REMEDIAL INVESTIGATION/ INTERIM REMEDIAL MEASURES WORK PLAN

FOR

CAMPUS SQUARE
PORTION OF 903 ELLICOTT STREET
CITY OF BUFFALO, ERIE COUNTY, NEW YORK
SITE NO. C915294

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ACRONYM LIST

AAR	Alternatives Analysis Report
ACM	Asbestos-containing Material
ASP	Analytical Services Protocol
BGS	Below Ground Surface
BSA	Buffalo Sewer Authority
CAMP	Community Air Monitoring Plan
CPP	Citizen Participation Plan
DER	Department of Environmental Remediation
DUSR	Data Usability and Summary Report
EDD	Electronic Data Deliverable
ELAP	Environmental Laboratory Accreditation Program
HASP	Health and Safety Plan
IRM	Interim Remedial Measures
MS/MSD	Matrix Spike / Matrix Spike Duplicate
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PAH	Polycyclic Aromatic Hydrocarbons
PID	Photo-ionization Detector
RI	Remedial Investigation
RI/AAR/RWP	Remedial Investigation / Alternative Analysis Report/ Remedial Work Plan
SCO	Soil Cleanup Objectives
Site	3.43-Acre portion of 903 Ellicott Street, Buffalo, New York
SVOC	Semi-volatile Organic Compounds
U.S. EPA	United States Environmental Protection Agency
VOC	Volatile Organic Compounds

EXECUTIVE SUMMARY

This document presents the Remedial Investigation and Interim Remedial Measures Work Plan for the Brownfield Cleanup Program Site No. C915294 located on a 3.43-acre portion of Ellicott Street in Buffalo, New York (the "Site"). The project details are summarized below:

Contaminant Source and Constituents

The contamination is associated with urban fill located on the Site. Constituents in the fill requiring remediation include semi-volatile organic compounds (SVOCs) and metals.

Extent of Contamination

The urban fill containing elevated concentrations of contaminants generally extends to five to eight feet below grade and is present across the Site.

Proposed Site Redevelopment

The Site's developers intend to replace several of the Pilgrim Village complex's multi-unit apartment buildings with a new eight-story, mixed-use building called Campus Square. The development will contain residential, retail, commercial and cultural offerings and will help to meet the growing demand for housing and services in the neighborhood, driven primarily by the burgeoning Buffalo Niagara Medical Campus directly south of the Site (the "Project").

Remedial Investigation

To characterize site conditions and identify the appropriate remedy for the Site, a Remedial Investigation (RI) will be implemented. The RI will include the collection and analysis of urban fill, native soil, and groundwater, if encountered.

Interim Remedial Measures

Because the contaminants are understood to exist within the urban fill at the Site, this document presents the proposed plan to address these contaminants through removal and off-site disposal.

1 INTRODUCTION

This Remedial Investigation/Interim Remedial Measures (RI/IRM) Work Plan provides a description of the procedures that will be implemented to characterize the nature and extent of contamination of soil at the Campus Square Site (the "Site") and the proposed methods to address that contamination. The Site has been assigned New York State Department of Environmental Conservation (NYSDEC) Site No. C915294. This RI/IRM Work Plan has been prepared in accordance with Division of Environmental Remediation "Technical Guidance for Site Investigation and Remediation" (DER-10). To effectively characterize the environmental conditions, this RI/IRM Work Plan discusses the following:

- Current and historic site conditions
- Contaminants of concern and the extent of the contamination
- Extent of RI activities
- Quality controls and protocols for analytical sampling
- Health and safety procedures to protect site workers and the local community
- Community participation activities
- Proposed remedial measures

On February 6, 2015, Campus Square LLC and North-Ellicott Management, Inc., (collectively "Applicants") acting as BCP Volunteers, submitted a BCP Application to remediate and develop a portion of 903 Ellicott Street in the City of Buffalo, New York. This parcel was subdivided from a 9.06-acre parcel on which was constructed the Pilgrim Village apartment buildings. Investigative and remedial actions covered under this IRM will include the entire 3.43-acre Site.

The Site is the location of the planned construction of a mixed use residential and commercial structure. An RI will be implemented to further evaluate the extent of the contaminated fill material and to aid in the preparation of an Alternatives Analysis Report (AAR). **Section 4 Remedial Investigation** describes the scope of the investigation during remediation. This document also described proposed IRM actions intended to address the contamination present at the Site.

Closure sampling will be conducted during the performance of the RI. The results of the closure sampling will determine if remedial SCOs are achieved during the subsequent IRM.

1.1 Site Description

The Pilgrim Village Apartment complex is located on the block bounded by Best Street, Michigan Avenue, East North Street and Ellicott Street. The complex consists of about 90 one- and two-story, wood and masonry town homes apartments with slab-on-grade floors.

Figure 1 shows the location of the Site and **Figure 2** shows the Project Area and Site Boundaries.

The initial phase of the redevelopment will consist of demolition of town homes/apartments on the Site. The new building that will be constructed for this phase will be an eight-story, mixed use residential and commercial structure. The first floor of the building will be used for commercial space and the remaining seven floors will be used for residential space.

1.2 Site History

The land comprising the Site was historically divided into small, mostly residential lots that were consolidated in 1980 to facilitate the development of the Pilgrim Village apartment complex.

A service/filling station operated on the northeast corner of the existing Pilgrim Village complex from approximately 1931 to 1968. Storage tanks containing petroleum products were identified in historical records for that service/filling station, to the north of the Site, but there are no records of tank removal. In addition, a Sanborn Map Report shows that a manufacturing facility called W.A. Eckert Mfg. Co. was located near the northern edge of the Site in 1925 and produced "aluminum & brass specialties." Lastly, based on recent investigation results, contaminated urban fill appears to have been deposited at the Site at some point in its history.

1.3 Site Geography, Geology, and Hydrogeology

The Site generally slopes to the north-northwest, although certain minor variations in elevation are present. The Site contains a mix of buildings, asphalt parking/driveway areas and landscaped/lawn areas.

Heterogeneous urban fill is present at the Site at depths ranging from five to eight feet below grade. Urban fill is defined as material coming from anthropogenic sources of the material re-worked to build a site to a defined grade. The urban fill material at the Site contains:

- Crushed Rock
- Sand
- Silt
- Clay
- Plastics
- Construction Debris
- Lumber
- Ash/Cinders
- Ceramics
- Bricks
- Metal

Native soil encountered beneath the fill consisted of Silty Clay – organic clays of medium to high plasticity and variable silt content with a reddish brown clay appearance.

Groundwater was not investigated during the recent evaluation of the Site. However, saturated conditions appear to be present at approximately seven feet below grade. Based on a review of NYSDEC data, the Site is not underlain by any mapped principal or primary aquifers. Groundwater at and in the vicinity of the Site is not used for public drinking water supply.

2 SUMMARY OF ENVIRONMENTAL CONDITIONS

2.1 Environmental Reports

Site characterization efforts were recently conducted to assess contaminant concentrations at the Site and summarized on **Figure 3**. The Subsurface Investigation letter report included in **Appendix A** provides additional detail.

During that work, C&S conducted a sampling program to characterize soil conditions at the BCP Site. The characterization program consisted of the advancement of 10 soil borings within the BCP Site and the sampling and analysis of six soil/fill samples. Each soil sample was analyzed for volatile organic compounds (VOCs) using EPA Method 8260B, semivolatile organic compounds (SVOCs) using EPA Method 8270C, and metals using EPA Method 6010. Analytical results from the investigation are summarized in **Section 2.2** below.

Four borings were also advanced off-site, north of the Site, along Ellicott Street. The off-site findings were similar to those on-site.

2.2 Nature and Extent of Contamination

BCP Site soils consist of five to eight feet of urban fill material. Consistent with urban fill, this urban fill contains SVOC and metal contamination, as shown in recent sampling. One VOC, methylene chloride, was also detected at concentrations above SCOs in the samples, although methylene chloride is a common laboratory contaminant. No discrete contamination layer was observed, and therefore, the extent of contamination within the fill material is difficult to identify due to its heterogeneous nature.

Analytes exceeding Restricted Residential SCOs (or higher) were detected in each of the six samples collected. One sample contained benzo(a)anthracene at concentrations above the Restricted Residential SCOs. The metals lead and mercury were detected at concentrations above the Restricted Residential SCOs; mercury above the Commercial Use SCOs; and arsenic above Industrial Use SCOs. Arsenic was also detected in the off-site sample at concentrations above the Industrial Use SCOs.

The variation in analyte concentrations across the Site indicates that the source of contamination is the variable urban fill material and no discrete source is located on-site or off-site. Contaminated urban fill is expected to exist on-site from surface to an average approximate depth of eight feet below grade. The Site is 3.43 acres. The estimated volume of contaminated soil/fill that exceeds Restricted Residential Use SCOs is approximately 1,200,000 cubic feet, or approximately 45,000 cubic yards.

3 OBJECTIVES, SCOPE AND RATIONALE

The objectives of the scope of work described in this Work Plan are to evaluate contaminant impacts to soil and identify and evaluate appropriate remedial actions necessary to redevelop the Site. The investigation work will include evaluating the magnitude and extent of contaminant impacts, conducting a qualitative exposure assessment for actual or potential exposures to contaminants at the Site and/or emanating from the Site, and producing data that will support the development of an acceptable RI Report and subsequent Alternatives Analysis Report (AAR). The IRM portion of this document details the remedial methods proposed to address the contamination present at the Site.

The RI is based on information previously gathered regarding historical operations conducted at the Site, the results of the limited site characterization, and the project objectives. The RI will include the following:

- Soil Evaluation – This task will consist of three primary elements: urban fill, underlying native soils, and site perimeter soils characterization.
    - The urban fill will be characterized to identify the extent and magnitude of contamination within the fill. This material will also be the subject of waste characterization sampling because subsequent remedial activities would possibly include the excavation and off-site disposal of the urban fill.
    - The underlying native soils will be characterized to determine the depth of impacts from the overlying urban fill.
    - The perimeter soils (assumed to be urban fill) will be characterized to assess the condition of off-site soil.
- Groundwater Evaluation – Subsequent to completing the above tasks, groundwater monitoring wells will be installed. Although groundwater impacts at the Site are not anticipated, groundwater monitoring wells have been proposed to characterize site-wide groundwater conditions.

The proposed IRM is intended to address the contamination known to exist within the urban fill. The IRM tasks include installing shoring, excavating the urban fill, and backfilling the excavation.

The RI and IRM activities will be completed in general accordance with NYSDEC Division of Environmental Remediation: Technical Guidance for Site Investigation and Remediation dated May 2010 (DER-10).

4 REMEDIAL INVESTIGATION

A previous soil investigation encountered fill material at the Site that is impacted by VOCs, SVOCs, and metals at concentrations above NYSDEC Soil Cleanup Objectives (SCOs). This part of the RI Work Plan describes the scope of investigative work necessary to collect sufficient data to determine the extent of contaminated fill material which will support a subsequent AAR and RWP in achieving Restricted Residential Use SCOs. This section of the RI Work Plan includes:

- Field Investigation
- Sampling Program
- Laboratory Analysis

4.1 Field Investigation

The RI intends to supplement the previous site characterization information by the advancement of soil borings, installing monitoring wells, and collecting and analyzing soil and groundwater samples.

4.1.1 Soil Boring Program

The advancement of soil borings across the Site will facilitate sampling of native material, fill material and construction of groundwater monitoring wells. To ensure complete coverage of the Site, a 50-foot by 50-foot grid will be established across the Site, as shown on **Figure 4**, resulting in 60 grid locations. From the borings, fill and native soil samples will be collected to document Site conditions. Six locations will also be used for the construction of groundwater monitoring wells, as discussed in **Section 4.1.3 Groundwater Monitoring.**

A rotary drill will be used to advance 4-1/4-inch hollow stem augers. Split-spoon samples will be advanced at two-foot intervals using a 140-pound hammer ahead of the augers. The augers and drilling rods will be decontaminated prior to use via high pressure sprayer. The split-spoons will be decontaminated prior to use via an Alconox wash followed by a potable water rinse. Between each soil sample and soil boring, decontamination procedures will be repeated.

Soils from the split-spoons will be screened in the field for visible impairment, olfactory indications of impairment, evidence of NAPLs, and/or indication of detectable VOCs with a PID, collectively referred to as "evidence of impairment" and the results will be recorded on boring logs.

Soil boring logs will be completed and include soil description, PID readings, etc. The boring logs will be included in the RI Report.

Fill Sampling

Fill samples will be collected from the borings based on evidence of impairment and to provide characterization across the Site. In 20 of the 60 grids, one urban fill sample will be collected and analyzed for the following:

- Target Compound List (TCL) volatile organic compounds (VOCs)

- TCL semivolatile organic compounds (SVOCs)
- TCL pesticides
- Polychlorinated biphenyls (PCBs)
- Target Analyte List (TAL) metals
- Total mercury
- Total cyanide
- Hexavalent chromium (from 8 of 20 samples only)

Additionally, eight samples will be collected from the urban fill for waste disposal characteristics. The waste characterization analysis will include:

- Toxicity Characteristic Leaching Procedure (TCLP) VOCs
- TCLP SVOCs
- TCLP pesticides/herbicides
- PCBs
- TCLP metals
- Reactivity
- Corrosivity
- Ignitability

Native Soil Sampling

Native soil will be visually assessed and sampled in each of the 60 grid locations. In order to assess the impact of fill on the underlying native soil, a soil sample will be collected from the top two feet of native material in each grid location. In 12 grid locations, an additional native soil sample will be taken at a depth of 15 feet below grade. The 72 native soil samples will be collected and analyzed for:

- TCL VOCs
- TCL SVOCs
- TCL pesticides
- PCBs
- TAL metals
- Total mercury
- Total cyanide
- Hexavalent chromium (from 29 of 72 samples only)

Based on the results, the 72 native soil samples will also serve as the final confirmatory samples during the subsequent remedial activities.

Assessment of Off-Site Conditions

Because the on-site contamination is not source-based (i.e., not from a point source release), off-site assessment will be limited to sampling along the perimeter of the Site. Fill samples will be collected along the BCP Site perimeter at 50-foot intervals (coinciding with the interior sampling grid) for a total of 31 samples. Surface soil samples will also be collected along the northern and eastern BCP Site boundaries for a total of 15 samples. Native soil samples will be collected at three locations along the southern boundary. The 49 perimeter samples will be analyzed for:

- TCL VOCs
- TCL SVOCs
- TCL pesticides
- PCBs
- TAL metals
- Total mercury
- Total cyanide
- Hexavalent chromium (from 19 of 46 samples only)

Off-site soil sample collection will be facilitated by the advancement of soil borings and surface samples.

4.1.2 Groundwater Monitoring

To characterize groundwater conditions at the Site, six monitoring wells will be installed. The wells will be installed from soil borings discussed in **Section 4.1.1 Soil Borings** and sampled. The wells will be located in the northern and northeastern portion of the Site, where nearby historical development included a gasoline station and a manufacturing facility. The remaining wells will be distributed across the Site, as shown in **Figure 5**.

The overburden wells will be constructed to intersect the top of the water table. Each well will be completed with 5 to 10 feet of 2-inch Schedule 40 0.010-slot well screen connected to an appropriate length of schedule 40 PVC well riser to complete the well. The annulus will be sand packed with quartz sand to approximately one to two feet above the screened section, and one to two feet of bentonite chips or pellets above the sand. The remaining annulus will be grouted to ground surface. Each well will be completed with a stick-up protective casing.

Following installation, the monitoring wells will be developed through the removal of up to ten well volumes using dedicated bailers or a peristaltic or submersible pump.

Groundwater sampling will follow well development and be conducted using low-flow purging and sampling techniques. Before purging the well, water levels will be measured using an electric water level sounder capable of measuring to the 0.01 foot accuracy. Peristaltic or bladder pumps using manufacturer-specified tubing will be used for purging and sampling groundwater. Calibration, purging and sampling procedures will be performed as specified by the USEPA[1] for low-flow sampling. Decontamination will be conducted after each well is sampled to reduce the likelihood of cross contamination. Calibration times, purging volumes, water levels and field measurements will be recorded in a field log and will be provided in the Final Engineering Report.

The groundwater samples will be analyzed for the following analyte list:

- TCL VOCs
- TCL SVOCs
- TCL pesticides
- PCBs
- TAL metals
- Total mercury

[1] U.S. EPA Region 1 Low Stress (low-flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells, January 19, 2010.

- Total cyanide
- Hexavalent chromium (from two of the six wells only)

Drilling decontamination, development, and purge fluids will be allowed to infiltrate the ground surface of the Site in the vicinity of each soil sampling location. Excess soil will be placed in a drum for subsequent removal.

A second round of groundwater sampling will be performed approximately four weeks after the first round. The second round of groundwater samples will be analyzed for the same analytes as in the first round.

4.2 Sampling Plan and Laboratory Analysis

Table 1 summarizes the sampling program described in the sections above. Additionally, Quality Assurance/Quality Control (QA/QC) samples will be collected, and the following describes the minimum number of samples per media type.

- Soil samples (excluding waste characteristic samples)
    - Blind duplicate – 10%
    - Matrix Spike/Matrix Spike Duplicate (MS/MSD) – 10%
- Groundwater samples
    - Trip blank – 1 per shipment
    - Blind Duplicate – 10%
    - Matrix Spike/Matrix Spike Duplicate (MS/MSD) – 10%

C&S will utilize the services of an NYSDOH Environmental Laboratory Approval Program (ELAP) certified laboratory for analytical testing. The laboratory results for the samples will be reported in a Category B deliverables package to facilitate validation of the data, and a third party validator will review the laboratory data and prepare a Data Usability Summary Report (DUSR). The validator will evaluate the analytical results for the field samples and quality assurance/quality control samples and compare the findings to USEPA guidance to determine the accuracy and validity of the results.

A summary of the RI activities will be submitted to the NYSDEC as monthly progress reports and will be included in the Final Engineering Report. All data submitted to the NYSDEC will be in approved electronic data deliverable (EDD) format.

5 QUALITY ASSURANCE AND QUALITY CONTROL PROTOCOLS

To ensure that suitable and verifiable data results are obtained from the information collected at the Site, quality assurance procedures are detailed in this section.

5.1 Sampling Methods, Analytical Procedures and Documentation

5.1.1 Sampling Methods

Sampling procedures will be conducted in accordance with the NYSDEC *Sampling Guidelines and Protocols Manual*. Collection of representative samples will include the following procedures:

- Ensuring that the sample taken is representative of the material being sampled;
- Using proper sampling, handling and preservation techniques;
- Properly identifying the collected samples and documenting their collection in field records;
- Maintaining chain-of-custody; and
- Properly preserving samples after collection.

Soil Sampling

Soil sampling will be performed using two methods: (1) field screening using a PID; and (2) grab samples. Whether soil samples are collected from the excavator bucket, direct-push rig sleeves, or split-spoons, they will be collected as grab samples that are split and placed into jars supplied by the laboratory as well as into individual zip-lock bags for screening. Screening soil samples will be allowed to sit in sealed zip-lock bag for a short period of time (minimum of five minutes). Head space measurements will then be taken from each zip-lock bag. To prevent cross contamination, zip-lock bags will not be reused and will be properly disposed. Calibration of all electronic field screening equipment will be completed daily and will be done to manufacturer's specifications.

As detailed in the *Sampling Guidelines and Protocols Manual*, grab samples will be placed in 4-ounce and 8-ounce, wide-mouth, glass jars. Sample jars will immediately be placed on ice in a cooler.

Closure sampling will be conducted during the RI and consist of 72 native soil samples across the Site.

Water Sampling

Groundwater sampling will be conducted in accordance with USEPA guidance for low-flow purging and sampling, as described in **Section 4**.

Water samples will be collected in 40 ml and 1-liter glass jars and immediately placed on ice. The water will be analyzed for VOC, SVOC and metals on a standard turnaround time.

QA/QC Sampling

Duplicate samples will be collected from a minimum of 10% of the locations, and will be selected randomly. Based on an estimate of 20 urban fill samples, 72 native soil samples, 49 perimeter samples and twelve groundwater samples; fifteen duplicate soil and two water samples will be collected. Matrix Spike /Matrix Spike Duplicates (MS/MSD) will also be collected on a 10% allocation.

Quality Assurance/Quality Control samples will not be collected and analyzed for the waste characterization sampling.

Table 6-1: Summary of Estimated Sampling

Sample Type	*Matrix*	*Est. #*	*Purpose*
Urban Fill	Soil	20	Characterization
Native Soil	Soil	72	Confirmatory
Perimeter	Soil	49	Characterization
Groundwater	Water	12	Characterization
Duplicate Soil	Soil	15	QA/QC
Duplicate Groundwater	Water	2	QA/QC
MS/MSD –So.	Soil	15/15	QA/QC
MS/MSD –Aq.	Water	2/2	QA/QC
	Total	**204**	

5.1.2 Analytical Procedures

Laboratory Analysis

Laboratory analysis will be conducted by a third-party laboratory that is accredited by the NYSDOH Environmental Laboratory Accreditation Program (ELAP). Laboratory analytical methods will include the most current NYSDEC Analytical Services Protocol (ASP).

Soil and groundwater samples sent to a certified laboratory will be analyzed in accordance with EPA SW-846 methodology for the following contaminants:

- Target Compound List for Volatile Organic Compounds (EPA Method 5035);
- Target Compound List for Semi-volatile Compounds (EPA Method 8270);
- TCL Pesticides (USEPA 8081);
- PCBs (USEPA 8082); and

- Target Analytes List for Metals (EPA Method 6010).

Category B deliverable will be requested to be used in a third-party data validation.

Data Usability

Data Usability Summary Report (DUSR) will be performed by a third-party data consultant using the most recent methods and criteria from the U.S. EPA. The DUSR will assess all sample analytical data, blanks, duplicates and laboratory control samples and evaluate the completeness of the data package. The waste characterization samples will not be validated.

5.1.3 Documentation

Custody Procedures

As outlined in NYSDEC *Sampling Guidelines and Protocols*, a sample is in custody under the following conditions:

- It is in your actual possession;
- It is in your view after being in your physical possession;
- It was in your possession and then you locked or sealed it up to prevent tampering; or
- It is in a secure area.

The environmental professional will maintain all chain-of-custody documents that will be completed for all samples that will leave the Site to be tested in the laboratory.

Air Monitoring Records

Air monitoring will be conducted to verify no impacts to ambient air. Air monitoring will be conducted continuously during the soil boring program on northern and eastern BCP Site boundaries. The monitoring will include periodic screening for VOCs and continuous screening for particulates. All records will be kept on-site during construction and will be made available for regulatory inspection. A daily air monitoring log, including discrete and time-weighted average meter readings, will be maintained through the end of remedial field activities. The specifics of the air monitoring procedures and criteria are detailed in the CAMP.

6 HEALTH AND SAFETY

To verify the safety of the workers and the local community during the performance of the work, monitoring practices of the work environment will be in place during all phases of RI activities. A Health and Safety Plan (HASP) was prepared that details procedures for maintaining safe working conditions and minimizing the potential for exposure to hazardous material. The HASP is provided in **Appendix D**.

Air monitoring during RI activities will be conducted using PID and an aerosol particle meter. Details on air monitoring are provided in the Community Air Monitoring Plan (CAMP). The CAMP is provided in **Appendix C**.

7 INTERIM REMEDIAL MEASURES

The following steps will be implemented to address the known contamination within the urban fill at the Site:

- Installation of temporary lag and pile steel sheeting shoring.
- Removal of approximately 16,000 cubic yards of urban fill for off-site disposal or treatment at a regulated facility.
- If necessary, dewatering of the excavation area and the treatment of captured water.
- Use of confirmatory soil sample results generated during the RI to show compliance with the Restricted Residential Use Soil Cleanup Objective.

This section of the report will identify the steps to be taken to remediate the Site and how the actions will successfully achieve the stated Restricted Residential Use Soil Cleanup Objectives.

7.1 Site Control

Site control is an important aspect of this remedial program. In order to safeguard the health and safety of site workers and the general public, access to all remedial work areas will be restricted. Perimeter fencing will be installed to facilitate site control. Additionally, temporary construction fencing will be erected around accessible excavations and staging areas to prevent unauthorized personnel from entering these areas as appropriate.

7.2 Site Preparation

Site preparation activities will include the following:

7.2.1 Shoring System

Trenches will be created in preparation for the installation of the shoring system. The shoring system, consisting of steel sheeting and will be designed to accommodate a maximum excavation depth of seven feet. The shoring system will be driven into the ground and tiebacks may be installed as necessary to provide adequate structural support. **Figure 6** shows a typical section design of the shoring system and **Figure 7** shows the proposed location of the shoring.

7.2.2 Water Collection and Treatment System

Contingent plans will be created to address stormwater, if any, in the excavation. These plans include the potential for pumping the excavation water using temporary sumps or a vacuum truck into steel holding tanks. Stored water will either be shipped for off-site treatment at a licensed treatment facility or will be characterized and treated, if necessary, on-site and discharged to the sanitary sewer under a Buffalo Sewer Authority permit. **Figure 8** shows a schematic of the treatment system.

7.3 Excavation

As discussed previously, the on-site urban fill material is present across the entire Site and the underlying native material meets the Restricted Residential Use SCOs. Based on this information, excavation is planned to occur across the Site and will include the removal and off-site disposal of all fill material. Fill excavated from the Site will not be re-used at other sites.

The depth of the excavation will be based on the sampling completed during the RI, which demonstrated that the underlying native material met the SCOs. The RI sampling will include one native soil sample from each 50-foot by 50-foot grid location.

Although petroleum or other similar impacts are not anticipated, a C&S scientist or engineer will screen the removed fill for visual and olfactory observations and for total volatile compounds using a photoionization detector (PID). If grossly contaminated fill is observed, the impacted material will be evaluated and may be handled separately from the remaining fill at the Site.

Excavated fill may be direct-loaded onto trucks for off-site disposal or stockpiled and loaded onto trucks for off-site disposal. Excavated fill to be stockpiled on-site will be placed on and covered by a minimum of double 6-mil polyethylene sheeting which is sufficiently anchored to prevent any wind and water erosion. The cover will be inspected at least once per day with corrective action taken as needed. The inspections and any corrective actions will be documented in logs and will occur until the fill materials have been properly removed and disposed off-site.

Good housekeeping practices will be followed during excavation activities to prevent leaving contaminated material on the ground surface (e.g., precautions will be taken to prevent impacts to the ground surface due to material spilled from the excavator bucket).

Transportation of all wastes will be completed by properly permitted vehicles. To the extent practicable, trucks will travel along routes that avoid residential areas.

7.4 Backfilling

The excavation at the Site will be backfilled with material such as clean soil, crushed stone, and/or concrete.

For each source of backfill that is imported to the Site, one of the following will be completed prior to importing the backfill.

a. Documentation will be provided to NYSDEC as to the source of the material and the consistency of the material in accordance with the exemption for no chemical testing listed in DER-10 Section 5.4(e)(5); **OR**

b. Chemical testing will be completed in accordance with the following table:

Recommended Number of Soil Samples for Soil Imported To or Exported From a Site			
Contaminant	**VOCs**	**SVOCs, Inorganics & PCBs/Pesticides**	
Soil Quantity (cubic yards)	**Discrete Samples**	**Composite**	**Discrete Samples/Composite**
0-50	1	1	3-5 discrete samples from different locations in the fill being provided will comprise a composite sample for analysis
50-100	2	1	
100-200	3	1	
200-300	4	1	
300-400	4	2	
400-500	5	2	
500-800	6	2	
800-1000	7	2	
1000	Add an additional 2 VOC and 1 composite for each additional 1000 Cubic yards or consult with DER		

Taken from DER-10 - Table 5.4(e)10

In the event that laboratory analytical testing is conducted, the results for each new source of fill must meet the values provided in Appendix 5 of DER-10 (provided as Appendix C in this Work Plan) for Restricted Residential use and must receive approval by the NYSDEC.

7.5 Air Monitoring

When urban fill is being excavated or moved at the Site, the Community Air Monitoring Plan (CAMP) included in **Appendix C** will be implemented at this Site. A particulate monitor was used at a downwind location on the perimeter of the Site. Another handheld detector was used in the excavation to ensure that the worker area was safe.

The action threshold for VOCs established in the CAMP is 5 ppm above background. If this value is exceeded for the 15-minute average work will be halted and work may resume once instantaneous readings fall below 5 ppm work. The action level for dust is 100 micrograms per cubic meter over background during a 15-minute average. If this limit is exceeded, dust suppression techniques will be employed, including using water to wet the area.

7.6 Erosion and Dust Controls

As part of the remedial actions to be performed at the Site, measures will be needed to limit erosion and dust generation. Erosion control and dust suppression techniques will be employed as necessary to limit erosion and fugitive dust generated in disturbed areas during remediation and redevelopment activities. Such techniques may be employed even if the community air monitoring results indicate that particulate levels are below action levels. Techniques may include but are not limited to:

- Using silt fencing, hay bales, and/or mulching
- Applying water on haul roads
- Wetting equipment and excavation surfaces
- Hauling materials in properly tarped or watertight containers
- Limiting vehicle speed on the Site
- Limiting the size of excavations
- Covering excavated areas and materials following excavation

Effectiveness of the dust suppression measures will be evaluated based on the results of the air monitoring that will be conducted under the Site-Specific Community Air Monitoring Plan provided in **Appendix C**.

7.7 Confirmatory Sampling

The RI will determine the depth of impacts from the overlying urban soil. Excavation depths will be determined from the RI results; additional confirmatory sampling will not be necessary.

7.8 Summary of Interim Remedial Measures

The IRM as described above will be effective in remediating the Site.

All confirmatory soil samples collected during the RI meet Restricted Residential Use SCOs at the bottom depth of the excavation for that grid location following the excavation. The urban fill materials will be properly excavated and disposed off-site. Backfill materials will meet NYSDEC requirements for backfill at BCP sites.

8 REPORTING

Based on the results of the work described above, one report will be prepared to describe the methodologies and results of the RI and IRM. The RI and IRM portions of the Report will describe:

- Investigative methods;
- Observations and findings;
- Inspection/Monitoring observations of the remedial measures;
- Results of the community air monitoring program; and
- Analytical results.

The AAR portion of the Report will include the following elements:

- An Alternatives Analysis
  - Description of remaining contamination, if any
  - Identification of potential, additional remedial measures
  - Evaluation of potential, additional remedial measures, including no action following the remediation
  - Identification of recommended additional remedy

The documents will be submitted to the NYSDEC for review and approval.

9 SCHEDULE

It is assumed that NYSDEC will promptly review this RI/IRM Work Plan followed by a 30-day comment period. Below is an anticipated schedule of milestones for the remediation of the Site.

Anticipated Date Milestone

March – May 2015: Preparation/execution of Brownfield Cleanup Agreement

April – May 2015: Sampling/data collection and preparation of RI/AAR/IRM report.

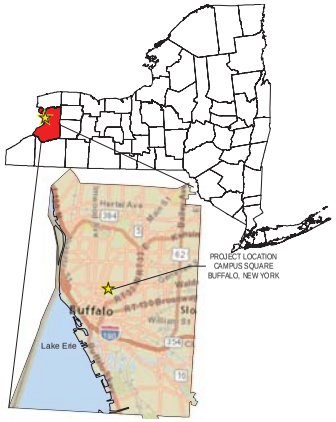
June 2015: Beginning of demolition of existing improvements

July – August 2015: Implement site remediation

September 2015 – January 2015: Completion and approval of Final Engineering Report and other Brownfield Cleanup Program requirements as needed (e.g., Environmental Easement, Site Management Plan, etc.); receipt of Certificate of Completion

February 2016 – July 2017 Construction of new mixed-use building

FIGURES



LEGEND

BCP SITE BOUNDARY

0 200 400 800 Feet

C&S Engineers, Inc.
141 Elm Street
Suite 100
Buffalo, New York 14203
Phone: 716-847-1630
Fax: 716-847-1454
www.cscos.com

N

CAMPUS SQUARE
REMEDIAL INVESTIGATION-
INTERIM REMEDIAL MEASURE
WORK PLAN
BUFFALO, NEW YORK
FEBRUARY 2015

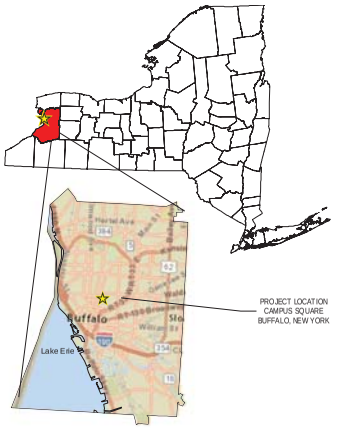
MARK	DATE	DESCRIPTION

REVISIONS

PROJECT NO:	063.001.001
DATE:	JANUARY 28, 2015
DRAWN BY:	A. DeMARCHI
DESIGNED BY:	A. DeMARCHI
CHECKED BY:	D. RIKER

SITE LOCATION

FIGURE 1



LEGEND

BCP SITE BOUNDARY

PARCEL BOUNDARY

0 50 100 200 Feet

C&S COMPANIES®
C&S Engineers, Inc.
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Fax: 716-847-1454
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CAMPUS SQUARE
REMEDIAL INVESTIGATION-INTERIM REMEDIAL MEASURE WORK PLAN
BUFFALO, NEW YORK
FEBRUARY 2015

MARK	DATE	DESCRIPTION

REVISIONS

PROJECT NO:	063.001.001
DATE:	FEBRUARY 2, 2015
DRAWN BY:	A. DeMARCHI
DESIGNED BY:	A. DeMARCHI
CHECKED BY:	D. RIKER

SITE DETAIL

FIGURE 2

Path: F:\Project\O63 - Campus Square\O63.001.001 - Brownfield Cleanup Program\Planning-Study\GIS\Projects\RI-IRM\RI_IRM_FIGURE_2_SITE_DETAIL.mxd

LEGEND

- BCP SITE BOUNDARY
- NO SAMPLE COLLECTED
- SAMPLE EXCEEDED RESTRICTED RESIDENTIAL USE CRITERIA FOR AT LEAST ONE COMPOUND
- SAMPLE EXCEEDED INDUSTRIAL USE CRITERIA FOR AT LEAST ONE COMPOUND

NOTES

1) Coordinate System: NAD 1983 StatePlane NY West FIPS 3103
Projection: Transverse Mercator
Datum: North American 1983
Units: Foot US

2) Survey data from Marathon Engineering, "Lot 1 of the Campus Square Subdivison, Final Subdivision Plat" Job No. 0535-14 August 21, 2014.

3) Base layer includes proposed development at site.

0 50 100 200 Feet

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REMEDIAL INVESTIGATION-INTERIM REMEDIAL MEASURE
WORK PLAN
BUFFALO, NEW YORK
FEBRUARY 2015

MARK	DATE	DESCRIPTION

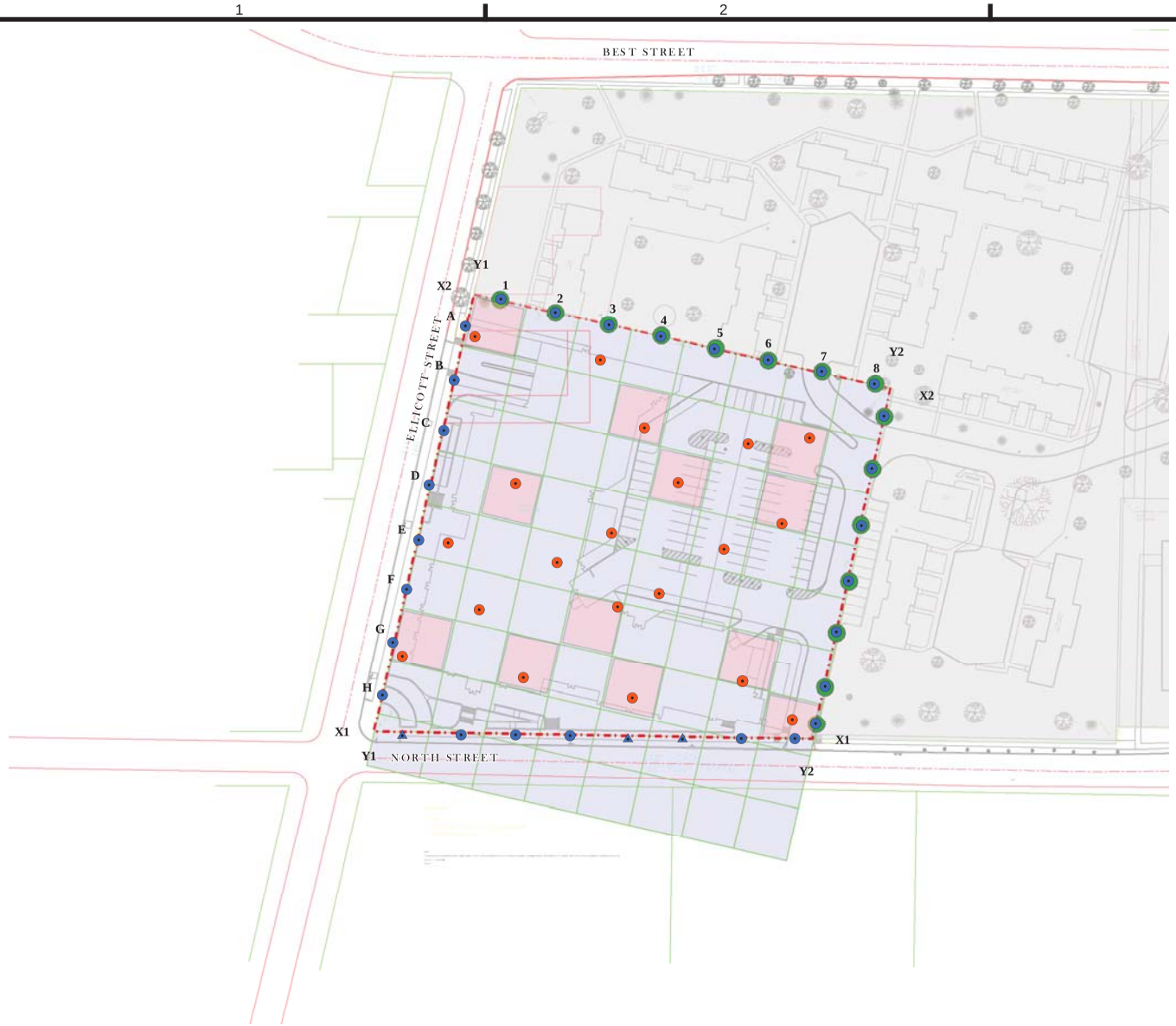
REVISIONS

PROJECT NO: 063.001.001
DATE: FEBRUARY 2, 2015
DRAWN BY: A. DeMARCHI
DESIGNED BY: A. DeMARCHI
CHECKED BY: D. RIKER

2014 SITE CHARACTERIZATION

FIGURE 3

Path: F:\Project\O63 - Campus Square\O63.001.001 - Brownfield Cleanup Program\Planning-Study\GIS\Projects\RI-IRM\RI_IRM_FIGURE_3TEST_SITE_DETAIL.mxd



LEGEND

- BCP SITE BOUNDARY
- PARCEL BOUNDARIES
- PERIMETER FILL SAMPLING
- PERIMETER SURFACE AND FILL SAMPLING
- PERIMETER FILL AND NATIVE SAMPLING
- PROPOSED FILL SAMPLING LOCATION
- NATIVE SAMPLING LOCATION AT 15 FEET

NOTES

1) Coordinate System: NAD 1983 StatePlane NY West FIPS 3103
Projection: Transverse Mercator
Datum: North American 1983
Units: Foot US

2) Survey data from Marathon Engineering, "Lot 1 of the Campus Square Subdivison, Final Subdivision Plat" Job No. 0535-14 August 21, 2014.

3) Base layer includes proposed development at site.

4) All grids will have native soil analysis.

0 50 100 200 Feet

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CAMPUS SQUARE
REMEDIAL INVESTIGATION
WORK PLAN
BUFFALO, NEW YORK
FEBRUARY 2015

MARK	DATE	DESCRIPTION

REVISIONS

PROJECT NO:	063.001.001
DATE:	March 17, 2015
DRAWN BY:	A. DeMARCHI
DESIGNED BY:	A. DeMARCHI
CHECKED BY:	D. RIKER

PROPOSED REMEDIAL INVESTIGATION

FIGURE 4

Path: F:\Project\O63 - Campus Square\O63.001.001 - Brownfield Cleanup Program\Planning-Study\GIS\Projects\RI-IRM\FIGURE_4_GRIDandPROPOSEDSAMPLE_LOCATIONS.mxd

LEGEND

- BCP SITE BOUNDARY
- PARCEL BOUNDARIES
- GROUNDWATER MONITORING WELL LOCATION

NOTES

1) Coordinate System: NAD 1983 StatePlane NY West FIPS 3103
Projection: Transverse Mercator
Datum: North American 1983
Units: Foot US

2) Survey data from Marathon Engineering, "Lot 1 of the Campus Square Subdivison, Final Subdivision Plat" Job No. 0535-14 August 21, 2014.

3) Base layer includes proposed development at site.

0 50 100 200 Feet

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CAMPUS SQUARE
REMEDIAL INVESTIGATION
WORK PLAN
BUFFALO, NEW YORK
FEBRUARY 2015

MARK	DATE	DESCRIPTION

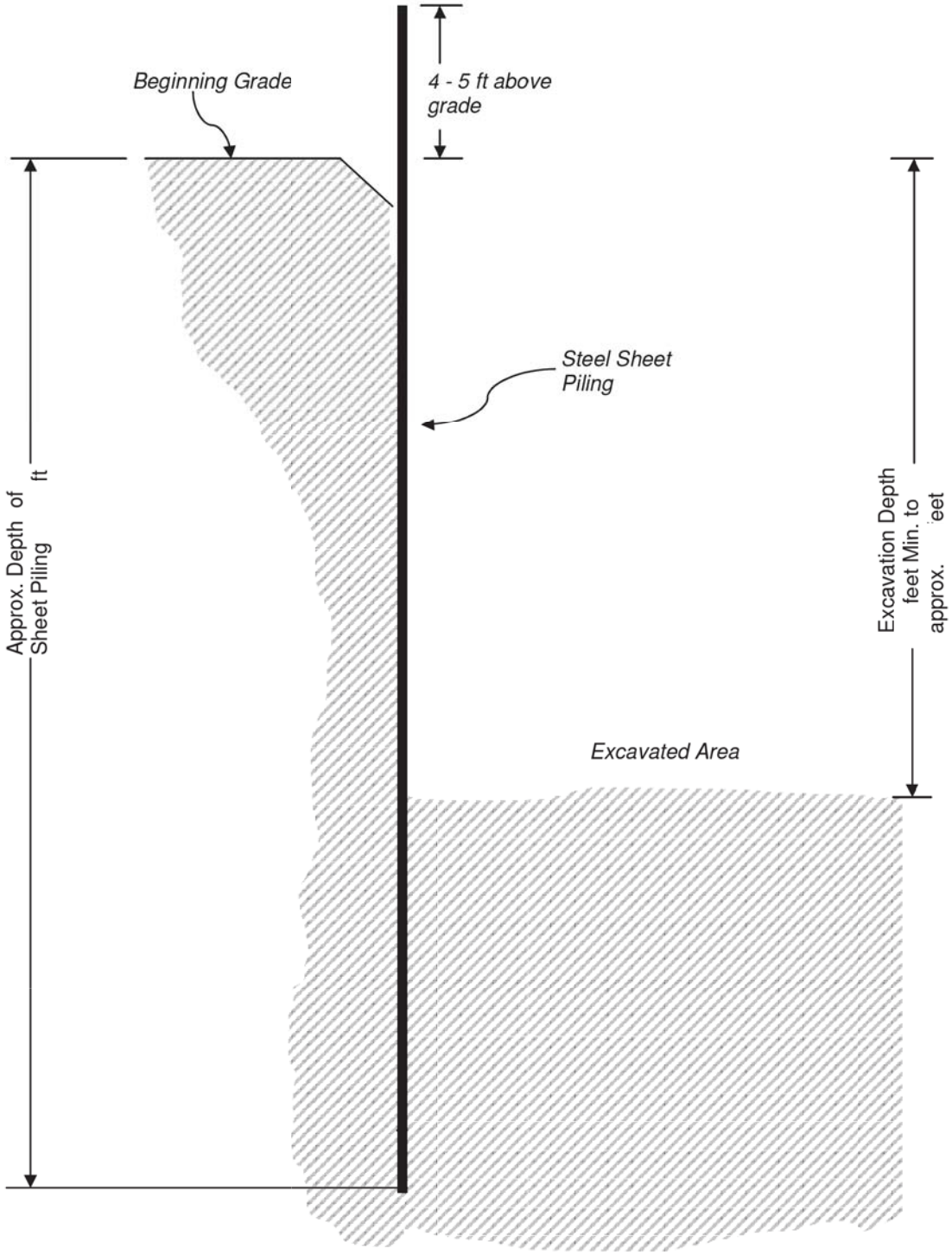
REVISIONS

PROJECT NO:	063.001.001
DATE:	March 17, 2015
DRAWN BY:	A. DeMARCHI
DESIGNED BY:	A. DeMARCHI
CHECKED BY:	D. RIKER

PROPOSED GROUNDWATER MONITORING WELL LOCATIONS

FIGURE 5

Path: F:\Project\O63 - Campus Square\O63.001.001 - Brownfield Cleanup Program\Planning-Study\GIS\Projects\RI-IRM\FIGURE_5_GWwell_LOCATIONS.mxd



TITLE:

TYPICAL SHORING DESIGN SECTION

C&S Engineers, Inc.
Buffalo, New York 14203
Phone: 716-847-1630
Fax: 716-847-1454
www.cscos.com

DATE:

SCALE: Not to Scale

FILE NO.

FIGURE

LEGEND

- BCP SITE BOUNDARY
- PARCEL BOUNDARIES
- SHORING LOCATION

NOTES

1) Coordinate System: NAD 1983 StatePlane NY West FIPS 3103
Projection: Transverse Mercator
Datum: North American 1983
Units: Foot US

2) Survey data from Marathon Engineering, "Lot 1 of the Campus Square Subdivison, Final Subdivision Plat" Job No. 0535-14 August 21, 2014.

3) Base layer includes proposed development at site.

0 50 100 200 Feet

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CAMPUS SQUARE
REMEDIAL INVESTIGATION-
INTERIM REMEDIAL MEASURE
WORK PLAN
BUFFALO, NEW YORK
FEBRUARY 2015

MARK	DATE	DESCRIPTION

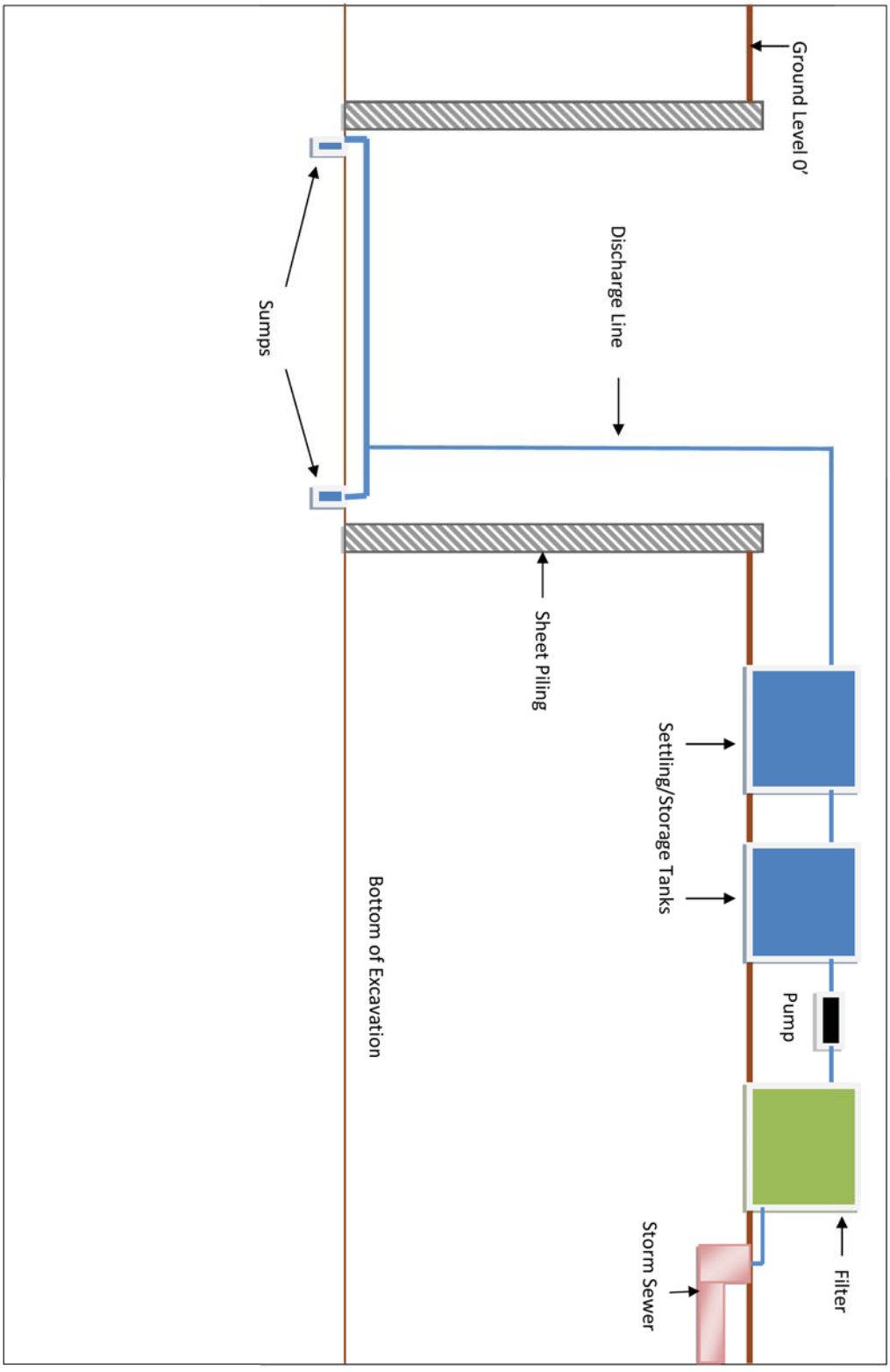
REVISIONS

PROJECT NO:	063.001.001
DATE:	February 23, 2015
DRAWN BY:	A. DeMARCHI
DESIGNED BY:	A. DeMARCHI
CHECKED BY:	D. RIKER

SHORING LOCATION

FIGURE 7

Path: F:\Project\O63 - Campus Square\O63.001.001 - Brownfield Cleanup Program\Planning-Study\GIS\Projects\RI-IRM\RI_IRM_FIGURE_7_SHORING.mxd



TITLE:

TEMPORARY DEWATERING TREATMENT SYSTEM

C&S Engineers, Inc.
Buffalo, New York 14203
Phone: 716-847-1630
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DATE:

SCALE: Not to Scale

FILE NO.

FIGURE

TABLES

Table 1 – Proposed Remedial Investigation Sampling Program

Task	Location	Number of Samples	Lab Analysis
Urban Fill Samples	50-foot by 50-foot grid	20	TCL VOCs, SVOCs and pesticides, PCBs, TAL Metals, Cyanide, Hex Chromium (subset only - 4 samples)
	Site-wide	8	TCLP VOCs, SVOCs, pesticides, herbicides, and metals, PCBs, reactivity, corrosivity, ignitability
Native Soil Samples	Site-wide	72	TCL VOCs, SVOCs and pesticides, PCBs, TAL Metals, Cyanide, Hex Chromium (subset only-15 samples)
Perimeter Soil Samples	50-foot centers	49	TCL VOCs, SVOCs and pesticides, PCBs, TAL Metals, Cyanide, Hex Chromium (subset only - 10 samples)
Groundwater Samples	Site-wide	12 (Two Events)	TCL VOCs, SVOCs and pesticides, PCBs, TAL Metals, Cyanide, Hex Chromium (subset only - 4 samples)

APPENDICES

APPENDIX A
SUBSURFACE CHARACTERIZATION REPORT

C&S Companies
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f: (716) 847-1454
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September 22, 2014

Jeff Lehrbach
Vice President/Chief Financial Officer
The McGuire Group
560 Delaware Avenue
Buffalo, New York 14202

-and-

Mark Trammell
MHT Holdings, Inc.
38 Holloway Blvd.
Buffalo, New York 14209-2361

Re: Campus Square Supplemental Subsurface Investigation

Dear Jeff:

McGuire Group requested C&S Engineers, Inc. ("C&S") to complete supplemental subsurface sampling of the urban fill soils at the current Pilgrim Village Apartments ("Site"). The parcel is being considered for potential redevelopment and based on the known presence of urban fill at the Site; the project is considering making application for inclusion in the NYSDEC's Brownfield Cleanup Program. C&S understands this sampling is being conducted to screen soils and determine if an environmental impairment exists.

SITE DESCRIPTION

The Pilgrim Village Apartment complex is located on the block bounded by Best Street, Michigan Avenue, East North Street and Ellicott Street. The complex consists of about 90 one and two story, wood and masonry town homes apartments with slab-on-grade floors.

The initial phase of the redevelopment will consist of demolition of town homes / apartments on the southwest corner of the Site. The new building that will be constructed for this phase will be an eight story mixed use residential and commercial structure with one below grade parking level. The finished parking floor will be approximately 12 to 14 feet below ground surface ("bgs"). The first floor of the building will be used for commercial space and the remaining seven floors will be used for residential space. This investigation targets a four acre portion of the Site that will be redeveloped in this phase.

SUBSURFACE INVESTIGATION

The investigation consisted of 14 soil borings to evaluate layers of urban fill that were encountered during the Geotechnical Investigation conducted on July 10, 2014. The borings were drilled using a 6620 DT Geo-probe from ground surface to approximately 10 feet bgs or until the top of the native soil material was encountered.

Borings were continuously sampled from ground surface to the final completion depth. Soil cores were collected for each vertical 4 foot interval. Soil from each core was visually described and recorded.

A map of boring locations is presented as Figure 1.

For the purposes of this letter report the generic term "fill" is defined as anthropogeneric sources of any one, or mixture, of the material re-worked to build a site to a defined grade. This material can include:

Crushed Rock	Lumber
Sand	Ash/Cinders
Silt	Ceramics
Clay	Bricks
Plastics	Metal
Construction Debris	

The urban fill onsite was a heterogeneous mixture of the materials listed above. No discrete contaminate layer was observed. Urban fill was generally encountered between 5 – 8 feet bgs.

Native soil encountered beneath the fill consisted of Silty Clay – organic clays of medium to high plasticity and variable silt content with a reddish brown clay appearance.

A total of 7 soil samples were collected and analyzed. Each soil sample was analyzed for Volatile Organic Compound ("VOC") (EPA Method 8260B), Semi-volatile Organic Compounds ("SVOC") (EPA Method 8270C) and Metals (EPA Method 6010). The following table summarizes the samples collected from each boring.

Table 1: Sample Collection

Boring	*Sample Depth (feet)*	*Matrix*
EBH-1	3-4	Brown silty clay with gravel and black fill
EBH-4	5	Yellow brown silt and fill with coal and rusted metal fragments
EBH-5	1-2	Brown silty sand with trace coal and fine crushed brick and concrete
EBH-6	1.5-2.5	Brown fine sand trace crushed fill with silty clay
EBH-8	6	Silt trace clay with fill
EBH-9	2-3	Dark brown silt some clay with dark grey silt
EBH-10	2-3	Fill silt dark brown with fine crushed brick and concrete

RESULTS

A total of 7 samples were collected for analysis. All seven soil samples exceeded Unrestricted Residential Use criteria for at least three compounds. The main contaminates of concern are metals – arsenic, lead, mercury and zinc. One sample (EBH-8 6') had an exceedance of two SVOCs. Methylene chloride was detected in 6 of the 7 samples; all detections were above Unrestricted Use. Methylene chloride is a common laboratory chemical used as a solvent in running analytical procedures. The presence of methylene chloride may be a laboratory artifact from analytical testing.

Arsenic was detected above Industrial Use in sample EBH-1 3-4 ft. Arsenic levels in this sample were over 10 times the Industrial Use standard. The table below presents soil sample results compared to 6 NYCRR Part 375 Soil Cleanup Objectives:

Table 2: Soil Sample Detections Exceeding NYSDEC Soil Cleanup Objectives

Boring ID	*Sample Depth*	*Criteria Exceeded*	*Exceeded Contaminates*
EBH-1	3-4	Industrial	Arsenic
		Unrestricted	Selenium Mercury Methylene Chloride
EBH-4	5	Industrial	Arsenic
		Commercial	Mercury
		Restricted Residential	Lead
		Unrestricted	Copper Selenium Zinc
EBH-5	1-2	Restricted Residential	Mercury
		Unrestricted	Lead Selenium Zinc Methylene Chloride
EBH-6	1.5-2.5	Restricted Residential	Benzo (a) anthracene
		Unrestricted	Lead Mercury Methylene Chloride Benzo (k) fluoranthene
EBH-8	6	Restricted Residential	Lead
		Unrestricted	Selenium Zinc Methylene Chloride
EBH-9	2-3	Restricted Residential	Lead

		Unrestricted	Mercury Methylene Chloride
EBH-10	2-3	Restricted Residential	Lead
		Unrestricted	Zinc Mercury Methylene Chloride

Table 3 attached to this letter presents all detected analytes against Soil Cleanup Objectives.

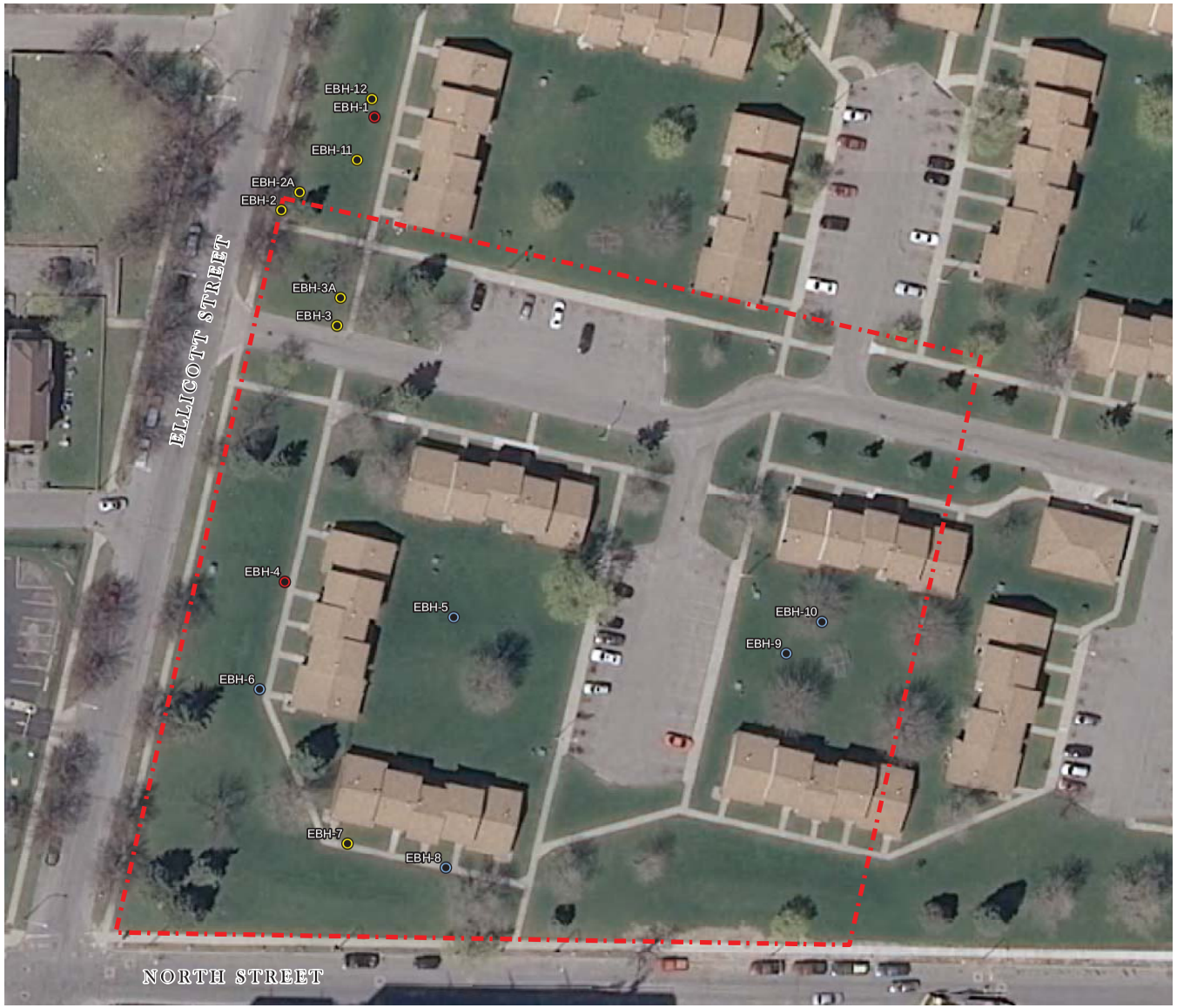
SUMMARY AND RECOMMENDATIONS

The supplemental subsurface investigation conducted on site of the proposed new eight story residential and commercial building. Urban fill was encountered throughout the Site between 5 to 8 feet bgs. Analytical results indicate that the urban fill contains concentrations of metals above Unrestricted Use. Mercury was detected in one sample (EBH-4 5 ft) above Commercial Use and arsenic was detected in two samples (EBH-4 5 ft and EBH-1 3-4 ft) above Industrial Use.

Due to the concentrations of metals detected in the urban fill above Restricted Residential SCOs in 6 of the 7 samples, the onsite soils may not be suitable for residential use.

Sincerely yours,
C&S ENGINEERS, INC.

Mark Colmerauer
Regional Environmental Service Manager



LEGEND

- PROPOSED BCP SITE BOUNDARY
- NO SAMPLE COLLECTED
- SAMPLE EXCEEDED RESTRICTED RESIDENTIAL USE CRITERIA FOR AT LEAST ONE COMPOUND
- SAMPLE EXCEEDED INDUSTRIAL USE CRITERIA FOR AT LEAST ONE COMPOUND

0 30 60 120 Feet

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N

CAMPUS SQUARE
PRE-DEVELOPMENT
ENVIRONMENTAL INVESTIGATION
SEPTEMBER 2014
BUFFALO, NEW YORK

MARK	DATE	DESCRIPTION

REVISIONS

PROJECT NO:	063.001.001
DATE:	SEPTEMBER 15, 2014
DRAWN BY:	C. MARTIN
DESIGNED BY:	C. MARTIN
CHECKED BY:	M. COLMERAUER

SAMPLING RESULTS

FIGURE 1