REPORT

REMEDIAL INVESTIGATION WORK PLAN

Legacy LaSalle, LLC– 89 LaSalle Avenue Site
Buffalo, New York
Brownfield Cleanup Program

Submitted To: Chief, Site Control Section
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Division of Environmental Conservation
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1.0 INTRODUCTION

Legacy LaSalle LLC (Legacy) has prepared this Remedial Investigation (RI) Work Plan in support of the submittal of a Brownfield Cleanup Program (BCP) application in accordance with the provisions of the New York State Department of Environmental Conservation's (NYSDEC) Subpart 375-3. The BCP application is requesting entry into the BCP for Legacy's property or parcels located at 67 and 89 LaSalle Avenue and portions of the City of Buffalo parcel (71 NY L&W RR, also referred to as 71 Cordova Ave.) for which Legacy has received designated developer status. All parcels are located in the City of Buffalo, New York (Site). The Site consists of three parcels comprising a total of approximately 10.6 acres located in the Main-LaSalle neighborhood just to the north of McCarthy Park (refer to Figure 1-1). Portions of the site encompass the former Buffalo Crushed Stone quarry Legacy is proposing to construct a high density, multifamily student housing community primarily for rent to the State University at Buffalo students. The project will consist of 4 - 6 separate residential buildings, a community building, parking facilities, a maintenance building and common area. Buildings will range in height from 3 to 5 stories and will contain approximately 300,000 square feet of space.

The Site development uses will encompass residential housing, support facilities, parking and vehicle access infrastructure. Golder Associates Inc. (Golder) was retained by Legacy to prepare this RI Work Plan to address the NYSDEC BCP requirements.

1.1 Site History

Based on the results of a recently conducted Phase I Environmental Site Assessment, the southern portions of the 89 LaSalle parcel and associated unaddressed parcels to the south including the City of Buffalo parcel were used as a stone quarry from approximately 1915 through 1950 by the Buffalo Crushed Stone company. Subsequently the quarried areas were used by the City of Buffalo as a landfill in the 1950s and 1960s for the disposal of a variety of demolition debris, ash, railroad ballast and reportedly some municipal waste. A building located on the northern portion of 89 LaSalle (proximate to LaSalle Ave.) was apparently constructed in the 1950's and at various times has housed a residential heating contractor, catering service and most recently, a local radio station. Several towers and antennas associated with the radio station are located to the south and southwest of the building on the 89 LaSalle Avenue parcel.

According to a recently performed Phase I ESA, the 67 LaSalle parcel has a history of use as a lumber yard since the early 1900s, more recently some of the structures on the parcel have been used for automotive storage after lumber yard operations ceased. The buildings remain on the parcel but are now vacant. There were no other noted uses of this property.

The parcel at 71 Cordova Avenue is generally vacant with the exception of a parking lot and tennis courts that are in need of repairs and upgrades. The portions of the 71 Cordova parcel associated with the parking lot and tennis courts have been excluded from BCP Site metes and bounds definition (i.e., they

are ineligible under the BCP program) as shown on Figure 3-1 and are therefore not part of the proposed RI.

1.2 Purpose and Scope

The Site has not been comprehensively characterized, therefore Legacy intends to investigate soil/fill and groundwater, if feasible, within the Site for the purpose of more fully characterizing the Site and identifying/evaluating remedial alternatives under the New York State BCP. Data collected during the RI will be used to identify potential health risks and to evaluate remedial alternatives.

The Work Plan proposes the following activities to identify and delineate, if present, soil/fill and groundwater impacts on the Site:

- Advancement of fifteen (15) subsurface soil borings to a depth of approximately 15-20 feet below ground surface (bgs) and collection/analysis of representative soil/fill samples to establish concentrations of specified Target Compound List contaminants of concern parameters.
- Manual collection of three (3) shallow soil/fill samples from test pits excavated to bedrock. Based on previous investigations the assumed depth of proposed test pits will be 3 to 4 feet below grade surface (bgs) on the 67 LaSalle parcel and at the northern border of the 89 LaSalle parcel. Analysis of representative soil/fill samples at each test pit location to establish concentrations of specified Target Compound List contaminants of concern parameters.
- Installation of up to three (3) on-site monitoring wells and collection/analysis for Target Compound List parameters of on-site groundwater samples to assess Site groundwater quality. Collection of groundwater potentiometric data will also be performed in conjunction with the sampling activities.

The data obtained from this RI, with the results of previous investigations (presented in Section 1.3) will be used to:

- Describe the amount, concentration, persistence, mobility, state (e.g., solid, liquid), and other relevant characteristics of the contaminants present.
- Define hydrogeological factors (i.e., depth to saturated zone, groundwater gradients, proximity to wetlands, etc).
- Define the potential human and environmental exposure pathways from the Site and the extent to which contaminants of concern from these pathways have the potential to pose a threat to human health or the environment.
- Determine the extent to which contaminant levels on the Site, if applicable, pose an unacceptable risk to human health or the environment.
- Develop Remedial Action Objectives (RAOs for the Site based on the contaminant characterization results, exposure pathways and risk valuation data.
- Provide sufficient information to allow for the identification of potentially feasible remedial alternatives.

Based on the current knowledge of potential Site impacts, the RAOs for the Site may require implementation of remedial actions designed to remove or cover impacted soil/fill material. It is Legacy's intent to propose a remedy that will meet the BCP's Track 4 clean up approach for achieving Restricted

Residential use. Depending on the results of the RI, this remedy is anticipated to consist of a combination of soil/fill excavation of identified "hot-spot" shallow soils, if any, that exceed Part 375 restricted residential Soil Cleanup Objectives (SCOs) combined with a soil cover system over exposed residual soil contamination that complies with the use-based SCOs in 6NYCRR Table 375-6.8(b0 levels for the top two feet.

1.3 Summary of Previous Investigations

Several investigations encompassing portions of the proposed BCP Site were previously performed for other proposed development activities on or adjacent to the BCP Site and are briefly summarized below.

1.3.1 Phase I ESAs

1985 RECRA Environmental Phase I Engineering Investigation

In 1985 RECRA Environmental completed a Phase I Engineering Investigation for the NYSDEC of the so-called LaSalle Reservoir site that encompassed approximately 50 acres and a substantial portion of the BCP Site. No environmental sampling was conducted as part of this study and the resulting conclusions were based on a US EPA hazard ranking system that is no longer in use and therefore of limited informational value. The report did reiterate the site history of the use of the northern portion of the quarry as a landfill area by the City of Buffalo from approximately 1951 through 1972.

2013 Phase I Environmental Site Assessment

A Phase I ESA was completed by LCS Inc.in September 2013 in conjunction with preparation of the BCP Application. The known or suspect Recognized Environmental Conditions (RECs) and de minimis conditions found during the conduct of the ESA are listed below as presented in the LCS Phase I ESA summary if findings:

- The subject property and adjacent properties were initially identified as being part of a quarry from at least 1916 until at least 1950. Sanborn maps indicate a gasoline tank on-site from at least 1935 until 1950.
- The subject property and/or its immediate adjacent properties were identified as a Historic VCP site, two State Sites, a Federal Brownfield site and a CERCLIS NFRAP site. The LaSalle Reservoir site includes two State sites and a CERCLIS NFRAP site. The narrative in the third party database states that this site was an approximately 50 acre limestone quarry. The limestone quarry was later utilized by the City of Buffalo as a landfill for municipal refuse, incinerator ash, household appliances, tree parts and construction and demolition debris, and may have also received suspected paint wastes mixed with sawdust, floor sweepings. The prior investigations completed at this LaSalle Reservoir site identified several potential concerns associated with typical solid waste landfill operations. It should be noted that within the third party database there is limited information regarding the geographical limits the 50-acre site, including the extent of the investigation, if any, completed on the subject property.
- LaSalle Reservoir, addressed at East Amherst Street, was identified in the Orphan Summary of the EDR report as a CERCLIS-NFRAP site; this listing may in part be

associated with portions of the subject property historically utilized as a quarry and municipal landfill.

- A railroad track extended onto a portion of the property from at least 1935 through at least 1950.
- Railroad tracks have been historically located south adjacent from at least 1935 through at least 1950 and west adjacent to the subject property from at least 1916 until at least 1990.
- South and east adjacent properties were identified as being a portion of a quarry from at least 1916 until at least 1950.
- A west adjacent property was utilized as an iron/steel works facility from at least 1957 until at least 2005.
- A filling station with automotive repair was located north adjacent to the subject property in at least 1935 until at least 1950.
- An automotive repair facility is located north of the subject property.
- A north adjacent property was identified in the RCRA Non-Generator, FINDS database and Manifest databases.

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The following de minimis conditions in connection with the Site were identified in the Phase I ESA:

- Partially hydric soils are located on portions of the subject property.

A complete copy of the September 2013 Phase I ESA is provided on a CD in Appendix A.

1.3.2 Previous Soil/Fill Investigations

1.3.2.1 1989 Phase II Investigation – LaSalle Reservoir Site

In 1989, the NYSDEC contracted Ecology and Environment to conduct a Phase II environmental site investigation of the LaSalle Reservoir Site that included portions of the BCP Site. The investigation included an electromagnetic terrain conductivity survey, a magnetometer survey, completion of 3 bedrock monitoring wells and collection and analysis of soil, fill and groundwater samples. The results of the investigation indicated that:

- The depth of the quarry is approximately 45 feet below the adjacent ground surface;
- The depth to groundwater in the bedrock wells ranged from 33 to 45 feet below grade surface, with flow to the northwest;
- Soil samples had concentrations of polycyclic aromatic hydrocarbons (PAHs) at concentrations which, at that time, exceeded NYSDEC's recommended Soil Cleanup Objectives presented in NYSDEC Technical and Administrative Guidance Memorandum;
- Groundwater samples had exceedences of Class GA Ambient Water Quality Standards for iron and magnesium only; and
- "Waste:" samples exhibited concentrations of lead which exceeded the typical background levels for soils in the eastern United States.

1.3.2.2 September 1995 Environmental Site Assessment / Cordova Street Extension Area

In September 1995, Frontier Technical Associates conducted an ESA of 5 acre parcel (referred to as Parcel 16) located in the northern portion of the LaSalle Reservoir Site that encompasses a portion of the proposed BCP Site. This assessment included a review of historical records, completion of 7 soil borings and analysis of 4 composite samples.

The results of the investigations indicated that the area had been backfilled with up to 44 feet of fill materials including gravel, sand, clay, bricks, glass, ash, wood, metal and miscellaneous debris. There appeared to be between zero and two feet of water above the top of bedrock (at the bottom of the fill). Contaminants identified in the fill materials included total petroleum hydrocarbons, elevated concentrations of lead, zinc and mercury and PAHs (in one sample). These findings were consistent with the 1989 LaSalle Reservoir Site investigation findings.

1.3.2.3 April 1997 Main-LaSalle Revitalization Project- Site Investigation Report

Investigations were conducted in August, November and December of 1996 by URS under contract to the Buffalo Urban Renewal Agency to further investigate the general 50 acre area known as the LaSalle Reservoir Site. It appears that approximately 25 test pits were completed within the limits of the proposed BCP Site and at nine of these test pits shallow (i.e., 2- 4 inches below grade surface) soil samples were collected for the analysis of TCL VOCs, SVOCs, pesticides and PCBs as well as TAL metals and cyanide. The contamination identified consisted primarily of PAHs and metals which were described as "widespread across the site at concentrations which exceed both recommended cleanup levels and RBCs" (Main-LaSalle Revitalization Project, Site Investigation Report, Rev. April 1997, URS Greiner, Inc.).

The report also provided the results of an extensive depth to bedrock assessment in portions of the proposed BCP Site which delineated the former quarry high wall location o differentiate between shallow bedrock and the deeper quarried areas where more extensive landfilling occurred. This delineation is included on the survey plans submitted as part of the BCP application.

1.3.2.4 April 2013 Limited Phase II Environmental Site Assessment

Legacy retained EnSol Inc. to conduct a limited environmental investigation of the 89 LaSalle properties and the City of Buffalo property (i.e., 71 Cordova Ave.) to assess the potential eligibility of these parcels for the New York Brownfield Cleanup Program.

The investigation of these properties consisted of:

- Advancement of 10 test pits to a maximum depth of 15 feet below ground surface with a minimum of two test pits in the area of a suspected Underground Storage Tank (UST) (no tank was found in the field);

- Visual and olfactory inspection of soil samples as well as headspace screening with a photoionization detector; and,
- Analysis of six soil samples for target compounds list (TCL) volatile organic compounds (VOCs), TCL semi volatile organic compounds (SVOCs), target analyte list (TAL) metals, cyanide, polychlorinated biphenyls (PCBs), herbicides, and pesticides via United States Environmental Protection Agency (USEPA) SW-846 Test Methods 8260, 8270, 6010/7470, 9012, 8082, 8151, and 8081, respectively.

The results of the test pit soil sampling investigation indicated that concentrations of certain SVOC, metals and pesticide compounds were detected at concentrations exceeding the 6 NYCRR Part 375 soil cleanup objectives for residential or restricted uses at several locations on the properties. No definitive pattern of impact was found and concentrations in excess of SCOs in soil/fill were found to be widespread across the six sample locations.

A summary of the soil sampling results for the test pit locations is presented in Table 1 of the Limited Phase II ESA (a full electronic file of the report is included on the CD attached in Appendix A) and a site map illustrating sample locations on the property is presented on Figure 2 – Test Pit Location Map in the report.

1.3.2.5 Supplemental Phase II Investigation – 67 LaSalle Ave. Parcel

A supplemental Phase II investigation of the 67 LaSalle Avenue parcel was conducted by Golder Associates on August 6, 2013. This investigation consisted of collecting two composite soil samples from the sidewalls and bottom of shallow test pits located on the parcel. Each test pit was excavated to bedrock refusal approximately 3 to 3.5 feet below grade surface. The lithology of the test pits indicated a predominant layer of dark fill (possibly consisting of cinders or ash-like material) mixed with gravel in the upper 1 to 1.5 feet of both test pits with the remaining depth consisting of soils with large quantities of stone or gravel. A representative composite sample was collected from each test pit for the analysis of TCL SVOCs, TAL metals, PCBs, and TCL herbicides and pesticides. The location of these test pits are shown on Figure 4-1 included as a separate electronic file on the CD in Appendix A.

In one of the test pits (TP67-1), a total of seven (7) semi-volatile organic compounds (SVOCs) and one metal were detected at concentrations exceeding the 6NYCRR Part 375 Restricted Residential Soil Cleanup Objectives (SCOs). No other compounds analyzed were detected above Part 375 SCOs. Table 4-1 included as a separate electronic file on the CD in Appendix A presents a summary of the sample results for all detected constituents in both test pits.

1.4 Project Organization and Responsibilities

Legacy has submitted the 89 LaSalle Avenue Site for entrance into the BCP as a volunteer per ECL§27-1405. Golder Associates Inc. (Golder) will manage the brownfield cleanup on behalf of Legacy. The proposed responsibilities of the key staff are summarized below:

Partick T. Martin, P.E., will be the Project Manager for the BCP program. In this capacity Mr. Martin will be responsible for overall coordination of all phases of the project from implementation of the Work Plan and subsequent reporting and documentation of the work performed.

Russell Marchese, will be the Project Geologist, responsible for the implementing the remedial investigation tasks. Responsibilities will include sample collection, well development and directing drilling subcontractors' activities.

Brian C. Senefelder, CHMM, will serve as Project Director and be responsible for the overall quality assurance and review of all project deliverables. He will interface with the Project Manager to address any technical issues and provide quality control for the entire project.

2.0 DATA OBJECTIVES

2.1 Acceptance or Performance Criteria

Acceptance or performance criteria specify the quality of data required to support decisions regarding remedial response activities and are based on the data quality objectives. The data quality and level of analytical documentation necessary for a given set of samples will vary depending on the intended use of the data.

Site-specific remedial action objectives will be developed during the RI process. Sampling data will be used to evaluate whether or not remedial alternatives can meet the objectives. Two data confidence levels will be employed in the RI: screening level data and definitive level data. In general, screening level confidence will apply to field measurements, including photo-ionization detector (PID) measurements, groundwater elevation measurements, and field analyses (i.e., pH, temperature, specific conductivity, and turbidity). Definitive level confidence will apply to samples submitted to an independent laboratory for chemical analysis.

Sampling and analytical acceptance and performance criteria such as precision, accuracy, representativeness, comparability, completeness, and sensitivity, will be defined in the QAPP (refer to Appendix B).

2.2 Data Evaluation Procedures

The RI scope of work is focused on providing reliable data to identify areas of the Site potentially requiring remediation, defining chemical constituent migration pathways, qualitatively assessing human health and ecological risks, and performing the remedial alternatives evaluation. The investigation will include the collection and analysis of soil/fill and groundwater samples to support remedial action objectives. Definitive level data quality will be required for chemical analysis of groundwater and soil/fill samples.

Field team personnel will collect environmental samples in accordance with the rationale and protocols described in the QAPP. United States Environmental Protection Agency (USEPA) and NYSDEC-approved sample collection and handling techniques will be used. Samples for chemical analysis will be analyzed, in accordance with USEPA SW-846 methodology to meet the definitive-level data requirements, by a New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP) Contract Laboratory Protocol (CLP)-certified laboratory. A full (Category B) deliverables package will be provided for all site characterization samples. Analytical results for site characterization samples will be evaluated by a third-party data validation expert for evaluation of the accuracy and precision of the analytical results. A Data Usability Summary Report (DUSR) will be prepared to describe the compliance of the analyses with the analytical method protocols detailed in the NYSDEC Analytical Services Protocol (ASP). The DUSR will provide a determination of whether the

data meets the project-specific criteria for data quality and data use. The validation effort will be completed in accordance with NYSDEC Division of Environmental Remediation DUSR guidelines.

3.0 INVESTIGATION SCOPE

The proposed RI will focus on investigating the Site for potential contaminants in soil/fill and groundwater that have not previously been characterized through the previous limited Phase II investigations.

The proposed RI investigation of the approximately 10.6-acre Site will supplement the soil/fill data across the entire Site were data gaps from previous investigations exist. A total of three (3) shallow soil locations, seventeen (15) subsurface soil borings, and three (3) groundwater monitoring locations are proposed for collection of representative soil/fill and groundwater samples for the RI.

Subsequent to receiving NYSDEC approval for the RI Work Plan, NTC will conduct the RI and prepare a report on the findings. The major components of the proposed RI tasks are described in detail below. Proposed RI sample and groundwater monitoring well locations are illustrated on Figure 3-1. Table 3-1 provides a summary of the proposed samples and analyses to be collected/performed as part of the RI.

3.1 Soil/Fill Investigation

3.1.1 Supplemental Subsurface Investigation Program

As previously noted the historical LaSalle Reservoir Site investigations performed for NYSDEC or BURA and the limited Phase II soil sampling program performed by Legacy on the Site in 2013 provided characterization of residual contaminant concentrations primarily in the upper 10 feet (or less depending on the depth to bedrock) of soil/fill across portions of the site. The results of these investigations indicate that consistently the primary contaminants of concern detected at relevant concentrations at a majority sampling locations are RCRA metals and SVOCs (specifically PAHs). PCBs and VOCs were not detected at concentrations exceeding Part 375 SCOs, with the exception of two VOCs, methylene chloride and acetone that are common laboratory contaminants and are believed to be anomalous detections. Two low level detections of pesticides/herbicides were found at one location, TP-15 as part of the 2013 limited Phase II investigation.

The LaSalle Reservoir and limited Phase II samples were not collected uniformly across the entire BCP site. In addition, groundwater was not encountered in the test pits performed as part of the limited Phase II investigations and very limited groundwater monitoring data was collected from a few wells installed as part of the scope of these investigations. Therefore, a soil boring program will be implemented to thoroughly characterize the subsurface soil/fill and groundwater media to better characterize the overall Site soil/fill overburden material and shallow groundwater, if present, for potential contaminants of concern. The subsurface soil sampling program proposes a total of fifteen (15) soil samples (B-1 through B-15) at evenly spaced intervals drilled to refusal depth (assumed to be top of bedrock) across the Site (except where grid locations overlap with limited Phase II test pits). Proposed borehole locations as depicted in Figure 3-1 may be adjusted in the field based on Site conditions, accessibility, NYSDEC preferences or other logistical concerns. If saturated soils or water is detected during soil boring

activities, three of the proposed borehole locations are proposed to be completed as temporary monitoring wells (MW-1 through MW-3) for characterization of Site groundwater.

3.1.1.1 Soil/Fill Sampling

A drilling rig capable of advancing a borehole using direct push drilling methods via a Geoprobe® drill rig equipped with a concrete core barrel will be used to advance the twelve subsurface soil borings that will not be completed as monitoring wells (i.e., all borings except B-1, B-11, and B-15) through the soil/fill to a maximum of twenty feet . The planned drilling method uses a 1.5-inch diameter, 4-foot core sampler with a dedicated PVC sleeve to advance and retrieve soil core samples at four foot intervals. The total depth of the borings is anticipated to be a maximum of twenty (20) feet or refusal, whichever occurs first. However, if the fill characteristics, contaminant impacts or saturated conditions warrant, select borings may be advanced deeper to better characterize subsurface conditions.

Three soil/fill boring locations (B-1, B-11 and B-15) will be advanced to a maximum depth of 45 feet bgs or refusal and completed as monitoring wells if saturated soils and or groundwater are encountered during drilling. The borings will be advanced and sampled using standard drill-rig mounted hollow stem auger methods. The drilling and sampling approach for these locations is described in detail in Section 3.1.1.2.2 below. The sample selection criteria however will be identical to the approach discussed below for the direct push soil/fill sampling locations.

Upon retrieval of each soil/fill core, the soil/fill samples will be screened for total organic vapors using a photo-ionization detector (PID). The organic vapor measurements will be recorded and the soil/fill material described on boring logs by a Golder field representative. The recovered soils will be characterized/classified by visual observation in accordance with ASTM Method D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Subsurface soil samples will be collected for chemical analysis at the boring locations shown on Figure 3-1. The depth from which samples are collected will be determined based on screening results of visual and olfactory observations and PID measurements. Samples will be collected from the discrete depth interval that displays the greatest evidence of contamination, if present. If there is no discernable difference across the entire boring depth based on the visual, olfactory or PID screening methods, the default sample collection approach will consist of collecting a composite from the 0 to 12 feet bgs strata. Subsurface soil/fill samples will be analyzed for, semi-volatile organic compounds (SVOCs), target compound list (TCL) pesticides, PCBs, target analyte list (TAL) metals, and cyanide. Based on the results of the previous investigations, VOCs, pesticides/herbicides and PCBs will not be analyzed in the samples to be collected during the RI, as these compounds were not detected or consistently detected at in concentrations exceeding Part 375 SCOs. A summary of proposed samples and analyses is provided in Table 3 -1.

All non-dedicated, downhole sampling equipment will be decontaminated between soil boring locations in accordance with accepted drilling practices using a high-pressure hotwater “steam” cleaner or scrubbed

using Alconox® and a hot water wash followed by clean potable water rinse. Subsequent to borehole advancement and soil/fill sampling at boring locations B-1, B-11 and B-15, a temporary monitoring well will be installed if saturated conditions are identified within the planned maximum 45-foot boring depth or if refusal is reached. If saturated conditions are not encountered within the maximum 45 foot boring depth the boring will be grouted from total depth to ground level with a grout mixture of 95% cement and 5% bentonite. All other boring locations advanced only for soil/fill sampling purposes will also be grouted in the same manner.

3.1.1.2 Groundwater Monitoring Well Installation and Sampling

3.1.1.2.1 Site Hydrogeology

Test pits advanced on the Site during the March and August 2013 soil/fill investigations were typically completed to the top of bedrock which varied across the site depending on extent of historical quarrying in a particular area. The maximum depth encountered was 10-12 feet bgs at TP-1, TP-3 and TP-14. Groundwater or saturated soils were not encountered in any of the test pit locations. Historical groundwater information is very limited within the footprint of the proposed BCP Site and not generally available based on a lack of historical monitoring well data with the exception of three bedrock wells installed in 1989 as part of the Phase II environmental site investigation performed by Ecology and Environment. Based on the location map provided in the April 1991 report, the monitoring well locations appear to all be outside the boundary of the quarried area and with the exception of MW-2 were located outside the proposed BCP Site boundary. The groundwater samples collected from these wells were analyzed for VOCs and metals and only exceedences of iron and magnesium were noted. Therefore no definitive interpretation with respect to saturated soil/fill conditions and depth to groundwater can be made within the proposed BCP Site boundary. Reliable information on the Site hydrogeology is complicated by the significant man-made bedrock elevation differential that exists across the site resulting from the historical rock quarrying activities.

Based strictly on the historical quarrying activities and the presence of a small surface water body located south/southeast of McCarthy Park in what was a portion of the former quarry, the general direction of localized groundwater flow in the vicinity of the Site is inferred to be to the south and south east. The proposed location of the three monitoring wells is intended to provide sufficient data to assess groundwater flow and elevations, if present.

3.1.1.2.2 Monitoring Well Installation

As noted in Section 3.1.2.1, three soil borings will be advanced using a standard drilling rig employing hollow-stem auger and completed as 2-inch wells to be used for measuring water levels and collecting groundwater samples. The proposed locations (B-1, B-14 and B-16) are illustrated on Figure 3-1. The final well installations will also depend on the presence of saturated soils in the soil/fill unit at the proposed monitoring well locations. The wells will be installed after the soil borings have established the

presence of saturated conditions (and any soil samples have been collected from the selected borings). If the borings are determined to be dry holes, completion of these borings as monitoring wells will not be performed and the Department will be consulted to assess the feasibility of installing well(s) at a different location or abandoning the well installation.

Shallow overburden well borings will be advanced using 4.25-inch I.D. hollow stem augers (HSA). A 2-inch diameter, 2-foot long split spoon sampler will be advanced ahead of the auger string with a standard 140-pound hammer. Recovered samples will be examined by qualified Golder personnel and characterized in accordance with ASTM Method D2488, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), scanned for total volatile organic vapors with a calibrated PID equipped with a 10.6 eV lamp (or equivalent), and characterized for impacts via visual and/or olfactory observations. All non-dedicated drilling tools and equipment will be decontaminated between boring locations using potable tap water and a phosphate-free detergent (i.e., Alconox).

Soil/fill samples from each boring will be collected from the discrete depth interval that displays the greatest evidence of contamination, if present. Subsurface soil/fill samples will be analyzed for TCL SVOCs, TAL metals, and cyanide. A summary of proposed samples and analyses is provided in Table 3 -1.

Subsequent to boring completion, each monitoring well will be constructed of 2-inch I.D. flush-joint Schedule 40 PVC solid riser and machine slotted screen (0.010-inch slot size). The monitoring well screen will be approximately 10 feet in length. Approximately 6 inches of silica sand will be placed at the bottom of each boring as a base for the well screen and as part of the sand pack. The well screen and attached riser will be placed within the borehole on top of the 6-inch sand layer and the remainder of the sand pack will be installed within the borehole annulus to a level of about 3 feet above the top of the well screen. A bentonite seal (2 feet thick) will be installed immediately above the sand layer. The bentonite seal will be constructed with 3/8-inch bentonite pellets or medium bentonite chips and allowed to hydrate sufficiently to mitigate the potential for down-hole grout contamination. The top of the well riser pipe will extend approximately 3 feet above grade and will be fitted with a lockable J-plug.

Provided that each of the wells yields sufficient water, groundwater samples will be collected from each of the wells using low flow sampling methods. The total depth of the wells is expected to be within 45 feet of ground surface.

3.1.1.2.3 Well Development

The newly installed monitoring wells will be developed no sooner than 24 hours after construction has been completed. The development procedure will require purging of the groundwater and periodically surging the water in the well to loosen and remove suspended fines from the well screen and sandpack.

Measurements of the water volume removed and water quality parameters including temperature, pH, conductivity, and turbidity will be recorded at regular intervals throughout the development process.

Development will continue until water quality measurements stabilize to within 10 percent of the previous measurement.

3.1.1.2.4 Groundwater Sample Collection

Groundwater will be collected from each well using low flow sampling techniques (typically less than 0.1 L/min) via dedicated plastic flex tubing and a peristaltic pump. If low-flow sampling is not feasible due to insufficient groundwater recharge rate, new and dedicated disposable bailers may be used to collect the groundwater samples. If sufficient groundwater volume is available, each well will be sampled for VOCs, SVOCs, TCL Pesticides, PCBs, TAL metals, and cyanide.

Field measurements for pH, specific conductivity, temperature, turbidity and water level as well as visual and olfactory field observations will be periodically recorded and monitored for stabilization during well purging prior to sampling. Purging will be considered complete when pH, specific conductivity and temperature stabilize and when turbidity measurements fall below 50 NTU or become stable above 50 NTU. Stability is defined as variation of between field measurements of 10 percent or less and no overall upward or downward trend in the measurements.

Prior to and immediately following collection of groundwater samples, field measurements for pH, specific conductivity, temperature, turbidity and water level as well as visual and olfactory field observations will be recorded. All groundwater samples will be collected in the pre-cleaned and pre-preserved laboratory sample bottles in accordance with protocols for analyses shown on Table 3-1. Quality Assurance/Quality Control (QA/QC) samples will be collected for the groundwater sampling event in accordance with the QAPP (Appendix B) including one trip blank (accompanying VOC samples only), one matrix spike (MS), one matrix spike duplicate (MSD), and one field duplicate sample. Subsequent to sample collection all groundwater samples will be placed on ice and shipped under chain of custody to the selected analytical laboratory.

The laboratory will be required to furnish an equivalent ASP Category B deliverables package to facilitate data evaluation and preparation of a DUSR by a third party validation expert. Accordingly, the samples will be analyzed by an NYSDOH ELAP-approved laboratory certified to perform CLP work.

3.2 Site Mapping and Survey

The existing topographic base map of the Site (revised March 2013, McIntosh and McIntosh) will be revised to locate RI monitoring well and sample locations. Soil/fill surface and boring locations will be field located based on measurements from known benchmarks (e.g., rebar, pins, etc.) established during

the 2013 boundary survey of the Site. Final monitoring well locations and elevations will be surveyed after installation.

The Site map was prepared by a New York State licensed surveyor and all modifications and additions will be performed by a licensed surveyor. The surveyor has established the horizontal and vertical elevations using the New York State Plane Coordinate System and most recent vertical datum. Elevations of the ground surface and top of PVC riser will be measured and recorded for each monitoring well.

4.0 REMEDIAL INVESTIGATION/ALTERNATIVES ANALYSIS REPORT

Upon completion of the RI fieldwork, a comprehensive RI/AA Report will be completed summarizing the tasks completed as described below.

4.1 Remedial Investigation Report

The RI section of the RIAA Report will include the following information and documentation, consistent with the NYSDEC's DER-10 Technical Guidance for Site Investigation and Remediation (Ref. 3).

- Introduction and background.
- A description of the site and the overall scope of the investigation activities.
- A description of the field procedures, methods performed during the RI.
- A discussion of the nature and rationale for any significant variances from the scope of work described in this Work Plan.
- The data obtained during the RI and historical data considered to be of useable quality.
- The results of an assessment of the achievement of RI acceptance/performance criteria as specified in the QAPP.
- Comparative criteria that may be used to calculate cleanup levels during the alternatives analysis report (AAR) process, such as NYSDEC Soil Cleanup Objectives and other pertinent regulatory standards or criteria.
- A discussion of contaminant fate and transport. This will provide a description of the hydrologic parameters of the Site, and an evaluation of the lateral and vertical movement of groundwater.
- Conclusions regarding the extent and character of environmental impact in the media being investigated.
- The conclusions of the qualitative exposure assessment and fish and wildlife impact analysis, if applicable.
- Conclusions regarding the effectiveness of the Interim Remedial Measures conducted with respect to the comparative criteria and remedial action objectives (RAOs) established for the Site.
- Supporting RI data. These will include boring logs, monitoring well construction diagrams, laboratory analytical reports, etc.

In addition, Golder will require third-party data review by a qualified, independent data validation expert. Specifically, a Data Usability Summary Report (DUSR) will be prepared, with appropriate data qualifiers added to the results. The DUSR will follow NYSDEC format per the NYSDEC's September 1997 DUSR guidelines and DER-10 guidance. The DUSR and any necessary qualifications to the data will be appended to the RI report.

4.2 Alternative Analysis Report

The Alternative Analysis Report (AAR) will include a remedial alternatives evaluation for on-site groundwater and soil/fill on portions of the Site if determined, based on the results of the Remedial

Investigation and reasonably anticipated future Site use, to exhibit elevated concentrations of constituents of concern.

The AAR will meet the requirements identified in NYSDEC Standards, Criteria, and Guidance (SCGs) (e.g., Part 375 SCO's and GA Groundwater Quality Standards).

Based on the remedial action objectives (RAOs) and cleanup goals established for the Site, volumes and areas of media potentially requiring remediation, if required, will be calculated/estimated. General Response Actions will then be delineated to address each of the Site problem areas. These response actions will form the foundation for the development and screening of applicable remedial alternatives against the following criteria as described in 6NYCRR 375-1.8(f):

- Protection of Human Health and the Environment
- Compliance with Standards, Criteria, & Guidance (SCGs)
- Short-term Effectiveness & Impacts
- Long-term Effectiveness & Permanence
- Reduction of Toxicity, Mobility, or Volume
- Implementability
- Cost
- Land Use

In addition, the criteria of Community Acceptance will be considered based on public comments on the RI/AAR Report and proposed remedial action. Following the screening of alternatives, a comparative analysis will be performed against the above criteria. The comparative analysis will allow for better understanding of the relative advantages and disadvantages of each of the alternatives, and will facilitate recommendation of further remedial action, if required.

5.0 INVESTIGATION SUPPORT DOCUMENTS

5.1 Quality Assurance Project Plan (QAPP)

A Quality Assurance Project Plan (QAPP) will be prepared as a stand-alone document (refer to Appendix B) for the RI activities described herein. The QAPP dictates implementation of the investigation tasks delineated in this Work Plan. A Sampling and Analysis Plan (SAP) identifying methods for sample collection, decontamination, handling, and shipping, is provided as Section 4.0 of the QAPP. The RI project management methods, organizational structure, and schedule are also included in the QAPP.

The QAPP will assure the accuracy and precision of data collection during the site characterization and data interpretation periods. The QAPP identifies procedures for sample collection to mitigate the potential for cross-contamination, as well as analytical requirements necessary to assure compliance with USEPA SW-846 methodology. The QAPP has been prepared in accordance with USEPA's Requirements for Quality Assurance Project Plans for Environmental Data Operations (EPA QA/R-5); the EPA Region IICERCLA Quality Assurance Manual, and NYSDEC's May 2010 DER-10 Technical Guidance for Site Investigation and Remediation.

5.2 Health and Safety Plan (HASP)

A Site Health and Safety Plan (HASP) has been prepared in accordance with 40 CFR 300.150 of the NCP and 29 CFR 1910.120 for the proposed BCP RI activities. A copy of the HASP is included as Appendix C of this Work Plan. The HASP will be enforced by Golder and any Golder subcontractors engaged in RI/IRM field activities in accordance with the requirements of 29 CFR 1910.120. The HASP covers on-site investigation and interim remedial activities. Golder's HASP is provided for informational purposes in Appendix C. Subcontractors will be required to develop and implement a HASP as or more stringent than Golder's HASP. Health and safety activities will be monitored throughout the Remedial Investigation. A member of the field team will be designated to serve as the on-site Health and Safety Officer throughout the field program. This person will report directly to the Project Manager and the Corporate Health and Safety Coordinator. The HASP will be subject to revision as necessary, based on new information that is discovered during the field investigation.

The HASP also includes a contingency plan that addresses potential site-specific emergencies, and a Community Air Monitoring Plan (CAMP) that describes required particulate and vapor monitoring to protect the neighboring community during intrusive site investigation activities. The CAMP is consistent with the requirements for community air monitoring at remediation sites as established by the New York State Department of Health (NYSDOH) and NYSDEC. Accordingly, it follows procedures and practices outlined under NYSDOH's Generic Community Air Monitoring Plan (dated December 2002) and NYSDEC Technical Assistance and Guidance Memorandum (TAGM) 4031: Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites.

5.3 Community Participation Plan (CPP)

In accordance with NYSDEC's Brownfield Cleanup Program guidance, a Citizen Participation Plan (CPP) is required for the 89 LaSalle Avenue Site RI activities. The CPP, included as Appendix D, meets the requirements of Attachment 2 of the NYSDEC Technical Administrative Guidance Memorandum (TAGM) DER-97-4058 and NYSDEC's DER-10 guidance. Golder will coordinate and assist Legacy with community relations throughout the course of the project.

6.0 PROJECT SCHEDULE AND SEQUENCE OF THE WORK

Figure 6-1 presents the tentative schedule for planned remedial investigation, interim remedial measures and assessment of remedial alternatives. As noted, the start of field activities is dependent on NYSDEC approval of the RI/IRM Work Plan.

7.0 REFERENCES

1. New York State Department of Environmental Conservation, *DER-10; Technical Guidance for Site Investigation and Remediation*, May 2010.

TABLES

TABLE 3-1

Analytical Program Summary
Remedial Investigation
Legacy LaSalle - 89 LaSalle Avenue BCP Site

Sample Media	Number of Samples				Analyses
	Field Samples	Duplicates	MS/MSD Samples	Trip Blanks	
Test Pit Shallow Soil Samples	3	1	1/1	0	TCL SVOCs TAL Metals and Cyanide
Subsurface Soil/Fill	15	1	1/1	0	TCL SVOCs TAL Metals and cyanide
Groundwater (3 temporary monitoring wells)	3	1	1/1	1	TCL VOCs TCL SVOCs TCL Pesticides, Total PCBs TAL Total Metals and cyanide

Notes:
MS = Matrix Spike
MSD = Matrix Spike Duplicate
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
TAL = Target Analyte List
TCL = Target Compound List