REMEDIAL DESIGN WORK PLAN

FORMER BUFFALO COLOR CORPORATION SITE
AREAS A, B, C AND E
NY BCA Nos. C915230, C915231 & C915232
BUFFALO, NEW YORK

Prepared for:

SOUTH BUFFALO DEVELOPMENT LLC

Buffalo, New York

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August 2010

MACTEC Project 3410090701

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1.0 INTRODUCTION

MACTEC Engineering and Consulting, Inc. (MACTEC) has prepared this Remedial Design (RD) Work Plan on behalf of South Buffalo Development LLC (SBD) for the Former Buffalo Color Corporation (BCC) Area ABCE Site (Site). SBD has entered into three separate Brownfield Cleanup Agreements (BCAs) with the New York State Department of Environmental Conservation (NYSDEC) as follows:

- BCC Areas A & B: BCA No. 915230
- BCC Area C: BCA No. 915231
- BCC Area E: BCA No. 915232

The location of the former BCC Site is shown on Figure 1 and the Site Plan is shown on Figure 2. This RD Work Plan was prepared in accordance with the requirements of the New York State Brownfield Cleanup Program, specifically the regulations provided in 6 NYCRR Part 375 (http://www.dec.ny.gov/regs/2491.html) and the Brownfield Cleanup Program Guide (Draft) NYSDEC (2004) (Guide).

SBD has teamed with Honeywell to facilitate the demolition of the former dye plant and remediate the property. The proposed remediation and redevelopment approach for the Site, crafted jointly by Honeywell and SBD, will utilize the Track 4 cleanup track in accordance with the New York Brownfield Cleanup Program (BCP) regulations to transform the Site from an abandoned and blighted property into viable commercial/industrial property. The goal for this Site is to remediate and build new, environmentally sustainable commercial/industrial facilities that will support jobs and promote the economic stability of the region. The plan also calls for creation of open space and access to the Buffalo River for the public within the previously remediated Area D of the property. Demolition of the former dye plant was initiated by SBD in June 2009 and was ongoing at the time this RD Work Plan was prepared. SBD's current schedule has demolition work being completed by May 2011. A web site has been established by SBD that provides information about the project. The web site address is http://www.buffalocolorredevelopment.com.

This RD Work Plan is based on the Remedial Work Plan presented in Chapter 9 of the NYSDEC-accepted Alternatives Analysis Report (AAR) (MACTEC, February 2009). A copy of the Remedial Work Plan is provided for reference in Appendix A.

1.1 SITE DESCRIPTION

The Site is located on the south side of the City of Buffalo, Erie County, New York, in an area of heavy industrial development that dates to the mid-1800s. The Site occupies approximately 47 acres near and adjacent to the Buffalo River and is described by four distinct areas (Areas A, B, C, and E). The Site layout is shown on Figure 2.

Area A is approximately 10.2 acres in size and is located on the southern end of the Site. The property is fenced and is accessible by vehicle via gated entrances along South Park Avenue. Presently, it includes various former production buildings, several aboveground storage tank (AST) farms, and an office/maintenance building. It is bounded by South Park Avenue to the north, the Buffalo River to the east, an inactive rail line to the south (beyond which is Area D, which is not part of the Site for the purposes of this remedial effort), and railroad tracks to the west.

Area B is approximately 5.5 acres in size and is located to the north of Area A. Area B is fenced and is accessible by vehicle via a gated entrance along Lee Street. Area B includes the former BCC office building, located at 100 Lee Street, and surrounding asphalt parking area which totals approximately three acres and is under separate ownership; this portion of Area B is not owned or controlled by SBD, nor is it part of the Brownfield Cleanup Agreements (BCA). The western portion of Area B (approximately 2.5 acres) is owned and controlled by SBD and is included in the BCA. Area B is bounded by a rail spur and Area C to the north, Lee Street to the east, South Park Avenue to the south, and railroad tracks to the west.

Area C is located on the northwestern corner of the Site. It is fenced and accessible by vehicle from gated entrances along Lee Street. Area C covers approximately six acres and includes the former powerhouse building and former ice house. Area C is bounded by Elk Street to the north, Lee Street to the east, a rail spur and Area B to the south, and railroad tracks to the west.

Area E is the largest of the four areas (approximately 25.5 acres) and is located on the northeastern side of the Site. Former BCC Building 322 and surrounding property totaling about 9.1 acres is under separate ownership and is not part of the BCA. The remaining 16.4 acres of Area E are owned and will be redeveloped by SBD under the BCA. The western side of Area E previously included various former production buildings, maintenance sheds, a former laboratory, the former wastewater treatment plant

(which at one time included several surface impoundments) and a large AST farm. The eastern half of Area E is vacant. Area E is bounded by Elk Street to the north, Orlando Street to the east (across which is a bulk petroleum terminal currently operated by Buckeye), and Prenatt Street to the south.

Area D covers approximately 20 acres and is located south of Area A, across a railroad embankment. Area D was remediated in the late 1990s via construction of a perimeter slurry wall, a vegetated surface cap, and groundwater extraction system. No buildings are present on Area D. The groundwater extraction system at Area D is operated as necessary to control groundwater levels and maintain an "inward" shallow groundwater gradient. Annual mowing, monthly visits, and quarterly inspection are conducted by a Honeywell contractor in accordance with a NYSDEC-approved Operations, Maintenance and Monitoring (OM&M) Plan. Because it was previously remediated, Area D is not part of the property being addressed under the NY BCP. Area D was purchased by SBD at the same time that SBD acquired Areas A, B, C and E.

1.2 SITE HISTORY

Originally founded as the Schoellkopf Aniline and Dye Company in 1879, the plant produced dyes and organic chemicals based primarily on aniline and various aniline derivatives. The company was reorganized into the National Aniline Chemical Company in 1916. It became one of the five companies that merged to create Allied Chemical Corporation (Allied Chemical) in 1920. The existing dye-making facility and the right to produce certain dyes and intermediates were sold by Allied Chemical to Buffalo Color Corporation (BCC) on July 1, 1977. At the time of the sale, the plant was divided into eight areas designated with the letters A, B, C, D, E, F, G, and H. BCC purchased the manufacturing areas A through E, while Allied Chemical retained the acid plant (which was sold to PVS in 1981), the research and development facility on Area F, and the parking lots on Areas G (Elk Street) and H (Smith Street).

In 2005, BCC filed for bankruptcy. During the bankruptcy proceedings, some of the facility's production equipment was sold and removed from the site. In conjunction with the bankruptcy, the office building and former plant hospital located at 100 Lee Street on Area B and the warehouse building (Building 322) located near Elk Street on Area E, along with some of the land under and around those buildings, were sold to other parties. Agreements are in place to preserve access rights to the land for the purposes of any required environmental investigation and remediation activities. The remaining buildings and property on Areas A, B, C, D and E were purchased by SBD in 2008.

1.3 NATURE AND EXTENT OF SITE CONTAMINATION

The Site has been extensively characterized by environmental investigations dating to the 1980s and including the 1996-1997 RCRA Facility Investigation, the 2007 Remedial Investigation. During these investigations, over 100 monitoring wells/piezometers and approximately 200 soil borings have been advanced across the Site. Over 250 groundwater samples and over 200 soil samples were submitted for analytical testing for a broad list of organic compounds, metals and other analytes. Hundreds of additional soil samples have been subjected to field instrument screening and visual inspection. Most recently, additional characterization of the Site was completed as part of Pre-Design Investigation (PDI) work during the 2009 and 2010 by MACTEC in accordance with various Pre-Design Investigation Work Plans.

The following summarizes the present understanding of contamination at the Site:

- SOIL (SOURCES OF GROUNDWATER CONTAMINATION): Based on proximity to shallow groundwater that contains similar contaminants, two likely sources of soil to shallow aquifer impact have been identified above the first zone of saturation: 1) approximately 2,100 cubic yards of soils impacted by semi-volatile organic compounds (SVOCs) located in the central part of Area A, and 2) approximately 5,500 cubic yards of soil impacted by volatile organic compounds (VOCs) in the vicinity of the large AST farm on the southwestern side of Area E.

- SOIL (DIRECT CONTACT PATHWAY): Metals (primarily arsenic and to a lesser extent mercury) and polycyclic aromatic hydrocarbons (PAHs) were found across the Site in both surface and subsurface soil at levels that exceed the NY Commercial Soil Cleanup Objectives (SCOs). For the direct contact pathway, surface soil samples are considered the most relevant data points. A background study completed by MACTEC suggests that the majority of the soil samples collected during the RI contained arsenic and PAHs at levels that are within the calculated Site-specific background standards. The data also suggests that the locations with levels of arsenic and PAHs within background levels are not sources of groundwater contamination. The majority of the site (roughly 60%) is currently covered by pavement or buildings, which have concrete floor slabs.

- SHALLOW AQUIFER: Groundwater is not used or planned for use at the Site or in the vicinity of the Site for drinking purposes. Thus, there is no current human exposure pathway associated with the presence of metals and inorganic compounds in the shallow aquifer at levels that exceed the NY Class GA standards (which are based on a potable use scenario). Potential adverse impact to the Buffalo River and ecological receptors via discharge of contaminated shallow groundwater exists at Area A, which is the only portion of the Site that abuts the river. Shallow groundwater on Areas B, C and E also flows toward the river. However, the RI/FS data indicate the chlorobenzene plumes on Areas C and E have not migrated beyond the property boundaries. During the pre-design investigation, additional monitoring wells will be installed on Areas C and E, and these wells (as well as certain existing wells in Area E) will be sampled to further delineate the extent of the groundwater plumes. Remedial action specified in the AAR focuses on

shallow groundwater impacted by chlorobenzene and other organic contaminants at the following locations:

- On the southern portion of Area A, where the shallow groundwater contains chlorobenzene, aniline and other organic Site-related constituents at part per million levels and which, under static conditions, extend to and could possibly flow into the Buffalo River;

- On the northwestern corner of Area C, where levels of VOCs, specifically chlorobenzene and other organic compounds, at part per million levels were identified; and

- On the southwestern portion of Area E in a limited area around the large AST farm where levels of chlorobenzene and other organic compounds have been identified in groundwater at part per million levels and impacted soil has also been identified.

- DEEP GROUNDWATER (CONFINED AQUIFER): Metals/inorganic compounds and part per billion levels of SVOCs were identified sporadically in the groundwater samples collected from the wells screened within the confined aquifer. As described in the AAR, institutional controls/environmental easements will be utilized to preclude on-Site use of the confined aquifer.

- SITE SEWERS AND STORMWATER OUTFALLS: The existing Site process sewers are connected to the nearby BSA sewer lines. The RI/FS sampling completed in 2007 identified the presence of residual contaminants in solids within the facility process sewers (including sediments or sludge). Shallow groundwater may infiltrate portions of facility storm sewers and discharge to the Buffalo River via existing stormwater outfalls, specifically Outfall 006 on Area A. Abandonment/plugging or rehabilitation of the Site underground sewer system will be completed by SBD, as described in the AAR.

- FORMER AREA E WASTEWATER LAGOONS: As discussed in Section 2.1 of the AAR, the former wastewater lagoons located on the southeastern side of Area E were drained, dredged and capped between 1984 and 1988 in accordance with closure plans approved by the NYSDEC. Groundwater samples collected from shallow wells located near the locations of the three former lagoons did not contain VOCs above NY Class GA standards or otherwise show evidence of impact related to the former lagoons. Additional groundwater monitoring will include sampling of specified monitoring wells in the vicinity of the former lagoons.

- AREA E LNAPL: Light non-aqueous phase liquids (LNAPL) in the form of a weathered petroleum substance were identified in two monitoring wells near the southeastern border of Area E during 2008 quarterly groundwater monitoring activities. Additional focused investigation of this area will be completed as part of the remedial design process to evaluate the extent of LNAPL and determine future monitoring and remedial requirements.

1.4 DESCRIPTION OF THE SELECTED REMEDY

Chapter 9 of the AAR (MACTEC, February 2009) presents the Remedial Work Plan for the Site (Appendix A). As provided in the AAR and modified based on the 2009-2010 PDI data, the preferred remedy for the Site consists of the following components:

- Soil (Vadose Zone) – Source area removal and installation of a cover system has been selected as the preferred alternative for the Site soil. This alternative involves excavation to the water table at the location identified as a likely source of groundwater contamination on Area E and off-Site disposal of contaminated soil. The cover system will use a combination of soil, pavement, and existing/new building structures to provide protection from direct contact exposure to contaminated surface soils, consistent with the presumptive remedy as identified in 6 NYCRR Part 375.

- Area A Groundwater – A downgradient hydraulic barrier wall will be installed on Area A along the Buffalo River shoreline to prevent migration of contaminated groundwater from Area A to the Buffalo River; this will include groundwater extraction as necessary to maintain hydraulic control.

- Area B Groundwater – Groundwater monitoring will be performed at Area B to verify the results of the Remedial Investigation, which indicated no significant groundwater contamination was present at that location. During 2008, groundwater monitoring at Area B will be performed in accordance with the ICM OM&M Plan. Based on the outcome of this monitoring at selected point of compliance (POC) wells, the scope and frequency of additional groundwater monitoring and/or remediation at Area B will be proposed.

- Areas C&E Groundwater – Removal and/or treatment of targeted soil and groundwater with the highest VOC concentrations, including dense non-aqueous phase liquids (DNAPL) with monitoring for the VOC plumes identified at Areas C&E. Long-term monitoring will be included for select Site and POC wells.

- Vapor Intrusion - An environmental easement will be implemented to ensure that occupied structures associated with future development at the Site are constructed such that the vapor intrusion (VI) pathway is eliminated.

- Site Sewers – Existing underground sanitary/process and storm sewer lines will be capped, removed or rehabilitated, as determined appropriate on an area-by-area basis by SBD and/or Honeywell in accordance with the project schedule.

- Institutional/engineering controls and environmental easements will be implemented that prohibit groundwater use, provide protocols for disturbance of Site soils and/or groundwater, limit future land use to commercial or industrial, and require elimination of the vapor intrusion pathway for all occupied structures.

To implement the preferred remedy, demolition of some or all of the abandoned former Buffalo Color dye manufacturing facility is necessary. SBD initiated demolition activities in June 2009 and expects to complete the demolition process by the Second Quarter of 2011.

SBD has retained MACTEC to complete the engineering design of the final remedy components. Pre-design studies have been completed and engineering design work has begun. The schedule for remedial design and construction is discussed in Section 3.0.

1.5 PROJECT ORGANIZATION

Listed below are the key project personnel and their office/primary telephone numbers.

NYSDEC Region 9

Mr. Martin Doster, Regional Hazardous Waste Remediation Engineer, (716) 851-7220
Mr. Eugene Melnyk, P.E., (716) 851-7220

South Buffalo Development LLC
Mr. Jon Williams, President of SBD Holdings 1, Inc., manager of SBD, (716) 856-3333

MACTEC Engineering and Consulting, Inc.
Mr. John Scrabis, Project Manager, (412) 279-6661

1.6 LIMITATIONS

This document was prepared for the sole use of SBD, Honeywell, and the NYSDEC. No other party should rely on the information contained herein without prior written consent of MACTEC. We believe that the information provided herein is reasonably supported by the results of the previous work made known to MACTEC and the application of professional standards of care that are generally accepted for completion of environmental investigations.

The scope of work described herein is based on information obtained during previous studies and our experience. If additional information becomes available which might impact our scope of work, we request the opportunity to review the information, reassess the potential concerns, and modify our approach, if warranted.

2.0 REMEDIAL DESIGN APPROACH

SBD has retained MACTEC to provide SBD with Pre-Design Investigation and Remedial Design services. The work includes the following:

- Project Management/Project Control
- Pre-Design Investigation Work Plans
- Site Management Plans
- Pre-Design Investigation
- Remedial Design
    - Pre-Demolition Groundwater Extraction and Treatment System Modifications
    - Remedial Design Final Remedy

Each of these tasks is described in detail below. The work will be completed in accordance with the Design Schedule presented in Section 3.0.

2.1 PROJECT MANAGEMENT / PROJECT CONTROL

The project will be managed and controlled from MACTEC's Pittsburgh, Pennsylvania office. Mr. John Scrabis will be the Project Manager and will be responsible for project scope, schedule and budget. Mr. Pat Pontoriero will serve as the Project Principal and will provide senior review. Technical support and design assistance will be provided via MACTEC staff located in Pittsburgh, Portland ME, and other offices, as necessary.

This task includes selection and retention of qualified subcontractors to provide drilling, test pitting, laboratory testing, and other design support services, as necessary. Also included in this task are meetings with NYSDEC, the Buffalo Sewer Authority, and others as necessary. In addition, MACTEC's Project Manager to visit the Site for kickoff meetings and as necessary during completion of field work.

2.2 PRE-DESIGN INVESTIGATION WORK PLANS

The pre-design investigation goals are: 1) collect and evaluate data for the design and implementation of the selected remedy and 2) completion of the additional studies specified in Section 9.3.6 of the AAR. MACTEC has prepared a Pre-Design Investigation (PDI) Work Plans (August, 2009) which address the additional environmental investigation activities specified in AAR Section 9.3.6, as well as Work Plans for the geotechnical and engineering evaluations needed to design the final remedy components.

The PDI Work Plans include a Scope of Work, site-specific Health and Safety requirements, an update to the existing Quality Assurance and Quality Control (QA/QC) Plan (prepared during the Remedial Investigation); identification of permits and approvals that may be necessary for the work, and a proposed schedule.

The PDI Work Plan for additional environmental studies defines the scope of work, requirements, and objectives of the activities specified in Section 9.3.6 of the AAR, including:

- Delineation and characterization of the Area E source area (preferred remedy is soil removal for this area).
- Delineation and characterization of the Area C/E chlorobenzene plumes (preferred remedy is in-situ remediation for these areas);
- Evaluation of light non-aqueous phase liquid (LNAPL) at Area E;
- Vapor Intrusion Evaluation for Area B (2 structures) and Area E (1 structure);
- Polychlorinated Biphenyls (PCB) Soil Sampling – Area A electrical building;
- Further Evaluation of Groundwater Contours for Confined Aquifer – Area E;
- Groundwater Monitoring – Former Area E Lagoons; and
- Evaluation of Other Potential Source Areas via Groundwater Monitoring on Areas B, C and E.

The PDI Work Plan for the additional environmental studies was issued to NYSDEC on August 6, 2009. NYSDEC issued review comments in a letter dated September 11, 2009. SBD issued a response letter to NYSDEC dated September 29, 2009 that addressed the NYSDEC comments.

A PDI Work Plan for geotechnical studies at Area A was prepared by MACTEC and issued to NYSDEC on October 22, 2009. The work plan defined the scope of work, requirements, and objectives of the following pre-design activities:

1. Area A – Geotechnical investigation for the design of the hydraulic barrier wall (preferred remedy for this area); and

2. Area A – Compatibility testing and evaluation of materials and methods for construction of the hydraulic barrier wall.

A PDI Work Plan for treatability testing of the Area C and E chlorobenzene groundwater plumes was issued by MACTEC on December 11, 2009. This work plan defines the scope of work, requirements, and objectives of the Area C & E treatability and bench scale testing of in-situ remediation alternatives for each location.

In addition to the work described in the PDI Work Plans noted above, additional PDI work items were completed as described in various email correspondence between MACTEC and NYSDEC in 2010.

2.3 SITE MANAGEMENT PLANS

A Site Management Plan (SMP) will be prepared for Areas A&B, Area C, and Area E, consistent with the requirements of the BCAs and the requirements of the NY Brownfield Cleanup Program. A draft Interim SMP was prepared by MACTEC and issued to NYSDEC on August 31, 2009. NYSDEC issued a comment letter dated September 9, 2009, with a specified deadline of October 15, 2009 for submittal of the revised SMP. On behalf of SBD and in response to the NYSDEC review comments, MACTEC prepared a revised Interim SMP dated October 14, 2009 that was issued to NYSDEC under SBD cover letter. The Interim SMP identifies Site management procedures that will be followed during the demolition and pre-remedial project stages.

Draft final SMPs for Areas C and E were issued to NYSDEC in May 2010. NYSDEC issued review comments via email on June 16, 2010. Final SMPs for Areas C and E will be issued in 2010, and the SMP for Areas A and B will be issued in 2011, in accordance with the project schedule.

The final SMPs will be prepared in accordance with the most current version of NYSDEC's SMP template and will include the following components:

- Introduction, background, and summary of remedial investigation (RI) results;
- A summary of the selected final remedy components;
- An Institutional and Engineering Controls Plan;
- An Excavation Work Plan that specifies requirements for excavation/grading activities, stockpiling and soil staging areas, waste characterization sampling, onsite reuse criteria, soil loading and transportation, and requirements for offsite disposal (we assume that the current draft version of this plan will require little to no modification);
- A Site Monitoring Plan;
- Health and Safety requirements for construction personnel, including requirements for Site and community air monitoring;
- Quality Assurance/Quality Control requirements;
- An Operations, Maintenance and Monitoring Plan (including requirements for long-term groundwater monitoring at Areas A, B, C and E); and
- Inspections, reporting, and certifications.

2.4 PRE-DESIGN INVESTIGATION

The PDI field work consists of the scope of work described in the PDI Work Plans (refer to above) and subsequent correspondence with NYSDEC. Each PDI Work Plan includes a detailed description of the sampling and testing program, health and safety requirements, Quality Assurance requirements, and work schedule. For the PDI work, MACTEC is responsible for oversight of geotechnical and environmental drilling, collection of geotechnical and environmental samples, and health and safety monitoring, including air and dust monitoring in accordance with project requirements.

MACTEC subcontracted the following work as part of the pre-design field investigations and studies:

- Geotechnical and environmental drilling services;
- Off-site geotechnical and chemical laboratory analysis of soil and groundwater samples;
- General geotechnical laboratory testing and geotechnical compatibility testing in support of the hydraulic barrier wall design;
- Site survey work;
- Treatability testing in support of the in-situ groundwater treatment; and
- Other services as deemed appropriate.

MACTEC will provide the results of the PDI work as part of the project design submittals, to include laboratory analyses, preliminary evaluations, and design basis criteria for the detailed design. The PDI summary section of the design documents will include validated data in tabular format and data usability summary reports (DUSRs).

Samples collected during the PDI will be submitted to NY-licensed laboratories approved by SBD and Honeywell for chemical analyses and geotechnical analyses. Chemical analysis results will be entered by MACTEC into the Locus Technology Environmental Information Management (EIM) database used by Honeywell. Data Validation will be completed for aqueous and soil samples collected for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals. Validation will be completed in accordance with NYSDEC DUSR procedures.

No data validation will be required for hazardous characteristics testing including those samples analyzed via the Toxicity Characteristic Leaching Procedure (TCLP) and for corrosivity, reactivity, and the paint filter test. These results will be used as reported by the laboratory.

The following subsections present a general description of the work that are described in detail in the PDI Work Plans.

2.4.1 Area A Hydraulic Barrier Wall Pre-Design Investigation

The AAR indicates that a vertical hydraulic barrier wall is to be constructed along the eastern boundary of Area A and "wrapped" along the northern and southern boundaries. The intent of the barrier wall is to create a physical and hydraulic barrier between impacted shallow aquifer groundwater at Area A and the Buffalo River. The wall would have the added benefit of reducing the volume of river water extracted by operation of the groundwater extraction system. The type of barrier wall has not been established at this time, but construction of a soil-bentonite (SB) or cement-bentonite (CB) slurry wall is currently anticipated. The scope of work and level of effort presented in this proposal is sufficient regardless of whether wall construction is SB, CB, or other options such as a sheet pile wall or in-situ soil stabilization/solidification (ISS) wall. The wall will be keyed into a glaciolacustrine clay stratum that has been identified during prior investigations at an approximate depth of 25 feet at Area A.

MACTEC's pre-design investigation will attempt to:

1. Confirm presence and depth of glaciolacustrine clay stratum along the proposed alignment of the wall;
2. Characterize index and engineering properties of subsurface soils;
3. Collect site groundwater to be used in laboratory compatibility testing with anticipated barrier wall materials in support of the design of the wall;
4. Collect surface and subsurface data to be used in the development of the wall alignment, including extent of the barrier along the north and south area boundaries, and to characterize the presence and nature of subsurface obstructions; and
5. Investigate and collect local source material that may be utilized in construction of the barrier (for SB and CB backfills).

The pre-design investigation includes the advancement of approximately 17 hollow stem auger (HSA) soil borings spaced approximately 100 feet apart. The borings will be advanced 5 to 10 feet into the glaciolacustrine clay for a total boring depth of approximately 30 to 35 feet each. Standard penetration testing (SPT) will be conducted at 5-foot intervals from the ground surface to the top of clay, then continuously for the boring interval within the clay stratum. Undisturbed thin-wall Shelby tube samples will be collected from the clay at each boring, and field vane shear testing will be conducted in selected borings within the clay to measure undrained shear strength of that stratum. Selected soil samples collected in the field drilling program will be sent to a geotechnical laboratory for indexing, permeability testing, and shear strength testing (if necessary).

The pre-design investigation will include evaluation and selection of the hydraulic barrier wall materials (backfill mixes or other barrier materials), and general methods for construction. Site-specific conditions, including groundwater chemistry, contaminant types and concentrations, and soil types will be considered when selecting candidate wall backfill mixes. This assessment will include performance of a two-phased laboratory testing program for a CB or SB slurry wall (or similar testing for an ISS wall). Phase 1 will consist of laboratory index and permeability testing of SB and/or CB backfill materials (or ISS backfill) for use with the slurry wall alternatives. The testing will establish potential mix designs for SB and/or CB (ISS backfill). Upon completion of the Phase 1 laboratory program, a Phase 2 laboratory program will be performed to assess the long-term compatibility of the backfill with the contaminated site groundwater. This testing program will include laboratory permeability testing of selected backfill specimens by permeating them with the site groundwater (up to three samples) to determine the effects of groundwater chemistry on the permeability of the barrier. In addition, one sample will be permeated with deionized water for control purposes. The testing will simulate the performance of the backfill over the intended design life of the barrier. The results of the compatibility testing will be used to confirm selection of the wall type and materials for the design phase.

The proposed pre-design investigation includes two days of test pitting with a backhoe. The test pitting will be performed for shallow characterization (existence, location, and depth) of old foundations and/or abandoned utilities along the proposed alignment of the hydraulic barrier. All test pits will be shallow (less than 12 feet) and will be backfilled with the excavated cuttings.

The work will also include a geophysical survey, as described in the Geotechnical PDI Work Plan. This will provide additional data to supplement and link the boring and test-pit data to better establish a continuous profile along the wall alignment.

A water intake or outflow structure exists on Area A along the Buffalo River that is believed to have been associated with a former Area A power house building. This structure was constructed into a vertical retaining wall (estimated at 15 to 20 feet high) and is approximately 40 feet long along the river bank. This structure appears to be a former aqueduct and water appears to flow perpendicular to the river below a bulkhead through a 2-foot high (minimum) slot observed above the water level. The upstream and downstream ends of this intake/outlet along the river bank consist of 2 to 3-foot wide/thick concrete retaining walls that extend perpendicular to the river toward the former plant. The extent or termination point of this apparent aqueduct is unknown, but appears to cross the proposed alignment of the hydraulic barrier wall. The pre-design investigation includes evaluation of this structure.

MACTEC will also review available information obtained from the Buffalo Color file documents/drawings and/or information available through SBD or the City of Buffalo regarding the location and construction of the Buffalo River Improvement Corporation (BRIC) water line that extends across Area A. MACTEC will also review available records, conduct visual inspections, and complete subsurface utility surveys as appropriate to identify other active subsurface utility lines that may be present within the hydraulic barrier wall alignment. This information is critical to ensure that the BRIC line and other utility lines are properly addressed during the design of the hydraulic barrier wall.

As part of this task, MACTEC may also engage contractors (approved by SBD) that specialize in hydraulic barrier wall construction and may, at their own expense or for a nominal fee, evaluate alternatives for barrier wall types and construction methods.

2.4.2 Area A Groundwater Modeling

MACTEC will conduct groundwater modeling to generate estimated design flow rates for groundwater extraction necessary to prevent groundwater flow around the hydraulic barrier wall. Modeling will include evaluation of the effects of wall design parameters (e.g., thickness, hydraulic conductivity, elevations) on the extraction rates and hydraulic capture. The modeling will be used to support the remedial design of the hydraulic barrier wall and potential modifications to the existing Area A groundwater extraction system. The modeling would likely be done assuming steady-state conditions. Seasonal flow variations would then be considered by modeling steady-state conditions for extreme conditions (e.g., high and low river levels) to determine the overall control scheme. The model will incorporate and build from, where appropriate, the data and assumptions used during the prior modeling efforts completed by MACTEC and others for the Area A groundwater extraction system design. Data from the 2008 hydraulic evaluation of the Area A extraction system, along with data obtained during nearly two years of system operation, will also be incorporated into the model.

MACTEC intends to utilize the existing model developed for the interim corrective measures (ICM), with minor modification, as well as a simple box model, and conduct sensitivity analyses on factors like barrier thickness, barrier K, river elevation, site aquifer K, and recharge rates. Particle tracking within the MODFLOW-MODPATH programs should be sufficient to illustrate groundwater flows.

To facilitate NYSDEC acceptance of the model, MACTEC will review the modeling approach and parameters with NYSDEC prior to implementing the modeling process.

2.4.3 Area C & Area E Groundwater Plume Delineation

As discussed in the AAR, the Remedial Investigation field work conducted to date identified the presence of chlorobenzene groundwater plumes in the shallow groundwater aquifer at both Area C and Area E. At the time the AAR was issued, the Area C chlorobenzene plume was estimated at 450 feet long by 135 feet wide (60,750 square feet); the Area E plume at 340 feet long by 135 feet wide (45,900 square feet).

MACTEC will complete a pre-design investigation, as described in the Environmental PDI Work Plan, to:

1. further delineate the extent of groundwater containing chlorobenzene and other VOCs for both plumes;
2. identify the presence and concentration of groundwater constituents that might impact in-situ treatment of chlorobenzene;
3. further define the characteristics of the shallow aquifer within the plume areas; and
4. define the target zone(s) for implementation of in-situ treatment.

As described in the Environmental PDI Work Plan, MACTEC will conduct groundwater profiling in an approximately 50-foot-on-center grid configuration (assume three sample locations taken across the width of the plumes), which results in an estimated 30 groundwater samples on Area C and 24 groundwater samples on Area E. At each proposed location, a single groundwater sample would be collected for off-site analysis of VOCs and SVOCs, with a subset (25%) also analyzed for biochemical oxygen demand (BOD), chemical oxygen demand (COD), and petroleum hydrocarbons. The work will be completed using direct-push drilling equipment (Geoprobe™ or similar).

The proposed extent of groundwater profiling at Area E overlaps much of the location proposed for soil source area profiling as discussed below; therefore, the groundwater profiling at Area E will coincide with the soil source area pre-design investigation activities.

2.4.4 Area C & Area E - Testing (treatability and field pilot testing) of in-situ remediation alternatives

Subsequent to the Area C and E groundwater plume delineation investigation described above, MACTEC will install a minimum of three additional monitoring wells within the Area C and E chlorobenzene groundwater plumes (six total), during which representative soil and groundwater samples will be

collected for purposes of conducting treatability studies in support of in-situ treatment design. Conceptually, the additional monitoring wells would consist of two-inch diameter polyvinyl chloride (PVC) wells with well screens installed with bottom of screen at approximately 10 to 12 feet below ground surface (bgs).

MACTEC is currently collaborating with experienced in-situ technology vendors to develop the treatability testing program. Field treatability testing will be completed by one or more qualified remediation vendors, selected by MACTEC and SBD after evaluation of proposals submitted by the vendors, to evaluate the effectiveness of potential in-situ treatment reagents and approaches. The scope of treatability studies proposed consist of evaluating the efficacy of both chemical oxidation and enhanced bioremediation approaches. The proposed treatability studies will likely include:

1. analysis of site-specific soil for natural oxidant demand;
2. field and/or bench-scale testing of chemical oxidant reagents using site-specific soil and/or groundwater; and
3. field and/or bench-scale testing of enhanced aerobic bioremediation reagents using site-specific soil and/or groundwater.

After results of the treatability testing program are complete and have been evaluated, a pilot study will be conducted in Area C and Area E to evaluate in-situ injections of reagents for treatment of groundwater. A separate pilot test will be conducted in each area to test the distribution of reagent injections, to confirm reagent dosage from the bench-scale test, and to develop full-scale design parameters for injection spacing, injection volumes, and methods. The pilot test will focus on reagent distribution effectiveness and will not be designed to evaluate long-term treatment effectiveness. The configuration of the pilot study injections may vary based on the selected reagent(s) from the treatability testing. It is anticipated that groundwater samples will be collected and analyzed by field instruments to evaluate radius of influence.

2.4.5 Area E Soil Source Removal Pre-Design Investigation

Based upon data collected during the Remedial Investigation, the scope of work for the Area E soil source area removal identified in the AAR includes excavation to the water table (a depth of approximately 4 to 5 feet below existing grade) and off-site disposal of VOC-impacted soil located around the AST farm in the southwestern corner of Area E.

MACTEC will conduct a pre-design investigation to:

1. better define the areal extent of source area contamination requiring removal;
2. confirm the depth to saturated soil, and accordingly depth of soil removal; and
3. characterize the contaminant levels within the source area to facilitate scoping the handling and disposal of these materials.

As described in the Environmental PDI Work Plan, the pre-design investigation consists of the advancement of soil borings in a 50-foot-on-center grid configuration throughout the estimated source area with collection of one soil sample per boring location (for a total of approximately 22 samples). The borings would be advance using direct-push drilling equipment into the first zone of saturation. Each soil sample will be collected and shipped for off-site laboratory analysis for VOCs, SVOCs, and metals. Approximately eight soil samples will be submitted for hazardous waste characteristics testing, including TCLP VOCs, SVOCs, pesticides/PCBs, and metals, corrosivity, flashpoint, and other tests as appropriate. This results in roughly one hazardous waste characteristics sample for every 1,000 cubic yards of in-place material.

As part of this task, MACTEC may also engage specialty contractors (with SBD's approval) who will evaluate alternatives for removal of the source area.

2.4.6 Additional Data to be Obtained

Consistent with Section 9.3.6 of the AAR, additional data to be obtained during the Pre-Design Investigation will consist of the following:

- Presence of LNAPL at Area E Wells R-14 and ICM-PZ-04S: As described in the RI Report and AAR, LNAPL was identified in well R-14 and piezometer ICM-PZ-04S during 2008 quarterly groundwater monitoring activities. Samples of the LNAPL and groundwater at these two locations were collected by MACTEC for laboratory testing during the Third Quarter 2008 groundwater monitoring event. The analytical results for these samples indicated that the LNAPL is a weathered petroleum hydrocarbon. Additional focused investigation of this area will be completed as part of the remedial design process to evaluate the extent of LNAPL and determine future monitoring and remedial requirements. The scope of this work will be described in the PDI Work Plan and will likely consist of a direct-push drilling investigation supplemented by installation of temporary piezometers to gauge LNAPL extent and thickness. During the direct-push investigation, real time monitoring devices connected to the drilling probe (such as those provided by Columbia Technologies) will be utilized to profile the LNAPL. Laboratory testing of the LNAPL and groundwater may also be conducted to evaluate chemical and physical parameters.

- Vapor Intrusion Issues (Area B and 343 Elk Street): As described in Section 3.2.5 of the AAR, Honeywell will attempt to collect additional vapor samples from the 100 Lee Street building, including indoor and outdoor air samples, during the remedial design process to be consistent with New York State Department of Health (NYSDOH) guidance. Honeywell will collect similar samples from the former Plant hospital building located on the southeastern corner of Area B.

This assumes that access to these two buildings will be granted by the current owner. On Area E, SBD and Honeywell will perform additional evaluation to determine if further vapor intrusion investigation or mitigation is necessary for the 343 Elk Street property. This also assumes that access to this building will be granted by the current owner.

- PCB Soil Sampling – Area A: Two surface soil samples will be collected adjacent to the electrical buildings present on Area A for PCB laboratory analysis, in accordance with the original RI Work Plan. These samples inadvertently were omitted during the RI sampling efforts.

- Groundwater Contours for Confined Aquifer – Area E: As depicted on AAR Figure 17 and described in the RI, data collected during the RI and during the prior RFI study indicates that a high point exists for the Confined Aquifer potentiometric surface at or near well R-07. Potential reasons for this condition include a natural anomaly, surveying error (i.e., incorrect top-of-casing elevation) or man-made conditions such as a compromised well seal. This issue will be further evaluated as part of future groundwater monitoring activities via an approach that will be detailed in the PDI Work Plan.

- Former Lagoons and Groundwater Conditions on Southeastern Portion of Area E: As part of future groundwater monitoring efforts, it was agreed that MACTEC will work with NYSDEC to identify existing monitoring wells for inclusion in the monitoring program that can be used to evaluate groundwater quality downgradient of the former Area E wastewater lagoons and where the RFI (Golder, 1997) identified aniline in groundwater. It is anticipated that monitoring wells R-08, R-09, R-11, R-13, and R-14, along with other wells as appropriate, will be included in the groundwater monitoring program for this area.

- Other Potential Source Areas: The analytical results for subsurface soil samples collected at certain RI boring locations on Areas B, C and E contained concentrations of some constituents above the Commercial Soil Cleanup Objectives (SCOs). NYSDEC has requested that further investigation of such sample locations be completed. To comply with NYSDEC's request, a new round of groundwater monitoring will be completed at Areas B, C and E during the pre-design investigation. The groundwater monitoring program will include "shallow" monitoring wells on Areas B, C and E that were previously sampled during the RI. The list will be expanded to include the "PS"-series piezometers screened within the fill/upper water table, the new monitoring wells to be installed on Areas C and E for further delineation of the chlorobenzene plumes, and the "R" series monitoring wells on the southeastern side of Area E (as specified above). In addition, water table monitoring wells will be installed to further investigate soil samples from four RI test borings (TB-C12, TB-E15, TB-E16, and TB-E30) that NYSDEC identified as requiring further study to determine whether or not they would be considered Source Areas as defined by Part 375-1.2. The groundwater sampling and analytical methods used will be the same as those used during the prior RI sampling event, with some modifications made as appropriate to focus on specific contaminants of concern (COCs). The complete list of wells/piezometers at Areas B, C, and E from which groundwater samples will be collected during the pre-design groundwater monitoring event is as follows:

    - Area B: RFI-18, RFI-27, RFI-28, RFI-30, RFI-35, RFI-45, PS-07, PS-08, and PS-9
    - Area C: RFI-20, RFI-31, PS-04, PS-05, PS-6, plus three new monitoring wells to further delineate the chlorobenzene plume (one of these new wells will be located approximately 100 ft. downgradient of boring TB-C12).
    - Area E: RFI-17, RFI-29, RFI-32, RFI-33, RFI-36, RFI-39, RFI-42, RFI-43, RFI-51, RFI-PZ-17, RFI-PZ-18, RFI-PZ-19, PS-01, PS-02, PS-03, PS-10, PS-11, PS-12, PS-13, R-08, R-09, R-11, R-13, R-14; three new monitoring wells installed to further delineate the Area

E chlorobenzene plume; and one well downgradient of test borings TB-E15, TB-E16, and TB-E30 (one well can adequately investigate all three of these borings).

- If laboratory results from the groundwater sampling described in this section are clearly indicative of (1) concentrated solid or semi-solid substances; (2) non-aqueous phase liquids; or (3) grossly contaminated media in accordance with Part 375-1.2, then additional investigation or remediation may be proposed. Costs for such additional investigation are not included in this proposal.

2.4.7 Pre-Design Investigation Reports

Upon completion of the PDI activities specified above, MACTEC will prepare PDI reports for Areas A&B and Areas C&E that document the following:

- Results of the Area A hydraulic barrier wall investigation work;
- The revised Area A groundwater model;
- Results of the Areas C & E groundwater plume delineation;
- Results of the Areas C & E treatability/pilot testing, including a description of the conceptual in-situ remediation approach for each area;
- Results of the pre-design activities associated with the Area E source area, including revised excavation estimates and proposed waste treatment/disposal methods; and
- Results of the additional investigation work specified in Section 9.3.6 of the AAR, specifically:
    - The results of the Area E LNAPL investigation;
    - Vapor intrusion testing results for the specified Area B and Area E structures;
    - Results for the PCB soil samples to be collected on Area A;
    - Updated groundwater contours for Area E and an updated interpretation of the shallow groundwater flow direction;
    - Results of groundwater monitoring completed at wells in the vicinity of the former Area E wastewater lagoons; and
    - The results of the groundwater monitoring activities completed to evaluate potential source areas on Areas B, C and E.

MACTEC will include a Design Basis Section in each PDI Report for the following remedial action components:

- Area A Hydraulic Barrier Wall;
- Additional Area A Groundwater Extraction System Modifications (if required);
- Area B Long-term Monitoring;
- Area C In-Situ Treatment;
- Area E In-Situ Treatment;
- Area E Soil Source Removal;
- Area E LNAPL, and
- Site Cover System (only generic specifications will be provided; it is assumed that actual specifications will be developed by SBD based on redevelopment requirements).

The PDI Reports will include tables, figures and attachments, as necessary. The PDI reports will be issued to NYSDEC as part of the design documents prepared for the proposed remedial activities.

2.5 REMEDIAL DESIGN

MACTEC will prepare and provide remedial design documents. SBD will use these documents to execute the remedial construction. Three phases of design documents will be issued: one for the Area A Groundwater Extraction and Treatment System Modifications which will occur prior to demolition of Area A; one for remediation of Areas C&E, and one for Areas A&B, in accordance with the schedule provided in Section 3.0, as described in the following paragraphs.

2.5.1 Area A Groundwater Extraction and Treatment System Modifications

In November 2009, MACTEC issued drawings for construction of modifications to the existing Area A groundwater extraction system. The work involves the relocation of the Area A extraction well piping, collection sump, groundwater collection system electrical and controls systems, and main effluent lines. Generally the project includes: installing new pipeline, power, and controls from the existing extraction wells to the existing groundwater treatment building, removing unused equipment in the existing groundwater treatment building, reuse of existing equipment, building improvements, new piping, new instrumentation and controls, and new effluent piping and appurtenances. MACTEC minimized the use of written stand-alone specifications by incorporating the specifications on the design drawings. The following work items are addressed in the drawings/specifications package that MACTEC provided to SBD:

1.1 Change extraction well piping (in well) from steel to HDPE.
1.2 Furnish and install extraction well piping (including cleanouts) from five existing extraction wells to entrance at existing groundwater treatment building
1.3 Furnish and install power and control wires and conduits (including pull boxes) from five existing extraction wells to existing groundwater treatment building
1.4 Furnish and install electrical service and controls for the existing extraction wells in the existing groundwater treatment building
1.5 Furnish and install transition piping from underground extraction well piping to interior building piping for five existing extraction well and three future extraction wells
1.6 Furnish and install transition piping for interior effluent piping to underground effluent piping
1.7 Furnish and install drain manhole, piping, valves, etc for effluent piping
1.8 Furnish and install two effluent pipes/cleanouts/magnetic warning tape from groundwater treatment building to BSA
1.9 Reprogram or replace existing programmable logic controller
1.10 Furnish and install interior extraction well piping, valves, meters, gauges, etc.

1.11 Repair roof
1.12 Prepare and recoat flooring
1.13 Remove ramp at overhead door
1.14 Replace overhead door
1.15 Install bollards at overhead door
1.16 Install pump cleaning station.
1.17 Remove, store and protect existing equipment (De-emulsification mix tank, oil/water separator, Coagulant mix tank, Caustic mix tank, flocculation tank, clarifier, clearwell, filter press and filter press) that will not be reused until Honeywell determines fate.
1.18 Remove and reinstall extraction well pump control panels.
1.19 Label extraction well pump control panels
1.20 Label all piping by name and flow direction
1.21 Relocate and modify as necessary existing equipment, tanks, etc that will be reused
1.22 Modify (rename and placard, pipe fittings, level controls, etc) existing tanks (acid feed tank to treated effluent tank, caustic feed tank to untreated effluent tank, and coagulant feed tank to backwash tank)
1.23 Furnish and install level controls; and high and low water level alarms(ultrasonic) in existing acid feed tank (proposed treated effluent tank)
1.24 Furnish and install level controls ; and high and low water level alarms (ultrasonic) in existing caustic feed tank (proposed untreated effluent tank)
1.25 Furnish and install level controls ; and high and low water level alarms (ultrasonic) in existing coagulant feed tank (proposed backwash tank)
1.26 Furnish and reinstall level controls and high water alarm for sump
1.27 Remove VFD's – not to be reused
1.28 Restore site and conduct site improvements as required
1.29 Install secondary containment pipe and manual leak detection for the effluent discharge piping (two pipes) in Area B
1.30 Provide regulatory agency acceptable erosion and sedimentation control procedures.

MACTEC provided the following design drawings (with specifications included on the drawings to the extent practicable):

1. Cover Sheet, including location plan and drawing index
2. General Notes, Abbreviations, and Legend
3. Existing Conditions Plan
4. Demolition Plan
5. Piping Plan
6. Civil Details – Trenching
7. Civil Details – General
8. Erosion and Sediment Control Notes
9. Piping and Instrumentation Diagram Legend
10. Piping Details at Treatment Plant
11. Piping and Instrumentation Diagram, Field Piping
12. Electrical Legend and Notes
13. Electrical Plan
14. Single-Line Drawing and Control Wiring Schematic

Excavation activities, including stockpiling and characterization of soil, will be conducted in accordance with the existing Draft Soil Fill Management Plan (MACTEC, 2008) or more current version. MACTEC provided design specifications for:

1. Submittal Procedures
2. Environmental Protection Procedures
3. Regulatory Requirements
4. Subcontractor Quality Control
5. Temporary Facilities and Controls
6. Dust Control
7. Field Engineering and Surveying
8. Off-Site Transportation and Disposal
9. Dewatering
10. Shoring
11. Earthwork
12. Erosion and Sedimentation Control
13. Precast Concrete Manholes, Frames, and Covers
14. Underground Piping
15. Concrete
16. Building improvements
17. Mechanical, General Requirements
18. Pumps
19. Piping and Valves
20. Hangers and Supports
21. Electrical, General Requirements
22. Electrical Basic Materials and Methods
23. Underground Electrical Work

The final design drawings for the pre-demolition modifications to the Area A groundwater extraction system modifications were stamped and signed by a professional engineer licensed to practice in New York State. The final drawings were submitted to NYSDEC for its records.

The design of additional Area A Groundwater Extraction and Treatment System modifications based upon groundwater modeling, design parameters for the Area A Hydraulic Barrier Wall, and other data collected during the pre-design investigation, will be conducted as part of the remedial design for the final site remedy and are not included in the pre-demolition design work; these activities will be completed by MACTEC, as necessary, during later stages of remedial design.

It will be necessary to determine horizontal and vertical control along the underground piping alignments specified by SBD. It is assumed that SBD will be the construction general contractor and responsible for permitting, and that Ontario Specialty Contracting, Inc., with support from local subcontractors as necessary, will complete the construction work.

2.5.2 Remedial Design – Final Remedy

The design of the final remedy is dependent on the findings, results, conclusions, and design basis information provided in the PDI report. The proposed scope of work and level of effort are presented on a conceptual basis in the proposal and may be subject to revision after the PDI report is completed. The design of the Final Remedy will include the following components:

- Area A Hydraulic Barrier Wall;
- Additional Area A Groundwater Extraction System Modifications (if required);
- Area B Long-term Monitoring;
- Area C Source Removal/Treatment;
- Area E Source Removal/Treatment; and
- Site Cover System.

As noted above, separate design package will be provided for Areas A&B and Areas C&E, consistent with the schedule provided in Section 3.0. MACTEC will prepare remedial design documents for the components of the final site remedy, which are described herein. The remedial design will involve the following submittals:

- 50 Percent Design;
- 90 Percent Design (for construction); and
- Record Drawings/Final Engineering Reports (incorporating NYSDEC comments and any changes made to the design during construction).

2.5.2.1 50 Percent Design

MACTEC will prepare a 50 Percent Design that will include a Design Basis, as well as the following components:

- Order of magnitude cost estimate;
- Master permit schedule;
- Design Drawings; and
- Select Technical Specifications.

Design drawing and technical specification packages will be developed for each of the remedial action components. Design drawing sets will be near complete. Select critical specifications will be prepared.

2.5.2.2 90 Percent Design

MACTEC will prepare a 90 Percent Design that will consist of fully developing the 50 Percent design components that SBD can use to complete draft bid documents. MACTEC will submit the 90 Percent

Design to SBD and Honeywell for review and comment, and will incorporate these comments into a 90 Percent Design deliverable to the NYSDEC. The 90 Percent Design will be used for construction. NYSDEC review comments on the 90 Percent Design submittal will be addressed during construction.

2.5.2.3 Record Drawings/Final Engineering Reports

MACTEC will prepare record drawings and Final Engineering Reports (FERs) for Areas A&B and Areas C&E that incorporate responses to the NYSDEC comments on the 90% Design, along with any changes made during construction. The record drawings and FERs will be stamped and signed by a professional engineer licensed to practice in New York State. FERs will be prepared in accordance with NYSDEC BCP guidance.

3.0 PROJECT SCHEDULE

Remedial construction will occur in three phases, with remediation of Areas C and E occurring first and targeted for completion by the end of 2010 and remediation of Areas A and B scheduled for completion by the end of 2011. Subsequent to completion of remedial construction, long-term operations, maintenance and monitoring (OM&M) will commence.

It should be noted that the schedule provided herein is consistent with and in some cases more aggressive than the remediation schedule provided in Section 10 of the AAR. Per the AAR, the remedial design activities (including pre-design investigation activities) are to be completed within 27 months from the execution of the Brownfield Cleanup Agreements, which occurred in late April 2009. Thus to be consistent with the AAR schedule, completion of remedial design is required by July 2011 and remedial construction is to be completed by April 2012. Many factors will affect the remedial design schedule, including the actual schedule for the demolition project, the length of SBD/Honeywell and NYSDEC review periods, and other factors such as weather. As the project proceeds, SBD will coordinate any schedule changes, should they be required, with NYSDEC.

4.0 REQUIRED PERMITS AND APPROVALS

Permits and approvals required during the various stages of the project are as follows:

Demolition: asbestos removal permits from NYSDOL, demolition permits, building permits from the City of Buffalo, and other necessary permits or approvals have been obtained by SBD for the demolition activities.

Pre-Design Investigations: Underground Injection Control Permit Authorization by Rule from the US EPA Region II (Erie County branch) for Area C/E treatability testing.

Remedial Construction: Underground Injection Control Permit Authorization by Rule from the US EPA Region II (Erie County branch) for Area C/E in-situ treatment; building permits from City of Buffalo, as applicable; submittals necessary to obtain coverage under the State Pollution Discharge Elimination System (SPDES) General Permit #GP-0-10-001 for storm water discharges associated with construction activity; other permits/approvals as necessary.

5.0 REFERENCES

The following is a list of significant references used in preparation of this Site Management Plan. Other documents, including project correspondence documents, were used to supplement the information obtained from the references listed below.

1. MACTEC Engineering and Consulting, Inc., March 2006, "Final Operations, Maintenance & Monitoring Plan, Interim Corrective Measure, Buffalo Color Area ABCE, Buffalo, New York".

2. MACTEC Engineering and Consulting, Inc., August 2008, "Remedial Investigation Report, Buffalo Color Corporation Area ABCE Site, Buffalo, New York."

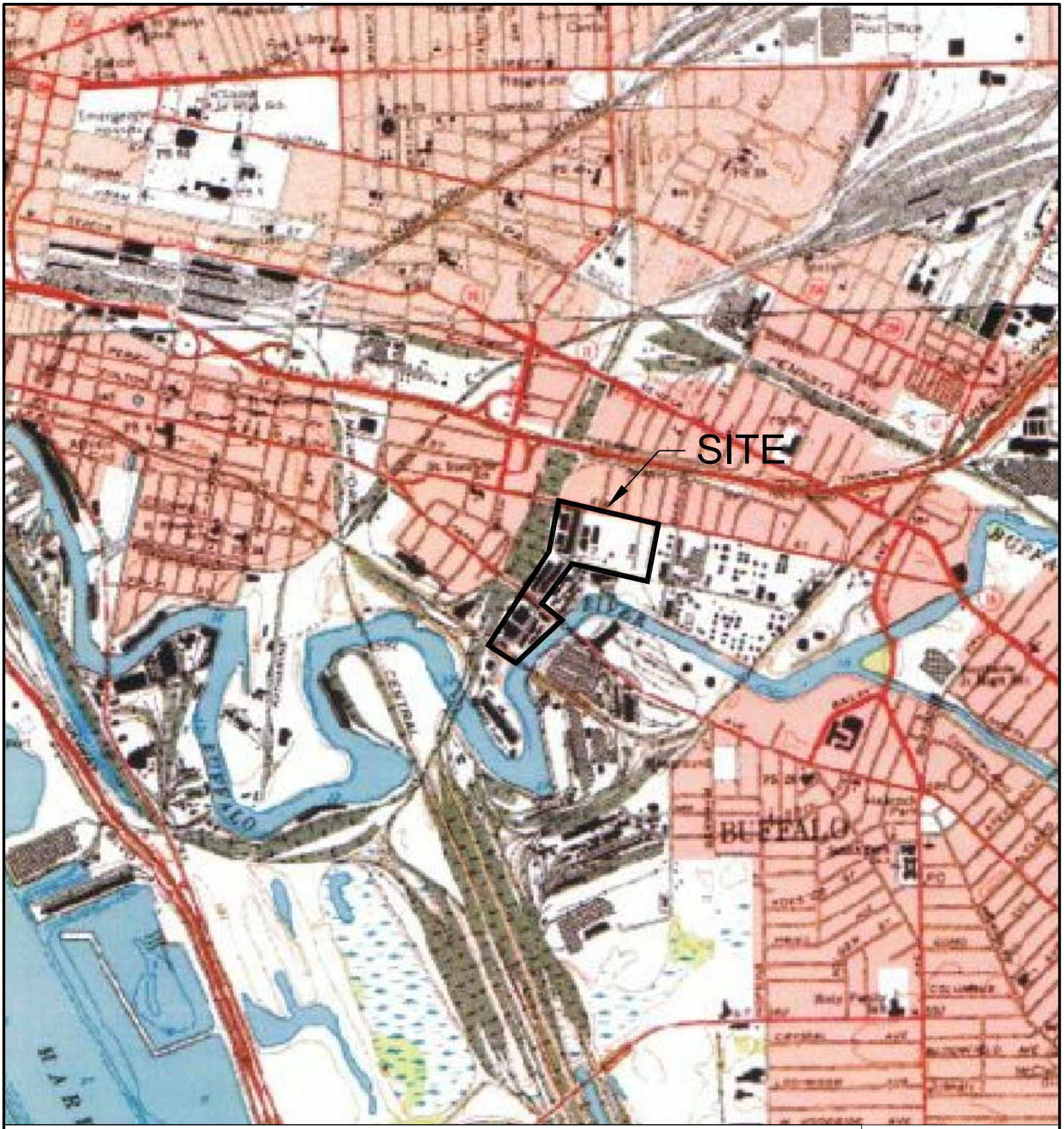
3. MACTEC Engineering and Consulting, Inc., February 2009, "Final Alternatives Analysis Report, Former Buffalo Color Corporation Site, Buffalo, New York."

4. MACTEC Engineering and Consulting, Inc., August 2009, "Pre-Design Investigation Work Plan".

5. New York State Department of Environmental Conservation, April 2009, Brownfield Site Cleanup Agreements (#C915230, #C915231 and #C915232).

FIGURES

DRAWN BY: NEL 7-27-2009 APPROVED BY: NF



SCALE 1:24000

1 0.5 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0.5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET

BUFFALO SE QUADRANGLE

SOUTH BUFFALO DEVELOPMENT
BUFFALO, NEW YORK
Project No.: 3410090701

MACTEC
Engineering & Consulting Inc.
800 North Bell Avenue, Suite 200
Pittsburgh, PA 15106

SITE LOCATION MAP
BUFFALO COLOR AREAS ABCE
BUFFALO, NEW YORK

FIGURE: 1

1

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Conrail Railroad

Area-A

Area-B

Area-C

Buffalo
Research Laboratory

Area-E

PVS
Chemicals

PVS
Chemicals

SOUTH PARK AVE.

LEE STREET

ELK STREET

ORLANDO STREET

BUFFALO RIVER
ELEVATION = 573.19'
FLOW

BCC OUTFALL 006

BCC OUTFALL 006
INV.=567.44', 36"
RCP

PVS
OUTFALL
004,

PVS
OUTFALL
003,

PVS
OUTFALL
002

PVS
OUTFALL
001

BCC
OUTFALL
011

85 80 84 83 82 54 53 52 51 50 48 47 75 LST LOADING FACILITY

150 121 100 123

VT3 234 203 207 204 208 205 220 223 222 221

312 312 310A 310 319 315 316 322 361 317 300 320 353 351 352 CLF1 TKR1

200 0 200
SCALE: 1"= 200'

SOUTH BUFFALO DEVELOPMENT BUFFALO, NEW YORK Project No.: 3410090701	MACTEC Engineering & Consulting Inc. 800 North Bell Avenue, Suite 200 Pittsburgh, PA 15106	SITE LAYOUT BUFFALO COLOR AREAS ABCE BUFFALO, NEW YORK FIGURE: 2	2

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APPENDIX A

REMEDIAL WORK PLAN

9 REMEDIAL WORK PLAN

The goal of the remedy selection process in the BCP is to select a remedy for a site that is fully protective of public health and the environment, taking into account the current, intended and reasonably anticipated future land use of the site.

This section presents the preferred remedy which has been selected as the final remedy for the Site. The preferred remedy is driven by and consistent with the BCP and SBD's proposed redevelopment approach (as described in Subsection 1.1) in that it is:

- Fully protective of human health and the environment;
- Allows for the creation of significant riverfront green space and public access;
- Provides for the accelerated demolition of the abandoned chemical plant;
- Eliminates the risks and hazards posed by the currently deteriorating infrastructure; and
- Meshes well with SBD's and other stakeholders' schedules for accelerated redevelopment of the Site.

9.1 PLANT DEMOLITION

Prior to remedial construction, SBD will complete asbestos abatement and demolition of the existing Buffalo Color facility. The work will be completed in accordance with applicable laws and regulations and will be performed as follows:

Asbestos abatement will include:

- Preparation of an asbestos abatement health and safety plan, to include requirements for employee training and medical monitoring, list of designated personnel, respiratory protection program, PPE, site and community air monitoring, and emergency procedures;
- Implementation of jobsite security to prevent access by unauthorized personnel;
- Implementation of a decontamination program;
- Implementation of a hazard communication program;
- Obtaining all required licenses, permits and approvals;
- Designation of regulated areas, including use of warning signs as appropriate;
- Provisions for adequate exhaust ventilation;
- Removal of friable asbestos, including pipe insulation and other insulating materials;
- Removal of non-friable asbestos, including floor tile, roofing materials, and transite;
- Implementation of a final cleaning and visual inspection program;
- Off-site disposal of ACM at licensed disposal facilities; and

- Preparation of submittals and reports, as necessary, to document the asbestos abatement program.

Demolition of the existing facility will include the following:

- Preparation and implementation of a demolition health and safety plan, to include requirements for employee training and medical monitoring, list of designated personnel, respiratory protection program, PPE, fire protection, site and community air monitoring programs, and emergency procedures;
- Implementation of a decontamination program;
- Implementation of a hazard communication program;
- Obtaining all required licenses, demolition permits and other permits, and approvals;
- Meeting with the appropriate City departments to discuss the re-use of foundations and slabs (SBD acknowledges that a demolition permit is required from the City);
- Mobilization of equipment and site preparation;
- Removal and proper disposal of residual chemicals remaining in piping, tanks, pits/sumps and process vessels;
- Cleaning/rinsing of piping, tanks, pits/sumps and process vessels and proper disposal of collected rinseate;
- Removal and proper disposal of regulated materials, including PCB electrical equipment, Universal wastes, mercury-containing equipment;
- Capping/plugging of drains and sewer lines exposed during demolition;
- Demolition/removal of buildings, tanks, piping, and ancillary structures, as required;
- Backfilling to grade (after cleaning) of pits and sumps;
- Cleaning (power washing, scouring, scabbling, etc.) and, if appropriate, sealing of structural floor slabs that will remain in place;
- Implementation of dust control measures;
- Implementation of erosion and sediment control measures;
- Site restoration; and
- Preparation of reports and submittals, as necessary, to document the completion of demolition activities.

9.2 DESCRIPTION OF PREFERRED REMEDY

The Preferred Remedy for the Site consists of the following components:

- Soil – Installation of a Site-wide cover system with Area E source area excavation
- Area A Groundwater – Installation of a downgradient hydraulic barrier wall combined with optimized Site groundwater extraction system and implementation of Site cover system
- Area B Groundwater – Groundwater monitoring and implementation of Site cover system

- Areas C&E Groundwater – Enhanced bioremediation with Area E source removal, implementation of Site cover system, and groundwater monitoring
- Site Sewers – plugging, removal and/or rehabilitation if necessary to mitigate active preferential contaminant migration pathways
- Use of institutional/engineering controls and environmental easements

The following subsections provide descriptions of the specific components of the preferred remedy.

9.2.1 Soil

Alternative S-3 (Cover System with Area E Source Area Excavation) has been selected as the preferred alternative for the Site soil. This alternative includes excavation to the water table and off-Site disposal of contaminated soil at the source area located on Area E (Figure 18) combined with the use of a cover system.

The source area at Area E contains approximately 8,100 cubic yards of VOC-impacted soil located around the AST farm in the southwestern corner of this area (Figure 18). The soil in this area has been targeted for removal. The removal will occur after SBD has removed/demolished the AST tank farm, buildings and any other ancillary structures that are located within the area. Removal of foundations and underground utilities that may exist within the excavation limits will also be completed. The criteria used to identify soil to be removed from this specific location will be as follows:

- Soil will be removed down to the first zone of saturation (expected to be encountered at a depth of 4 to 5 feet below existing ground surface).
- Soil above the water table within the designated area that exhibits noticeable NAPL and/or sustained open-air photoionization detector (PID) readings above 10 parts per million will be removed.
- Locations of RI soil samples (and any additional samples collected during the remedial design process) within the designated area shown through laboratory testing to contain total concentrations of Site-specific VOCs (benzene, chlorobenzene, and related compounds) or Site-specific SVOCs (aniline, nitrobenzene and related compounds) that exceed 10 parts per million (ppm) will be removed. The 10 ppm criterion was selected based on review of the analytical results for the RI soil samples collected from borings advanced around the AST farm versus other Area E soil samples (which exhibited much lower levels, if any, of similar substances).

Confirmatory soil samples will be collected from the excavation sidewalls at a frequency of one sample for every 50 lineal feet of sidewall. The confirmatory samples will be analyzed for Target Compound List (TCL) VOCs and SVOCs. No excavation bottom samples are proposed because the excavation will extend to the water table. No saturated soil samples will be collected for confirmatory analyses. Additional samples may be required if “grossly contaminated” materials are encountered (as defined in the draft Soil Fill Management Plan provided in Appendix A).

The horizontal limits of excavation will be determined based on the above criteria. Excavation will not be performed beyond property lines. If data obtained during remedial design or source area removal indicates that soil contamination at the Area E source area extends beyond the property line, additional delineation will be necessary. Excavation may be limited by the presence of subsurface obstructions or active utility lines.

As noted in prior sections, the cover system to be utilized as part of the remedy, consistent with the redevelopment of the Site, will involve use of a combination of clean soil, pavement, or building structures to provide protection from direct contact exposure to contaminated surface soils. As identified in the RI report and illustrated on Figure 20, areas that must be covered to eliminate the direct contact pathway under a Commercial use scenario exist throughout the Site. Although certain portions of the Site surface soil may in fact meet the Commercial SCOs, it would be difficult to properly delineate and manage these areas during future redevelopment. Thus, the cover system will extend across the entire Site. The cover system will reduce infiltration of precipitation through impacted soil into groundwater and promote surface drainage. The cover system will consist of a minimum of one foot of soil, asphalt or concrete pavement (with appropriate granular subbase), or building structures, consistent with the presumptive remedy as identified in 6 NYCRR Part 375. If portions of Area A are used as natural habitat resource areas, the cover soil thickness will be increased to two feet or more and the cover material shall meet the "Protection of Ecological Resources" SCOs as described in 6NYCRR Part 375-6.7. Existing paved surfaces, including building floor slabs, asphalt parking lots, and access drives which SBD chooses to use as part of the cover system will be cleaned, rehabilitated, and maintained as necessary. Any required actions for the parking lot associated with the 100 Lee Street property (Area B) will be coordinated with the owner. A demarcation layer will be placed between existing surface soils and any new soil cover materials so the boundary between clean fill and existing Site soils can be identified in the future. Best Management Practices will be implemented to manage stormwater runoff from paved surfaces, as appropriate.

9.2.2 Groundwater

Due to the variability of shallow groundwater conditions across the Site, a multi-faceted remedy has been selected to address Site groundwater in the shallow aquifer and attain the groundwater RAOs as described in the following subsections. The long term goal of groundwater remediation is restoration of groundwater to its classified use; the short term goal is plume stabilization. In addition to the remedy components described below, the implementation of a Site-wide cover system will serve to reduce surface water infiltration and minimize the soil-to-groundwater migration pathway.

9.2.2.1 Area A Shallow Groundwater

Alternative GW-A-2 (Downgradient Hydraulic Barrier Wall with Groundwater Extraction) has been selected as the preferred alternative for Area A shallow aquifer groundwater. This alternative involves the continued operation of the Area A groundwater extraction system, with an evaluation period to identify modifications as necessary to optimize groundwater containment and accommodate redevelopment. Effluent from the groundwater extraction system will continue to be pretreated as necessary to meet the requirements of the Buffalo Sewer Authority (BSA) discharge permit. During recent correspondence with the BSA (and as documented in MACTEC's letter to NYSDEC dated April 8, 2008), BSA indicated that the effluent from the Area A groundwater extraction system, due to its location, would not be discharged to any Combined Sewer overflows (CSOs).

As described in Section 7.2.1.2, the hydraulic barrier wall would be installed along the eastern edge of Area A bordering the Buffalo River. The edges of the wall would be "wrapped" along the southern border and a portion of the northern boundary of Area A (along Area D and South Park Avenue, respectively) to provide for the sufficient containment of groundwater (Figure 21). The intent of the hydraulic barrier wall is to create a physical barrier between impacted shallow aquifer groundwater at Area A and the Buffalo River. The wall would have the added benefit of reducing the volume of river water extracted by operation of the ICM. The wall would be toed into the glaciolacustrine clay layer, which acts as an aquitard separating the Shallow Aquifer from the Confined Aquifer present in the basal till and Onondaga limestone immediately below the clay. The type of wall used (sheet pile, slurry wall, etc.) would be determined based on pre-design studies. For evaluation purposes, it is assumed that the wall would be approximately 1,320 feet long and extend to an average depth of 25 feet. Soils and wastes generated during installation of the wall will be managed in accordance with the Soil Fill Management Plan (see Section 9.2.4).

The erosion protection mattress located along the southern end of the Area A riverbank was installed as an Interim Corrective Measure (see Section 2.3). The remainder of the Area A shoreline consists of vertical concrete walls and other man-made structures. The final design will address contaminated soils located between the hydraulic barrier wall and the river and will include, to the extent feasible, the restoration of the river bank to a natural vegetative state. Opportunities to enhance the habitat along the Area A shoreline will be considered during the final design process.

The LNAPL present at EW-5 and other wells/piezometers must be monitored and controlled through periodic recovery via hand bailing or use of absorbent materials. If accumulations of LNAPL increase significantly or occur persistently at new locations within Area A, or if the LNAPL interferes with operation of the groundwater extraction system, additional investigation and/or LNAPL recovery efforts will be implemented.

9.2.2.2 Area B Shallow Groundwater

Alternative GW-B-2 (Groundwater Monitoring) has been selected as the preferred alternative for the Area B shallow aquifer groundwater. During 2008, groundwater monitoring at Area B will be performed in accordance with the ICM OM&M Plan. Based on the outcome of this monitoring period, the scope and frequency of additional groundwater monitoring at Area B will be proposed.

9.2.2.3 Area C/E Shallow Groundwater

Alternative GW-C&E-2 (Enhanced Bioremediation and Groundwater Monitoring) has been selected as the preferred alternative for the Area C and E shallow groundwater. As noted in previous Sections, Alternative GW-C&E-2 includes in-situ enhanced bioremediation of the limited chlorobenzene plumes identified at Areas C&E. A pre-design investigation, including a treatability study, would be required to collect Site-specific data related to geochemical and biological processes at the Site in order to determine the appropriate amendments for enhanced bioremediation. Based on the results of the treatability study, a pilot-scale test would be conducted on-site to determine the injection point locations, spacing, and effectiveness. The full-scale implementation would be based upon the results of the treatability and pilot-scale tests. At Area E, it may be advantageous to directly apply the bio-enhancement additive to the subsurface during the source area removal action.

The long term goal of groundwater remediation is restoration of groundwater to its classified use; the short term goal is plume stabilization. The criteria for determining success for the biotreatment process will be based on confirmation through groundwater monitoring that concentrations of COCs in the plume have been reduced and that the plume is not migrating beyond the Site. If migration beyond the Site boundary occurs, an evaluation of additional remedial alternatives will be completed.

During 2008, groundwater monitoring at Areas C and E was performed in accordance with the ICM OM&M Plan. Additional groundwater monitoring may be performed as necessary to support the predesign study and to monitor the effects of treatment. The scope and frequency of additional groundwater monitoring at Areas C and E will be assessed upon evaluation of the outcome of the treatment program.

9.2.3 Site Sewers

It is recognized that Site process/sanitary and storm sewers represent potential preferential contaminant migration pathways within certain areas of the Site. It should be noted that, based on plant records and interviews with former plant personnel, it appears that no underground chemical conveyance or process piping is present at the site; all such lines are/were reportedly aboveground lines. However, as a precautionary measure, procedures for the proper management of underground piping encountered during excavation activities associated with remedy implementation or redevelopment are addressed in the Soil Fill Management Plan, a draft copy of which is provided in Appendix D. The following subsections identify the

remedial approach selected for the Site sewer system. SBD will obtain any necessary permits and approvals from the City and the BSA for these activities.

9.2.3.1 Storm Sewers

Underground storm sewer lines at the Site discharge stormwater (including water from existing building roof drains and surface runoff that is conveyed to storm sewer inlets) to the Buffalo River at Outfall 006 on Area A and at Outfall 011. These outfalls are former SPDES-permitted outfalls formerly operated by Buffalo Color. These outfalls previously also received significant volumes of non-contact cooling water (NCCW) when the Buffalo Color plant was in operation.

During the RI, sampling at Outfalls 006 and 011 indicated that groundwater likely infiltrates the storm sewer lines in areas where the lines are below the water table. At present, it has not been determined if the existing storm sewer lines and river outfalls will be preserved and reused during redevelopment of the Site. It is anticipated that SBD will evaluate the storm sewer lines and make a determination early in the redevelopment process (consistent with the schedule provided in Section 10.0) regarding which storm sewer lines/outfalls (if any) will be reused. If the lines/outfalls will be reused, then remedial measures consisting of the removal and proper disposal of sediment, followed by camera surveys where accessible/appropriate and rehabilitation of portions of the lines subject to infiltration, will be completed. If the storm sewers/outfalls will not be reused, then the associated manholes, inlets, and river outfalls will be plugged or sealed.

9.2.3.2 Sanitary Sewers

As with the storm sewers, it has not been determined if the existing sanitary lines will be preserved and reused during redevelopment of the Site, or if they will be abandoned or removed. Similar to the storm sewer system, it is anticipated that SBD will evaluate the sanitary sewer lines and make a determination early in the redevelopment process (consistent with the schedule provided in Section 10) regarding which sanitary sewer lines (if any) will be reused. Certain sewer lines may be removed during the course of remedial construction or redevelopment activities. Lines that will not be reused but left in place will be capped or plugged at inlets and where they connect with BSA sewer lines. Lines that will be reused (if any), will be flushed, camera surveyed where accessible/appropriate, and rehabilitated as necessary to prevent groundwater infiltration. Work involving the sanitary sewer lines will be coordinated with the BSA, as appropriate.

9.2.3.3 Contaminant Migration along Sewer Bedding

No evidence to indicate that sewer bedding materials are presently acting as preferential migration pathways for contaminated groundwater was found during the RI process. However, at Area A, because the underground sewer lines that connect to Outfall 006 are below the water table, the final remedy for shallow groundwater (installation of a downgradient hydraulic barrier wall combined with groundwater extraction) will designed to ensure elimination of any potential migration along the Outfall 006 bedding material. If

Outfall 006 is to remain, the hydraulic barrier wall will be sealed to the outside of the pipe to eliminate this potential migration pathway.

On Area E, the results of the soil sampling, groundwater sampling and MIP survey completed during the RI indicate that the chlorobenzene-impacted groundwater at the main AST farm has not migrated along the 36-inch diameter BSA sewer main. This sewer line runs parallel to the southern boundary of the Site, between the Site and the PVS Chemicals property (Figures 3 and 16). While it is expected that the soil and groundwater remediation to be performed at this location will minimize (if not eliminate) the potential for future migration of chlorobenzene-impacted groundwater along the 36-inch BSA sewer, it was agreed during the August 7, 2008 meeting with NYSDEC that a low-permeability collar (most likely a clay or grout collar) would be installed. Details regarding the type and location of the collar will be provided in the Remedial Design. .

9.3 GENERAL REQUIREMENTS

The following subsections describe the additional requirements, including institutional/engineering controls and environmental easements, which must be implemented as part of the preferred remedy for the Site.

9.3.1 Future Use Of Site

Environmental easements/deed notices will be implemented to ensure that the Site can be used only for commercial or industrial purposes (as the terms are defined in 6 NYCRR Part 375-1), unless the Site is subsequently remediated to meet residential use standards. The environmental easements and deed notices will be described in detail as part of the Institutional and Engineering Control Plan (which will be part of the Site Management Plan as noted below in Section 9.3.4)

9.3.2 Groundwater Use

The potable or consumptive use of groundwater (which is prohibited by City of Buffalo ordinance) will be prohibited at the Site through implementation of an environmental easement/deed notice.

9.3.3 Vapor Intrusion

An environmental easement will be implemented to ensure that occupied structures associated with future development at the Site are constructed such that the vapor intrusion (VI) pathway is eliminated. This can be accomplished through construction methods, such as installation of subslab vapor barriers and/or subgrade vapor collection systems (passive or active), or through additional characterization (conducted in accordance with NYSDEC and NYSDOH VI guidance) to ensure that the area over which the structure will reside does not present a potential VI concern.

9.3.4 Site Management Plan

A Site Management Plan must be prepared for the Site, consistent with 6 NYCRR Part 375 and the Guide. The plan will include the following components:

- Introduction, background, and summary of RI results;
- An Institutional and Engineering Control Plan;
- A Soil Fill Management Plan that specifies requirements for excavation/grading activities, stockpiling and soil staging areas, waste characterization sampling, onsite reuse criteria, soil loading and transportation, and requirements for offsite disposal ;
- Health and Safety for construction personnel, including requirements for Site and community air monitoring;
- A Quality Assurance/Quality Control Plan;
- An Operations, Maintenance and Monitoring Plan;
- Notification and reporting requirements; and
- Tables, figures and appendixes, as necessary

The Site Management Plan will be provided as a separate document later in the BCP process, consistent with the project schedule provided in Section 10. As requested by NYSDEC during the August 7, 2008 meeting, a draft Soil Fill Management Plan has been prepared, a copy of which is provided in Appendix B.

An environmental easement will be implemented that requires that any excavation or other disturbance of Site soil meets the requirements of the Site Management Plan.

9.3.5 Confined Aquifer

Based on the previous investigation data and RI data, no further investigation or remediation of the confined aquifer (i.e. the saturated unit present with the “basal” till unit and underlying Onondaga limestone) is required.

9.3.6 Additional Data To Be Obtained

The RI data adequately assesses environmental conditions at the Site. NYSDEC has requested that SBD obtain certain limited additional data. This request will be addressed as part of the remedial design process. The data to be obtained consist of the following:

- Delineation of Area C Chlorobenzene Plume: The well with the highest chlorobenzene concentration on Area C (well RFI-20) is located on the upgradient corner of the Site (Figure 16). NYSDEC has inquired if the chlorobenzene could be associated with conditions at the adjacent Honeywell Buffalo Research Laboratory. That facility conducts annual groundwater monitoring as a condition of its RCRA permit.

MACTEC obtained and reviewed a copy of a recent Groundwater Monitoring Report (Parsons, May 2007) for the laboratory site. Groundwater samples collected on the site, which were analyzed for VOCs in accordance with EPA Method 8260, did not identify detectable concentrations of chlorobenzene. Thus, it is not believed that an off-site release from this location is responsible for the Area C groundwater contamination. As part of the remedial design process, MACTEC will further evaluate the on-Site extent of the Area C chlorobenzene plume. This will include the installation of additional monitoring wells on Area C during predesign studies.

- Delineation of Area E Chlorobenzene Plume: The RI data indicates that the chlorobenzene plume on Area E is limited to the vicinity of the AST farm and has not migrated offsite. To verify this conclusion and to further evaluate the location and extent of the plume, additional monitoring wells will be installed during predesign studies. Additional test borings may also be advanced as part of the pre-design studies for the Area E source area removal, which would provide additional data on the extent of the impacted area.

- Presence of LNAPL at Area E Wells R-14 and ICM-PZ-04S: As described in Section 3.2.3, LNAPL has been identified in well R-14 and piezometer ICM-PZ-04S during 2008 quarterly groundwater monitoring activities. Samples of the LNAPL and groundwater at these two locations were collected by MACTEC for laboratory testing during the Third Quarter 2008 groundwater monitoring event. The analytical results for these samples were not available as of the date of this report and will be provided separately. Additional focused investigation of this area will be completed as part of the remedial design process to evaluate the extent of LNAPL and determine future monitoring and remedial requirements.

- Vapor Intrusion Issues (Area B and 343 Elk Street): As described in Section 3.2.5, Honeywell will attempt to collect additional vapor samples from the 100 Lee Street building, including indoor and outdoor air samples, during the remedial design process to be consistent with NYSDOH guidance. Honeywell will collect similar samples from the former Plant hospital building located on the southeastern corner of Area B. This assumes that access to these two buildings will be granted by the current owner. On Area E, SBD and Honeywell will perform additional evaluation to determine if further vapor intrusion investigation or mitigation is necessary for the 343 Elk Street property. This also assumes that access to this building will be granted by the current owner.

- PCB Soil Sampling – Area A: Two surface soil samples will be collected adjacent to the electrical buildings present on Area A for PCB laboratory analysis, in accordance with the original RI Work Plan. These samples inadvertently were not collected during the RI sampling efforts.

- Groundwater Contours for Confined Aquifer – Area E: As depicted on Figure 17 and described in the RI, data collected during the RI and during the prior RFI study indicates that a high point exists for the Confined Aquifer potentiometric surface at or near well R-07. Potential reasons for this condition include a natural anomaly, surveying error (i.e., incorrect top-of-casing elevation) or man-made conditions such as a compromised well seal. This issue will be further evaluated as part of future groundwater monitoring activities.

- Former Lagoons and Groundwater Conditions on Southeastern Portion of Area E: As part of future groundwater monitoring efforts, it was agreed that MACTEC will work with NYSDEC to identify existing monitoring wells for inclusion in the monitoring program that can be used to evaluate groundwater quality downgradient of the former Area E wastewater lagoons and where the RFI (Golder, 1997) identified aniline in groundwater. It is anticipated that monitoring wells R-08, R-09, R-11, R-13, and R-14, along with other wells as appropriate, will be included in the groundwater monitoring program for this area.

- Other Potential Source Areas: The analytical results for subsurface soil samples collected at certain RI boring locations on Areas B, C and E contained concentrations of some constituents above the

Commercial SCOs. Examples of these sample locations include Area B soil boring TB-B09 (834 mg/kg arsenic), Area C boring TB-C12 (60.2 mg/kg mercury), and Area E boring TB-E16 (470 mg/kg chlorobenzene, total SVOCs > 10,000 mg/kg). Although the RI groundwater data indicate that these substances are not present in the Site groundwater at levels of concern, NYSDEC has requested that further investigation of such sample locations be completed to determine if they represent threats to the shallow groundwater at the Site that will not be controlled via implementation of the remedy currently proposed in the AAR.

To comply with NYSDEC's request, a new round of groundwater monitoring will be completed at Areas B, C and E during the pre-design environmental studies. The groundwater monitoring program will include "shallow" monitoring wells on Areas B, C and E that were previously sampled during the RI. The list will be expanded to include the "PS"-series piezometers screened within the fill/upper water table, the new monitoring wells to be installed on Areas C and E for further delineation of the chlorobenzene plumes, and the "R" series monitoring wells on the southeastern side of Area E (as specified above). In addition, water table monitoring wells will be installed to further investigate soil samples from 4 test borings (TB-C12, TB-E15, TB-E16, and TB-E30) that NYSDEC identified as requiring further study to determine whether or not they would be considered Source Areas as defined by Part 375-1.2. The groundwater sampling and analytical methods used will be the same as those used during the prior RI sampling event, with some modifications made as appropriate to focus on specific COCs. If available, the logs of all PS wells will be submitted to NYSDEC. The complete list of wells/piezometers at Areas B, C, and E from which groundwater samples will be collected during the pre-design groundwater monitoring event is as follows:

- Area B: RFI-18, RFI-27, RFI-28, RFI-30, RFI-35, RFI-45, PS-07, PS-08, and PS-9
- Area C: RFI-20, RFI-31, PS-04, PS-05, PS-6, plus three new monitoring wells to further delineate the chlorobenzene plume (one of these new wells will be located approximately 100 ft. downgradient of boring TB-C12).
- Area E: RFI-17, RFI-29, RFI-32, RFI-33, RFI-36, RFI-39, RFI-42, RFI-43, RFI-51, RFI-PZ-17, RFI-PZ-18, RFI-PZ-19, PS-01, PS-02, PS-03, PS-10, PS-11, PS-12, PS-13, R-08, R-09, R-11, R-13, R-14; three new monitoring wells installed to further delineate the Area E chlorobenzene plume; and one well downgradient of test borings TB-E15, TB-E16, and TB-E30 (one well can adequately investigate all three of these borings).

- If laboratory results from the groundwater sampling described in this section are clearly indicative of (1) concentrated solid or semi-solid substances; (2) non-aqueous phase liquids; or (3) grossly contaminated media in accordance with Part 375-1.2, then additional investigation or remediation may be proposed.

9.4 CONTINGENCY PLAN

During the course of remedial design and construction, it may be appropriate for SBD to consider alternative or additional measures to facilitate remediation of the Site consistent with the Preferred Remedial Alternative set forth herein. Those measures which SBD may, at its discretion, consider include:

- Stabilization/Grouting: During source removal work, grouting or stabilization methods may be appropriate under certain circumstances, such as to eliminate preferential migration pathways along bedding materials of underground utility lines exposed within the excavation or around building foundations that cannot be removed.
- On-Site Treatment of Soil: During remediation or construction activities, on-Site treatment of excavated soils may be appropriate to reduce concentrations of metals or organic compounds prior

to off-Site disposal. Measures may include mixing or blending of additives to stabilize metals or biodegrade organic materials.

- Use of Sewer Infrastructure: It may be appropriate to utilize sections of existing sewer lines as conveyance structures for groundwater extraction piping on Area A (as part of the groundwater collection system to be used in conjunction with the hydraulic barrier wall) or as collection points for groundwater at other locations, if appropriate.

Prior to implementation of any of the above listed contingency items, a Work Plan will be prepared that details the scope and schedule for the proposed activities. The Work Plan will be submitted to NYSDEC for review and approval.