February 13, 2018

Kevin Carpenter
Senior Environmental Engineer
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau C, 11th Floor
625 Broadway, Albany, New York 12233-7014

Re: Little Britain Road Service Center (VCP Index # A3-0388-0599)
Revised MW05-8C Investigation Work Plan

Dear Mr. Carpenter:

For your review and approval please find the enclosed revised MW05-8C Investigation Work Plan (Work Plan) completed by Central Hudson Gas & Electric Corporation (Central Hudson) for the Little Britain Road Service Center located in New Windsor, New York (Site). The report has been revised on the basis of the New York States Department of Environmental Conservation (NYSDEC) February 9, 2018 comment letter.

To summarize Central Hudson's responses to the NYSDEC comments and the specific revisions incorporated into the final revised Work Plan, each individual NYSDEC comment is repeated below in bold and followed by a brief description of the implemented revision in italics (if necessary).

- **Page 1, Section 1 – The results from the November 2017 packer testing indicated TCE concentrations significantly lower than the May/June 2017 data while other parameter concentrations were similar to the earlier data. Some discussion regarding this difference should be added.**

  Response: Discussion added in footnote on page 1.

- **Page 1, Section 1 – Additional description of what is meant by the term "bottom section" of the bedrock well should be added.**

  Response: Clarification added.

- **Page 2, Section 1.3 –The reference to MW96-6 being south of the building should be reviewed and corrected if necessary.**

  Response: Corrected reference to state "MW94-4B2".

- **Page 4, Section 2, First Bullet – A discussion should be added describing how contamination will be prevented from migrating deeper while extending the MW05-8C corehole.**

Response: Clarification added to Section 2.2.1. The borehole will be flushed with potable water and evacuated prior to commencing drilling and packer testing.

- **Page 4, Section 2.1 - A shallow bedrock well at the top of the bedrock aquifer should be considered if no overburden aquifer is identified.**

  Response: Clarification added. Central Hudson will evaluate the packer testing and downhole geophysical data to assess the potential for installing a water table bedrock monitoring well in addition to the two deeper bedrock monitoring wells currently planned at each cluster location. All proposed bedrock well locations will be discussed and agreed upon with NYSDEC prior to installation.

- **Page 5, Section 2.2.1 - A rock chip sample should be analyzed from the location of highest PID to assess the degree to which the matrix contains NAPL if any.**

  Response: The occurrence of non-aqueous phase liquid (NAPL) should be obvious based on the presence of sheen/oil on the water surface, retrieved rock core, and/or rock chips generated from the corehole. If a sheen or elevated photoionization detector (PID) readings (greater than 100 parts per million [ppm]) are observed in the return water/rock core/rock chips, then the water/rock core/rock chips will be screened for the presence of NAPL using a hydrophobic dye (oil in soil test kit).

- **Page 5, Section 2.2.1 – A cross-section well design figure should be included in the work plan.**

  Response: An example of a typical bedrock monitoring well cluster construction has been included.

- **Page 6, Section 2.2.2 - Depending upon the results from MW05-8C, a sample from the approximately 125' depth in the new wells should also be collected.**

  Response: Agree. If the results from MW05-8C suggest that impacts "clean up" below the 125 feet below ground surface (bgs) interval, then the 125 feet bgs interval may be selected for packer testing at each new location. The decision will be made based on review of the downhole geophysical logging results for individual well locations and packer testing and downhole geophysical logging results from MW05-8C.

- **Page 6, Section 2.2.2 – A discussion should be added describing the how the intervals for rock chip PID screening will be selected and any impact of the air rotary method the PID screening results or if the headspace method will be used.**

  Response: Clarification added. If a sheen or elevated PID readings (greater than 100 ppm) are observed in the return water/rock core/rock chips, then a sample of the recovered water/rock core/rock chips will be screened for the presence of NAPL using a hydrophobic dye (oil in soil test kit). Headspace screening is a tool to evaluate potential presence of VOCs in the field and not necessarily to quantify the concentration. In theory, the concentrations detected in vapors could be lower due to the air rotary drilling technique.

- **Page 8, Section 2.5 – Based on the previous data and the extended depth, three intervals may be necessary and should be considered, especially in MW05-8C.**

  Response: Acknowledged. Central Hudson will evaluate the downhole geophysical and packer testing data and propose monitoring well screen locations to the NYSDEC prior to installation. The 6-inch diameter corehole allows the flexibility of installing up to three permanent wells within the same corehole, if necessary.

- **Page 8, Section 2.5 –The maximum design screen length of the overburden wells should be described.**

  Response: A maximum design screen length of 10 feet has been added.

- **Page 8, Section 2.5 –The slot-size, sand and screen length of the bedrock wells should be described.**

  Response: Additional detail regarding slot-size, sand and screen length of the bedrock wells has been added.

- **Page 8, Section 2.7 - The parameters to be monitored during purging and acceptable relative differences should be described.**

  Response: Parameters to be monitored have been added.

- **Page 9, Section 2.8.4 – The survey should tie the new wells into the existing well network and/or verify some or all elevations as a check.**

  Response: Clarification that all wells, new and existing, will be included in the survey.

- **Page 11, Section 3 –Raw analytical data should be submitted electronic format with the report in addition to the EDD submission.**

  Response: Clarification added.

Please contact me at (845) 486-5641 or jgallo@cenhud.com if you have any questions.

Sincerely,

Jesse Gallo
MGP Project Manager

cc: Amen Omorogbe – NYSDEC
Maureen Schuck – NYSDOH
Kristin Kulow – NYSDOH
Wayne Mancroni – Central Hudson
Mark McLean – Central Hudson

ARCADIS Design & Consultancy for natural and built assets

Central Hudson Gas & Electric Corp.

MW05-8C INVESTIGATION WORK PLAN

VCP Index # A3-0388-0599

Little Britain Road Service Center

New Windsor, New York

January 2018 (revised February 2018)

CONTENTS

FIGURES

1 INTRODUCTION

This MW05-8C Investigation Work Plan (Work Plan) was prepared to support additional subsurface investigations at the Central Hudson Gas and Electric Corp. (Central Hudson) Little Britain Road Service Center site (New York State Department of Environmental Conservation [NYSDEC] Voluntary Cleanup Agreement [VCP] Index No. A3-0388-0599) located in New Windsor, New York. This version of the Work Plan incorporates the NYSDEC February 9, 2018 comments on the January 2018 version of the Work Plan. Previous investigations have shown elevated levels of dissolved-phase volatile organic compounds (VOCs) in bedrock groundwater at the site, with the highest concentrations at monitoring well MW05-8C. The site layout and location of MW05-8C is shown on Figure 1. The scope of investigations described herein was developed to further investigate the lateral and vertical extent of dissolved-phase VOCs near monitoring well MW05-8C.

Monitoring well MW05-8C is constructed as an open hole bedrock well from 50 to 125 feet below ground surface (bgs). Packer testing and groundwater sampling completed in 2005 indicated elevated levels of VOCs in groundwater at 74 to 88 feet bgs and 122 to 125 feet bgs. Central Hudson performed additional packer tests at MW05-8C and groundwater sampling targeted at these intervals in November 2017. The purpose of the additional testing was to: 1) confirm the 2005 packer testing results; 2) evaluate whether leakage possibly occurred during the 2005 packer testing; and 3) gather additional data to develop the scope of work detailed in this Work Plan.

The November 2017 investigation consisted of:

- thoroughly flushing the open bedrock corehole with clean potable water;
- subsequently evacuating all water from the well;
- packer testing the two bedrock intervals: 73-83 feet bgs and 115-125 feet bgs; and
- analyzing collected packer test groundwater samples for VOCs using United States Environmental Protection Agency (USEPA) Method 8260C.

The analytical results from the additional packer testing indicate relatively similar VOC concentrations in both intervals, as summarized in the following table:

Interval (feet bgs)	TCE[1]	cis-1,2-DCE	trans-1,2-DCE	VC	1,2-DCB	Toluene
73-83	212	13,300	55.8	430	ND	133
115-125	13.5	10,100	68.2	927	26.3	46.5

Notes:
Concentrations given in micrograms per liter (ug/L); TCE = trichloroethene; cis-1,2-DCE = cis-1,2-dichloroethene; trans-1,2-DCE=trans-1,2-dicloroethene; VC = vinyl chloride; 1,2-DCB = 1,2-diclorobenzene; and ND = not detected.

[1] Note that the concentration of TCE detected during packer testing is approximately an order of magnitude lower than that detected during groundwater sampling conducted in May 2017; the difference in TCE in concentration could be attributed to the different sampling methodology or seasonality.

The data obtained from the November 2017 packer testing showed that the bottom section of bedrock (i.e., 115 to 125 feet bgs) at monitoring well MW05-8C contains elevated concentrations of dissolved-phase VOCs. The testing also showed that the 115 to 125 ft bgs interval was considerably more transmissive than the 73 to 83 ft bgs interval. As such, this Work Plan includes investigations designed to delineate the lateral and vertical (i.e., below 125 feet bgs) extent of VOCs near MW05-8C.

The remainder of this Work Plan provides relevant site background information and the specific objectives and scope of the investigation.

1.1 Site Description

The Little Britain Road Service Center (the "site") is located at 610 Little Britain Road, New Windsor, Orange County, New York (Figure 1). The site encompasses approximately 9 acres with the Service Center building located near the center of the site. Access to the site is from Little Britain Road to the south. The majority of the site is fenced; three gates, one each to the north, southwest and east of the Service Center building, provide access to the fenced area. The employee parking lot, located east of the service center building, and an open grassy field located between the service center building and Little Britain Road are located outside of the fenced area but within the site boundary. The employee parking lot, the entrance driveway, and the areas immediately surrounding the Service Center building are paved; the remainder of the site is either gravel covered or vegetated. The City of Newburgh Lake Washington Stilling Basin is located approximately 150 feet west of the site.

1.2 Investigation Objectives

The objectives of the investigation are to:

- Further delineate the horizontal and vertical extent of dissolved-phase VOCs proximal to monitoring well MW05-8C;
- Further characterize the overburden and bedrock geology;
- Further evaluate the horizontal and vertical hydraulic gradients and groundwater flow patterns at the site; and
- Provide a network of monitoring points suitable for future monitoring of groundwater conditions.

1.3 Site Geology and Hydrogeology

Overburden at the site ranges in thickness between less than 5 feet in the north-central portion of the site to greater than 55 feet thick along the southern boundary of the site property. The overburden consists of between 3 and 15 feet of sand and gravel fill underlain by up to 50 feet of dense silty sand and gravel till along the southern property boundary. Till thickness decreases to the northwest until it is minimal or non-existent. The overburden in underlain by a bedrock consisting of the Stissing Dolostone member of the Wappinger Group. The dolostone is fine-grained, medium grey, slightly fractured and weathered with massive bedding and calcite recrystallization along fractures. The bedrock surface is highest (~290 feet

above mean sea level [AMSL[2]]) near the northwest corner of the Service Center building and lowest south of the building, near monitoring well MW94-4B2 (~241 feet AMSL). The bedrock surface also slopes downward to the northern site boundary to an elevation of ~268 feet AMSL.

The water table at the site is approximately 10 feet bgs and is located within the overburden and bedrock. Groundwater flow in the overburden and bedrock is to the north and northeast. The bedrock surface likely influences the flow direction in the overburden and causes localized mounding. Groundwater flow in the bedrock is within a complex network of fractures, and as such, flow within the bedrock can be tortuous. Downward vertical gradients are observed from the overburden to the bedrock and likely within the bedrock, itself. Ultimately, all groundwater beneath the site is expected to move to the east and discharge to the Hudson River, which is located approximately 2.5 miles east of the site.

[2] Reference datum is North American Vertical Datum of 1988 (NAVD 88).

2 SCOPE OF INVESTIGATION

The MW05-8C investigation will consist of:

- extending the corehole at existing monitoring well MW05-8C and conducting down-hole geophysical testing and packer testing on the new section of corehole;
- installing a bedrock monitoring well cluster at MW05-8C;
- installing five overburden monitoring wells (MW18-10A through MW18-14A);
- drilling five bedrock coreholes, conducting down-hole geophysical testing and packer testing on the coreholes, and collecting groundwater samples for VOC analysis from packer intervals;
- installing and developing two monitoring wells (S/D) in the five coreholes (MW18-10C through MW18-14C) based downhole testing results;
- collecting groundwater samples from new and existing monitoring wells for VOC analysis; and
- measuring water levels at new and existing monitoring wells and the Lake Washington Stilling Basin.

These activities will be supported by air monitoring, surveying, and waste management activities.

As shown on Figure 1, monitoring wells will be installed:

- On-site and hydraulically downgradient from bedrock monitoring well MW05-8C; and
- Off-site and hydraulically upgradient from MW05-8C, on the City of Newburgh property between the site and Lake Washington Stilling Basin.

The following sections present a detailed discussion of the scope of the investigation and support activities.

2.1 Overburden Drilling

Five overburden monitoring wells (MW18-10A through MW18-14A) will be installed to evaluate the presence/absence of VOCs in overburden groundwater and characterize overburden groundwater flow. Monitoring well borings will be drilled using a conventional drill rig and hollow-stem auger (HSA) drilling techniques. Soil will be sampled continuously during drilling using 2-inch diameter by 2-foot long split spoon samplers. Since overburden wells will be paired with bedrock wells, overburden soil samples need only be collected during the installation of the bedrock casing or during drilling of the monitoring well boring. Given the existing site data, overburden monitoring well borings will likely terminate on the bedrock surface and the overburden monitoring well will likely be installed immediately above the bedrock surface. There is potential for the water table to lie below the bedrock surface at one or more of the proposed overburden well locations; in this case, an overburden monitoring well will not be installed, but a shallow water table bedrock monitoring well may be considered based on review of the downhole geophysical testing and/or packer testing (discussed below).

Recovered soil encountered during the overburden drilling will be visually characterized for color, texture, moisture content, and obvious impacts and screened with a photoionization detector (PID). The presence of visible staining, sheens, non-aqueous phase liquid (NAPL), and odors encountered in the soil will be

noted. Although this investigation does not anticipate collecting soil samples for laboratory analysis, soil samples will be collected for analysis if visual impacts are observed.

2.2 Bedrock Drilling

Prior to installing new bedrock coreholes at the site, additional drilling and testing will be completed at/below existing open-hole monitoring well MW05-8C to evaluate the extent of dissolved-phase VOCs below the bottom of MW05-8C (i.e., below approximately 125 feet bgs). The results of the drilling and testing below MW05-8C will be evaluated and used to assign target depths for drilling the five new bedrock well clusters proposed to be installed radially from MW05-8C. The following sections provide detail regarding bedrock drilling at the site.

2.2.1 Extension of MW05-8C

Bedrock monitoring well MW05-8C will be extended from approximately 125 feet bgs (current depth of open corehole) to approximately 185 feet bgs using HQ-sized rock coring tools. The borehole will be flushed with potable water and evacuated prior to drilling to remove impacted groundwater from the existing open corehole. The lithology and fractures of recovered rock cores will be described, and the cores will be screened for total VOCs using a PID. If a sheen or elevated PID readings (greater than 100 ppm) are observed on the retrieved rock core, then the presence of NAPL will be evaluated using a hydrophobic dye (oil in soil test kit). Rock Quality Designations (RQDs) for each 5-foot core run will be calculated during drilling to provide an estimate of the general competency of the bedrock. The rate of penetration (number of minutes per 5-foot interval) and qualitative observations regarding water production or loss will be recorded during bedrock coring.

Packer tests will be completed every approximately 20 feet from 125 to 185 feet bgs during the corehole extension drilling. Once 20 feet of new bedrock is drilled a single packer assembly fitted with a 20-foot length of screen will be placed in the corehole and inflated to isolate the bottom 20 feet of corehole. A submersible pump will then be placed in the packer interval and a packer test will be completed as described in Section 2.4. The corehole will be advanced and packer tested every 20 feet until the target depth of 185 feet is reached, resulting in three packer-test intervals. Groundwater samples will be collected at each packer test interval and submitted for laboratory analysis of VOCs using USEPA Method 8260C on a 48-hour turn-around-time (TAT) basis. The laboratory results will be evaluated to determine:

- The location of a deep bedrock monitoring well screen within MW05-8C, if levels of VOCs are low or not detected in the packer test sample(s); and
- Whether additional drilling and packer testing should be performed to greater depths, if elevated levels of VOCs are detected in the packer test samples collected from 125 to 185 feet bgs.

A shallow bedrock monitoring well screen will also be installed in the corehole. The position of the shallow and deep monitoring wells will be determined based on a review of the new and old (2005 and 2017) packer testing data. An example of a typical bedrock monitoring well cluster construction is provided on Figure 2.

2.2.2 Installation of New Bedrock Coreholes

Five new bedrock well clusters will be installed to evaluate the horizontal and vertical extent of dissolved-phase VOCs radially from monitoring well MW05-8C. Two bedrock well clusters [MW18-10C(S/D) and MW18-11C(S/D)] will be positioned on the City of Newburgh property to monitor bedrock groundwater quality between the site and the Lake Washington Stilling Basin. The other three bedrock well clusters [MW18-12C(S/D), MW18-13C(S/D), and MW18-14C(S/D)] will monitor the bedrock groundwater quality horizontally and vertically from the zones of elevated VOC concentrations defined at monitoring well MW05-8C.

Bedrock borings will be advanced through the overburden and into competent bedrock using the HSA drilling methods described in Section 2.1. Once competent bedrock is encountered the augers will be advanced an additional 3 feet to create a rock socket. If auger refusal is encountered, then fluid rotary employing a 7 7/8-inch roller-bit will be used to drill the socket. Once the rock socket is drilled, a 6-inch permanent black steel casing will be installed to the bottom of the 3-foot socket. Next, the 6-inch casing will be grouted in place from the bottom up using a cement-bentonite grout and tremie pipe as the augers are withdrawn from the corehole.

After the grout has cured a minimum of 24 hours, the bedrock will be drilled using 5 7/8-inch air rotary to a depth defined by the information collected during the corehole extension at MW05-8C. Rock chips evacuated from the corehole during drilling will be described for lithology and visual impacts and screened for total VOCs using a PID. If a sheen or elevated PID readings (greater than 100 ppm) are observed in the return water/rock chips, then a sample of the recovered rock chips will be screened for the presence of NAPL using a hydrophobic dye. The rate of penetration and qualitative observations regarding water production will be recorded during bedrock drilling.

Once the corehole has advanced the target depth, the drill string will be withdrawn, and the corehole will be thoroughly flushed with clean potable water. A packer test, using a single packer assembly, will then be completed on the bottom 10 feet of corehole in accordance with Section 2.4. A groundwater sample will be collected during the packer test and will be submitted for VOC analysis using USEPA Method 8260C analysis on a one-week TAT. The results of the packer test will be evaluated to determine whether additional drilling and packer testing should be performed at the location. If the analytical results indicate low or non-detect concentrations, then additional drilling and packer testing would not be required. If the results show elevated concentrations of VOCs, then additional drilling and packer testing may be performed at the locations.

2.3 Geophysical Logging

Once bedrock has been cored and the packer test completed at the bottom of the corehole, down-hole geophysical logging will be performed at each of the five new open bedrock corehole locations (MW18-10C through MW18-14C) and the MW05-8C extended corehole. The geophysical logging will include:

Tool	Description/Use
Fluid temperature	Measures the temperature of water in the corehole with depth. Changes in temperature can indicate intervals where groundwater may be entering or exiting the corehole.
Fluid resistivity	Measures the electrical resistivity of water in the corehole with depth. Changes in resistivity can indicate intervals where groundwater may be entering or exiting the corehole.

Tool	Description/Use
Caliper	Records the corehole diameter. Changes in corehole diameter can be related to fracturing or caving along the corehole wall.
Natural gamma	Records the amount of natural gamma radiation emitted by the rocks surrounding the corehole. Can identify changes in lithology. For example, it may distinguish between dolomite and shale beds.
Single-point resistance	Records the electrical resistance from points within the corehole to an electrical ground at land surface. Can determine lithology, water quality, and location of fracture zones.
Acoustic televiewer	Records a magnetically oriented image of the corehole wall based on acoustic reflectivity. Televiewer logs indicate the location and strike and dip of fractures and lithologic contacts.
Optical televiewer	Provides a color image of the corehole used to view lithology, fracture characteristics, degree of weathering, impacts (e.g., NAPL), and iron staining.
Heat-pulse flowmeter	Records flow rates in the corehole and gives the direction of fluid flow vertically.

It is anticipated that the geophysical logging will commence no less than three business days after all coreholes have been drilled to their final depth. Geophysical logging will be useful for understanding the hydraulic and physical properties of the bedrock. Results from the geophysical logging will be used to identify discrete packer testing intervals at each bedrock corehole location.

2.4 Packer Testing

Packer testing will be completed at each new bedrock corehole to target highly fractured and/or transmissive zones in the bedrock identified by the down-hole geophysical logging. The purpose of the testing is to estimate the groundwater yield and relative degree of impacts at each targeted interval. A field geologist/hydrogeologist will oversee each test.

A packer assembly, consisting of two inflatable packers and standpipe containing a 10-foot long screen between the packers, will be lowered into the corehole and used to isolate the bedrock interval selected for testing. Once isolated (packers inflated), the water level outside and inside the standpipe (above the packer) will be monitored for five minutes with a minimum of one reading performed per minute. These data will be used to assess the rate of water inflow or outflow from the portion of the corehole above and inside the packer interval. Next, a submersible pump will be lowered into the packer assembly and the target zone will be pumped at a moderate rate until the packer interval in completely evacuated (goes dry) or until the water level stabilizes. Water quality parameters (pH, specific conductance, and temperature) will be measured during pumping and a groundwater sample will be collected from the packer interval once parameters stabilize and a minimum of one packer volume has been removed by pumping or when enough water has recharged back into the packer interval following total evacuation. Collected groundwater samples will be analyzed for VOCs using USEPA Method 8260C on a 3-day turnaround time.

During the test, the water level outside the standpipe will also be monitored to assess packer seal integrity. A sustained decrease in the water level outside the standpipe that mimics the decrease in water level inside the packer interval during pumping could indicate that the integrity of the seal is poor. In this case, the test will be stopped, and the packer assembly removed from the corehole and inspected for leaks or damage. Leaks, if any, will be repaired. The packer assembly will then be reinstalled, and the test will be repeated. It is important to note that a water-level decrease above the packer test interval is

often not indicative of a poor packer seal, but rather may indicate a hydraulic connection between one or more fractures above the packer to one or more fractures below the packer (i.e., within the test interval).

At the completion of each test, the packer assembly will be removed from the corehole and decontaminated prior to conducting the next test.

2.5 Monitoring Well Construction

The results of the various tests (packer, geophysical, analytical) and drilling observations will be evaluated to determine appropriate intervals to install permanent bedrock monitoring well screens. Central Hudson will coordinate with the NYSDEC to gain concurrence on proposed permanent monitoring well construction prior to installing wells.

As discussed in Section 2.2.2, the corehole at each new well location will be drilled using 5 7/8-inch air rotary tooling, which results in a nominal 6-inch diameter corehole. A corehole of this diameter allows the flexibility of installing up to three permanent PVC monitoring wells within the same corehole; however, this Work Plan assumes that two bedrock intervals will be selected for installing permanent wells, as follows:

- Shallow interval – this interval will be selected to monitor the highest VOC concentrations laterally from monitoring well MW05-8C.
- Deep interval – this interval will be selected to monitor groundwater below the VOC plume (i.e., provide a bottom to the plume).

Overburden monitoring wells will be constructed using 2-inch diameter, Schedule 40 PVC riser pipe and 0.010-inch slot PVC screens with a maximum length of 10 feet. Morie #0 or equivalent sand packs will be placed in the annulus surrounding the screened interval of each well to a height of approximately 2 feet above the top of screen. A 2-foot thick bentonite seal will be placed above the sand pack. If the seal is installed above the water table, it will be manually hydrated using potable water. The remainder of the annular space will be filled with cement-bentonite grout to within approximately 2 feet of ground surface.

As discussed above, bedrock monitoring wells will be constructed as clusters within the same corehole at the five new well locations and existing MW05-8C location. The cluster to be installed at MW05-8C will be constructed using 1.5-inch diameter and 1-inch diameter Schedule 40 PVC monitoring wells. The clusters at the five new locations will be constructed using two 2-inch diameter, Schedule 40 PVC monitoring wells and Morie #0 or equivalent sand packs. All bedrock monitoring wells will be constructed using 0.010-inch slot PVC screens with a maximum length of 10 to 20 feet; however, the final screen length will be determined based on review of the downhole geophysical and packer testing data. The annulus between the well screens will be filled with 2 feet of sand above the lower screen followed by bentonite above the sand, and finally 2 feet of sand below the upper well screen. The sand above the bentonite will help to keep the bentonite from swelling into the upper screen once it is hydrated.

All monitoring wells will be completed at the surface with protective stickup or flush-mount well protectors.

An example of the bedrock monitoring well cluster construction is provided on Figure 2.

2.6 Well Development

Monitoring wells will be developed following installation to remove fine material that may have settled in the well, remove any drilling fluids that were used during well installation, and to enhance the hydraulic communication with the surrounding formation. Monitoring wells will be allowed to set for at least two days following installation to allow the grout to cure before developing the well. Wells will be developed by surging and purging the entire screened interval at each location. The monitoring wells will be considered properly developed when a minimum of three well volumes of water have been removed or until a monitoring well has been pumped dry after surging.

2.7 Groundwater Sampling and Water Level Monitoring

One round of groundwater samples will be collected from all new and existing monitoring wells at least one week following well development. Groundwater samples will be collected using low-flow purge and sampling methods and submitted for laboratory analysis of VOCs. Turbidity, temperature, specific conductance, pH, oxidation-reduction potential, dissolved oxygen, and depth to water will be measured and recorded every approximately 5 to 15 minutes during purging. Wells will be considered stabilized and ready for sample collection when turbidity values are below 50 nephelometric turbidity units (NTUs), the specific conductance values remain within 3%, the dissolved oxygen values remain within 10%, and pH remains within 0.1 units for three consecutive readings.

VOCs will be analyzed using USEPA Method 8260C. Quality Assurance/Quality Control (QA/QC) samples will be collected, consisting of matrix spike/matrix spike duplicates (MS/MSDs), field blanks, rinse blanks, and trip blanks. All samples, including QA/QC samples, will be submitted under chain-of-custody procedures to a NYSDOH Environmental Laboratory Accreditation Program (ELAP) laboratory.

A synoptic round of static water levels will be measured at all new and existing monitoring wells and a gauging station on the Lake Washington Stilling Basin prior to sampling.

2.8 Support Tasks

Numerous activities will be performed to support the field efforts described above. A summary of these activities is described below.

2.8.1 Data Validation

All analytical data generated during monitoring well sampling (as discussed in Section 2.7) will undergo full Tier III data validation. Data Usability Summary Reports (DUSRs) will be prepared in accordance with requirements discussed in NYSDEC's DER-10 Technical Guidance for Site Investigation and Remediation, dated May 3, 2010. Analytical results will be submitted to the NYSDEC in the most recent version of the EQuIS electronic data deliverable (EDD) format. Raw analytical data will also be provided to the NYSDEC in electronic format.

2.8.2 Health and Safety

A site-specific Health and Safety Plan (HASP) will be prepared to present the health and safety procedures, methods, and requirements that will apply to field personnel during implementation of the field work. Field activities will be conducted using Modified Level C personal protective equipment (PPE). All onsite project personnel who work in areas where they may be exposed to site contaminants will be trained as required by Occupational Safety and Health Administration (OSHA) Regulation 29 CFR 1910.120 (HAZWOPER).

2.8.3 Community Air Monitoring Program

Air monitoring will be conducted during all drilling activities in accordance with the New York State Department of Health's (NYSDOH's) Generic Community Air Monitoring Plan (CAMP), provided in Appendix 1A of NYSDEC's DER-10. One upwind and one downwind air monitoring station will be required during drilling for fugitive dust and VOC monitoring.

2.8.4 Survey

Following construction of the protective well covers, the top of the inner casings and ground surface at each new and existing well will be marked and surveyed to the nearest 0.01 foot, and the elevation will be determined relative to North American Vertical Datum of 1988 (NAVD 88) and North American Datum (NAD 83). The measuring point on all wells will be marked on the innermost well casing. A gauging station will be installed and surveyed on the Lake Washington Stilling Basin.

2.8.5 Decontamination

All down-hole drilling equipment and non-dedicated/non-disposable drilling and well development/ sampling equipment will be decontaminated prior to use at the site, in between each well location, and prior to leaving the site.

2.8.6 Waste Management

All investigation-derived waste (IDW) generated during the investigation including soil/rock cuttings, drilling fluids, purged groundwater, and decontamination fluids will be containerized in new 55-gallon steel drums for characterization and offsite disposal by Central Hudson.

3 REPORTING

A data summary report will be prepared following completion of the field activities and preparation of the DUSR(s). It is anticipated that the report will discuss the following general topics:

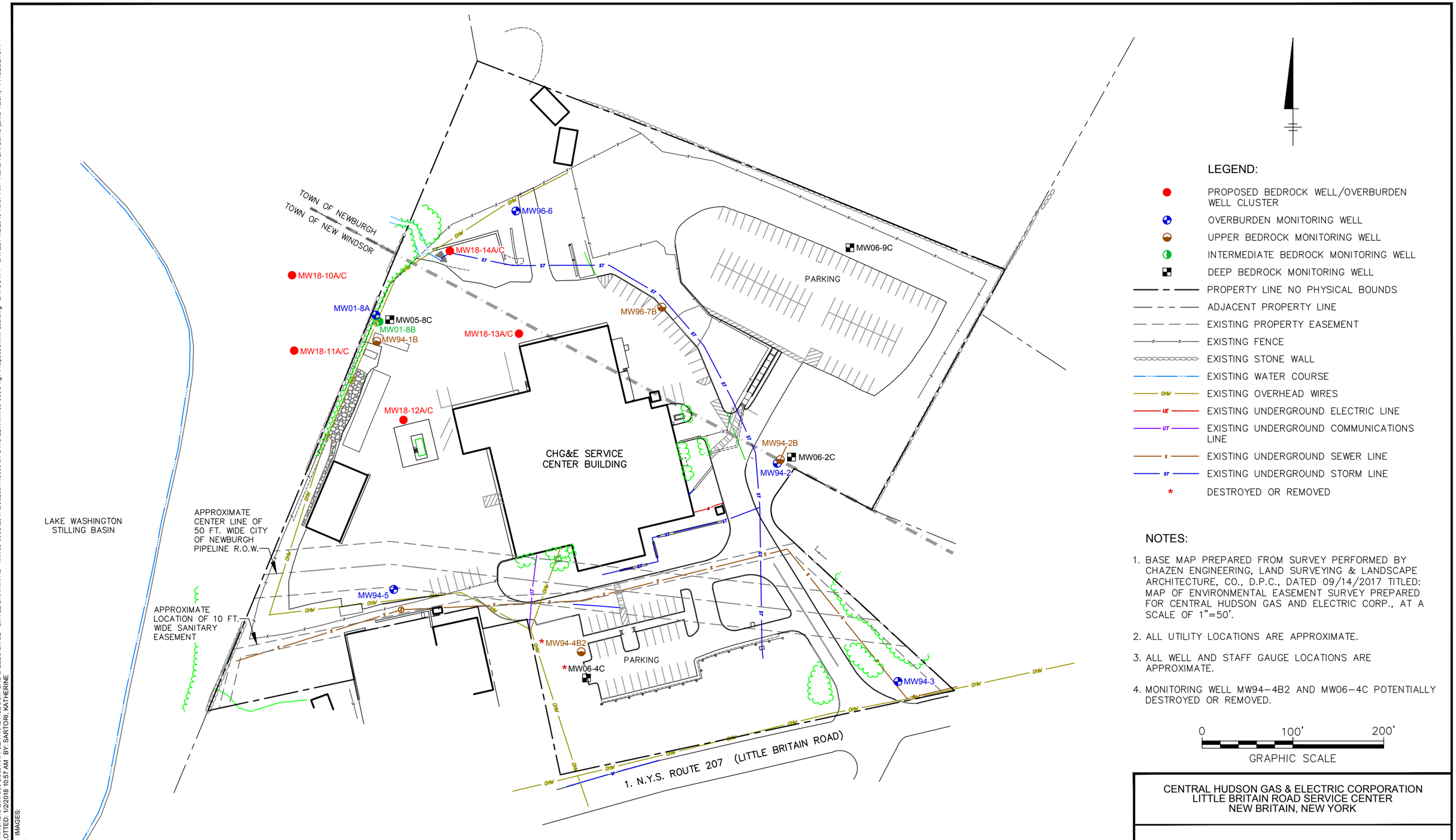
- Site and project background;
- Physical characteristics of the site;
- Field activities completed;
- Methodologies used to complete the field activities;
- Findings of the field activities;
- Understanding of the conceptual site model, including the geologic and hydrogeologic conditions at the site;
- Understanding of the distribution of VOCs in groundwater; and
- Recommendations for further investigations, if warranted.

The text of the report will be supported by subsurface logs, down-hole geophysical logs, analytical data summary tables, and figures illustrating site-specific data, including a water table and potentiometric surface map(s) for the overburden and bedrock.

4 SCHEDULE

Weather and access permitting, field activities are anticipated to commence in the second quarter of 2018 following receipt of written approval of this Work Plan from the NYSDEC. The data summary report will be submitted to the NYSDEC for review and approval after the field program is completed.

FIGURES



LEGEND:

- PROPOSED BEDROCK WELL/OVERBURDEN WELL CLUSTER
- OVERBURDEN MONITORING WELL
- UPPER BEDROCK MONITORING WELL
- INTERMEDIATE BEDROCK MONITORING WELL
- DEEP BEDROCK MONITORING WELL
- PROPERTY LINE NO PHYSICAL BOUNDS
- ADJACENT PROPERTY LINE
- EXISTING PROPERTY EASEMENT
- EXISTING FENCE
- EXISTING STONE WALL
- EXISTING WATER COURSE
- OHW — EXISTING OVERHEAD WIRES
- UE — EXISTING UNDERGROUND ELECTRIC LINE
- UT — EXISTING UNDERGROUND COMMUNICATIONS LINE
- S — EXISTING UNDERGROUND SEWER LINE
- ST — EXISTING UNDERGROUND STORM LINE
- * DESTROYED OR REMOVED

NOTES:

1. BASE MAP PREPARED FROM SURVEY PERFORMED BY CHAZEN ENGINEERING, LAND SURVEYING & LANDSCAPE ARCHITECTURE, CO., D.P.C., DATED 09/14/2017 TITLED: MAP OF ENVIRONMENTAL EASEMENT SURVEY PREPARED FOR CENTRAL HUDSON GAS AND ELECTRIC CORP., AT A SCALE OF 1"=50'.
2. ALL UTILITY LOCATIONS ARE APPROXIMATE.
3. ALL WELL AND STAFF GAUGE LOCATIONS ARE APPROXIMATE.
4. MONITORING WELL MW94-4B2 AND MW06-4C POTENTIALLY DESTROYED OR REMOVED.

0 100' 200'

GRAPHIC SCALE

CENTRAL HUDSON GAS & ELECTRIC CORPORATION
LITTLE BRITAIN ROAD SERVICE CENTER
NEW BRITAIN, NEW YORK

SITE PLAN

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1

Date Start/Finish: **Drilling Company:** **Driller's Name:** **Drilling Method:** **Bit Size:** **Auger Size:** **Rig Type:** **Sampling Method:**	**Northing:** **Easting:** **Casing Elevation:** **Borehole Depth:** 185 feet bgs **Surface Elevation:** **Descriptions By:**	**Well ID:** **Nested Well Cluster** **Client:** Central Hudson Gas and Electric **Location:** Little Britain Road Service Center New Windsor, New York

Well Construction

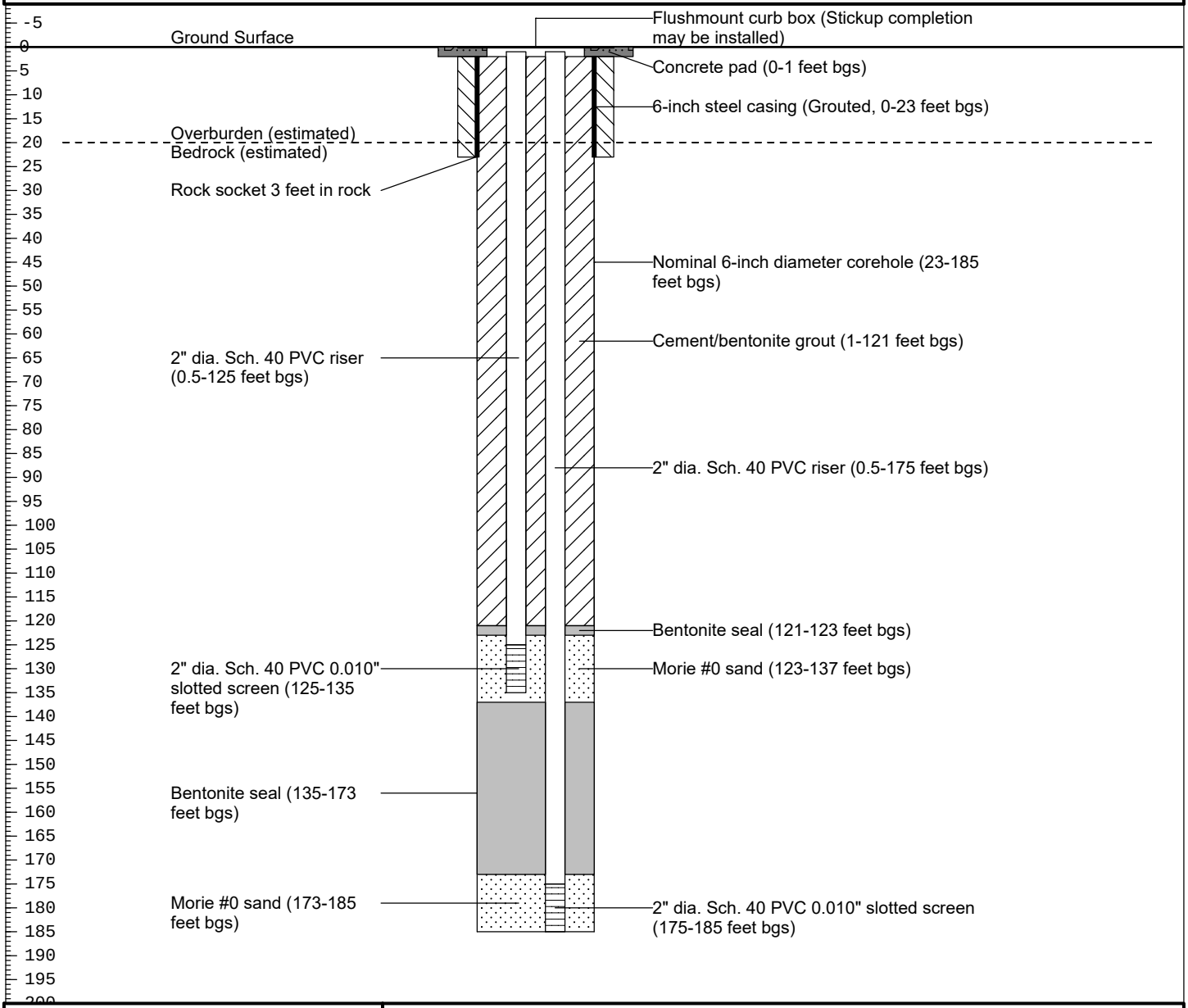


FIGURE 2. EXAMPLE BEDROCK MONITORING WELL CONSTRUCTION

ARCADIS Design & Consultancy for natural and built assets

Remarks: AMSL = above mean sea level; bgs = below ground surface; NA = not available;

This schematic is approximate; actual well depths will be determined based on the results of packer testing and downhole geophysical testing.

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