochester Gas and Electric PROJ. NUMBER: GEI 091980-1003	BORING ID: **C1** WELL ID: **N/A** PAGE 1 of 1 DATE: 9/29/09

Drilled By:	TG&B	Rig Type:	GeoProbe	Sediment Surface EL (ft):	392.5	Water Depth (ft):	4.8
Foreman:	Mark Avakean	Drilling Method:	Vibracore	EL Datum:	NGVD29	Water EL (ft):	397.3
Logged By:	K. Wolfe	Borehole Dia (in):	3	Total Boring Depth (ft):	7	Water EL Date:	9/29/09

Depth (ft)	Sample Information					USCS Visual Descriptions and Remarks
	Type & No.	Pen. (in)	Rec. (in)	Blows/6 in.	VOC (ppm)	*Groundwater levels dependent upon conditions present at time of measurement. Stratification lines represent approximate boundaries between soil types; actual transitions may be gradual.*
0	S1	84		NA	3.6 ppm 4.4 ppm	S1 (0-4"): NARROWLY GRADED SAND (SP); ~90% fine sand, <5% fines, <5% gravel, light brown, wet.
					4.9 ppm	S1 (4-11"): SILT (ML); ~90% fines, <5% sand, <5% gravel, dark gray, wet.
						S1 (11-24"): Similar to S1 (0-4").
2					3.1 ppm	S1 (24-30"): WIDELY GRADED GRAVEL WITH SAND (GW); ~75% gravel up to 2", ~20% fine to coarse sand, <5% fines, light brown, wet.
4						No odors- PID readings may be due to moisure (raining). 35% recovery.
6						Bottom of borehole at 7 feet.

NOTES:

Drilled to 7 feet but B. Coulombe suspects a rock at the end was pushing the last 4 feet.

ABBREVIATIONS:

PEN = PENETRATION LENGTH OF SAMPLER OR CORE BARREL
REC = RECOVERY LENGTH OF SAMPLE
VOC = VOLATILE ORGANIC COMPOUND CONCENTRATION
SVOC = SEMI-VOLATILE ORGANIC COMPOUND CONCENTRATION
TOC = TOTAL ORGANIC COMPOUND CONCENTRATION
PPM = PARTS PER MILLION
IN/FT = INCHES/FEET
N/M = NOT MEASURED
N/A = NOT APPLICABLE

GEI Consultants, Inc.
1301 Trumansburg Rd.
Suite N
Ithaca, NY 14850
(607) 216-8955

PROJECT NAME: Ph. 2 Assessment in Genesee River
LOCATION: Rochester, New York
CLIENT: Rochester Gas and Electric
PROJ. NUMBER: GEI 091980-1003

BORING ID: **C1A**
WELL ID: **N/A**
PAGE 1 of 1 DATE: 9/29/09

Drilled By:	TG&B	Rig Type:	GeoProbe	Sediment Surface EL (ft):	392.5	Water Depth (ft):	2.5
Foreman:	Mark Avakean	Drilling Method:	Vibracore	EL Datum:	NGVD29	Water EL (ft):	395.0
Logged By:	K. Wolfe	Borehole Dia (in):	3	Total Boring Depth (ft):	5.75	Water EL Date:	9/29/10

Depth (ft)	Sample Information					USCS Visual Descriptions and Remarks
	Type & No.	Pen. (in)	Rec. (in)	Blows/6 in.	VOC (ppm)	*Groundwater levels dependent upon conditions present at time of measurement. Stratification lines represent approximate boundaries between soil types; actual transitions may be gradual.*
0	S1	69		NA	5.4 ppm	S1(0-37"): SILT (ML); ~90% fines, <5% gravel, <5% sand, gray, wet.
2					5.1 ppm	S1(37-52"): NARROWLY GRADED SAND (SP); ~90% fine sand, <5% gravel, <5% fines, light brown, wet.
4						No odors- PID readings may be due to moisture (raining). 75% recovery.
						Bottom of borehole at 5.75 feet.

NOTES:

Samples collected for VOC, SVOC, TOC and particle size: 091980-C1A(0-37") at 1600, 091980-C1A(37-52") at 1615.

ABBREVIATIONS:

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SVOC = SEMI-VOLATILE ORGANIC COMPOUND CONCENTRATION
TOC = TOTAL ORGANIC COMPOUND CONCENTRATION
PPM = PARTS PER MILLION
IN/FT = INCHES/FEET
N/M = NOT MEASURED
N/A = NOT APPLICABLE

GEI Consultants, Inc. 1301 Trumansburg Rd. Suite N Ithaca, NY 14850 (607) 216-8955	PROJECT NAME: Ph. 2 Assessment in Genesee River LOCATION: Rochester, New York CLIENT: Rochester Gas and Electric PROJ. NUMBER: GEI 091980-1003	BORING ID: **C2** WELL ID: **N/A** PAGE 1 of 1 DATE: 9/29/09

Drilled By:	TG&B	Rig Type:	GeoProbe	Sediment Surface EL (ft):	Not Recorded	Water Depth (ft):	2.5
Foreman:	Mark Avakean	Drilling Method:	Vibracore	EL Datum:	NGVD29	Water EL (ft):	Not Recorded
Logged By:	K. Wolfe	Borehole Dia (in):	3	Total Boring Depth (ft):	11	Water EL Date:	9/29/09

Depth (ft)	Sample Information					USCS Visual Descriptions and Remarks
	Type & No.	Pen. (in)	Rec. (in)	Blows/6 in.	VOC (ppm)	*Groundwater levels dependent upon conditions present at time of measurement. Stratification lines represent approximate boundaries between soil types; actual transitions may be gradual.*
0	S1	132		NA	3.8 ppm	S1(0-20"): NARROWLY GRADED SAND (SP); ~90% fine sand, <5% gravel, <5% sand, dark gray, wet, slight hydrocarbon-like odor.
2					5.9 ppm	S1(20-51"): SILT (ML); ~90% fines, <5% gravel, <5% sand, dark gray, wet, slight hydrocarbon-like odor.
4					5.1 ppm	S1(51-90"): Similar to S1(0-20").
6						
8					3.8 ppm	S1(90-101"): Similar to S1(20-51") but hydrocarbon-like odor.
10						76% recovery.
						Bottom of borehole at 11 feet.

NOTES:

Samples collected for VOC, SVOC, TOC and particle size: 091980-C2(0-20") at 1720, 091980-C2(20-51") at 1735.

ABBREVIATIONS:

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REC = RECOVERY LENGTH OF SAMPLE
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SVOC = SEMI-VOLATILE ORGANIC COMPOUND CONCENTRATION
TOC = TOTAL ORGANIC COMPOUND CONCENTRATION
PPM = PARTS PER MILLION
IN/FT = INCHES/FEET
N/M = NOT MEASURED
N/A = NOT APPLICABLE

GEI Consultants, Inc. 1301 Trumansburg Rd. Suite N Ithaca, NY 14850 (607) 216-8955	PROJECT NAME: Ph. 2 Assessment in Genesee River LOCATION: Rochester, New York CLIENT: Rochester Gas and Electric PROJ. NUMBER: GEI 091980-1003	BORING ID: **C3** WELL ID: **N/A** PAGE 1 of 1 DATE: 9/29/09

Drilled By:	TG&B	Rig Type:	GeoProbe	Sediment Surface EL (ft): 392.2	Water Depth (ft): 2.6
Foreman:	Mark Avakean	Drilling Method:	Vibracore	EL Datum: NGVD29	Water EL (ft): 394.8
Logged By:	K. Wolfe	Borehole Dia (in):	3	Total Boring Depth (ft): 5	Water EL Date: 9/29/09

Depth (ft)	Sample Information					USCS Visual Descriptions and Remarks
	Type & No.	Pen. (in)	Rec. (in)	Blows/6 in.	VOC (ppm)	*Groundwater levels dependent upon conditions present at time of measurement. Stratification lines represent approximate boundaries between soil types; actual transitions may be gradual.*
0	S1	40		NA	0.0 ppm	S1(0-7"): SILTY SAND (SM); ~70% fine to coarse sand, ~20% fines, ~10% gravel up to 1/2", light brown, wet.
					0.0 ppm	S1(7-27"): NARROWLY GRADED SAND (SP); ~90% fine sand, <5% gravel, <5% sand, light brown, wet.
2					0.0 ppm	S1(27-36"): Similar to S1(0-7") except gravel up to 3/4" and pieces of leaves present.
					0.0 ppm	S1(36-40"): Similar to S1(7-27") except gray.
4						100% recovery.
						Bottom of borehole at 5 feet.

NOTES:

Samples collected for VOC, SVOC, TOC and particle size: 091980-C3(0-7") at 0815 (on 9/30/09), 091980-C3(20-51") at 0830 (on 9/30/09).

ABBREVIATIONS:

PEN = PENETRATION LENGTH OF SAMPLER OR CORE BARREL
REC = RECOVERY LENGTH OF SAMPLE
VOC = VOLATILE ORGANIC COMPOUND CONCENTRATION
SVOC = SEMI-VOLATILE ORGANIC COMPOUND CONCENTRATION
TOC = TOTAL ORGANIC COMPOUND CONCENTRATION
PPM = PARTS PER MILLION
IN/FT = INCHES/FEET
N/M = NOT MEASURED
N/A = NOT APPLICABLE

Appendix C

Data Usability Summary Reports

Data Usability Summary Report (DUSR)

NYSDEC ASP Category B

Client/Company:	GEI Consultants, Inc., Ithaca, New York (GEI)
Site/Project Name:	RG&E Genesee River Sediment Project
Laboratory:	TestAmerica – Buffalo, New York (TA-BUF)
SDGs/Lab Project #:	RSJ0349, RSJ0350, & RSJ0351
Date(s) of Collection:	September 29, 2009 through October 1, 2009
Number and Type Samples & Analyses:	22 sediment samples for Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX), 18 Polycyclic Aromatic Hydrocarbons (PAHs), and Percent Solids
Senior Data Reviewers:	Dr. Nancy C. Rothman, New Environmental Horizons, Inc. Susan D. Chapnick, New Environmental Horizons, Inc.
Date Completed:	January 6, 2010

This Data Usability Summary Report (DUSR) is based on guidance developed by the New York State Department of Conservation (NYSDEC), June 1999, for technical review of analytical data in lieu of a full third party data validation. The objective of the DUSR is to determine whether or not the data as presented meet NYSDEC ASP 2005, or EPA method QC acceptance criteria, as applicable.

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I. Required DUSR Questions

1. ***Is the data package complete as defined under the requirements for the NYSDEC ASP Category B or USEPA CLP deliverables?***

   Yes.

2. ***Have all holding times been met?***

   Yes.

3. ***Do all the QC data: blanks, instrument tunings, calibration standards, calibration verifications, surrogate recoveries, spike recoveries, replicate analyses, laboratory controls and sample data fall within the protocol required limits and specifications?***

   In general yes, with some QC exceptions resulting in qualification of data as described in Section III.

   Further details on these issues and other deviations and QC exceptions from NYSDEC ASP 2005 QC protocols, as applicable, are noted in Section III, below.

4. ***Have all of the data been generated using established and agreed upon analytical protocols?***

   Yes. Analytical data were generated using established EPA Methods (see analytical references in Section II below). Deviations from EPA or other method protocols and NYSDEC ASP 2005 QC protocols, as applicable, are discussed in Section III.

5. ***Does an evaluation of the raw data confirm the results provided in the data summary sheets and quality control verification forms?***

   Yes. The raw data were checked to verify that detected results met retention time and mass spectral criteria, where applicable, for qualitative identification. A spot check was performed to verify quantitative accuracy for reporting of all results.

6. ***Have the correct data qualifiers been used?***

   The laboratory used the "D" qualifier for all results reported from an analytical run performed at a dilution factor (DF) greater than 1; however, this qualifier should only be used to identify results reported from a secondary dilution analysis. This "D" qualifier was removed from the validated data results.

II. Sample Descriptions and Analytical Parameters

The sample IDs, date of sampling, identification of MS/MSD/MD, FD, FB, TB, if applicable and the analytical parameters reviewed in this DUSR are listed in Table 1. Any deviations noted for sample collection or receipt (*e.g.*, temperature or preservation issues) are included in Section III, below.

Table 1. Sample Descriptions and Analytical Parameters

Sample ID	Lab ID	Collection Date	Matrix	Analytical Parameters [1]	Sample Type
091980-C1A (0-37)	RSJ0349-01	9/29/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample
091980-C1A (37-52)	RSJ0349-02	9/29/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample
091980-C2 (0-20)	RSJ0349-03	9/29/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample
091980-C2 (20-51)	RSJ0349-04	9/29/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample
091980-C3 (0-7)	RSJ0349-05	9/30/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample
091980-C3 (7-27)	RSJ0349-06	9/30/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample
091980-COMP-C4/C4A	RSJ0349-07	9/30/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample
091980-C5	RSJ0349-08	10/1/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample
091980-09ES1 (0-14)	RSJ0350-01	10/1/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample
091980-09ES1 (14-23)	RSJ0350-02	10/1/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample
091980-09ES2	RSJ0350-03	10/1/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample
091980-09ES4	RSJ0350-04	10/1/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample
091980-09ES6	RSJ0350-05	10/1/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample
091980-09ES7	RSJ0350-06	10/1/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample
091980-09ES9	RSJ0350-07	10/1/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample

Table 1. Sample Descriptions and Analytical Parameters - *continued*

Sample ID	Lab ID	Collection Date	Matrix	Analytical Parameters [1]	Sample Type
091980-09ES12	RSJ0350-08	10/1/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample
091980-09WS1	RSJ0351-01	9/30/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample
091980-09WS3	RSJ0351-02	9/30/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample
091980-09WS4	RSJ0351-03	9/30/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample
091980-09WS5	RSJ0351-04	9/30/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample
091980-09WS2 (0-16)	RSJ0351-05	9/30/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample
091980-09WS2 (16-32)	RSJ0351-05	9/30/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample

Analytical method references:

BTEX: Benzene, Toluene, Ethylbenzene, and Xylenes analysis by EPA SW-846 Method 8260B

PAHs: Naphthalene, 2-Methylnaphthalene, Acenaphthylene, Acenaphthene, Dibenzofuran, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, and Benzo(g,h,i)perylene analysis by EPA SW-846 Method 8270C

[1] Samples were also analyzed for Particle size, Black Carbon, and Total Organic Carbon (TOC) by TestAmerica – Burlington, VT. These analyses were not reviewed for this NYS DUSR, at the client's request.

III. Data Deficiencies, Analytical Protocol Deviations, and Quality Control Problems

The following QC elements, as applicable to the analytical methods, were reviewed during this DUSR:

- Data package completeness and reporting protocols
- Sample receipt, holding times and preservation criteria
- Calibration criteria (instrument tuning, initial and continuing calibration verifications)
- Method, field, and instrument blank results
- Laboratory Control Sample (LCS), Blank Spike (BS), or Matrix Spike Blank (MSB) recoveries

- Surrogate or System Monitoring Compound (SMC) Recoveries
- Matrix Spike (MS) / Matrix Spike Duplicate (MSD) Recoveries
- MS/MSD, sample/Matrix Duplicate (MD), or sample/Field Duplicate (FD) Relative Percent Differences (RPDs)
- Sample result reporting (including reporting limits and units)
- Other method-specific QC if applicable and reported (e.g., internal standard areas)
- Deficiencies or protocol deviations as noted in the Laboratory Narrative

During this review of BTEX and PAHs, various results were estimated (J) due to QC issues. Table 2 summarizes the actions taken during this review. NEH generated a validated data spreadsheet based on the electronic project database file (EDD) received from GEI for these SDGs. All results were considered acceptable compared to NYSDEC ASP 2005 and method criteria, as applicable, with the understanding of the potential uncertainty (bias) in the qualified results.

Table 2. Summary of Data Validation Actions

Field Sample ID	Analyte	Qualifier	Bias	Validation Comments
091980-09ES1 (0-14)	Benzene & Toluene	J	I	Replicate analysis imprecision
091980-09WS1 & 091980-09WS2 (16-32)	Benzene	J	I	Result uncertain below the calibration range
091980-09ES12	Ethylbenzene	J	I	Result uncertain below the calibration range
091980-09ES6, 091980-09ES12, & 091980-09WS1	m-Xylene & p-Xylene	J	I	Result uncertain below the calibration range
091980-09ES6 & 091980-09ES12	o-Xylene	J	I	Result uncertain below the calibration range
091980-C1A (37-52), 091980-09ES1 (14-23), 091980-09ES2, 091980-09ES4, 091980-09ES6, 091980-09ES7, 091980-09WS1, & 091980-09WS2 (0-16)	Toluene	J	I	Result uncertain below the calibration range
091980-09ES12	Xylenes, total	J	I	Result uncertain below the calibration range
091980-09WS1 & 091980-09WS3	2-Methylnaphthalene	J	I	Result uncertain below the calibration range
091980-09WS5	Acenaphthene	J	I	Result uncertain below the calibration range

Table 2. Summary of Data Validation Actions

Field Sample ID	Analyte	Qualifier	Bias	Validation Comments
091980-09ES12	Anthracene	J	I	Result uncertain below the calibration range
091980-C2 (0-20) & 091980-C3 (0-7)	Benzo[a]anthracene	J	I	Result uncertain below the calibration range
091980-09ES12	Benzo[g,h,i]perylene	J	I	Result uncertain below the calibration range
091980-C2 (0-20) & 091980-C5	Chrysene	J	I	Result uncertain below the calibration range
091980-09WS3	Dibenzofuran	J	I	Result uncertain below the calibration range
091980-C3 (0-7)	Fluoranthene	J	I	Result uncertain below the calibration range
091980-09WS4 & 091980-09WS5	Fluorene	J	I	Result uncertain below the calibration range
091980-C2 (20-51) & 091980-C3 (0-7)	Pyrene	J	I	Result uncertain below the calibration range

Qualifiers: U = Analyte is non-detect at the "DV Result" value; UJ = Non-detect is estimated; J = Result is estimated; R = Result is rejected and is unusable for project decisions.

Bias: *L = Low; H = High; I = Indeterminate*

As required by the DUSR, the following sections document the QC reviewed and the issues that required action or affected the data certainty in terms of the project data quality objectives (DQO) of accuracy, precision, representativeness, comparability, and sensitivity. The DQO of completeness can be evaluated by the project manager after all data are generated.

Data Package Completeness and Reporting Protocols

- The initial and continuing calibrations and sample quantitation lists for BTEX contained many compounds in addition to the targets requested. During this review, only the target compounds were assessed.
- The lab reported m-Xylene & p-Xylene and o-Xylene as well as Xylene, total for all samples.
- Sample IDs, which indicated the depth of collection, were reported by the lab missing the inch symbol (") following the depth. For example, sample with Chain-of-Custody (COC) ID 091980-C1A (0-37") was reported by the lab as 091980-C1A (0-37). Since the lab data package and EDD have the same ID reported, no action was taken except to note this reporting discrepancy.
- The laboratory used in-house QC limits to judge acceptability of surrogates, LCS, and calibrations. During this review, the NYSDEC ASP 2005 QC limits for the compounds specified in Exhibit E were used to evaluate the acceptability of the

laboratory quality control, unless otherwise discussed below, while the in-house limits were used to judge the other spiked compounds.

- For BTEX analysis, the laboratory spiked only Benzene and Toluene in the LCS; this is considered acceptable. For the PAH LCS, the laboratory spiked all 18 target PAHs.
- The laboratory reported too many significant figures for some data. For organic results, NYSDEC ASP 2005 indicates that one significant figure should be reported for values < 10; however, the laboratory reported two significant figures for values < 10.
- There were several issues identified in the reporting of results as follows: 1) all results analyzed at a dilution (dilution factor (DF) >1) were flagged with a "D" qualifier; however, this qualifier should only be used to identify results of a secondary dilution; 2) the "Test_Type" field in the EDD incorrectly identified initial analyses as dilutions if DF > 1; 3) reanalysis of PAH extracts at secondary dilutions were improperly identified as "Reextract" analyses; 4) sample matrix was identified as Soil ("SO") in the EDD, whereas all samples were identified as "Sed" on the COC; and 5) inconsistent/incorrect preparation methods for BTEX were listed for the samples (e.g., 5030B, 5030A, Methanol prep). These database (EDD) issues were not corrected during this review at the client's request.
- For BTEX analysis, low-level analysis was performed for sixteen samples, four samples were analyzed as medium-level samples, and two samples were analyzed as both low-level and medium-level samples. The nomenclature used in the data package for the medium-level analyses infers that approximately 5g of sample was added to 500 mL methanol and 5 mL of extract was analyzed. However, it is believed that this is a shorthand description of the actual medium-level analysis since a GC/MS system can't handle analysis of 5 mL of methanol. Recalculation of reporting limits and results during this review suggests that the laboratory followed Method 5035A sample preparation: approximately 5 g of sample was added to 10 mL of methanol and 100 µL of extract was purged in 5 mL of water.
- For medium-level BTEX analysis, the laboratory did not account for the sample moisture contribution to the overall extract volume as required by Method 5035A and 8000C section 11.10.5. No action was taken except to note this discrepancy in reporting.
- For PAHs, it appears as though the laboratory did not account for the actual weight of sample extracted in their calculation of results. A check of various data points suggest that the laboratory defaulted all calculations to 30 g extracted regardless of the actual weight extracted. Since all actual extraction weights ranged from 30.05 g to 30.57 g, and since all data were properly reported to two significant figures, the effect of using a default of 30 g was not considered to have a significant affect on the data (i.e., < 3% error).

Sample Receipt, Holding Times, and Preservation

- Samples were received from GEI in three coolers on October 5, 2009 and the laboratory assigned a separate project number (RSJ0349, RSJ0350, & RSJ0351) for each of the coolers. A single report was prepared for all three project numbers by the laboratory.
- The sediment samples were not preserved in the field for BTEX analysis (*i.e.,* SW-846 Method 5035A was not employed for Volatile sample preservation).

- There was no sample receipt documentation in the data package other than a note on the bottom of the COC of "3 @ 5°C". The project narrative did not raise any additional issues. Therefore, it was assumed that all samples were received intact, at 4 ± 2°C.

Calibration

- There were no issues with the calibrations for BTEX and PAHs.

Method, Field, and Instrument Blank Results

- The method blanks were all non-detect for BTEX and PAHs; therefore, no action was required.
- There were no trip blanks or field blanks associated with the samples in these projects.

Laboratory Control Sample (LCS), Blank Spike (BS), or Matrix Spike Blank (MSB) recoveries

- The LCS recoveries were acceptable for all analyses, indicating acceptable accuracy for the methods as performed by the laboratory.

Surrogate or System Monitoring Compound (SMC) Recoveries

- The laboratory monitored only the three Base/Neutral (B/N) surrogates for PAH analysis. The three acid surrogates, which are not relevant to PAH analysis, were not reported.
- A few surrogate recoveries were outside ASP 2005 criteria in the BTEX and PAH analyses; however, recoveries were within lab limits and within ± 10% of ASP 2005 criteria; therefore, recovery results were considered acceptable.
- The PAH surrogate Nitrobenzene-d_5 was recovered high (outside lab limits and outside + 10% of ASP 2005 limits) in two samples; however, since the other two B/N surrogates were recovered within criteria, no action was required.

Matrix Quality Control (Matrix Spike/Matrix Duplicate/Matrix Spike Duplicate and Field Duplicate Samples)

- There were no MS/MSD analyses performed for BTEX or PAHs on the samples in these projects. Therefore, accuracy and precision in the sample matrix for the target compounds could not be evaluated.
- No field duplicate was collected with these sediment samples. Therefore, overall precision of sampling through analysis and representativeness of the sample results could not be assessed.

Sample result reporting (including reporting limits and units)

- All results are reported with sample-specific reporting limits (adjusted for dilution factors) on a dry-weight basis for sediments (based on sample percent solids) in units of µg/Kg.
- All non-detects were reported at levels less than or equal to the NYSDEC ASP 2005 Contract Required Quantitation Limits (CRQLs) for samples analyzed without dilution (*i.e.,* dilution factor (DF) = 1). Several samples, as shown in the attached Data Review Checklists and in the EDD, were analyzed with dilutions (DF ranged from 2 to 100) since one or more of the target analytes would have been reported over

the instrument calibration range in a DF=1 analysis. The non-detects associated with the DF > 1 analyses, which have elevated reporting limits, need to be evaluated by the data user for project uses.

- Several detected BTEX and PAH results were reported at concentrations below the sample-specific reporting limits (RL). During this assessment, these results were qualified as estimated (J) with indeterminate bias due to uncertainty in quantitation at a level below the instrument calibration range. Table 2 identifies the analytes and samples that were estimated due to reporting at levels below the RL.
- Sample 091980-09ES1 (0-14) was analyzed as a medium-level sample for BTEX. An initial analysis at DF=1 reported ethylbenzene over the calibration range. It appears as though a second medium-level preparation of the sample was done and a DF=4 analysis of this new extract was performed. A comparison of the DF=1 and DF=4 for benzene and toluene indicated imprecision between the two analyses (RPD > 50% for toluene and benzene between the two analyses even though both runs reported these compounds within calibration range). Based on professional judgment, the higher DF=4 results for toluene and benzene were chosen for reporting of results. The data for benzene and toluene were considered estimated (J) however, due to the observed imprecision between the replicate analyses. These results suggest that sample heterogeneity may have affected the BTEX results for these samples.
- There were multiple analyses for BTEX for five other samples and secondary dilution analyses for five PAH samples. The attached Data Review Checklists show a comparison of results for each set of analyses for each sample and describe the decisions made for data acceptance. All data not accepted for reporting were eliminated from the project database file so that only one valid result for each compound was reported for each sample.

New Environmental Horizons, Inc.

Data Usability Summary Report (DUSR)

NYSDEC ASP Category B

Client/Company:	GEI Consultants, Inc., Ithaca, New York (GEI)
Site/Project Name:	RG&E Genesee River Sediment Project
Laboratory:	TestAmerica – Buffalo, New York (TA-BUF)
SDGs/Lab Project #:	RSJ0389
Date(s) of Collection:	October 1, 2009
Number and Type Samples & Analyses:	5 sediment samples for Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX), 18 Polycyclic Aromatic Hydrocarbons (PAHs), and Percent Solids
Senior Data Reviewers:	Dr. Nancy C. Rothman, New Environmental Horizons, Inc. Susan D. Chapnick, New Environmental Horizons, Inc.
Date Completed:	January 8, 2010

This Data Usability Summary Report (DUSR) is based on guidance developed by the New York State Department of Conservation (NYSDEC), June 1999, for technical review of analytical data in lieu of a full third party data validation. The objective of the DUSR is to determine whether or not the data as presented meet NYSDEC ASP 2005, or EPA method QC acceptance criteria, as applicable.

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I. Required DUSR Questions

1. ***Is the data package complete as defined under the requirements for the NYSDEC ASP Category B or USEPA CLP deliverables?***

   Yes.

2. ***Have all holding times been met?***

   Yes.

3. ***Do all the QC data: blanks, instrument tunings, calibration standards, calibration verifications, surrogate recoveries, spike recoveries, replicate analyses, laboratory controls and sample data fall within the protocol required limits and specifications?***

   In general yes, with some QC exceptions resulting in qualification of data as described in Section III.

   Further details on these issues and other deviations and QC exceptions from NYSDEC ASP 2005 QC protocols, as applicable, are noted in Section III, below.

4. ***Have all of the data been generated using established and agreed upon analytical protocols?***

   Yes. Analytical data were generated using established EPA Methods (see analytical references in Section II below). Deviations from EPA or other method protocols and NYSDEC ASP 2005 QC protocols, as applicable, are discussed in Section III.

5. ***Does an evaluation of the raw data confirm the results provided in the data summary sheets and quality control verification forms?***

   Yes. The raw data were checked to verify that detected results met retention time and mass spectral criteria, where applicable, for qualitative identification. A spot check was performed to verify quantitative accuracy for reporting of all results.

6. ***Have the correct data qualifiers been used?***

   The laboratory used the "D" qualifier for all results reported from an analytical run performed at a dilution factor (DF) greater than 1; however, this qualifier should only be used to identify results reported from a secondary dilution analysis. This "D" qualifier was removed from the validated data results.

II. Sample Descriptions and Analytical Parameters

The sample IDs, date of sampling, identification of MS/MSD/MD, FD, FB, TB, if applicable and the analytical parameters reviewed in this DUSR are listed in Table 1. Any deviations noted for sample collection or receipt (*e.g.*, temperature or preservation issues) are included in Section III, below.

Table 1. Sample Descriptions and Analytical Parameters

Sample ID	Lab ID	Collection Date	Matrix	Analytical Parameters [1]	Sample Type
09ES C14	RSJ0389-01	10/1/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample [used for MS/MSD in BTEX]
09ES C13	RSJ0389-02	10/1/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample
09WS C6	RSJ0389-03	10/1/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample
09WS C7	RSJ0389-04	10/1/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample
09WS C8	RSJ0389-05	10/1/2009	SED	BTEX, PAHs, & Percent Solids	Field Sample

Analytical method references:

BTEX: Benzene, Toluene, Ethylbenzene, and Xylenes analysis by EPA SW-846 Method 8260B

PAHs: Naphthalene, 2-Methylnaphthalene, Acenaphthylene, Acenaphthene, Dibenzofuran, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, and Benzo(g,h,i)perylene analysis by EPA SW-846 Method 8270C

[1] Samples were also analyzed for Particle size, Black Carbon, and Total Organic Carbon (TOC) by TestAmerica – Burlington, VT. These analyses were not reviewed for this NYS DUSR, at the client's request.

III. Data Deficiencies, Analytical Protocol Deviations, and Quality Control Problems

The following QC elements, as applicable to the analytical methods, were reviewed during this DUSR:

- Data package completeness and reporting protocols
- Sample receipt, holding times and preservation criteria

- Calibration criteria (instrument tuning, initial and continuing calibration verifications)
- Method, field, and instrument blank results
- Laboratory Control Sample (LCS), Blank Spike (BS), or Matrix Spike Blank (MSB) recoveries
- Surrogate or System Monitoring Compound (SMC) Recoveries
- Matrix Spike (MS) / Matrix Spike Duplicate (MSD) Recoveries
- MS/MSD, sample/Matrix Duplicate (MD), or sample/Field Duplicate (FD) Relative Percent Differences (RPDs)
- Sample result reporting (including reporting limits and units)
- Other method-specific QC if applicable and reported (e.g., internal standard areas)
- Deficiencies or protocol deviations as noted in the Laboratory Narrative

During this review of BTEX and PAHs, various results were estimated (J) due to QC issues. Table 2 summarizes the actions taken during this review. NEH generated a validated data spreadsheet based on the electronic project database file (EDD) received from GEI for these SDGs. All results were considered acceptable compared to NYSDEC ASP 2005 and method criteria, as applicable, with the understanding of the potential uncertainty (bias) in the qualified results.

Table 2. Summary of Data Validation Actions

Field Sample ID	Analyte	Qualifier	Bias	Validation Comments
09ES C13	Benzene	J	I	Result uncertain below the calibration range
09ES C13	Anthracene, Indeno[1,2,3-cd]pyrene, Benzo[k]fluoranthene, & Fluorene	J	I	Result uncertain below the calibration range
09ES C14	2-Methylnaphthalene	J	I	Result uncertain below the calibration range
09WS C7	Indeno[1,2,3-cd]pyrene & Benzo[k]fluoranthene	J	I	Result uncertain below the calibration range

Qualifiers: U = Analyte is non-detect at the "DV Result" value; UJ = Non-detect is estimated; J = Result is estimated; R = Result is rejected and is unusable for project decisions.

Bias: L = Low; H = High; I = Indeterminate

As required by the DUSR, the following sections document the QC reviewed and the issues that required action or affected the data certainty in terms of the project data quality objectives (DQO) of accuracy, precision, representativeness, comparability, and sensitivity. The DQO of completeness can be evaluated by the project manager after all data are generated.

Data Package Completeness and Reporting Protocols

- The initial and continuing calibrations and sample quantitation lists for BTEX contained many compounds in addition to the targets requested. During this review, only the target compounds were assessed.

- The lab reported m-Xylene & p-Xylene and o-Xylene as well as Xylene, total for all samples.
- The laboratory used in-house QC limits to judge acceptability of surrogates, LCS, and calibrations. During this review, the NYSDEC ASP 2005 QC limits for the compounds specified in Exhibit E were used to evaluate the acceptability of the laboratory quality control, unless otherwise discussed below, while the in-house limits were used to judge the other spiked compounds.
- For BTEX analysis, the laboratory spiked only Benzene and Toluene in the LCS; this is considered acceptable. For the PAH LCS, the laboratory spiked all 18 target PAHs.
- The laboratory reported too many significant figures for some data. For organic results, NYSDEC ASP 2005 indicates that one significant figure should be reported for values < 10; however, the laboratory reported two significant figures for values < 10.
- There were several issues identified in the reporting of results as follows: 1) all results analyzed at a dilution (dilution factor (DF) >1) were flagged with a "D" qualifier; however, this qualifier should only be used to identify results of a secondary dilution; 2) the "Test_Type" field in the EDD incorrectly identified initial analyses as dilutions if DF > 1; and 3) sample matrix was identified as Soil ("SO") in the EDD, whereas all samples were identified as "Sed" on the COC. These database (EDD) issues were not corrected during this review at the client's request.
- All samples for BTEX were analyzed as low-level samples.
- For PAHs, it appears as though the laboratory did not account for the actual weight of sample extracted in their calculation of results. A check of various data points suggest that the laboratory defaulted all calculations to 30 g extracted regardless of the actual weight extracted. Since all data were properly reported to two significant figures, the effect of using a default of 30 g was not considered to have a significant affect on the data (i.e., < 3% error).

Sample Receipt, Holding Times, and Preservation

- The sediment samples were not preserved in the field for BTEX analysis (*i.e.,* SW-846 Method 5035A was not employed for Volatile sample preservation).
- There was no sample receipt documentation in the data package other than a note on the bottom of the COC of 2°C. The project narrative did not raise any additional issues. Therefore, it was assumed that all samples were received intact.

Calibration

- There were no issues with the calibrations for BTEX and PAHs.

Method, Field, and Instrument Blank Results

- The method blanks were all non-detect for BTEX and PAHs; therefore, no action was required.
- There were no trip blanks or field blanks associated with the samples in these projects.

Laboratory Control Sample (LCS), Blank Spike (BS), or Matrix Spike Blank (MSB) recoveries

- The LCS recoveries were acceptable for all analyses, indicating acceptable accuracy for the methods as performed by the laboratory.

Surrogate or System Monitoring Compound (SMC) Recoveries

- The laboratory monitored only the three Base/Neutral (B/N) surrogates for PAH analysis. The three acid surrogates, which are not relevant to PAH analysis, were not reported.
- A few surrogate recoveries were outside ASP 2005 criteria in the BTEX analyses; however, recoveries were within lab limits and within ± 10% of ASP 2005 criteria; therefore, recovery results were considered acceptable.

Matrix Quality Control (Matrix Spike/Matrix Duplicate/Matrix Spike Duplicate and Field Duplicate Samples)

- There were no MS/MSD analyses performed for PAHs on the samples in this project. Therefore, accuracy and precision in the sample matrix for the PAHs could not be evaluated. Accuracy and precision were acceptable in the MS/MSD analysis for BTEX performed on sample 09ES C14. These results are an indication of acceptable analysis of BTEX, by the laboratory, for the site matrix.
- No field duplicate was collected with these sediment samples. Therefore, overall precision of sampling through analysis and representativeness of the sample results could not be assessed.

Sample result reporting (including reporting limits and units)

- All results are reported with sample-specific reporting limits (adjusted for dilution factors) on a dry-weight basis for sediments (based on sample percent solids) in units of µg/Kg.
- All non-detects were reported at levels less than or equal to the NYSDEC ASP 2005 Contract Required Quantitation Limits (CRQLs). Therefore, sensitivity was acceptable for the analyses performed in this project.
- Several detected BTEX and PAH results were reported at concentrations below the sample-specific reporting limits (RL). During this assessment, these results were qualified as estimated (J) with indeterminate bias due to uncertainty in quantitation at a level below the instrument calibration range. Table 2 identifies the analytes and samples that were estimated due to reporting at levels below the RL.

Appendix D

Laboratory Data Packages (CD-ROM)