SUPPLEMENTAL FEASIBILITY STUDY

BB&S Treated Lumber Site
Site # 1-52-123
Southampton, New York

Work Assignment No. D004445-16.1

Prepared for:

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau E
625 Broadway
Albany, New York 12233-7017

Prepared by:

AECOM Technical Services Northeast, Inc.
40 British American Blvd.
Latham, New York 12110

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1.0 INTRODUCTION

1.1 General

The New York State Department of Environmental Conservation (NYSDEC) issued a Work Assignment (No. D004445-16.1) to AECOM Technical Services, Inc. (AECOM; formerly Earth Tech Northeast, Inc.), under an existing State Superfund Standby Contract, primarily to perform a Remedial Design (RD) and to provide construction oversight of Remedial Action (RA) at the BB&S Treated Lumber Site (#1-52-123) (BB&S Site). The RD/RA is necessary to address soil and groundwater contamination stemming from historical lumber pressure treatment operations at the site. The BB&S Site is located in the Town of Southampton, New York (Figure 1).

In March 2007, AECOM issued a Pre-Design Investigation (PDI) Report for the BB&S Site which described investigation activities conducted to provide the data necessary to complete the RD. In November 2007, AECOM issued a Remedial Design Work Plan (RDWP) to describe work activities to be conducted to complete the RD. One of the RDWP work tasks (Task 2A) was Additional Pre-Design and Testing Activities, which included activities necessary to support final RD concepts.

The additional pre-design activities were completed between May 2008 and September 2008. The results of these activities were presented in the Supplemental Pre-Design Investigation Report (AECOM, July 2009).

1.2 Proposed Record of Decision Amendment

Based on data generated during the additional pre-design activities and testing, AECOM and NYSDEC staff concluded that an amended RA for the Site from that prescribed in the February 25, 2000 Record of Decision (ROD) was justified and appropriate. The remedy originally selected in the ROD included the installation of groundwater extraction wells on-site and on adjacent property in an effort to contain the plume of contaminated groundwater. A long-term groundwater monitoring program would also be instituted. Remediation of impacted on-site and off-site soil would require excavation and consolidation within the lumberyard for treatment using solidification/stabilization technology followed by on-site entombment. All excavated areas would be backfilled with clean soil.

Based on the additional data generated from the PDI studies and on other factors, amendments to the proposed remedy for the site include the following:

- For the groundwater remedy, eliminate the pump and treat component and instead develop a comprehensive monitoring program. In addition, public water will be made available to home and business owners situated immediately downgradient of the Site.

- For the soil remedy, due to the increased soil volume now requiring remediation, replace the on-site soil treatment remedy with an excavation and off-site disposal remedy.

AECOM and NYSDEC have conducted an evaluation of the proposed revised remedial alternatives and amended remedy for the site, relative to the February 2000 ROD, in accordance with the criteria required in the New York State Regulation for the Remediation of Inactive Hazardous Waste Sites (6 NYCRR Part 375). This evaluation was completed as a Supplemental Feasibility Study (FS). This report presents the results of this Supplemental FS. Upon issuance of this report, AECOM will prepare the final design specifications and contractor bid documents necessary for the NYSDEC to procure a contractor to complete the remedial construction.

2.0 SITE DESCRIPTION AND BACKGROUND

2.1 Site Description

The BB&S Inactive Hazardous Waste Disposal Site #1-52-123 is located in the Town of Southampton in eastern Suffolk County, Long Island (Figure 1). The five-acre site, currently in use as a lumberyard for wholesale and retail lumber distribution, is located on Speonk-Riverhead Road, approximately 1.5 miles north of the Hamlet of Speonk. The site is in a rural area considered part of the Central Pine Barrens Preserve. There are homes and businesses within a half-mile radius of the site, including south of the site in the general direction of groundwater flow. There are some homes and businesses in the downgradient area that still utilize private water supplies, obtained primarily from the Upper Glacial Aquifer, a highly transmissive sand and gravel aquifer. The Upper Glacial Aquifer is underlain by the Gardiners Clay unit to the south of the site at approximately 120-150 feet below ground surface (bgs).

2.2 Site History

From the early 1980s to 1996, the site operated as a lumber treatment and storage facility. Lumber was pressure treated using chromated copper arsenate (CCA). CCA is a 6 NYCRR Part 371 listed hazardous waste when spent or disposed of without treatment (code number F035). CCA was documented to be released to the environment through surface spills and sump leakage. A flame proofing solution containing zinc oxide was also used at the site for a time to treat wood.

Releases of CCA to groundwater are believed to have occurred through leakage from the collection sumps and through malfunction of an on-site water supply well valve. Spills originating from the concrete pad most likely account for soil contamination noted in the vicinity of the metal and frame buildings and for contamination found in the on-site drainage ditch. Higher concentrations of CCA derived contaminants found off-site on the west side of Speonk-Riverhead Road within the pine barrens, across from a site drainage culvert, indicate larger surface discharges or spills in the past. Drippings from stored and treated lumber most likely account for soil contamination east of the former treatment area within the on-site lumber yard.

BB&S conducted its own environmental study between 1985 and 1987 after the Suffolk County Department of Health Services (SCDHS) identified chromium contamination in an on-site water supply well. As a result, BB&S installed a network of on-site and off-site groundwater monitoring wells and three groundwater extraction wells. BB&S used the extraction wells to pump and treat groundwater at the site from 1987 to 1996. The groundwater treatment system frequently failed to meet surface water discharge requirements for chromium. Consequently, the NYSDEC placed the BB&S Site on the New York State Registry of Inactive Hazardous Waste Disposal Sites and negotiated with BB&S to have the company perform a Remedial Investigation/Feasibility Study (RI/FS). BB&S declined to perform additional investigations. Therefore, the NYSDEC performed the RI/FS using state superfund monies.

Subsequent to the RI/FS, Earth Tech Northeast, Inc. (Earth Tech, now AECOM) initiated the PDI in April 2001 through April 2003 that included shallow soil sampling and groundwater profiling of the chromium plume. In the summer of 2003, work was suspended while the NYSDEC negotiated with BB&S after the company expressed an interest in implementing a remedy at the site. The negotiations failed and, in February 2005, the NYSDEC resumed its plan to design and implement the remedy. The additional PDI field work was completed between September 2005 and February 2006. Results of those PDI activities completed between 2001 and 2006 were included in a PDI Report dated March 2007, prepared by Earth Tech.

Additional pre-design investigation activities were initiated by AECOM on behalf of the NYSDEC in December 2007 and included an assessment of the existing groundwater treatment system installed by BB&S in 1987, on-site and off-site soil sampling, installation and sampling of four sentinel multi-level groundwater monitoring wells, survey and sampling of existing private water supplies, a literature review to identify available technologies suitable for treating contaminated soil on-site, and bench scale testing of the contaminated soil to evaluate treatability. Additional private water supply well sampling and off-site sentinel well installation and sampling activities were initiated by the NYSDEC in April 2009 as part of long term efforts to monitor groundwater plume migration and potential impacts to potable water supplies. Results of the additional pre-design investigation activities completed in 2008 were presented in the Supplemental Pre-Design Investigation Report (AECOM, July 2009).

3.0 SUMMARY OF PRE-DESIGN INVESTIGATION SITE CHARACTERIZATION

As described in the original ROD and other documents, many soil and groundwater samples were collected at the site to characterize the nature and extent of contamination. The primary contaminants of concern include inorganics (metals), specifically chromium (in both the hexavalent and trivalent forms) and arsenic. A total of 174 soil borings were advanced from 2001 through 2008 as part of the PDI, and approximately 500 soil samples were submitted for laboratory analysis of arsenic and chromium in order to further delineate the nature and extent of contaminated soil associated with the BB&S Site.

Chromium and arsenic are present in soil and exceed their respective soil cleanup objectives (SCOs) identified in Part 375. Chromium and arsenic are found exceeding their SCO values in surface, shallow and deep soil on-site; and in surface and shallow soil off-site just outside the eastern perimeter of the site and in an area referred to as a "drainage swale" (a zone of surface runoff). The off-site drainage swale begins at Speonk-Riverhead Road, near the BB&S Site former treatment building and drip pad, and drains off-site in a southwestern direction. Analytical results identified elevated arsenic and chromium concentrations above SCO values that extend approximately 700 feet in the drainage swale west of the road. Copper was often found above its SCO value in soil where arsenic and chromium were also found. Zinc was also found in soil above its SCO value, but to a lesser extent throughout the site.

The site groundwater monitoring well network was expanded in May 2008 with the installation of 14 new groundwater monitoring wells. Specifically, the NYSDEC installed four off-site multi-level monitoring wells (MW-17 through MW-20) to further delineate the groundwater plume and assess downgradient groundwater quality. Also, two additional on-site shallow monitoring wells (MW-21 and MW-22) were installed in the former lumber treatment source areas to further characterize source area groundwater quality and to further delineate the vertical extent of soil contamination.

Groundwater in the Upper Glacial Aquifer flows south from the site toward the Atlantic Ocean. The BB&S groundwater plume extends at least 4,000 feet south of the site and the primary contaminant is hexavalent chromium. Arsenic and copper were also detected in groundwater both on-site and immediately downgradient of the site. Copper and zinc were infrequently noted in groundwater above their Standard, Criteria, and Guidance (SCG) values.

The following are the media which were investigated and a summary of the findings of the investigation.

3.1 Nature and Extent of Soil Contamination

3.1.1 On-Site Soil Conditions

Based on the RI and PDI data, an estimated 12,700 cubic yards (CY) of soil would require remediation to obtain compliance with Part 375 SCOs to protect the groundwater for arsenic (16 ppm) and hexavalent chromium (19 ppm). There is no Part 375 SCO for total chromium for protection of groundwater due to its low solubility.

Of 102 soil samples collected for hexavalent chromium analyses during the RI and PDI, many of which were of impacted soil with total chromium concentrations as high as 1,300 ppm on-site and 1,180 ppm off-site (refer to the RI, March 2007 PDI, and July 2009 Supplemental PDI), all but two results were non-detect or well below 19 ppm (one of the two samples was collected from beneath the former treatment building where the concrete cap would be maintained, and the second was from the off-site drainage swale and within the current proposed excavation limits).

Figure 2 depicts the lateral and vertical limits of the proposed on-site soil to be excavated and removed to obtain compliance with the SCO's for arsenic and chromium based on analytical results for all samples collected in the on-site area both during the PDI and previous investigations. Based upon evaluation of this figure, the volume of impacted soil in on-site areas requiring remediation is estimated at 12,700 CY. As further indicated on Figure 2, shallow soil arsenic and chromium contamination has been detected around the former treatment building and concrete drip pad building, and along the northern and eastern perimeter of the site. This delineation is consistent with that depicted in the RI and FS. The on-site area with the most widespread impacted soil appears to surround the former treatment building and concrete drip pad. Impacted soil was detected up to a depth of 5 feet below grade near most of the perimeter of these structures.

During the PDI, soil borings were drilled beneath the contaminant source area to depths ranging from 10 to 40 feet bgs. Specifically, borings were drilled through the concrete drip pad, inside the former CCA treatment building, and inside the vehicle maintenance shop (refer to Figure 2 for the concrete drip pad, former CCA treatment building, and vehicle maintenance shop locations). Based upon review of the analytical data generated, samples from two borings installed through the concrete drip pad exhibited the highest concentrations detected in site soil, with 1,410 ppm of arsenic and 1,300 ppm of total chromium at a depth of 4 feet bgs, and elevated concentrations of arsenic to a depth of 8 feet bgs. In addition, deeper soil samples collected beneath the former treatment building exhibited elevated concentrations of arsenic at 23 feet bgs (233 ppm) to 39 feet bgs (47.1 ppm).

In general, soil samples collected along the northern and eastern sides of the site exhibited impacted soil to a depth of 1 to 3 feet bgs. The concentrations of metals in samples from these locations ranged from non-detect to 231 ppm for arsenic and 1.5 to 320 ppm for total chromium.

3.1.2 Off-Site Soil Conditions

Based on the RI and PDI data, an estimated 5,700 CY of off-site soil would require remediation to obtain compliance with Part 375 unrestricted use SCOs for arsenic (13 ppm), trivalent chromium (30 ppm) and hexavalent chromium (1 ppm). Excavation to these SCOs would also be protective of the groundwater. The majority of off-site soil requiring remediation is located from the western property boundary across Speonk-Riverhead Road within the drainage swale (5,600 CY). Only approximately 100 CY of off-site soil located just outside of the eastern property boundary will require remediation.

Figure 3 depicts the lateral and vertical limits of off-site (drainage swale) soil proposed to be excavated and removed to obtain compliance with the SCO's for arsenic and chromium based on analytical results for all samples collected during the PDI and previous investigations. The map depicts the total volume of soil to be removed from the drainage swale and is approximately 5,600 CY. Analytical results identified concentrations of arsenic up to 672 ppm and chromium up to 1,180 ppm in surface soil.

Figure 3 also shows that soil with arsenic and/or chromium exceeding their SCOs are essentially confined laterally near the longitudinal axis of the base of the swale (i.e., did not extend laterally out of the swale) extending approximately 700 feet west from the culvert discharge point where discharge of CCA waste from the site to the drainage swale originated. The most elevated detections of arsenic and/or chromium were found at depths of 1 to 4 feet bgs. There were 15 samples collected from the drainage swale and analyzed for hexavalent chromium. The samples were collected from the surface down to a depth of 2 feet bgs. Thirteen samples were found to be non-detect and only two samples had detections of 2 ppm and 3 ppm. The PDI sampling rationale was based on the RI surface and subsurface hexavalent chromium results being non-detect or very low even in areas of high total chromium, suggesting the hexavalent chromium overall chemically reduced to the trivalent state.

3.2 Nature and Extent of Groundwater Contamination

The PDI groundwater analytical results generated from sampling between 2005 and 2008 indicate that the chromium concentrations along the axis of the contaminant plume have decreased since completion of the RI in 1998. Chromium concentrations in on-site monitoring wells detected during the RI were reported as high as 10 ppm, whereas during the PDI the maximum concentrations decreased to below 1 ppm. The groundwater sample results from monitoring conducted in 2008 revealed total chromium and/or hexavalent chromium concentrations in either or both the total matrix or filtered samples from 17 of the monitoring well samples exceeded applicable New York State Ambient Water Quality Standards for Groundwater (NYSGWS) of 50 parts per billion (ppb). Arsenic was detected above the NYSGWS of 25 ppb without an accompanying chromium exceedance in one well (MW-4).

The highest total or hexavalent chromium concentration (677 ppb in June 2008 and 700 ppb in September 2008) was reported in the recently installed downgradient intermediate depth (90 feet bgs) well MW-17I located approximately one-third of a mile south of the site at 1480 Speonk-Riverhead Road (see Figure 4 for June 2008 groundwater sampling results). The highest hexavalent chromium reported in an on-site well was 370 ppb detected in well MW-5 (70 feet bgs). Contaminant concentrations during the June, July and September 2008 sampling round were noticeably lower than during the previous groundwater sampling round (October 2005), and indicate a continued significant decrease since completion of the RI. The decreasing contaminant trends at the site reflect an attenuating plume in the former source area and likely indicate decreasing contaminant loading rates from the former source area soil to groundwater. The elevated chromium concentrations in samples from downgradient wells MW-17I and MW-19D (130 feet bgs) indicate the contaminant plume has expanded deeper into the aquifer downgradient of the Site, to depths of 130 feet or more below grade.

The volatile organic compound (VOC) results for all groundwater samples collected during the most recent 2008 sampling event were non-detect.

Private water supply wells within the range of 0.25 - 1.0 miles south of the site are in the potential path of the plume. As described previously, in all samples analyzed during the PDI, site related contaminants of concern (i.e., arsenic, chromium and copper) were either non-detect or detected at concentrations less than MCLs. Although the most recent residential well sampling and analysis in the area did not find any private water supply wells contaminated above MCLs, monitoring of plume migration indicates a possible future impact to private water supplies.

4.0 EVALUATION OF AMENDED REMEDY

4.1 Description of Proposed Changes

4.1.1 New Information

PDI groundwater data collected in the summer of 2008 has shown that the contaminant plume has attenuated since issuance of the ROD. The highest contaminant concentrations (hexavalent chromium at 660 ppb) are now found in downgradient groundwater monitoring wells and also appear to have migrated vertically to depths of at least 130 feet or more bgs. Remaining private water supply wells nearest the site and within the plume were most recently sampled by the Department in June 2008, March 2009 and June 2009. Hexavalent chromium was detected in two of the wells sampled in June 2008, but at levels below the water quality standard of 50 ppb that are known to cause adverse health effects. Furthermore, since issuance of the ROD, a public water line has been installed by the Suffolk County Water Authority (SCWA) along Old Country Road and Speonk-Riverhead Road, making public water available to residents and businesses located immediately downgradient of the site to the south.

Based upon subsequent soil data gathered and evaluated during the PDI, the planned on-site and off-site excavation limits have been redefined and expanded from those identified in the ROD. Specifically, the total approximate volume of on-site and off-site soil determined to require remediation has been increased from 5,300 CY to 18,400 CY, a 247% increase in volume of 13,100 CY.

4.1.2 Proposed Changes

Based on a number of factors, it is recommended that the groundwater extraction and treatment remedial alternative selected for the site in the ROD be eliminated and replaced with a comprehensive groundwater monitoring program, including taking necessary actions to fund and provide an alternate water source (AWS) in accordance with Department program policy DER-24 (Assistance for Contaminated Water Supplies, dated July 2008) to authorized homes and businesses as determined by the Department and the NYSDOH. The major factors considered in making this recommendation are as follows:

While the contaminant plume has migrated downgradient of the site and vertically to depths of 130 feet or more bgs, the PDI groundwater sample data shows that contaminant levels have decreased significantly at the BB&S Site since issuance of the ROD, indicating reduced contaminant loading to groundwater in the former lumber treatment source area and residual impacted soil at the site.

Implementation of soil remedial actions planned for the BB&S Site can be expected to further reduce or eliminate future contaminant loading to groundwater, which would promote increased attenuation rates of the groundwater plume.

The ROD groundwater remedial scenario would not remove contaminants that are now migrating further downgradient of the site. Based on the lateral and vertical expanse of the plume downgradient of the site, the cost to implement a combined on-site and off-site groundwater remedial scenario is currently estimated to be in the range of $8 to $10 million.

A public water supply is now available to potentially impacted properties located downgradient of the BB&S Site. The NYSDEC will offer to fund and provide the AWS to authorized homes and businesses as determined by the Department and the NYSDOH. The offer would include a connection to the existing public water supply, which would provide protection to public health from potential exposure to contaminated groundwater. The estimated cost to fund and provide an AWS to authorized homes and businesses is approximately $160,000.

It is also proposed that the on-site soil treatment remedy identified within the ROD be replaced with an excavation and off-site disposal remedy. The major factors considered in making this recommendation are as follows:

- The PDI redefined the extent of contaminated soil requiring remediation. As a result, the planned excavation limits have since been expanded from those originally identified in the ROD to include additional impacted soil located both on-site and off-site. Based on results from the PDI the volume of soil proposed for remediation is being increased by 13,100 CY from the ROD. Under this proposal an estimated 12,700 CY of on-site contaminated soil would be excavated and disposed of off-site. In addition, an estimated 5,700 CY of off-site contaminated soil, located primarily within the drainage swale, would also be excavated and disposed of off-site. An estimate of soil excavation volumes is provided in Table 1.

The updated estimated present worth cost to complete the soil remedy as prescribed in the ROD taking into account the revised excavation limits (18,400 CY) is $11.7 million (Table 2). The estimated present worth cost for the proposed amended remedy for the off-site disposal of 18,400 CY of soil is $7.6 million (Table 3).

4.2 Evaluation of Proposed Changes

4.2.1 Remedial Goals

Goals for the cleanup of the site were established in the original ROD. The goals selected for this site are to:

- Eliminate, to the extent practicable, ingestion of groundwater affected by the site that does not attain NYSDOH Part 5 Drinking Water Standards.
- Eliminate, to the extent practicable, exposures to workers from shallow contaminated soil on-site.
- Eliminate, to the extent practicable, exposures to the public from shallow contaminated soil on-site and off-site.
- Eliminate, to the extent practicable, the exposure of wildlife to shallow contaminated soil on-site and off-site.

4.2.2 Evaluation Criteria

The criteria used to compare the remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste sites in New York State (Part 375). For each criterion, a brief description is provided. A detailed discussion of the evaluation criteria and comparative analysis is contained in the original Feasibility Study.

The first two evaluation criteria are called threshold criteria and must be satisfied in order for an alternative to be considered for selection.

1. **Protection of Human Health and the Environment.** This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

   For groundwater, both the proposed remedy and the ROD remedy would result in an untreated portion of the plume being left to migrate. Under both scenarios, protection of public health would be achieved through monitoring well and private water supply monitoring and the offer to fund and provide an AWS to authorized homes and businesses as determined by the Department and the NYSDOH. The proposed remedy would be protective of the environment in that the groundwater has recently been determined to be attenuating. In addition, there are no surface water bodies, fish, wildlife, or vegetation in danger of being affected by the groundwater.

   With regard to the proposed soil remedy, excavation and off-site disposal would be protective of human health and the environment since contaminated soil would be removed from the site and off-site from the drainage swale and the eastern side of property boundary. The solidification/stabilization and on-site placement of contaminated surface and shallow soil required in the current ROD remedy would have been protective of human health and the environment by covering the contamination with a protective cover. However, the on-site treatment and placement remedy would have left the treated, contaminated media in place. The proposed off-site disposal remedy would be more protective of the environment than the ROD on-site treatment remedy because less residual contamination would remain that could potentially provide an ongoing source of contamination to the groundwater. The excavation depths from both alternatives would be sufficient in protecting human health and ecological receptors because potential surface soil exposures would be eliminated. The engineering and institutional controls proposed would reduce the potential for contact with remaining subsurface contaminated soil below the former treatment area.

2. **Compliance with New York State Standards, Criteria, and Guidance (SCGs).** Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

   The relevant soil cleanup objectives at the BB&S site are in compliance with Part 375 SubPart 6 Remedial Program SCOs. On-site soil compliance with groundwater protection SCOs for arsenic (16 ppm) and hexavalent chromium (19 ppm) would be achieved. There is no Part 375 SCO for total chromium for protection of groundwater due to its low solubility. For off-site soil compliance with unrestricted use SCOs for arsenic (13 ppm), trivalent chromium (30 ppm), and hexavalent chromium (1 ppm) would be achieved.

   Groundwater, drinking water and surface water SCGs identified for the BB&S site are based on NYSGWS and Part 5 of New York State Sanitary Code. For groundwater, the SCG for total chromium is 50 ppb and arsenic is 25 ppb. Once the source is removed, the groundwater standards would be met over time.

   The proposed remedy would not be effective for remediation of contaminated groundwater, as groundwater treatment is not part of the proposal. However, given the recent reductions in groundwater contaminant concentrations the proposed remedy would monitor the remedial goals by evaluating the changes over an extended period of time to verify that selected downgradient locations are experiencing a decrease in contaminated groundwater concentrations. The ROD remedy would be expected to achieve the remedial action objectives for a significant portion of the contaminated groundwater. However, any contamination remaining adjacent to and below the former CCA treatment area and the former drip pad area (refer to Figure 2) has a potential to

leach from site soil and provide a potential ongoing source of groundwater contamination. The amount of on-site soil contamination to remain in this area has been estimated at 14,000 CY. Additionally, it is assumed that groundwater contamination located downgradient of the site would not meet SCGs as they would not be captured for remediation but would continue to decrease in concentration.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. **Short-term Effectiveness.** The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

   With regard to the proposed and ROD soil remedies, both remedies would have short-term impacts. The impacts associated with remedial construction would be more significant with the on-site treatment and placement alternative, which would require more handling of the contaminated media. In addition, the on-site treatment and placement alternative would have left the contaminated media in place and would have posed various degrees of short-term impacts to BB&S workers, visitors, the public, and the environment from disturbance and/or transport. The proposed remedy eliminates this impact.

   For groundwater, the proposed remedy would not be expected to generate contaminant releases. However, the ROD remedy involves intrusive construction work which could cause releases of contamination during excavation activities. The proposed groundwater remedy would be expected to potentially pose minor disruptions to off-site areas (installation of outpost and monitoring wells). The ROD remedy would be expected to pose significant disruptions to current site activities and operations during construction of the treatment building.

4. **Long-term Effectiveness and Permanence.** This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks; 2) the adequacy of the engineering and/or institutional controls intended to limit the risk; and 3) the reliability of these controls.

   The ROD remedy would be considered a reliable and permanent remedy for site-contaminated groundwater and an adequate and reliable remedy for protecting human health and the environment (in terms of affecting habitat or vegetation) due to groundwater. The ROD remedy would establish long-term effectiveness for the shallow and intermediate portion of the aquifer related to metals because those areas of the plume would be captured and treated. Portions of the downgradient contaminant plume that would not be captured for treatment would continue to attenuate. For both alternatives, institutional controls would be imposed upon groundwater use at the site which would comply with NYSDOH and SCDHS use and development restrictions.

   For remediation of impacted soil, the proposed soil remedy is considered to be a reliable remedy for site contaminated soil as a significant portion of the metals contaminated soil would be removed. On-site contaminated soil located in inaccessible areas would remain on-site indefinitely and potentially impact the groundwater. Therefore, both the proposed remedy and the ROD remedy are reliable remedies for mitigating environmental impacts associated with on-site subsurface soil contamination. An institutional control with an environmental easement on the site would be implemented for the proposed remedy to limit the risks associated with the

contaminated soil left on-site adjacent to and below the former CCA treatment area and the former drip pad area located along the western perimeter of the site. The amount of on-site soil contamination to remain in this area has been estimated at 14,000 CY. Also with respect to the proposed remedy, to address future construction or excavation, a soil management plan would be developed.

For groundwater, the proposed remedy would not be considered a permanent long-term site remedy for contaminated groundwater because the groundwater would not be actively remediated. Despite this, the proposed remedy would provide controls that would monitor the presence of metals in the groundwater in the vicinity of the site. In addition, the proposed remedy would include monitoring the progress (effectiveness over time) of natural attenuation including the contamination levels, the extent of contamination and the natural processes.

5. **Reduction of Toxicity, Mobility or Volume.** Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

   The proposed soil remedy would provide for the greatest reduction of toxicity, mobility and volume of contaminants in soil, as a significant portion of the contamination would be removed from the site. The solidification/stabilization and on-site placement of contaminated surface and shallow soil ROD remedy would have also reduced the toxicity and mobility, but not the volume of contaminated soil by leaving the treated media in place on-site.

   For groundwater, the proposed remedy would not reduce the toxicity, mobility and volume of groundwater contaminants, as treatment of the contaminants is not part of this proposal. The ROD remedy provides for the greatest reduction of toxicity, mobility and volume of contaminants in groundwater, as a significant portion of the contamination would be captured and treated. Additionally, any residual waste generated on-site as part of the groundwater treatment process would be disposed of off-site. On the other hand, recent sampling of the groundwater indicates that the contaminant plume is attenuating since completion of the ROD.

6. **Implementability.** The technical feasibility and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

   Both the proposed and ROD soil remedies could be implemented on a technical basis, although they are complicated by the active on-site lumber business operations. Both remedies would remediate surface and subsurface soil by excavation of contaminated soil using conventional excavation equipment and standard construction methods. In order to complete the ROD remedy component for soil, ex-situ solidification/stabilization, it would be necessary to designate a portion of the BB&S property as a CAMU, and thus be subject to long term site management and potential long term impacts to on-site business operations. Although the planned excavation limits have been expanded the proposed soil remedy would result in a short term impact to the on-site lumber business during remedial construction. Long term impacts of the proposed remedy primarily involving the monitoring of groundwater contaminant levels and annual certification that institutional and engineering controls are in place would be minimal.

   In terms of administrative concerns, these alternatives could be implemented and would require coordination and approval by Town of Southampton, Suffolk County agencies and utility

companies as well as site occupants. An institutional control in the form of an environmental easement on the site would be imposed to preclude contact with remaining contaminated media on-site under both remedies. There are no anticipated, specific problems associated with obtaining permits or approvals from the various agencies and other concerns.

For groundwater, both the proposed remedy and ROD remedy could be implemented on a technical basis. Implementation of the ROD remedy would be more complicated than the proposed remedy due to on-site lumber business operations. The materials and services necessary for these remedial alternatives are readily available. In terms of administrative concerns, these alternatives could be implemented through the required coordination and approval by numerous Town of Southampton, Suffolk County agencies and utility companies. For both remedies there are no anticipated problems from the various agencies associated with obtaining permits or approvals and imposing institutional controls upon groundwater use at the site to comply with SCDHS use and development restrictions.

7. **Cost-Effectiveness.** Capital costs and annual operation, maintenance and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision.

    - The ROD provided an estimated Present Worth Cost to construct and operate the On-Site Groundwater Remedial Scenario at approximately $3.7 million. Adjusting that cost for an estimated 4% per year inflation increase, the current present worth cost for the On-Site Remedial Scenario for groundwater is estimated to be at least $5.7 million. The On-Site Remedial Scenario also would not remove contaminants that are migrating downgradient of the Site. Based on the lateral and vertical expanse of the plume downgradient of the Site, the cost to implement a combined On-Site and Off-Site Groundwater Remedial Scenario is estimated to be in the range of $8 to $10 million.

    - The cost estimate for the proposed groundwater remedy associated with long term on and off-site monitoring of the attenuation of the contaminant plume is $1.4 million. The public water line recently installed by the SCWA provides additional benefits and remedial options at no additional cost to the Department.

    - The cost estimate for the proposed soil remedy associated with off-site disposal of hazardous soil to a Subtitle C facility and non-hazardous soil to a Part 360 landfill is $7.6 million. On the other hand, the cost for construction and long-term on-site management for 30 years in a CAMU cell in accordance with the ROD is estimated at $11.7 million.

This final criterion is considered a modifying criterion and is considered after evaluating those above. It is focused upon after public comments on the proposed ROD amendment have been received.

8. **Community Acceptance.** Concerns of the community regarding the proposed changes are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the final remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

4.3 Recommended ROD Changes

Based on the analyses presented above, AECOM recommends the Department consider amending the ROD for the BB&S Site. Recommended changes to the ROD include:

- Eliminating the groundwater extraction and treatment component. An existing public water supply could be offered to authorized homes and businesses as determined by the Department and the NYSDOH. The cost estimate for the proposed groundwater remedy associated with long term on-site and off-site monitoring of the attenuation of the contaminant plume is $1.4 million, an estimated savings of approximately $4.3 million over a 30 year period from the ROD remedy.

- Based upon the elimination of the groundwater extraction and treatment component, a revision of soil SCOs for the protection of groundwater in accordance with Part 375. Implementation of this revision would result in a volume increase of on-site soil requiring remediation from 4,000 CY to 12,700 CY. In addition, the revision would result in a volume increase of off-site soil requiring remediation from 1,300 CY to an estimated 5,700 CY.

- The revision of the remedial technology for impacted soil is based upon PDI data, revised soil SCOs, and cost savings. The proposed remedy includes the off-site transportation, pre-treatment (as necessary) and disposal of hazardous and non-hazardous soil exceeding SCOs at an estimated cost of $7.6 million, an estimated savings of at least $3 million from the ROD remedy.

- Development of a site management plan.

- The imposition of an institutional control at the on-site area of the site in the form of an environmental easement to limit the risks associated with the contaminated soil left on-site adjacent to and below the former CCA treatment area and the former drip pad area located along the western perimeter of the site. The amount of on-site soil contamination to remain in this area has been estimated at 14,000 CY.

The estimated present worth cost to carry out the amended remedy for the revised soil and groundwater components is $9,000,000. The cost to construct the recommended amended remedy is estimated to be $6,700,000 and the estimated average annual cost for 30 years is $70,000.

5.0 RECOMMENDATIONS FOR POST-REMEDIATION SITE MANAGEMENT

Recommendations for the management of the site following remedial action (i.e., excavation of on-site and off-site soil) are as follows:

1. Installation of additional off-site groundwater wells to monitor plume attenuation. The new off-site wells would include sentinel groundwater monitoring wells between the contaminant plume and downgradient water supply wells. Locations proposed for four additional downgradient multi-level monitoring wells (MW-23, MW-24, MW-25 and MW-26) are shown on Figure 5.

2. Sampling of a select number of groundwater wells and downgradient private water supply wells to monitor plume migration over the 30-year monitoring period.

3. Development of a site management plan (SMP), since the proposed remedy results in contamination above unrestricted levels remaining on-site. The SMP would include the following controls: (a) address residual contaminated soil adjacent to and below the former CCA treatment area and the former drip pad area located along the western perimeter of the site that may be excavated during future redevelopment. The plan would require soil characterization and, where applicable, disposal/reuse in accordance with Department regulations; (b) identify any use restrictions; (c) provide for the operation and maintenance of the components of the remedy; and (d) long-term monitoring of groundwater.

4. The imposition of an institutional control on-site in the form of an environmental easement that would (a) require compliance with the approved site management plan; (b) limit the use and development of the property to commercial or industrial; (c) restrict the use of groundwater as a source of potable water, without necessary water quality treatment as determined by the NYSDOH and/or the SCDHS; and (d) require the site property owner to complete and submit to the Department a periodic certification. The property owner would provide a periodic certification, prepared and submitted by a professional engineer or such other expert acceptable to the Department, until the Department notifies the property owner in writing that this certification is no longer needed. This submittal would contain certification that the institutional controls and engineering controls, are still in place, allow the Department access to the site, and that nothing has occurred that would impair the ability of the control to protect public health or the environment, or constitute a violation or failure to comply with the site management plan.

5. Site engineering control measures (i.e., fencing) would be repaired and maintained to restrict access and protect remedial components.

TABLES

Table 1
BB&S TREATED LUMBER
EXCAVATION VOLUME ESTIMATE
April 27, 2009

Waste Type	Site Location	Excavation Area I.D.	Exc. Area (Ft^2)	Exc. Depth (Ft.)	Soil Volume (Yd^3)	Add 15% Contingency	Est. Weight (Ton)
F-035 Listed Hazardous Waste Soil Quantity	Treatment Building/Drip Pad Area	1A	723	1	26.8	30.8	46.2
		1B	1,008	1	37.3	42.9	64.4
		1C	4,153	1	153.8	176.9	265.3
		2A	593	2	43.9	50.5	75.8
		2B	5,752	2	426.1	490.0	735.0
		2C	2,667	2	197.6	227.2	340.8
		3A	2,699	3	299.9	344.9	517.3
		3B	3,010	3	334.4	384.6	576.9
		3C	3,793	3	421.4	484.7	727.0
		4A	5,623	4	833.0	958.0	1,437.0
				Subtotal	**2,774.3**	**3,190.4**	**4,785.7**
	Drainage Swale Area	1A	25,701	1	951.9	1,094.7	1,642.0
		2A	1,646	2	121.9	140.2	210.3
		3A	8,899	3	988.8	1,137.1	1,705.6
		4A	1,360	4	201.5	231.7	347.6
		4B	1,574	4	233.2	268.2	402.2
		4C	1,016	4	150.5	173.1	259.6
		5A	971	5	179.8	206.8	310.2
		5B	2,373	5	439.4	505.4	758.0
		5C	2,784	5	515.6	592.9	889.3
		7A	4,279	7	1,109.4	1,275.8	1,913.7
				Subtotal	**4,892.0**	**5,625.8**	**8,438.6**
			Total Hazardous Soil Quantity		**7,666.3**	**8,816.2**	**13,224.3**
Non-RCRA Hazardous Waste Soil Quantity	Lumberyard Storage Areas	1/2A	128,714	0.5	2,383.6	2,741.1	4,111.7
		1/2B	1,810	0.5	33.5	38.5	57.8
		1/2C	736	0.5	13.6	15.7	23.5
		1D	31,360	1	1,161.5	1,335.7	2,003.6
		1E	49,362	1	1,828.2	2,102.5	3,153.7
		1F	19,026	1	704.7	810.4	1,215.6
		2D	1,228	2	91.0	104.6	156.9
		2E	1,617	2	119.8	137.7	206.6
		3D	3,623	3	402.6	462.9	694.4
		3E	2,000	3	222.2	255.6	383.3
		3F	1,664	3	184.9	212.6	318.9
		4B	6,222	4	921.8	1,060.0	1,590.1
		4C	2,084	4	308.7	355.1	532.6
			Total Non-Hazardous Soil Quantity		**8,376.0**	**9,632.4**	**14,448.7**
				Total Soil Quantity	**16,042.3**	**18,448.6**	**27,673.0**
				Total On-Site Soil Quantity	**11,150.3**	**12,822.9**	**19,234.3**
				Total Off-Site Soil Quantity	**4,892.0**	**5,625.8**	**8,438.6**

All areas computed in Autocad

Table 2
Soil Remediation Cost Estimate
On-Site Treatment and Burial - Listed Hazardous Waste

BB&S Treated Lumber Site - Speonk, NY
NYSDEC Site No. 1-52-123

Description: Excavate estimated 8,800 cubic yards Listed (F035) soils and dispose onsite in permitted CAMU cell. Assume 100% of excavated soil will require solidification/stablilization (S/S) prior to placement in cell to comply with Land Disposal Restrictions. Backfill excavations w/ clean fill and restore. Includes 30 year O&M for CAMU cell and 30 year Certification for Site Managment Plan (SMP).

Item	Unit	Unit Cost	Quantity	Total
Remediation Contractor Site Work:				
Mobilization/demobiliation	LS	$ 50,000	1	$ 50,000
Secure fence, post signs, survey	LS	$ 60,000	1	$ 60,000
Clearing & grubbing	AC	$ 1,500	2	$ 3,000
Excavating, stockpiling[1]	CY	$ 30	8,800	$ 264,000
Backfill/regrade off-site area	CY	$ 15	5,600	$ 84,000
Backfill/regrade on-site areas	CY	$ 15	3,200	$ 48,000
Seed Drainage Swale	SF	$ 3	51,000	$ 153,000
Asphalt apron around bldg[2]	SF	$ 2.00	10,000	$ 20,000
Soil Treatment (ex-situ S/S)				
Treatability study[3]	LS	$ 30,000	1	$ 30,000
Treatment reagent[4]	TON	$ 600	396	$ 237,600
S/S (100% excavated soil + reagent)	TON	$ 12	13,596	$ 163,152
Compliance sampling[5]	EA	$ 190	15	$ 2,773
Place treated soil in CAMU cell	CY	$ 15	11,330	$ 169,950
On-Site CAMU Cell:				
CAMU cell excavation[6]	CY	$ 20	11,330	$ 226,600
CAMU cell construction and liner system[7]	LS	$ 300,000	1	$ 300,000
CAMU cell QA/QC	LS	$ 100,000	1	$ 100,000
CAMU cell fencing and signage	LF	$ 35	600	$ 21,000
CAMU cell O&M	YR	$ 100,000	30	$ 3,000,000
CAMU cell closure[8]	LS	$ 150,000	1	$ 150,000
SMP Certification	YR	$ 15,000	30	$ 450,000
			Subtotal Capital Cost:	$ 5,533,075
			15% Engineering and Legal:	$ 829,961
			30% Contingency:	$ 1,659,923
			Total Capital Cost (Present Value Cost):	$ 8,022,959
			Cost per cubic yard of impacted soil	$ 912

NOTES:

1 Includes post excavation analysis at 1 sample per 100 square feet. Soil volume includes additional approx. 15% contingency.
2 Assumes that half of area is 4" thick asphalt (where traffic is minimal) and half is 8" thick where vehicle traffic may be present.
3 Includes analytical/physical testing; initial characterization; reagent formulation; final testing.
4 Based on treating 100% of excavated soil @ 1.5 ton/yard, at 3% reagent rate.
5 One sample per 1,000 tons of S/S treated soil, analyzed for TCLP Metals with 48-hr TAT.
6 Excavation volume includes 25% vol. increase of excavated soil + reagent.
7 Assume 25K ft^2 x 12 ft deep cell, double composite liner, 2' clay layer, sand layer, leachate collection system.
8 Includes geosynthetic cover, soil cover, drainage fabric, topsoil and hydroseed.

Table 2
Soil Remediation Cost Estimate
On-Site Treatment and Burial - Non-Hazardous Waste

BB&S Treated Lumber Site - Speonk, NY
NYSDEC Site No. 1-52-123

Description: Excavate estimated 9,600 cubic yards non-hazardous soils and dispose onsite in permitted CAMU cell. Assume 100% of excavated soil will require solidification/stablilization (S/S) prior to placement in cell. Backfill excavations w/ clean fill and restore. Includes add-on 30 year O&M for CAMU cell and 30 year Certification for Site Managment Plan (SMP) beyond that included under Item A estimates.

Item	Unit	Unit Cost	Quantity	Total
Remediation Contractor Site Work:				
Mobilization/demobiliation (see Item A)	LS	$ 50,000	0	$ -
Secure fence, post signs, survey (see Item A)	LS	$ 60,000	0	$ -
Clearing & grubbing	AC	$ 1,500	1	$ 1,500
Excavating, stockpiling[1]	CY	$ 30	9,600	$ 288,000
Backfill/regrade off-site area (NA)	CY	$ 15	0	$ -
Backfill/regrade on-site areas	CY	$ 15	9,600	$ 144,000
Seed Drainage Swale (NA)	SF	$ 3	0	$ -
Asphalt apron around bldg (NA)	SF	$ 2.00	0	$ -
Soil Treatment (ex-situ S/S)				
Treatability study[2] (see Item A)	LS	$ 30,000	0	$ -
Treatment reagent[3]	TON	$ 600	432	$ 259,200
S/S (100% of excavated soil+reagent)	TON	$ 12	14,832	$ 177,984
Compliance sampling[4]	EA	$ 190	15	$ 2,926
Place treated soil in CAMU cell	CY	$ 15	12,360	$ 185,400
On-Site CAMU Cell:				
CAMU cell excavation[5] (Beyond Item A)	CY	$ 20	12,360	$ 247,200
CAMU cell construction and liner system[6] (Beyond Item A)	LS	$ 260,000	1	$ 260,000
CAMU cell QA/QC (Beyond Item A)	LS	$ 85,000	1	$ 85,000
CAMU cell fencing and signage (Beyond Item A)	LF	$ 35	525	$ 18,375
CAMU Cell O&M (Beyond Item A)	YR	$ 25,000	30	$ 750,000
CAMU cell closure[7] (Beyond Item A)	LS	$ 130,000	1	$ 130,000
SMP Certification (see Item A)	YR	$ -	30	$ -
			Subtotal Capital Cost:	$ 2,549,585
			15% Engineering and Legal:	$ 382,438
			30% Contingency:	$ 764,876
			Total Capital Cost (Present Value Cost):	$ 3,696,898
			Cost per cubic yard of impacted soil	$ 385

NOTES:

1 Includes post excavation analysis at 1 sample per 100 square feet. Soil volume includes additional approx. 15% contingency.
2 Includes analytical/physical testing; initial characterization; reagent formulation; final testing.
3 Based on treating 100% of excavated soil @ 1.5 ton/yard, at 3% reagent rate.
4 One sample per 1,000 tons of S/S treated soil, analyzed for TCLP Metals with 48-hr TAT.
5 Excavation volume includes 25% vol. increase of excavated soil + reagent.
6 Assume 25K ft2 x 12 ft deep cell, double composite liner, 2' clay layer, sand layer, leachate collection system.
7 Includes geosynthetic cover, soil cover, drainage fabric, topsoil and hydroseed.

Table 3
Soil Remediation Cost Estimate
Off-Site Disposal of Listed Hazardous Waste

BB&S Treated Lumber Site - Speonk, NY
NYSDEC Site No. 1-52-123

Description: Excavate estimated 8,800 cubic yards Listed (F035) soils and ship to Subtitle C landfill for disposal. Assume 20% of excavated soil will require pretreatment by disposal facilty to comply with Land Disposal Restrictions. Backfill excavations w/ clean fill and restore. Includes 30 year Certification for Site Management Plan (SMP).

Item	Unit	Unit Cost	Quantity	Total
Remediation Contractor Site Work:				
Mobilization/demobiliation	LS	$ 50,000	1	$ 50,000
Secure fence, post signs, survey	LS	$ 40,000	1	$ 40,000
Clearing & grubbing	AC	$ 1,500	2	$ 3,000
Excavating, stockpiling[1]	CY	$ 30	8,800	$ 264,000
Compliance sampling[2]	EA	$ 190	9	$ 1,672
Backfill/regrade off-site area	CY	$ 15	5,600	$ 84,000
Backfill/regrade on-site areas	CY	$ 15	3,200	$ 48,000
Seed Drainage Swale	SF	$ 3	51,000	$ 153,000
Asphalt apron around bldg[3]	SF	$ 2.00	10,000	$ 20,000
LT&D F035 Listed Waste				
Load Soil	CY	$ 12	8,800	$ 105,600
Transport to Belleville, Mi.[4]	TON	$ 142	13,200	$ 1,874,400
Waste Disposal (w/pretreatment)[4]	TON	105.00	2,640	$ 277,200
Waste Disposal (no treatment)[4]	TON	78.00	10,560	$ 823,680
SMP Certification	YR	$ 25,000	30	$ 750,000
			Subtotal Capital Cost:	$ 4,494,552
			15% Engineering and Legal:	$ 674,183
			20% Contingency:	$ 898,910
			Total Capital Cost (Present Value Cost):	$ 6,067,645
			Total Cost to Construct:	$ 5,055,145
			Cost per cubic yard of impacted soil	$ 690

NOTES:

1 Includes post excavation analysis at 1 sample per 100 square feet. Soil volume includes additional approx. 15% contingency.
2 One sample per 1,000 yards excavated soil analyzed for TCLP Metals with 48-hr TAT.
3 Assumes that half of area is 4" thick asphalt (where traffic is minimal) and half is 8" thick where vehicle traffic may be present.
4 Includes 5% Contractor markup.

Table 3
Soil Remediation Cost Estimate
Off-Site Disposal of Non-Hazardous Waste

BB&S Treated Lumber Site - Speonk, NY
NYSDEC Site No. 1-52-123

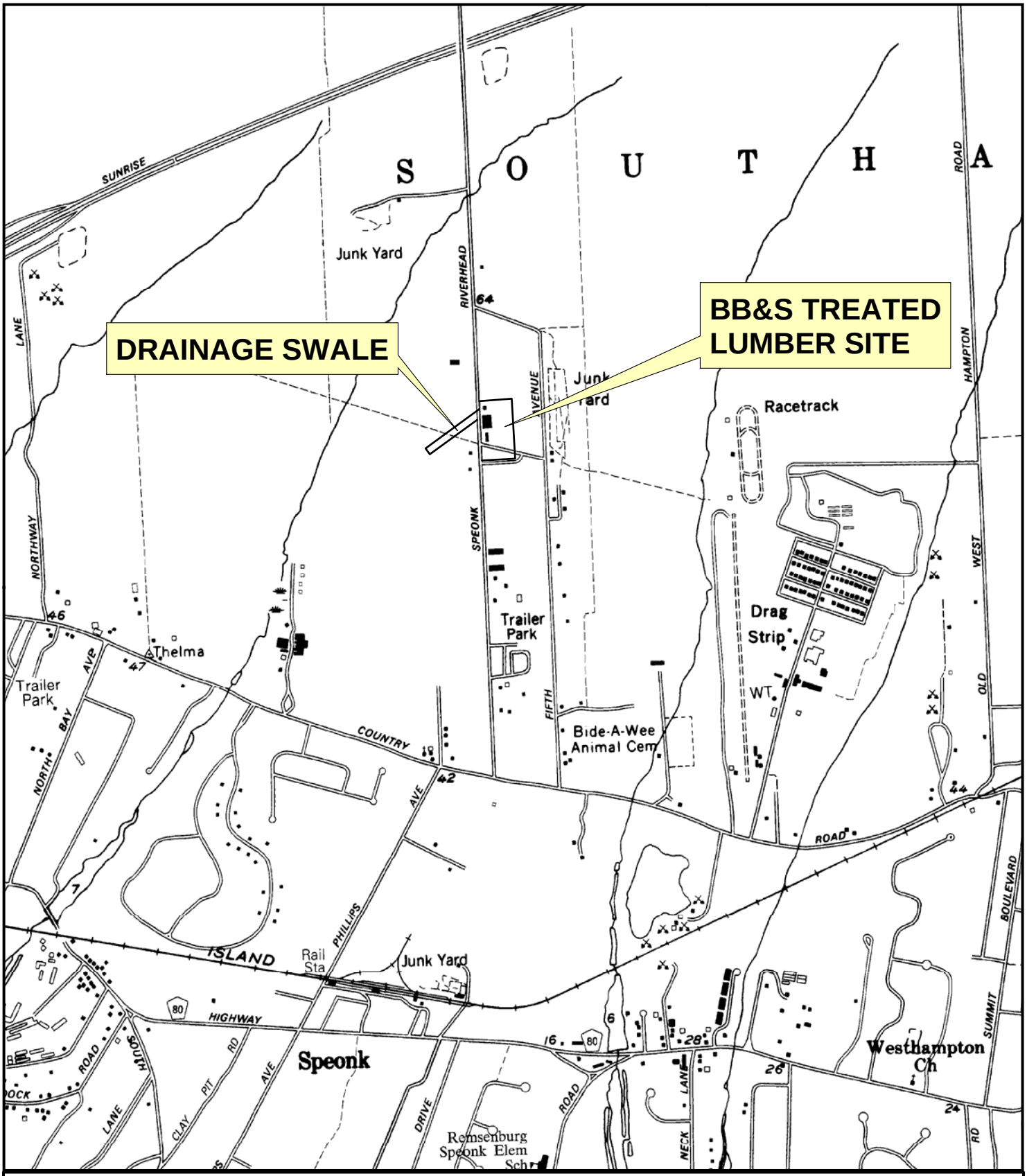
Description: Excavate estimated 9,600 cubic yards non-hazardous soils to clean up to Part 375 Unrestricted Use SCOs of 13 ppm Arsenic and 30 ppm Chromium. Ship to Part 360 landfill for disposal. Backfill excavations w/ clean fill and restore.

Item	Unit	Unit Cost	Quantity	Total
Remediation Contractor Site Work:				
Mobilization/demobiliation (see Item A)	LS	$ 50,000	0	$ -
Secure fence, post signs, survey (see Item A)	LS	$ 40,000	0	$ -
Clearing & grubbing	AC	$ 1,500	0	$ -
Excavating, stockpiling[1]	CY	$ 30	9,600	$ 288,000
Backfill/regrade off-site area (NA)	CY	$ 15	0	$ -
Backfill/regrade on-site areas	CY	$ 15	9,600	$ 144,000
Seed Drainage Swale (NA)	SF	$ 3	0	$ -
Asphalt apron around bldg (NA)	SF	$ 2.00	0	$ -
LT&D Non-Haz Waste				
Compliance sampling[2]	EA	$ 190	10	$ 1,824
Load Soil	CY	$ 12	9,600	$ 115,200
Transport to Brookhaven Landfill	TON	$ 11	14,400	$ 158,400
Waste Disposal	TON	30.00	14,400	$ 432,000
SMP Certification (see Item A)	YR	$ -	30	$ -
			Subtotal Capital Cost:	$ 1,139,424
			15% Engineering and Legal:	$ 170,914
			20% Contingency:	$ 227,885
			Total Capital Cost (Present Value Cost):	$ 1,538,222
			Total Cost to Construct:	$ 1,538,222
			Cost per cubic yard of impacted soil	$ 160

NOTES:

1 Includes post excavation analysis at 1 sample per 100 square feet. Soil volume includes additional approx. 15% contingency.
2 One sample per 1,000 tons of excavated soil, analyzed for TCLP Metals with 48-hr TAT.

FIGURES



AECOM

N

2,000 0

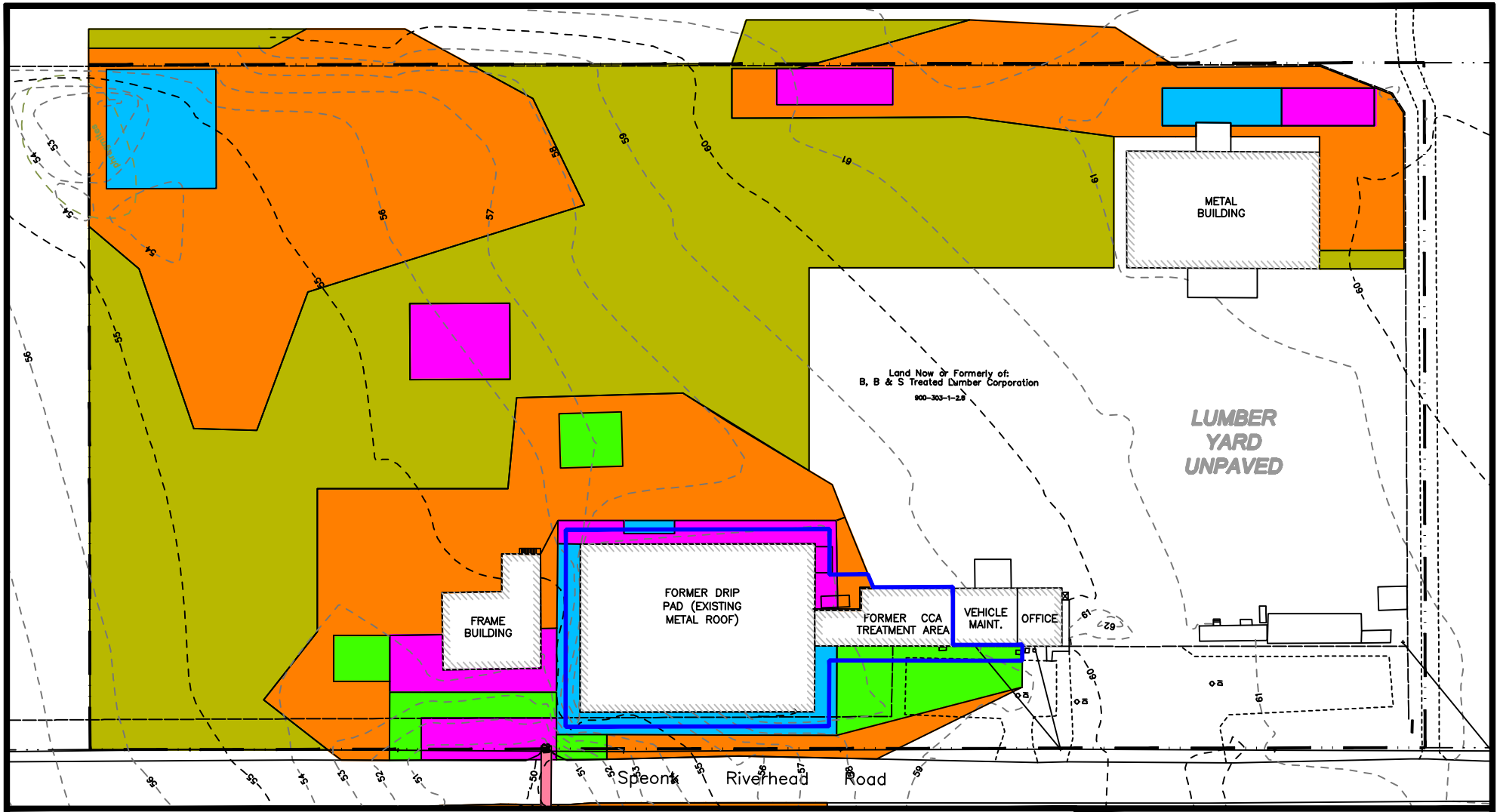
Scale in Feet

FIGURE 1
SITE LOCATION MAP
BB&S TREATED LUMBER SITE
NYSDEC SITE # 1-52-123

MAP SOURCE INFORMATION:
Background imagery from NYS Office of Cyber Security & Critical Infrastructure Coordination Geographic Information Systems Clearinghouse, dated 2007.

JULY 2009

97347



LEGEND

- ROAD
- BUILDING
- PROPERTY BOUNDARY
- ----60---- TOPOGRAPHIC SURFACE CONTOUR (1 FT.)

PLANNED EXCAVATION DEPTH BELOW EXISTING GRADE*

- 0.5 FT.
- 1 FT.
- 2 FT.
- 3 FT.
- 4 FT.
- 5 FT.

LIMIT OF CONTAMINATED SOIL TO REMAIN UNDER ENVIRONMENTAL EASEMENT (DEPTH VARIES 0 – 40FT.)

0' 100'

SCALE (FEET)

NOTES:

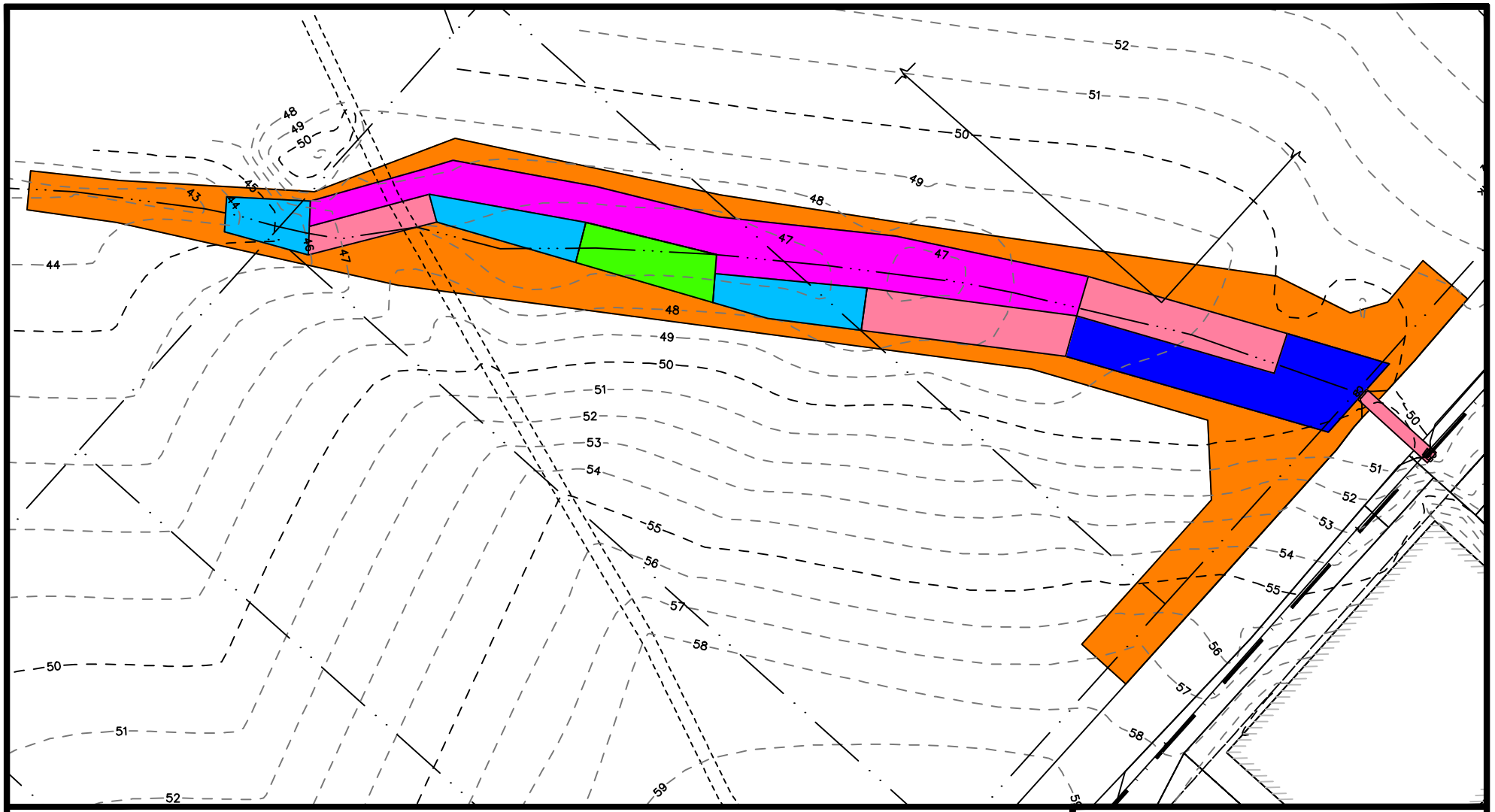
1) Soil excavation limits, within BB&S property boundary designed to achieve NYCRR Part 375 SCOs for groundwater protection and commercial property use of 16 ppm Arsenic, 50 ppm Total Chromium and 19 ppm Hexavalant Chromium.
2) Soil excavation limits outside of BB&S property boundary designed to achieve NYCRR Part 375 Unrestricted Use of 13 ppm Arsenic, 30 ppm Total Chromium and 1 ppm Hexavalant Chromium.
3) * Excavation areas and depths shown are approximate. Actual limits to be determined upon confirmation sample results.

AECOM

FIGURE 2
PLANNED EXCAVATION LIMITS OF ON-SITE IMPACTED SOILS

BB&S TREATED LUMBER SITE
TOWN OF SOUTHAMPTON, SUFFOLK COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
		97347	MARCH 09	2



LEGEND

- ROAD
- BUILDING
- PROPERTY BOUNDARY
- SWALE THALWEG (APPROXIMATE)
- -----60----- TOPOGRAPHIC SURFACE CONTOUR (1 FT.)

PLANNED EXCAVATION DEPTH BELOW EXISTING GRADE*

- 1 FT.
- 2 FT.
- 3 FT.
- 4FT.
- 5FT.
- 7FT.

0' 75'

SCALE (FEET)

NOTES:

1) Soil excavation limits designed to achieve NYCRR Part 375 SCOs Unrestricted Use of 13 ppm Arsenic, 30 ppm Total Chromium and 1 ppm Hexavalant Chromium.
2) * Excavation areas and depths shown are approximate. Actual limits to be determined upon confirmation sample results.

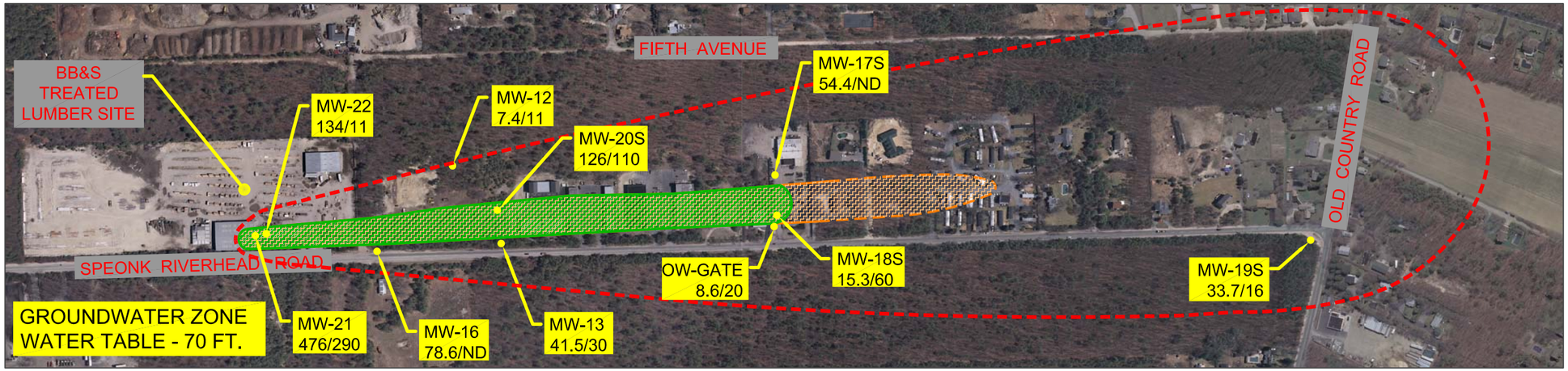
AECOM

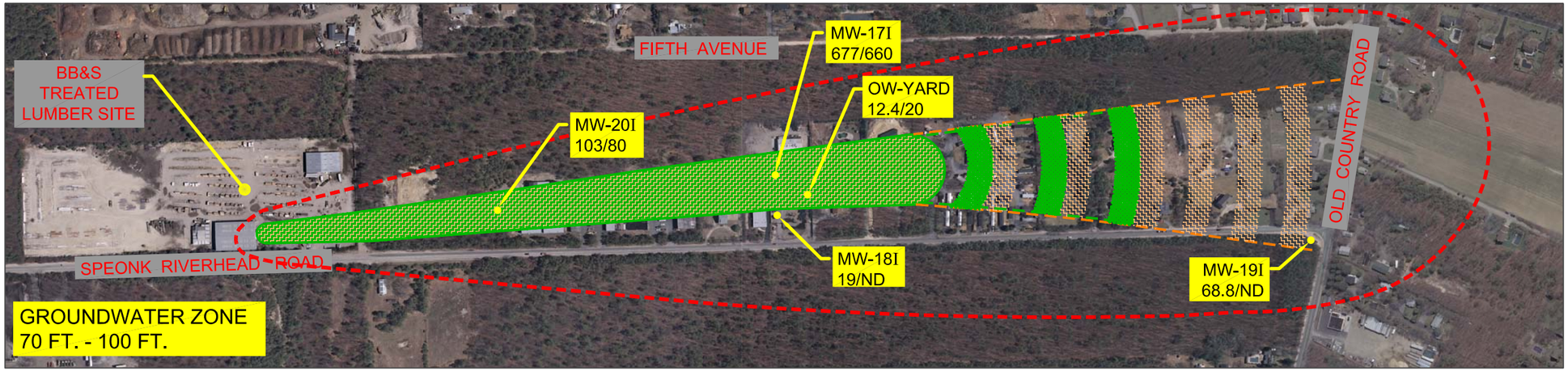
FIGURE 3

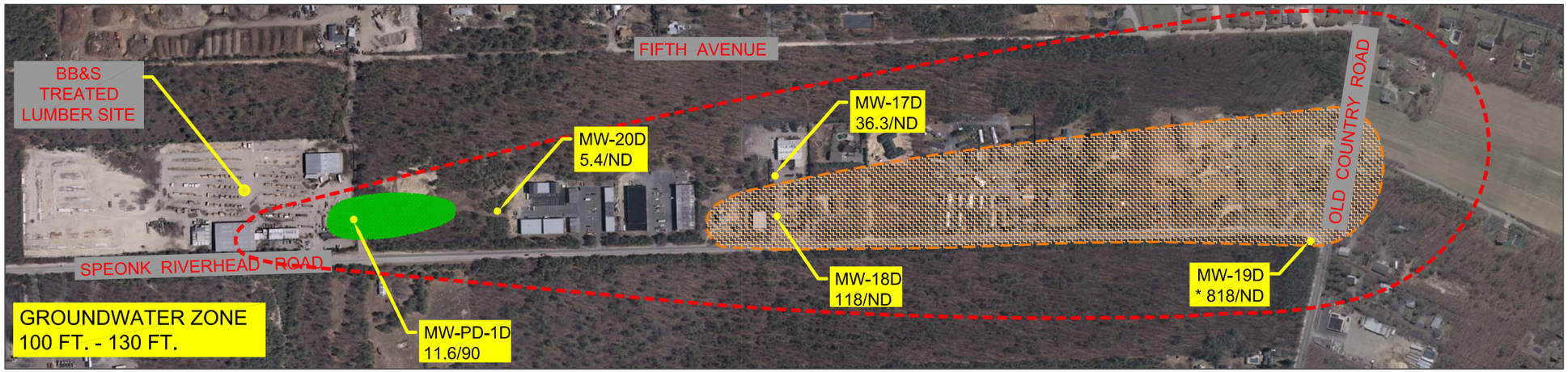
PLANNED EXCAVATION LIMITS OF OFF-SITE DRAINAGE SWALE IMPACTED SOILS

BB&S TREATED LUMBER SITE
TOWN OF SOUTHAMPTON, SUFFOLK COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
		97347	MARCH 09	3







MW-22
134/11
•

Monitoring well location with reported Total Chromium / Hexavalent Chromium concentration (ppb) (June 2008)

Approximate Total Chromium Plume Limit > 50 ppb

Approximate Hexavalent Chromium Plume Limit > 50 ppb

Estimated Limit of Detectable Hexavalent Chromium

Note: Lines dashed where inferred

MAP SOURCE INFORMATION:
Background imagery from NYS Office of Cyber Security & Critical Infrastructure Coordination Geographic Information Systems Clearinghouse, dated 2007.

PLAN

0’ 250’ 500’ 1000’

* : Total Chromium results possibly bias high due to sample turbidity. Well retested in October 2008 with Total Chromium results = 42.1 ppb.

VERIFY SCALE IF PLAN SHEET IS REDUCED
1-INCH

REV	DESCRIPTION	DRN	CHK	DATE (M/D/Y)

DRN: KAM
DES: W/OH
CHK: ---
APP: ---

AECOM
EARTH TECH
40 BRITISH AMERICAN BLVD.
LATHAM, NEW YORK 12110
(518) 951-2200

BB&S TREATED LUMBER SITE
NYSDEC SITE NO. 1-52-123
SPEONK, NEW YORK

ESTIMATED CHROMIMUM GROUNDWATER PLUME LIMITS
JUNE 2008

PROJECT START DATE (M / Y)
MARCH 2009

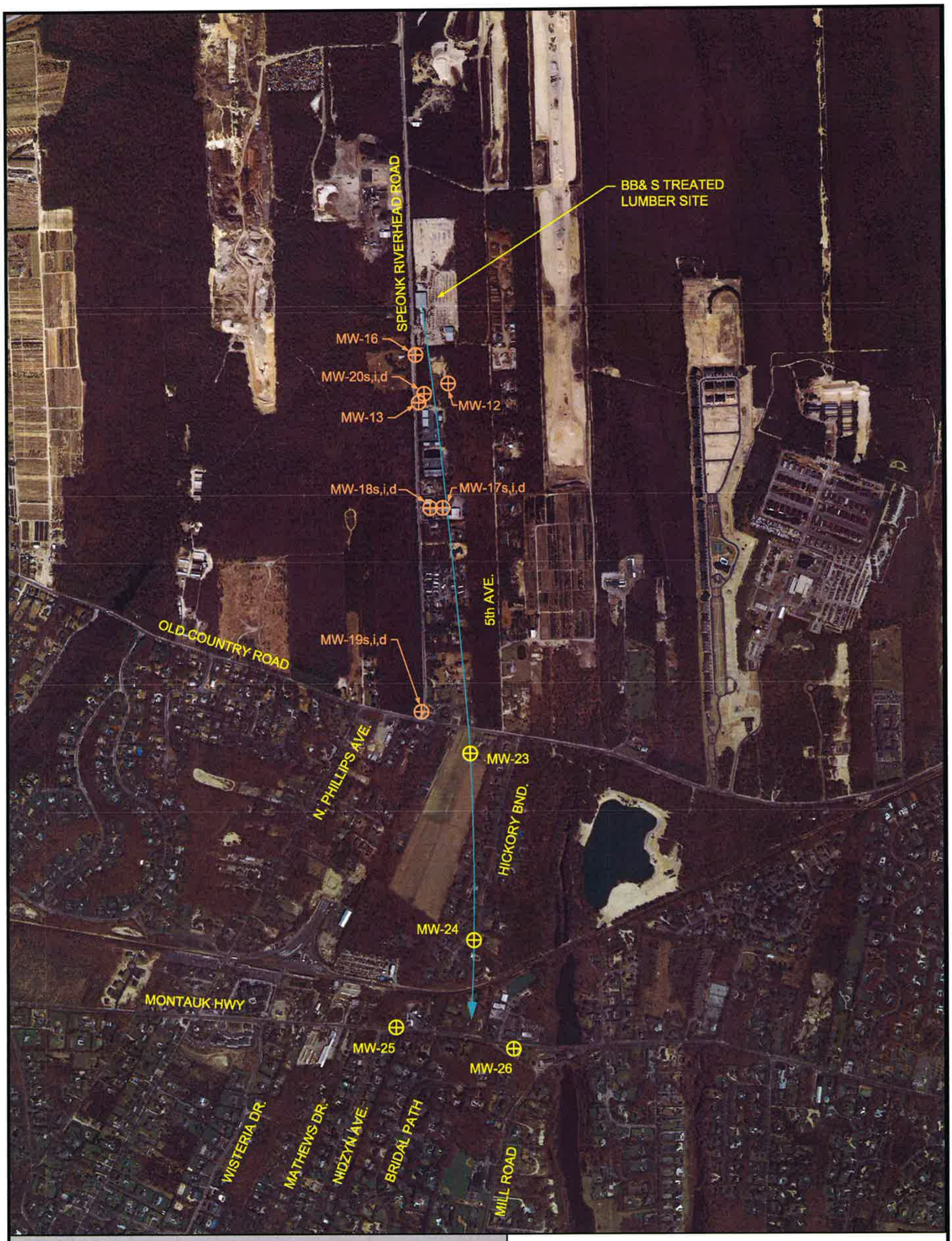
PROJECT NO.
97347

FILENAME
IMAGE-DWG.dwg

SHEET NO.
4

DRAWING NO.
FIGURE 4

Plotted By: keith.meister
Plot File Date Created: May/18/2009 4:33 PM
Layout-Sheet Name: PLUME
Filename: L:\WORK\97347\CADD\REF\REF-DWG\IMAGE-DWG.DWG



LEGEND

- GENERALIZED GROUNDWATER FLOW DIRECTION
- EXISTING BB&S DOWNGRADIENT MONITOR WELL
  (s,I,d) = SHALLOW, INTERMEDIATE, DEEP NESTED TRIPLET WELL
- PROPOSED DOWNGRADIENT NESTED TRIPLET MONITOR WELL

PLAN

0' 500' 1000' 2000'

AECOM

PROPOSED DOWNGRADIENT MONITORING WELL LOCATION MAP

BB&S TREATED LUMBER SITE - NYSDEC SITE No. 1-52-123
TOWN OF SOUTHAMPTON, SUFFOLK COUNTY, NEW YORK

FILE NAME:	DRN	PROJECT NO.	DATE	FIGURE NO.
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