



Environment

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2015 Construction and Restoration Work Plan

West Branch of Bloody Brook Bloody Brook Voluntary Cleanup Program Onondaga County, New York

February 2015

Prepared for:

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**2015 CONSTRUCTION AND RESTORATION WORK PLAN
WEST BRANCH OF BLOODY BROOK
ONONDAGA COUNTY, NEW YORK**

CERTIFICATION STATEMENT

I, Nickcole M. Evans, P.E., certify that I am currently a NYS registered professional engineer and that this *2015 Construction and Restoration Work Plan* was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10). This work plan was also prepared in accordance with Paragraph II.B.2 of the Voluntary Cleanup Agreement for Remedial Investigation/Remedial Action between the New York State Department of Environmental Conservation and Lockheed Martin Corporation (Index #: D7-0001-01-09).



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In accordance with New York State Education Law, it is a violation for any person, unless he is acting under the direction of a licensed professional engineer, to alter this Work Plan in any way.

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1.0 Introduction

This Construction and Restoration Work Plan (CRWP) has been developed for a portion of the West Branch of Bloody Brook (WBBB) and surrounding area, pursuant to a Voluntary Cleanup Agreement (VCA) between Lockheed Martin Corporation (Lockheed Martin) and New York State Department of Environmental Conservation (NYSDEC) (Index #: D7-0001-01-09, effective July 20, 2002). For the purposes of this CRWP, the site is defined as that portion of the WBBB and the surrounding area commencing on the southern boundary of the New York State Thruway (Thruway) and ending at Onondaga Lake Parkway.¹ The WBBB is located in the Town of Salina, and a portion of the site is located in the Village of Liverpool, Onondaga County, New York. Site location and area maps are included as Figures 1 and 2.

This CRWP defines the procedures by which AECOM Technical Services Northeast, Inc. (AECOM) will complete remediation efforts to address cadmium found in the sediments within and soil adjacent to the WBBB. Pursuant to the March 2014 *Decision Document* issued by NYSDEC, the excavation and off-site disposal of contaminated soil and sediment to be completed during the 2014 through 2016 construction seasons will include the following:

- all sediment from the West Branch of Bloody Brook and Bloody Brook, from below the confluence of the West and Middle Branches of Bloody Brook, between the New York State Thruway and the Onondaga Lake Parkway;
- top 2 feet of side bank soil from the West Branch of Bloody Brook and Bloody Brook, from below the confluence of the West and Middle Branches of Bloody Brook, between the New York State Thruway and Old Liverpool Road, with the exception of the existing gabion-lined section, channel side banks will be reconstructed with a minimum of two feet of clean cover material;
- side bank soil from Bloody Brook between Old Liverpool Road and the Onondaga Lake Parkway that exhibit cadmium concentrations greater than 4 parts per million (ppm) (up to two feet below grade);
- the wooded area: soils in the top two feet that exhibit cadmium concentrations greater than 4 ppm, and soils from 2 to 6 feet below grade that exhibit cadmium concentrations greater than 100 ppm;
- residential properties: soils in the top two feet that exhibit cadmium concentrations greater than 2.5 ppm, and soils from 2 to 4 feet below grade that exhibit cadmium concentrations

¹ The term "site" in the VCA is defined as: a portion of the banks, surface waters, and sediments of the West and Middle Branches of Bloody Brook located in the Town of Salina, which commences downstream of Interstate 90, the New York State Thruway, and which extends generally southward past the confluence of the West Branch and the Middle Branch of Bloody Brook, and ends on the upstream side of Onondaga Lake Parkway. After examining data developed during remedial investigation work in the Middle Branch, NYSDEC determined that no further action was required for that branch of Bloody Brook. For this reason, the "WBBB site" in this construction work plan relates only to those areas within the VCA site where the remedial program continues to be implemented and remedial action is being performed.

- greater than 10 ppm;
- apartment complex area: soils in the top 2 feet that exhibit cadmium concentrations greater than 4.3 ppm and soils from 2 to 4 feet below grade that exhibit cadmium concentrations greater than 10 ppm;
- Onondaga County drainage district easement: soils in the top two feet that exhibit cadmium concentrations greater than 10 ppm; and
- commercial-light industrial area downstream of Old Liverpool Road: soils in the top two feet that exhibit cadmium concentrations greater than 9.3 ppm where surface disposal of brook dredge spoils occurred.

The remedial action activities described in this CRWP are for work that will be completed during the 2015 construction season, starting at the temporary access road on the side closest to the Thruway and ending at the confluence of the Middle and West Branches of Bloody Brook located slightly upstream of Old Liverpool Road, shown in Appendix A. The 2015 construction and restoration work will be completed in accordance with the existing site-specific Health and Safety Plan that was provided to NYSDEC in May 2014. These remedial action activities will be completed under United States Army Corps of Engineers (USACE) Nationwide Permit No. 38, Application No. 2008-00823 and NYSDEC Individual Water Quality Certification No. 7-3148-00150/00002. The portions of the site to be disturbed during the 2015 construction season have been included in the Phase 1A Cultural Resource Survey completed in 2014 and summarized in the *Phase 1A Archaeological Survey Report* submitted to the NYSDEC on May 19, 2014. Details on these remedial construction activities as well as restoration activities to be completed after contaminated sediment and soil are removed are discussed in Section 2 of this document.

In addition to sediment and soil excavation for removal of cadmium contamination on the site, AECOM has also been retained by Lockheed Martin to design and complete the replacement of five culverts that cross over the WBBB within the limits of the site. The need for the culvert replacements was identified by Onondaga County based on the condition of the structure and the required repairs and maintenance necessary to keep the structure performing as originally designed. The activities to be completed to replace the Brookview Lane, Sunflower Drive, Floradale Road, Pearl Street, and Town Gardens Drive culverts are discussed in Section 3 of this document.

The remaining sections of this CRWP, Section 4 (Community Air Monitoring), Section 5 (Waste Management), Section 6 (Quality Assurance and Reporting), Section 7 (Spill Prevention and Response Plan), Section 8 (Green and Sustainable Remediation), and Section 9 (Schedule) pertain to both the remedial construction and the culvert replacement activities.

2.0 Remedial Construction

This section discusses the remedial excavation and restoration activities for the 2015 construction season. The 2014 excavation was completed to the temporary access road on the side closest to the Thruway, as shown in Appendix A. Polyethylene sheets were used as a barrier to separate the clean backfill placed as part of the 2014 construction activities and the remaining contaminated soil to be removed in 2015. In the portions of the site excavated and backfilled during the 2014 construction activities, final restoration and planting will be completed in accordance with the NYSDEC approved *2014 Revised Restoration Work Plan* dated August 2014 with the following field changes, which were approved by the NYSDEC on November 12, 2014:

- The size of trees to be planted in the wooded/wetland area was changed from 2.5 to 3 inches to a mix of 1.5 to 2.5 and 2.5 to 3 inches. Portions of the site have limited access and finished grades that make planting the larger 2.5 to 3 inch trees difficult, due to the larger root balls.
- The number of trees to be planted in the wooded/wetland area was changed from 2,066 to 270 due to the following reasons:
 - Trees previously existing on the site and preserved were not taken into consideration in the number of trees proposed in the *2014 Revised Restoration Work Plan*;
 - The estimate for the quantity of trees in the *2014 Revised Restoration Work Plan* was based on a standard tree per acre density for planting a new forest plantation of seedlings in large open areas. Such plantations are managed by thinning every 10 to 15 years. In addition, large planting stocks, with a mix of 1.5 to 2.5 inch and 2.5 to 3 inch trees, are being used instead of seedlings, which were proposed to be used in the *2014 Revised Restoration Work Plan*. Therefore, the trees are being planted on 14 to 16 foot centers more closely resembling an older forest; and
 - The revised quantity of trees was also reduced to reflect the elongated shape of the habitat plots.

The temporary contractor staging area that was constructed and used during the 2014 construction season will be utilized during the start of the 2015 construction season, with the intent to complete the remediation and restoration in this area during the 2015 construction season. The soil requiring excavation under the temporary access road and the staging area will be excavated and restored as remediation is completed in those areas.

The temporary construction facilities located at 203 Midwood Drive will remain in place and continue to be used through the 2015 and 2016 construction seasons. The soil removal that is required to be completed within and adjacent to the property located at 203 Midwood Drive will be completed with the excavation of the adjacent soil. If the soil in and adjacent to the property located at 203 Midwood Drive cannot be excavated due to the location of the temporary construction facilities, polyethylene sheets will be used as a barrier to separate the clean backfill placed as part of the adjacent construction activities and the remaining contaminated soil, and the remaining contaminated soil will be excavated after the temporary construction facilities are removed. At the end of the 2016 construction season, the temporary construction facilities will be removed and the lot restored.

2015 construction season excavation and restoration activities will generally be completed in the following sections:

- Upstream of Brookview Lane Culvert
- Brookview Lane Culvert to Sunflower Drive Culvert
- Sunflower Drive Culvert to Floradale Road Culvert
- Floradale Road Culvert to Pearl Street Culvert
- Pearl Street Culvert to Town Gardens Drive Culvert
- Downstream of Town Gardens Drive Culvert

Site controls installed and utilized during the 2014 construction season remain on site and will be used during the 2015 construction season. Prior to 2015 excavation activities, site preparation and controls extending beyond what will be utilized from the 2014 construction season will be implemented and installed as discussed in the following sections.

2.1 Site Preparation and Controls

2.1.1 Tree Removal

Trees requiring removal to complete the 2015 excavation were identified during a survey performed by AECOM on September 11 and 12, 2014. Tree removal activities were initiated on January 20, 2015 and are planned to be completed prior to March 31, 2015, pursuant to the NYSDEC approved November 2014 *Tree Removal Work Plan for 2015 Construction Season*. If the tree removal activities cannot be completed by March 31, 2015, NYSDEC will be notified and the steps need to be followed to remove trees between March 31st and November 1st will be followed. Tables 1 and 2 and Figure 3 identify the trees that will be leveled during these activities. Stumps left in place during the initial tree leveling activities will be removed during excavation and will be disposed of based on the planned removal actions for the soil from which the material was removed. The access road installed along the WBBB and ending at the Brookview Lane culvert, pursuant to the November 2014 *Tree Removal Work Plan for 2015 Construction Season* will be used to complete excavation activities upstream of the Brookview Lane culvert.

2.1.2 Erosion and Sediment Controls

Erosion and sediment controls will be installed during the site preparation phase in accordance with the August 2010 *New York State Stormwater Management Design Manual*. Land-based and water-based erosion and sediment controls that will be used for this phase of the project include, but are not limited to:

- Silt fence;
- Silt fence, hay bales, and/or straw wattles around active stockpiles;
- Stabilized construction entrances; and
- Intermediate coffer dams and/or stone check dams.

Silt fencing will be installed at locations downgradient of the work areas to intercept sediment runoff and promote deposition of suspended sediments. The filter fabric material that will be used to create the silt fencing will be Mirafi® 100x or an approved equivalent. Adjoining sections of filter fabric will be overlapped by six inches and folded. Details regarding the installation of silt fencing and other potential erosion and sediment controls are included in Appendix A.

All erosion and sediment controls will be constructed prior to excavation activities in accordance with the manufacturer's details. Erosion and sediment control measures will be regularly inspected to ensure that they are operating correctly. Repairs will be made as necessary to maintain all erosion and sediment controls throughout the duration of the project. After restoration activities are completed and ground surfaces are stabilized, the temporary erosion and sediment controls will be removed. Where excavation is being completed in a residential property, the erosion controls will be placed off the property in the easement adjacent to the residential property. Prior to starting excavation within the residential property, the erosion controls will be moved to the perimeter of the excavation within the residential property.

2.1.2.1 Monitoring and Maintenance of Control Measures

AECOM will designate a competent person to monitor the erosion and sediment control measures to verify that the control measures are operating as intended and to identify any control measures in need of repair. The designated inspector will monitor all erosion and sediment control devices at least once every work day and maintain inspection results in site documents. AECOM will begin implementing any corrective actions within one business day of discovery and will complete the corrective actions in a reasonable time frame. Repairs will be made as necessary to maintain the erosion and sediment controls until the controls are no longer needed. Maintenance requirements for the erosion and sediment control devices used during performance of remedial action activities may include repairs or modifications based on site conditions and planned remedial action activities.

Silt fencing will be monitored at least once each day and following a rain event. Sediment will be removed from the silt fence if sediment has accumulated to a depth of 6 inches above the existing grade, or as deemed appropriate by the on-site inspector.

Maintenance of the stabilized temporary access roads may require periodic top dressing with additional stone or the washing and reworking of existing stone as appropriate. Any site soil deposited on local roads will be removed and if necessary street sweeping equipment will be used to wash the road.

Once the remedial action is completed, all staging and support facilities have been removed, and all ground surfaces restored, the temporary erosion and sediment controls will be inspected weekly and after a rainfall event. These inspections will continue until the ground surface is stabilized and the erosion and sediment controls are no longer needed.

2.1.3 Temporary Site Security Fencing

Prior to starting excavation activities, a site security fence will be installed around the perimeter of the construction area. Where excavation is being completed in a residential property, the site fence will be placed off the property in the easement adjacent to the residential property. Prior to starting excavation within the residential property, the site fence will be moved to the perimeter of the excavation within the residential property.

2.2 Bypass Pumping

A temporary bypass pumping system will be operated 24 hours per day, seven days a week during impacted material removal and restoration activities in and adjacent to the brook.

The bypass system shown in Appendix A will be capable of conveying the maximum system design flow to the specified discharge point using a combination of pumps and pipes. Bypass pumps and

generators, when used, will be sound attenuated. Flow will be conveyed through piping to the proposed discharge point. An outfall will be installed downstream of the construction area for transfer of upstream water back into the active stream as shown in Appendix A. The outfall will limit sediment dispersion associated with the outflow of the bypass system.

A visual leak test of the bypass pumping discharge piping and outfall area will be performed using existing stream water prior to the full operation.

The proposed system will contain the following:

- The pumping system will include a sump with a minimum of two submersible pumps.
- The pumping system will be self-priming and capable of operating with automatic controls based on the liquid level in the bypass pumping system sump.
- The pumping system will be equipped with the necessary float switches or level monitoring devices required for starting and stopping the pump. In addition, the system will be configured to send a message to designated site personnel if the water level in the bypass pumping system reaches a critical depth.

In the event the influent storm water exceeds the maximum system design flow, the bypass pumping process will continue throughout the duration of the event to reduce the storm flow through the brook channel, and overtopping procedures will be implemented as described below.

2.2.1 Water Quality Controls

Temporary intermediate coffer dams, hay/straw bales, and/or filter socks will be installed downstream prior to the installation of the bypass pumping system and removed after the system is in place and operating properly.

Pumps will be operated to minimize sediment removal and disturbance during the pumping process. Water will be discharged into an outfall to limit sediment dispersion. If there is an exceedance of the turbidity action level (i.e., greater than 50 nephelometric turbidity units [NTUs] above the upstream monitoring location) downstream of the bypass system, all activities in the brook bottom will stop until the downstream monitoring location turbidity is less than the turbidity action level. The downstream monitoring location will be approximately 100 feet downstream from bypass discharge. Causes for the excessive turbidity will be reviewed and corrections to procedures and or modifications to the erosion control measures will be completed prior to re-starting activities.

2.2.2 Bypass Pumping System Monitoring

Direct observation of WBBB water levels, relative to critical bypass structure elevations, will be used as the primary indicator of imminent overtopping conditions. The following sections describe the monitoring procedures that will be used to prepare for imminent overtopping events.

2.2.2.1 Weather Monitoring

Weather conditions and weather forecasts, including regional weather patterns, radar, and local weather forecasts, will be monitored on a daily basis to provide advance warning of potential high-flow conditions. Various online resources provide access to daily forecasts and radar loops showing up-to-the-minute weather patterns.

2.2.2.2 Water Level Monitoring

Water levels in the WBBB will be monitored on a daily basis by direct visual observation and measurement of the relative difference between current water surface elevation and nearest adjacent crest elevations at critical locations (i.e., low points) along the temporary bypass system. The water level during steady flow is expected to be 0.5 feet below the top of the hydraulic control structure (e.g., sump). The procedures described below will be used to monitor the water level.

Dry Weather Water Level Monitoring Procedures: Dry weather shall be any period when there has been no rainfall the previous day and no rainfall forecasted for the current day. During dry weather periods, water levels will be visually inspected daily.

Wet Weather Water Level Monitoring Procedures: Wet weather shall be any period when there has been rainfall within or near the WBBB watershed within the past 12 hours, or rainfall is forecasted for the current day. During wet weather periods, due to the potentially short response time of the WBBB watershed, water levels will be visually inspected and water levels measured for all designated monitoring locations at hourly (i.e., 1-hour) intervals.

If visual observations or water level monitoring indicate that water levels are less than 0.5 feet from the top of the hydraulic control structure or suggest that WBBB water levels are rising rapidly, appropriate response action will be taken as summarized below.

2.2.3 Bypass Pumping System Overtopping

Actions that will be completed to minimize the damaging effects of and in response to an overtopping event are summarized in the following sections,

2.2.3.1 Mitigation Procedures

Mitigation procedures are activities that will be performed on a regular basis or in the event of a potential overtopping to reduce the amount of damage that could result from an overtopping event. To the extent practicable, mitigation procedures are listed below.

- The quantity of equipment, personnel, and construction materials within the in-stream work area, at any given time, will be minimized.
- At the end of each work day, open excavation(s) within the stream bed (up to the ordinary high water line) will be backfilled and secured and all equipment that is not necessary for operation of the temporary bypass system will be removed from the in-stream work area, as practicable.
- In the event of overtopping, and if water levels are higher inside the work area than outside, a portion of the downstream end of the bypass system may be removed to minimize the buildup of water within the in-stream work area. If water levels are lower inside the work area, pumping may be employed to dewater the area.

2.2.3.2 Response Actions

Response actions are activities that will be performed in the event of imminent or actual overtopping to minimize the potential for injury to personnel and damage to equipment. Response actions will be performed as outlined below.

Water Level Threshold*	Response Action
Water level less than 0.5 feet from the top of the hydraulic control structure and holding steady or falling	<ul style="list-style-type: none"> - Perform Wet Weather Water Level Monitoring
Water level less than 0.5 feet from the top of the hydraulic control structure and rising	<ul style="list-style-type: none"> - Start secondary pump to increase pumping volume. During this time, unarmored excavations will be covered with polyethylene sheeting and weighted down with sandbags to minimize contamination of water in the event of overtopping - Remove equipment and personnel from the stream channel - Remove sandbags, as needed, from the upstream bypass structure to open the emergency spill way to allow consistent flow through the brook and to limit the potential for upstream flooding. - Re-Entry into the steam channel will be permitted after the water level has receded to a safe level as determined by the on-site health and safety personnel

*Note: water levels may fluctuate in response to rainfall and close monitoring of precipitation data will be required.

2.3 Remedial Construction Activities

Prior to starting any remedial construction activities, Lockheed Martin and AECOM will obtain access to the properties by the property owners. In addition, AECOM will work with property owners and public utility providers to properly locate all utilities. Excavation activities upstream of the Brookview Lane culvert will begin in the area of stream marker 12+50 where two crews will work simultaneously moving outward from the starting location. One crew will work moving downstream toward the Brookview Lane culvert, and one crew will work moving upstream toward the temporary access road in the wooded area of the site and toward the area of the site that was excavated and backfilled during the 2014 construction activities. The remedial construction activities are summarized below.

2.3.1 Sediment and Side Bank Soil Excavation

All non-cohesive sediments overlying either the clay layer or the engineered base within the WBBB and top 2 feet of side bank soil will be excavated. Prior to starting excavation activities in or adjacent to the brook, a bypass system will be installed as described above to temporarily transfer the brook water around the stream channel. The bypass system will initially be installed to transfer the brook water from stream marker 7+50 to 23+00. After completing construction activities through the

downstream wing wall of the Floradale Road culvert, the bypass system will be installed to transfer the brook water from stream markers 23+00 to 27+00. After completing construction activities through the downstream wing wall of the Pearl Street culvert, the bypass system will be installed to transfer the brook water from stream markers 27+00 to 33+00. Bypass system locations summarized above are approximate and location of bypass system will be determined in the field to accommodate field conditions.

The gabion baskets lining the vertical channel walls between the wooded area and Brookview Lane and the flagstone lining portions of the remaining brook side banks will be removed as part of the 2015 construction activities and reused where possible for restoration. The March 2014 *Decision Document* issued by NYSDEC does not require the removal of the gabion baskets, but due to potential structural issues related to retaining the gabion basket lined vertical channel, the gabion basket lining will be removed and the side banks reconstructed.

The gabion basket stone and flagstone may be reused to backfill excavations deeper than 2 feet. If used as backfill, the stone material will be placed at depths below 2 feet to allow for placement of the required soil cover and restoration of those areas as summarized below. In addition, the stone may be used for armoring the stream side banks and the bottom of the stream channel. Prior to reuse, the gabion basket stone and flagstone will be rinsed to remove impacted soil and sediment. All rinse water will be captured and treated as construction water, and the soil rinsed from the gabion stone and flagstone will be captured and properly disposed. In addition, the flagstone will be broken into smaller pieces to allow for reuse. Any stone not reused for site restoration will be properly disposed of.

Reuse of flagstone is unlikely to be a viable option due to the sequence of the flagstone removal. If the flagstone is reused, a wipe sample will be collected and analyzed for cadmium from the first five stones removed from the stream side banks and rinsed to confirm proper decontamination of the flagstone, which is embedded in the brook side banks. If the wipe sample analytical results indicate that cadmium concentrations are 2.5 ppm or less, no further sampling and analysis will be completed. If the cadmium concentration is greater than 2.5 ppm, the rinse procedure will be reviewed and corrections to the procedure will be implemented until wipe sample analysis results show a cadmium concentration of 2.5 ppm or less.

2.3.2 Upland Soil Excavation

Based on the data summarized in Table 3, upland soil (soil at the top of the stream side banks) from the Onondaga County drainage district easement, residential properties, and the apartment complex property will be removed to depths between 2 and 6 feet, as shown in Appendix A. Excavation will be completed by surveying the existing grade; removing soil to the required depth; and surveying the excavated grade to confirm the required depth has been achieved. For excavations greater than 2 feet below ground surface, the excavation will be properly supported to prevent slope failure.

2.3.3 Brook Channel and Side Bank Restoration

Sediment removed from the brook channel will be backfilled with imported low-permeable soil as needed to maintain the hydraulic grade line of the brook channel and with a 6-inch layer of stone to control erosion, as needed. The channel will be replaced to the existing width and elevation. A hydraulic analysis, Appendix B, and armor analysis, Appendix C, was completed to determine projected flows through the WBBB and was used to establish stream bottom and side bank armoring and stream grading throughout the channel.

The side slopes will be backfilled with 0.5 feet of imported general fill soil; layer of woven geotextile (Mirafi FW700), or an approved equivalent, placed on top of the general fill soil; and 1.5 feet of 6- to 12-inch stone placed on top of the woven geotextile material. The side bank armoring will be installed to the 100 year flood elevation or greater as needed to armor the brook side banks for erosion control. Where the armoring is not placed, 1.5 foot of the general fill soil will be placed with 0.5 feet of topsoil and planted as shown in Appendix A. All soil backfill will meet the requirements of NYSDEC Technical Guidance for Site Investigation and Remediation (DER-10) Section 5.4(e). Prior to placement of backfill material, a nonwoven, permeable geotextile fabric (SKAPS GT121), or an approved equivalent, will be placed as a demarcation layer at the bottom of each excavation. Channel and side bank restoration is shown in Appendix A.

In the area of the gabions from stream marker 11+5 to stream markers 13+5, a block wall will be installed as shown in Appendix A. The block wall is being installed to keep the brook side banks and slope to the brook side banks within the Onondaga County drainage district easement and to maintain the existing center line of the brook. The backfilled grade will be surveyed to confirm a minimum of 2 feet of cover is in place.

The streambed and side banks will be monitored on an annual basis for 5 years. The inspection will be conducted in the early summer during typical low flow conditions. Conducting monitoring during this time period will allow for more of the stream bed and side banks to be easily inspected. The inspection will consist of a visual inspection of the streambed and side banks for erosion of the placed material. If large areas of erosion are observed (i.e., 5 square feet of material missing) these areas will be replaced. If areas are identified for replacement, an evaluation will be conducted to determine if the selected material or design needs to be changed. Prior to implementing any changes, the changes will be submitted to NYSDEC for approval. The monitoring activities will be summarized and included in an annual site monitoring report that will be submitted to NYSDEC.

2.3.4 Wooded Area Restoration

A detail restoration plan including a detail planting plan was submitted and approved by NYSDEC for the wooded area of the site. The portion of the site upstream of the 2014 Restoration Limit, as shown in Appendix A, will be restored in accordance with the NYSDEC approved *2014 Revised Restoration Work Plan* dated August 2014 and the NYSDEC approved field changes summarized in Section 2.0 of this CRWP.

2.3.5 Upland Soil Restoration

Restoration of upland areas (areas at the top of the stream side banks) within the Onondaga County drainage district easement, residential properties, and the apartment complex property will be backfilled with imported soil that meets the requirements of NYSDEC DER-10 Section 5.4(e). A minimum of 2 feet of cover will be placed, including 1.5 feet of general fill and 0.5 feet of topsoil and planted as shown in Appendix A. Prior to placement of backfill material, a nonwoven, permeable geotextile fabric (SKAPS GT121), or an approved equivalent, will be placed as a demarcation layer at the bottom of each excavation. The backfilled grade will be surveyed to confirm a minimum of 2 feet of cover is in place. Residential properties will be restored as close as practical to existing conditions with consideration for input from the homeowner and will include the placement of sod, trees, and plantings similar to what was removed from the area.

Upland areas will be visually inspected annually for a five year period. The inspection will included an evaluation of all plantings and any possible erosion. All plantings will be inspected after the first year. Plantings will be replaced until they are successfully established for a period of one year. If erosion is

observed, the affected area will be fixed and an evaluation conducted to determine the cause. In some cases an alternative material or plantings may be installed. Any modifications to the restoration will be discussed with the property owner and reviewed and approved by NYSDEC. The monitoring activities will be summarized and included in an annual site monitoring report that will be submitted to NYSDEC.

2.3.6 Dewatering, Collection, and Transfer of Construction Water

Any water identified as potentially contaminated by direct contact with contaminated media (outside of the stream bed) will be collected for management. Typical construction water could include, but is not limited to, the following:

- Groundwater or surface water entering excavations.
- Surface water resulting from precipitation during construction which has come in contact with potentially contaminated soils, fill, or debris.
- Liquids drained from covered stockpiles.
- Liquids generated during decontamination and cleaning activities.
- Liquids generated from the dewatering system.

The means and methods of collecting construction water will vary with the location of the water and the estimated volume. Pump type and capability will vary with the application. General pumping will be performed as follows:

- Pre-designed Sumps;
- 2- to 3-inch trash pumps for various excavations; and
- 2-inch submersibles where continuous pumping is needed.

In most cases, construction water will be pumped directly from the water source location to a weir tank through a bag filter to a holding tank. The weir tank will allow soil and sediment to settle out of the construction water, and the filter bags will retain soil and sediment from the construction water. The weir tank and filter bags will allow clean water to be placed into the holding tank. The treated construction water will be discharged into the WBBB or the sanitary sewer. Solid wastes resulting from the operation and maintenance of the water treatment system will be disposed of as impacted soil and sediment.

Prior to the construction water being discharge into the WBBB, it will be sampled to confirm it meets the appropriate discharge requirements [i.e., flow (monitor), total suspended solids (10 mg/L) and cadmium (1.2 µg/l)]. Batch sampling will be conducted prior to the initial discharge. Once water meets appropriate discharge requirements, weekly sampling (continuous flow) will be conducted to ensure compliance.

Prior to the construction water being discharged to the sanitary sewer, a permit will be obtained from Onondaga County Department of Water Environment and Protection, and the permit conditions will be followed including sample frequency and discharge limits.

3.0 Culvert Construction

In addition to sediment and soil excavation for removal of cadmium contamination on the site, Lockheed Martin has agreed to design and complete the replacement of five culverts that cross over the WBBB within the limits of the site. The need for the culvert replacements was identified by Onondaga County based on the condition of the structure and the required repairs and maintenance necessary to keep the structure performing as originally designed. The activities to be completed to replace the Brookview Lane, Sunflower Drive, Floradale Road, Pearl Street, and Town Gardens Drive culverts are discussed in this section. Details and design drawings for the culvert construction are included in Appendix D.

A Joint Application was submitted on February 3, 2015 to USACE for the requisite Preconstruction Notification for use of Nationwide Permit No. 3 – Maintenance for authorization of the culvert replacements in accordance with Nationwide Permit General Condition No. 31. In addition, the Joint Application for permit was submitted to NYSDEC to modify NYSDEC Individual Water Quality Certification No. 7-3148-00150/00002 to allow for the culverts to be replaced.

Before starting any culvert construction activities, Lockheed Martin and AECOM will obtain the needed permits to work within the Town of Salina roadways and will complete the required roadway closures and notifications to the effected residents. For example, a maintenance and protection of traffic plan will be provided to the Town of Salina Highway Superintendent for each of the culverts prior to closing any roadways. The Town of Salina Highway Superintended will be contacted regarding the need to retain certain materials (e.g., corrugated beam railings used for guard rails), and the Town of Salina Attorney will be contacted regarding the need for a Utility Construction Agreement. In addition, the culvert replacement activities will be completed in coordination with property owners and public utility providers (e.g., OCWA, OCDWEP, National Grid, Verizon, etc.) to properly locate all utilities.

A preliminary construction schedule, including the schedule for replacing the culverts is included as Appendix F. Prior to starting the culvert replacement construction activities, the portion of the brook to be disturbed by the construction activities will be dewatered. The dewatering for the culvert replacements will be in conjunction with the permit to perform remediation activities into the WBBB as described in the USACE Nationwide Permit No. 38, Application No. 2008-00823 and NYSDEC Individual Water Quality Certification No. 7-3148-00150/00002. In addition, temporary chain link fence at least 6-foot high will be placed around the work zone as shown on the design drawings in Appendix D.

The existing corrugated metal culvert pipes will be replaced with a single span four-sided precast concrete structure on the approximate existing horizontal and vertical alignment. The new replacement culverts will be embedded below the grade of the streambed to allow natural deposition to cover the interior of the culvert bed (a minimum embedment of 20 percent of the culvert vertical rise).

Soil excavated for the replacement of the culverts will be handled with the adjacent soil removed for remediation. Soil borings were collected in the vicinity of each of the five culverts to characterize the extent of cadmium concentration. Results are summarized in Table 4. Soil and

sediment disturbed to remove and replace the culverts with a cadmium concentration of greater than 2 ppm will be handled as impacted material and shipped off-site for proper disposal at a permitted landfill.

After construction of the new culverts, the brook banks and adjacent properties will be restored as shown in Appendix A.

4.0 Community Air Monitoring

Community air monitoring will be performed during all intrusive activities at the site in accordance with the Community Air Monitoring Plan (CAMP) (Appendix E). In addition to the equipment designated in the CAMP, site conditions will be continuously monitored for visual dust. Appropriate actions will be taken to mitigate the risk of dust traveling off site following any visual observation of dust. Typical mitigation methods such as wetting the area, covering exposed surfaces, or reducing truck traffic will be employed. The air monitoring data and manual recordings, including any exceedance of the dust alert/action limits in accordance with DER-10 guidance, will be made available to the NYSDEC and New York State Department of Health (NYSDOH) personnel upon request.

5.0 Waste Management

In-situ waste characterization activities were completed in December 2014 in accordance with the NYSDEC approved October 2014 *Culvert and 2015 Construction Season Waste Characterization Soil Sampling Work Plan*. The waste characterization activities included collection and analysis of composite samples for characterization of waste soils and sediments associated with the 2015 construction activities. The sample locations are shown on Figure 4, and the analytical results are summarized in Table 5. The soils associated with LMC-WBBB-WC-25-120314 were characterized as hazardous due to a cadmium concentration exceeding 1.0 milligram/liter (mg/L) as determined by a Toxicity Characteristic Leaching Procedure (TCLP) analysis. All other parameters analyzed were not detected or were detected at concentrations below the associated regulatory limit.

The majority of the soil and sediment will be treated and disposed of as non-hazardous waste material. The soil and sediment disposed of as non-hazardous waste material will be excavated and direct loaded or stockpiled and loaded at a later time to be shipped off-site for proper disposal at a permitted landfill. In order to achieve acceptable consistency for the waste facility, the soil and sediment will be mixed with drier non-hazardous material already designated for off-site disposal and/or mixed with drying agents (e.g. cement kiln dust), as needed. As summarized below, the waste classified as hazardous waste will be stabilized on site and resampled for final waste characterization before being transported off site for disposal at a permitted landfill.

5.1 On-Site Waste Stabilization and Management of Hazardous Waste Soil

Similar to 2014 construction activities, the excavator will mix EnviroBlend into the soil in 0.5-foot to 1-foot thick horizontal lifts across a specified area. Once the first lift is thoroughly mixed, it will be stripped off and staged on top of 6-mil polyethylene sheets exposing the next 1-foot lift to be amended. Again, EnviroBlend will be applied to this next exposed lift, the soil and EnviroBlend will be mixed by excavator, stripped off, and placed on top of the already mixed material. This will continue until the desired depth is achieved. Once the excavated material is thoroughly mixed, it will be covered with 6-mil polyethylene sheets until end disposal facility approval is received, and the soil is ready for to be shipped off-site for proper disposal at a permitted landfill. Additional samples will be collected and analyzed as required by the off-site permitted landfill. For any additional samples collected on site for waste characterization as required by the off-site permitted landfill, the procedures used for the collection of composite samples collected in accordance with the NYSDEC approved October 2014 *Culvert and 2015 Construction Season Waste Characterization Soil Sampling Work Plan* (AECOM, 2014) will be followed.

To minimize the potential for dust, the stabilization media, (i.e., EnviroBlend) will be stored in one ton super sacs. When mixing the media and soil the media will be applied as close to the soil surface as possible. Once applied, the media will be mixed using an excavator. Mixing activities will be monitored to ensure dust generation is limited.

6.0 Quality Assurance and Reporting

Quality assurance associated with this CRWP is meant to reinforce the work to be performed and assure aspects of this CRWP and applicable local, state, and federal guidelines are adhered to during construction. Relevant items that may represent deviations from the approved remedial action design or schedule would be discussed with the NYSDEC representative and field changes will be submitted and approved as needed.

Progress meetings will be held on site on a regular basis (e.g., weekly, semi-weekly, or other mutually agreed upon frequency) to discuss status of project, progress-to-date, issues encountered, deviations from the approved remedial action design or schedule, corrective actions necessary, submittals/approvals necessary, schedule updates, etc.

Reporting will include daily, weekly, and monthly reporting requirements further below.

6.1 Daily Reporting

A daily construction report will be assembled following each work day will contain the information listed below, and will be kept in the project files.

- List of personnel, subcontractors, equipment, and visitors on site including interactions held that day with property owners, government officials, or other third party persons
- Inventory of site deliveries including materials brought on site with associated bills of lading, if applicable, (e.g., fill material)
- Description of work performed on site including soil removal activities completed that day with associated waste and shipping documents and materials used or placed on site (e.g., landscaping items and personal protective equipment)
- Documentation of decisions made that impact on-site work including potential deviations from relevant work plans
- Record of samples collected
- Description of soil and sediment erosion controls inspections and repairs and modifications completed
- Summary of quality control activities
- Record of request for information
- List of transmittals and submittals
- Description of any community air monitoring conducted that day in accordance with the CAMP
- Photographic or written documentation associated with the work

6.2 Weekly Reporting

A weekly construction report will be assembled and submitted to NYSDEC following each work week and will contain the information listed below.

- Remedial construction activities completed for report week
- Remedial construction samples collected and analytical results received for report week
- Field changes requested and approved during report week

- Remedial construction activities projected for next week
- Remedial construction activities projected for two week outlook
- Remedial Construction activities issues, responses, and resolutions

6.3 Monthly Reporting

A monthly report will be assembled, submitted to NYSDEC, and distributed consistent with the requirements of the VCA. The monthly report will contain the information listed below.

- Description of administrative activities
- Summary of investigation and remedial program activities including analytical data received, field changes requested and/or approved, projected work for next month

7.0 Spill Prevention and Response Plan

Performance of the remedial action activities, within the work areas, poses a potential for accidental spills and discharges. The immediate containment of a spill or discharge of hazardous materials is necessary to minimize the potential impact to human health and the environment. This section contains a Spill Prevention and Response Plan that includes procedures to be followed in the event of a spill or release at the work area during the remedial action activities.

7.1 Storage and Spill Prevention

Spill prevention has been developed as an integral part of this project. The key elements of the spill prevention program include the items listed below.

- Leak proof containment liners on the decontamination and cleaning pad.
- Portable fuel tanks with secondary containment (i.e. diesel and gasoline) including a 500 gallon tank with 110% secondary containment.
- Lockable steel containers – small chemical storage (e.g., oils, greases, etc.).
- Lined stockpiles with 6-mil polyethylene sheets.
- Secondary containment for the construction water treatment system.
- Storage cabinets for flammable materials.
- On-site inventory of spill response materials including sorbent pads and boom.
- Daily walk-through inspections of the construction site to check the piping, equipment, and tanks for leakage, soils for staining and discoloration, excessive accumulation of rainwater in containment structures, and verification that dike drain valves are sealed closed (which will be repaired or replaced as needed).
- Storm water management systems have been established to prevent washout and migration of active sediment removal areas including
 - Decontamination graded to a collection sump; secondary containment with curbing and the liner barrier walls;
 - silt fence;
 - turbidity curtain; and
 - stabilized construction entrances.
- Heavy equipment and haul truck operators will be trained in the proper loading of the solid waste materials so that the waste is kept within the truck bed during loading and transit. Haul vehicles will be inspected daily to check for damage that could cause materials to be spilled out during waste transfer. Loading will take place on an impermeable surface (such as polyethylene sheeting) so that spilled waste may be easily cleaned up. Solid wastes spilled outside of the loading or staging areas during transit will be promptly cleaned up, either by hand with shovels or by using heavy equipment.
- Trucks hauling materials off site will be lined and covered, as necessary. Trucks used for transporting materials on site from removal area to stockpile area would be covered, as needed.

7.2 Spill Response Plan

This section addresses spill response measures for potential spills or discharges of contaminant-related materials that could occur at the WBBB site during the work activities. A release constitutes potential for groundwater, surface water or atmospheric contamination.

Releases that could occur during the performance of work at this location include but are not limited to the following:

1. Oil/petroleum spills (diesel, gasoline, hydraulic fluid, etc.);
2. Hazardous waste spills (impacted soils);
3. Chemical spills/releases (solvents, acid, paints, etc.); and
4. Soil/sediment spill or release.

Spilled or released materials can be in the form of a solid, liquid, gas, or any combination thereof. The state of the discharged product at the time of release and the physical characteristics of the location could yield the movements summarized below.

1. Vertical movement – downward seepage through soil horizons and upward movement of vapors and dust in the atmosphere.
2. Lateral movement – horizontal movement of product following the contour of ground surfaces.
3. Combination – it is important to recognize the three-dimensional movement when containing a hazardous material.

7.2.1 Notification

In the event of a reportable spill, the AECOM on-site Construction Manager will immediately notify the AECOM Project Manager. The AECOM Project Manager will then immediately notify the Lockheed Martin Project Manager.

The AECOM Project Manager will provide the Lockheed Martin Project Manager with the following information.

1. Exact location of the release.
2. Type and description of released material.
3. Estimated amount of material released.
4. Extent of any injury or property damage.
5. Extent of actual or potential environmental damage, if known.
6. Summary of actions, if any, that have been taken to control the release.

The Lockheed Martin Project Manager will be responsible for calling the New York State Spill Hotline within 2 hours of notification of a spill. Other notifications may include the National Response Center (NRC) at 800-424-8802, and/or the Town of Salina and Village of Liverpool emergency response personnel as set forth in the *Technical Field Guidance Spill Reporting and Initial Notification Requirements* (NYSDEC, 1996).

7.2.2 Spill Countermeasures

Where hazardous substances may be released by spilling impacted soil or other hazardous substances, such that employees may be exposed to these hazards, hazardous materials trained employees must perform the appropriate spill containment procedures. Countermeasures will be implemented and will include the following general procedures:

1. Solid Spills (soil/sediment)
 - Take timely action to control and clean-up the release so that any hazard or potential hazard to human health, life or the environment will be expeditiously controlled and eliminated.
 - Immediately remove and place impacted materials into staging piles or containers.
 - Cover piles, secure and protect containers as appropriate.
 - Perform waste characterization and disposal.
2. Liquid and/or Sludge Spills (fuel, construction water, misc. chemicals)
 - Take timely action to control and clean-up the release so that any hazard or potential hazard to human health, life, or the environment will be expeditiously controlled and eliminated.
 - Absorb with sand, clean fill, or other absorbent material.
 - Remove and place the absorbent/spill mixture into staging piles or containers.
 - Cover piles, secure and protect containers as appropriate.
 - Perform waste characterization and disposal.
3. Fuel spills on water
 - All work activities shall be halted.
 - Take timely action to control and clean-up the release so that any hazard or potential hazard to human health, life or the environment will be expeditiously controlled and eliminated.
 - Will be managed with floating oil booms, sorbent pads and other typical water based spill management practices.
 - Remove and containerize spent sorbents.
 - Decontamination of impacted equipment.
 - Waste characterization and disposal.
4. General Techniques: When choosing the containment techniques to be employed, the possible movements of the material must be considered. The following actions can be employed to limit the movement of a spill.)
 - Place a dam – Dams may be constructed of earth, sandbags, absorbent booms, boards, concrete, or other suitable material.
 - Dig a trench – Trenching is often used in lieu of damming. The trenches can be lined to serve as a collection area.
 - Use a dike – Dikes are like dams, only they are typically pre-built as a means of aiding containment at a storage staging area.
 - Remove the source – Retrieve liquids or sludge, if possible.
 - Limit upward movement – Reduce vapors and dust by spraying with water, foam, or other suitable material.

Employees performing these procedures are required to be properly trained, wear the proper protective clothing and equipment for the materials present, and follow established standard operating procedures for spill control. The Health and Safety Officer will evaluate the conditions of the spill and determine the appropriate level of personal protective equipment. Air monitoring, as needed,

to determine the appropriate level of personal protective equipment needed in response to the spill/release will be completed.

Once contained, the spill shall be cleaned up in accordance with standard remediation methods. Upon completion of a satisfactory cleanup, the spill incident shall be reviewed by all management personnel in order to determine the conditions leading to the spill, additional prevention methods, and corrective actions to be immediately implemented.

Following the spill/release incident, AECOM will investigate its causes, evaluate response, re-evaluate procedures (and propose procedure modifications, if necessary) and write a report on the findings to be submitted to Lockheed Martin, and NYSDEC within 48 hours. A copy of the New York State *Spill Guidance Manual* will also be kept at the work area in the event of a spill or release.

The equipment for spill containment and cleanup will be maintained on site and stored in the main, onsite storage area as summarized below.

Equipment / Supplies	Minimum Quantities
PIG® Spill Kits	3 EA
55-gallon drums	1 EA
Sorbent Pads	20 bales
Disposable bags	5 EA
Personal Protective Equipment	For two individuals
8-inch Floating Oil Boom	500 LF
Shovels, brooms, etc.	3 EA
Speedi-Dri	1 pallet
Overpack Drums	4 EA
Enviro-clean	5 gallons

7.3 Spill Vendors

In the case of an unforeseen spill emergency occurs and additional supplies or assistance is needed the following vendors will be utilized.

1. Op-Tech
6392 Deere Road
Syracuse, NY 13206
Ph#: 315-463-1643

8.0 Green and Sustainable Remediation

The work completed as part of this work plan will comply with all NYSDEC guidance documents including DER-31: Green Remediation. To ensure compliance with DER-31 the work will be completed using the best practices and techniques described below.

- Materials will be collected from local sources as available (e.g., backfill).
- Rechargeable batteries will be used for field instruments versus disposable batteries.
- Biodegradable soil stabilization matting will be used for sidebank restoration, as applicable.
- Non-impacted soils will be properly segregated from impacted soils for reuse on site.
- Solid waste volume reductions will be evaluated to properly balance acceptable water content limits for off-site disposal.
- Noise impacts to off-site receptors will be minimized.
- Work and traffic patterns will be sequenced to minimize local traffic congestion.
- Remedial work phases will be sequenced to reduce or limit double handling of materials at the site.
- An idle reduction plan will be implemented for all on-site vehicles and machinery.
- Efficient traffic patterns will be established on site to minimize soil disturbance and noise.
- Equipment will be suitably sized to perform the work.
- Routine and on-time maintenance to equipment will be performed to improve fuel efficiency (i.e., oil changes).
- Re-vegetation/stabilization of excavated areas will be completed as soon as possible to minimize dust control measures.
- To the extent practicable, energy efficient systems and office equipment will be utilized within the site trailers.
- All vehicles and equipment that consume diesel fuel will use Low Sulfur Diesel Fuel.

9.0 Schedule

In general, work will begin at the point where remedial construction activities stopped in 2014 and travel downstream to avoid any recontamination of downstream soils. Work is not expected to be completed during the winter months (i.e., January and February). A project schedule is provided as Appendix F.