

Bingham Park Remediation Staff Report

Kobe Riley, Deputy Director

**Richard Lovett, Environmental Compliance Support Manager
Greensboro Parks and Recreation Commission**

February 8, 2023

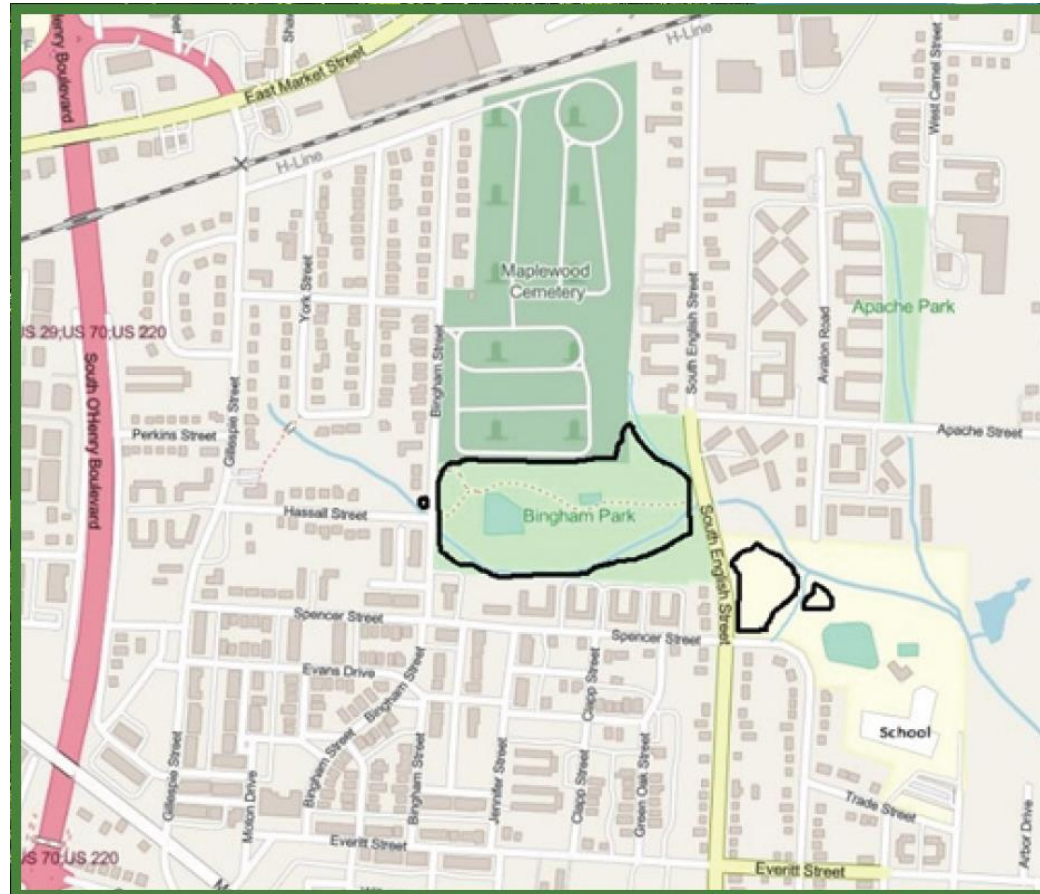
Overview

- Recognitions
 - Bingham Park Environmental Justice Team
 - Community partners
 - NC Department of Environmental Quality
 - HDR, Inc.
 - City departments and officials
- History of Bingham Park
- Project background
- Investigation and results
- Remediation options
- Next steps
- Discussion and questions

History of Bingham Park

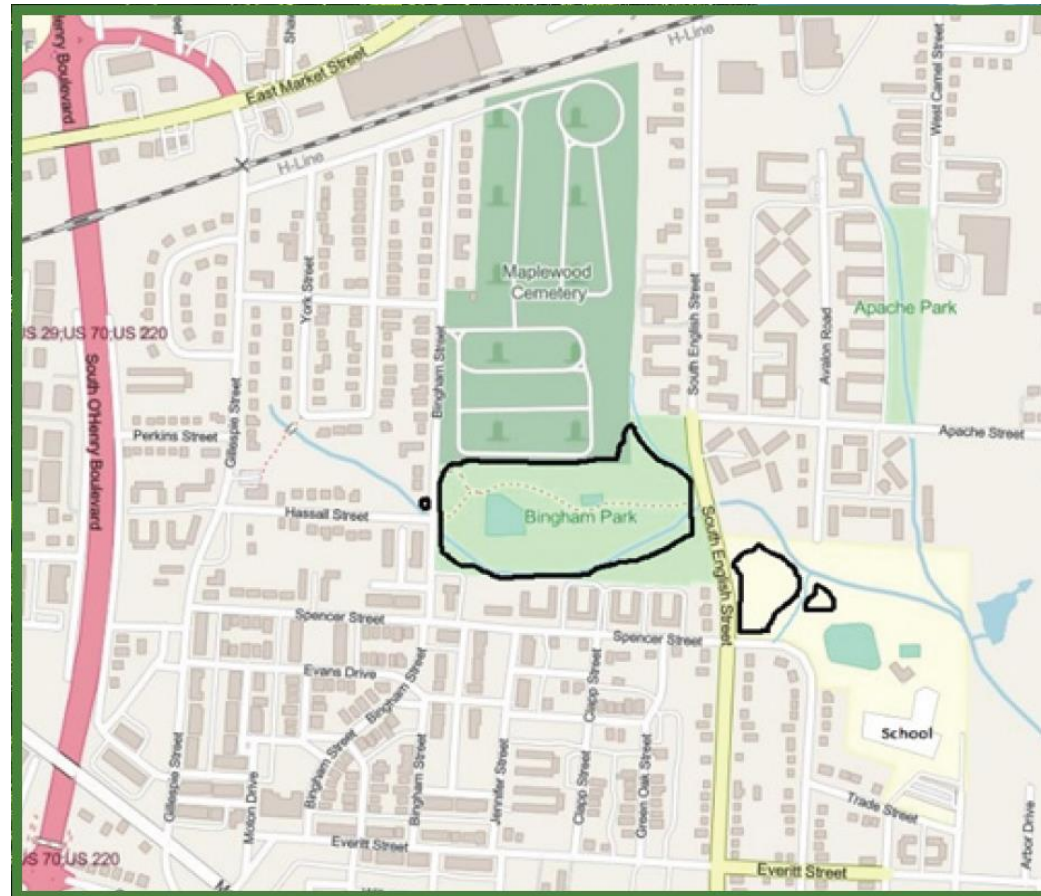
Bingham Park is an approx. 12-acre facility located at 500 Bingham St. in Greensboro. It borders S. English Street between E. Market Street and McConnell Road. The park is an integral part of three neighborhoods: Eastside Park, Willow Oaks, and Cottage Grove.

The park is situated on top of a pre-regulatory landfill. There was an incinerator on site that burned household waste from Guilford County and the US Military. The materials placed in the landfill were ash and disposal fragments from items burned in the incinerator. The incinerator was reported to operate from 1922 to 1955 before the site was converted to parkland as it remains today.



History of Bingham Park

In the late 2000's, the City began planning efforts, in collaboration with the community, to redesign and improve the park. In 2010, however, North Carolina Department of Environmental Quality (NCDEQ) designated the site as an inactive hazardous waste/pre-regulatory landfill. The site is called a pre-regulatory landfill because it was in operation before 1983 when landfill standards were established to protect health and the environment. Pre-regulatory landfills could have types of waste that are not allowed in today's modern, lined landfills.



Background

Community interest in the needs at Bingham Park continued to grow in the 2010s. Initial environmental site assessments were conducted by NCDEQ. From 2011-12, a contractor hired by NCDEQ surveyed the park and established boundaries for waste along with adjacent properties including nearby Guilford County Schools property. From 2012-2016 a series of remedial investigations completed by the NCDEQ contractor included waste boundary delineation, surveying, soil cover, surface water, sediment and landfill gas screenings. NCDEQ experienced several funding challenges and third-party contractor issues which lead to delays in the project from 2016 to 2020.

In 2020, researchers from UNCG and Cone Health received a three-year award from the Robert Wood Johnson Foundation to be Interdisciplinary Research Leaders for Bingham Park environmental health research. This resulted in the creation of the community-led Bingham Park Environmental Justice Team. This Team is comprised of community members and representatives from several organizations including Collaborative Cottage Grove, Greensboro Housing Coalition, New Hope Community Development Group, Cone Health, and the UNCG Center for Housing and Community Studies. This Team has engaged in regular calls discussing a myriad of topics including remediation options with NCDEQ, health outcomes with epidemiologists, and environmental justice with the EPA. Results from these efforts have included:

- Requests from the City to NCDEQ to conduct a comprehensive investigation of the park (within the limits of previous identified soil impacts) because the earlier NCDEQ assessments were primarily focused along the creek and perimeter of the park and did not fully assess the interior of the park property.
- The study of additional remediation options including removal of waste from the site.
- Increased awareness of the project and needs, communication, and collaboration between all parties involved.

Investigation and Results

In 2020 the City requested that the NCDEQ conduct a **Comprehensive Investigation** of the park (within the limits of previous identified soil impacts) because prior NCDEQ assessments were primarily focused along the creek and park boundaries and did not fully assess all areas of the park. The resulting investigation occurred in spring 2022 and included:

- The entire park was gridded into 100-foot intervals so that the investigation would collect data from every 100 feet across the entire site.
- The borings (sampling locations) were advanced (drilled) to bedrock (refusal) to get a better understanding of the depth of the impacted soils. Each boring has soil samples collected and analyzed for lead.

The results included:

- Air monitoring during the investigation did not identify any elevated concentrations of lead or asbestos. According to NCDEQ, this is a good indicator that the selected remedial option will have little to no impact on the surrounding community.
- 179 waste samples were collected during the March and April 2022 sampling event. The average level of total lead was 2,007 milligram per kilogram (mg/kg). The median (mid-point of 179 samples) of total lead was 1,510 mg/kg. 11 samples were reported with total lead levels above 5,000 mg/kg. Two samples were reported with total lead levels above 10,000 mg/kg (SB-7 and SB-14).
- The results from the highest concentrations showed the lead was not mobile and seemed to be fixed (attached/bonded) to the soil.

Investigation and Results

The key findings and takeaways included:

- The samples exhibiting the highest lead concentrations were also used in testing to see if a stabilizer (chemical or process) was needed to allow the material to be disposed of at a “Non-hazardous” landfill.
 - The results of the tests showed that using a chemical agent, and in a separate experiment, concrete the lead was contained (stabilized) and could be disposed of as non-hazardous in a traditional solid waste landfill. The leaching test showed that there was no need for any stabilization process because the lead has bonded to the soil making it immobile (not able to move) and can be disposed of (without treatment) in a non-hazardous waste landfill.
- The primary constituents of concern in the soil are metals. The elevated levels of metals onsite exceed the NCDEQs soil standards.
- The soil does not “leak” lead onto adjacent properties or water systems. The lead has a “bond” to the soil that keeps it in place. The waste located on the park property is not contributing to groundwater water contamination on or migrating off site.
- The depth of soil is not as deep as the NCDEQ first projected. Less soil would need to be removed if the full removal option was selected. (206,000 CY)
- The waste is classified as non-hazardous but will need post excavation sampling to confirm. The waste located on the park property is not contributing to surface water contamination on or migrating off site.

Investigation and Results

Investigations conducted by contractors of the NCDEQ have determined the following:

- Waste is up to 20-feet-thick and covers about 12.7 acres.
- Soil cover and vegetation prevents park users from coming into physical contact with the waste except along 1,200 feet of the onsite streambank where exposed waste presents physical hazards. Physical hazards at the site include broken glass, brick, plastic, metal pieces, and other types of debris. The incinerated waste located onsite contains all the items listed above.
- Because of the physical hazards present, park users could be exposed by entering, playing, or wading in the stream.
- Contamination is contained onsite according to samples taken outside the waste disposal area.
- No harmful or explosive landfill gases were identified in landfill gas monitoring.
- The community surrounding the site uses public water for drinking purposes. There are no known drinking water wells within 1,000 feet of the landfill.

Based upon its assessment and risk calculations, the NCDEQ advised:

- Park users should not drink water from or wade in the stream channel.
- Digging in or eating the soil could put a child or other park user at risk for exposure to arsenic, iron, manganese, lead, and SVOCs.

Resulting from this assessment, at the request of NCDEQ the City placed signs at Bingham Park advising that visitors should not access the stream or dig in the soil at the property.

Acreage of Waste Extent: 11.04 Ac.

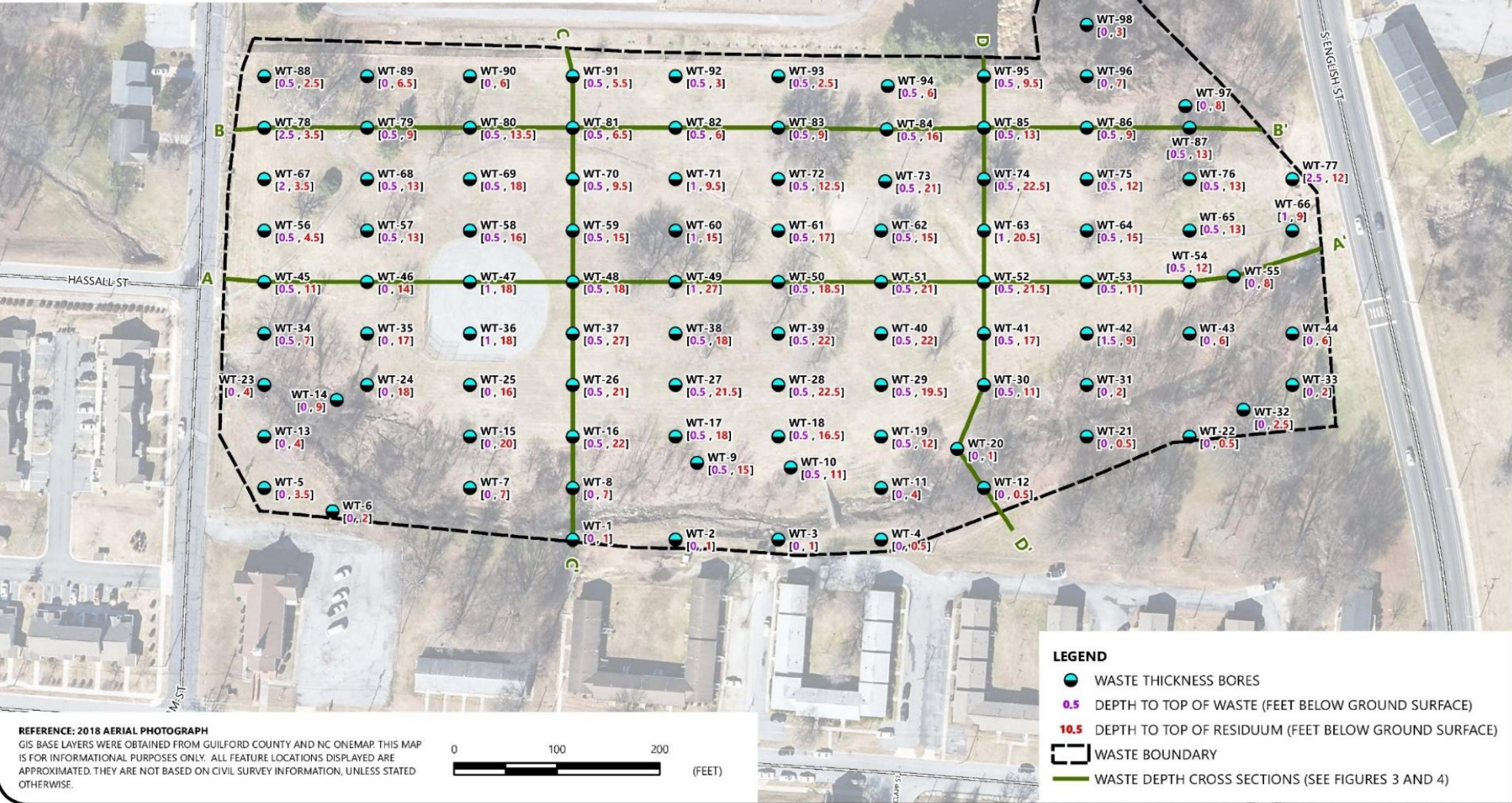
Modelled Average Waste Depth: 10.52 Feet

Waste Volume Estimate	
Cubic Feet	5,057,765
Cubic Yards	187,325

Waste volume was calculated as the volumetric difference between a 3D model of the top of waste and a 3D model of the top of residuum.

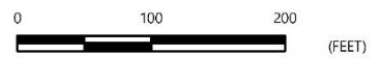
High End Waste Volume Estimate	
Cubic Feet	5,563,542
Cubic Yards	206,057

High end estimate includes a 10% increase in waste over the 3D modelled waste volume.



Drawing Path: T:\ENVA\Projects\2020\22050076_NC010.LF_Bingham Park_Greensboro\4_ENVA\GIS_02_WASTE_THICKNESS.mxd plotted by Dhommans 07-15-2022

REFERENCE: 2018 AERIAL PHOTOGRAPH
 GIS BASE LAYERS WERE OBTAINED FROM GUILFORD COUNTY AND NC ONEMAP. THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. ALL FEATURE LOCATIONS DISPLAYED ARE APPROXIMATED. THEY ARE NOT BASED ON CIVIL SURVEY INFORMATION, UNLESS STATED OTHERWISE.



- LEGEND**
- WASTE THICKNESS BORES
 - 0.5 DEPTH TO TOP OF WASTE (FEET BELOW GROUND SURFACE)
 - 10.5 DEPTH TO TOP OF RESIDUUM (FEET BELOW GROUND SURFACE)
 - WASTE BOUNDARY
 - WASTE DEPTH CROSS SECTIONS (SEE FIGURES 3 AND 4)

Assessment of Bingham Park at 100 ft. Intervals, Spring 2022

Waste Thickness



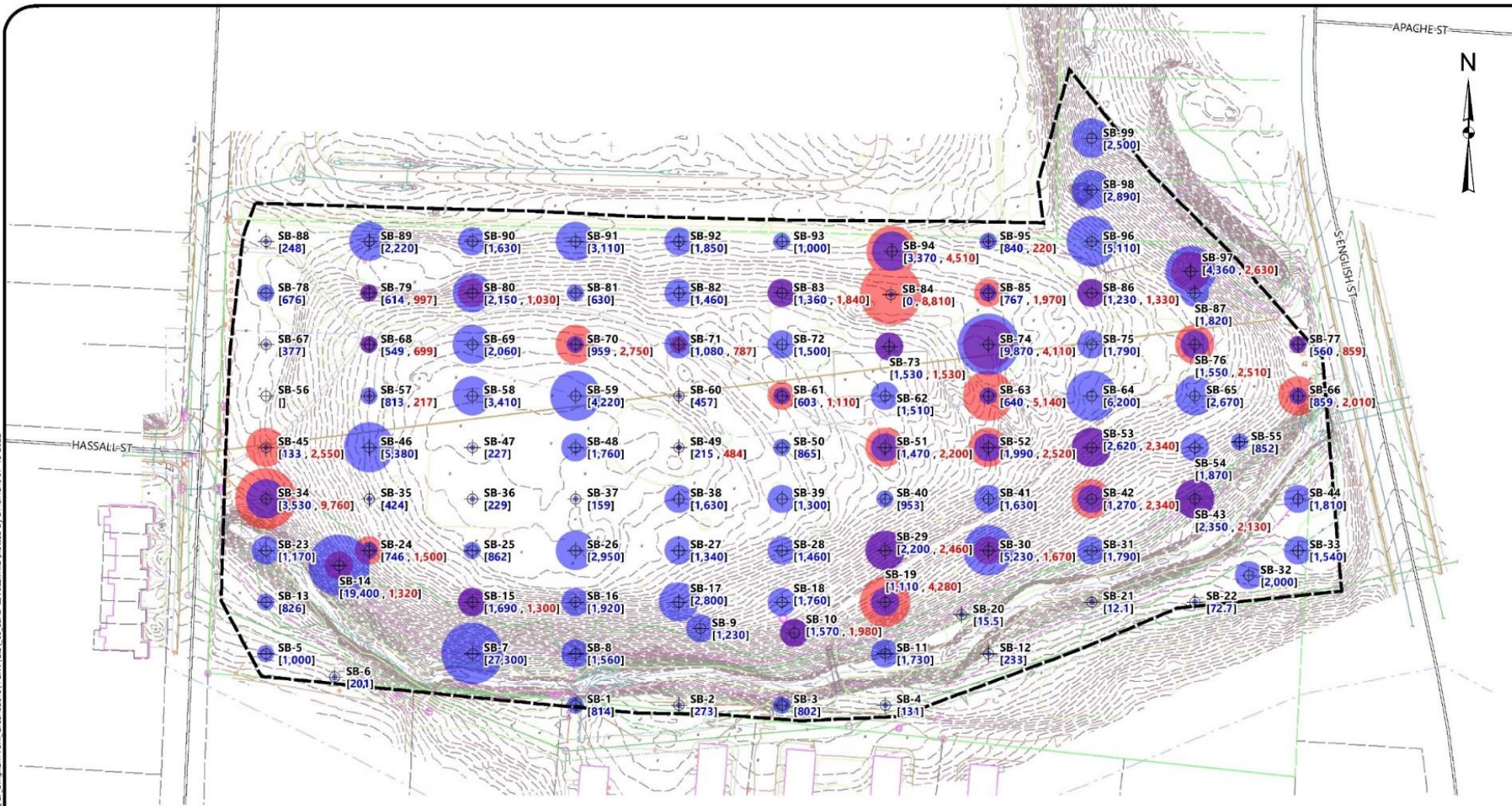
WASTE THICKNESS

BINGHAM PARK TASK ORDER 244RA-13
 401 BINGHAM STREET
 GREENSBORO, GUILFORD COUNTY, NORTH CAROLINA

SCALE:
1" = 100'
 DATE:
7-15-22
 PROJECT NUMBER
22050076
 FIGURE NO.

Assessment of Bingham Park at 100 ft. Intervals, Spring 2022 Lead Levels

Drawing Path: \\NENA\Projects\2022\22050076_NCDEQ LF Bingham Park_Greensboro\4 ENV\GIS_06_LEAD_LEVELS.mxd plotted by Dismore on 07-15-2022



LEAD LEVELS AT 0-5 FEET AND 5-10 FEET BELOW GROUND SURFACE

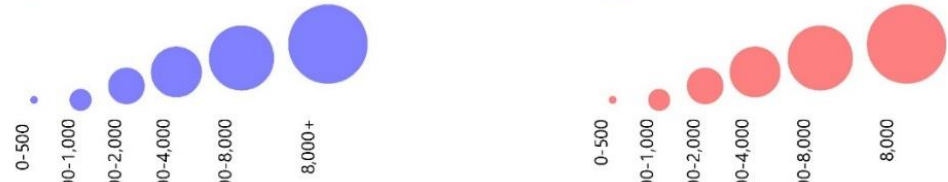
BINGHAM PARK TASK ORDER 244RA-13
401 BINGHAM STREET
GREENSBORO, GUILFORD COUNTY, NORTH CAROLINA

LEGEND

- SOIL/WASTE SAMPLE BORINGS
- WASTE BOUNDARY

0.5 LEAD CONCENTRATION IN SAMPLES AT 0-5' BGS IN MG/KG

10.5 LEAD CONCENTRATION IN SAMPLES AT 5-10' BGS IN MG/KG



BGS = Below Ground Surface

mg/kg = Milligrams per Kilogram

SCALE:

1" = 100'

DATE:

7-15-22

PROJECT NUMBER

22050076

FIGURE NO.

6

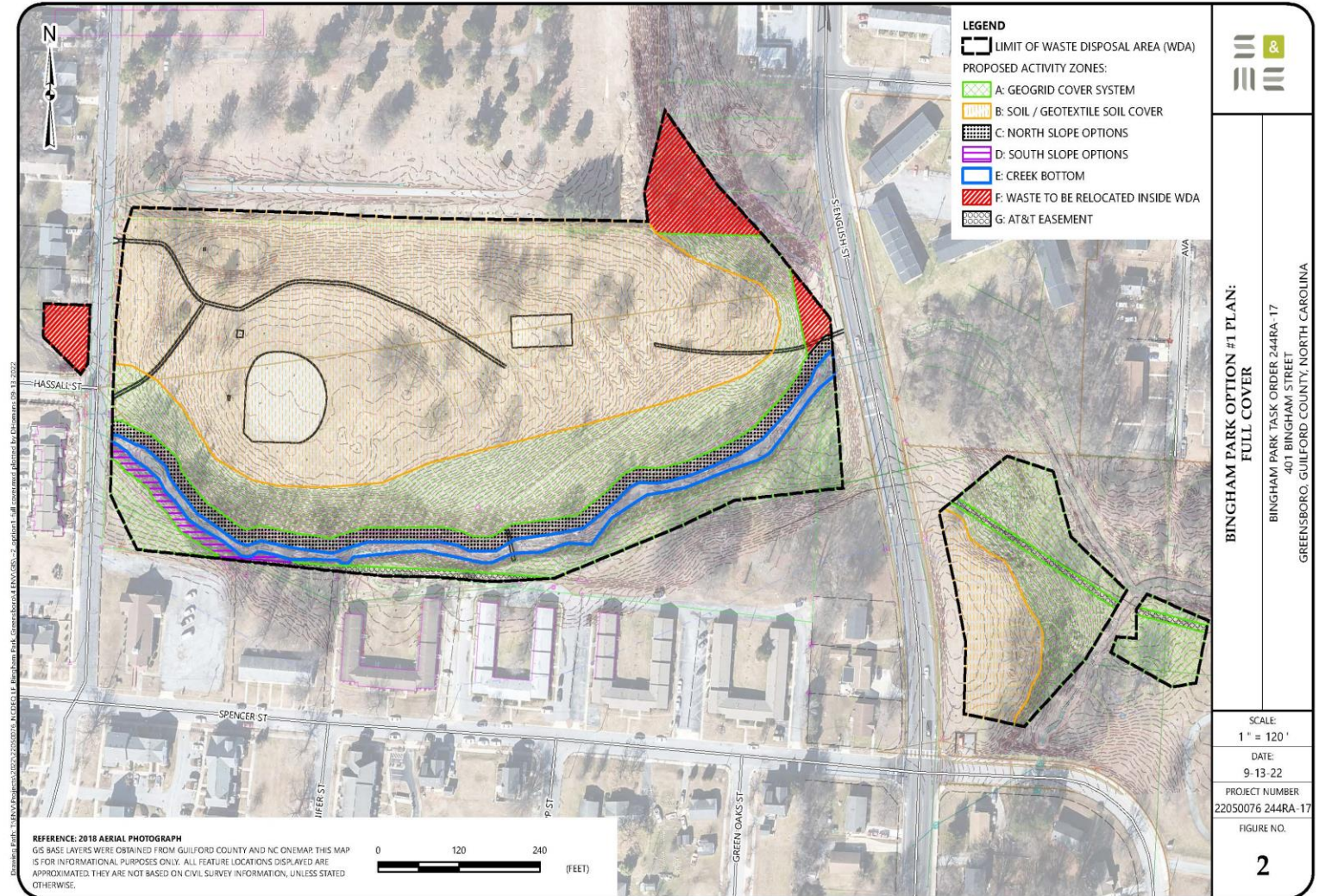
Remediation Options

- Option 1: Cap and Cover
 - Waste kept in place; entire park would be capped with a geotextile grid and covered with new soil to keep grid in place.
 - Significant limitations on what amenities can be returned.
- Option 2: Modified Cap and Cover
 - Waste kept in place, entire park would be capped with a geotextile grid and covered with new soil to keep grid in place. Some mature trees to remain.
 - Significant limitations on what amenities can be returned.
- Option 3: Limited Consolidation
 - Partial waste removal in specific locations. Remainder of the park would be capped with a geotextile grid and covered with new soil to keep grid in place.
 - Significant limitations on what amenities can be returned. Location with partial removal may allow for limited amenities.
- Option 4: Full Removal
 - Full removal of all waste; entire park would be covered with new soil.
 - Few limitations on what amenities can be returned following community engagement.

Option 1 – Cover System

Option 1 Cover System

- Install a cover system over the waste disposal area consisting of geofabric and geocells. Some waste relocation and stabilization of the southwestern stream bank is included. The stream stabilization includes limited relocation of waste, installation of Envirolock geobags or geolifts, creating a soft armoring of the of the bank and a rock toe. The geobags or geolifts are layered to develop a stable wall where vegetation is grown on and into the wall materials. This option also includes removal of all trees and installation of limited park amenities.



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Cap and Cover Geo Textile Grid



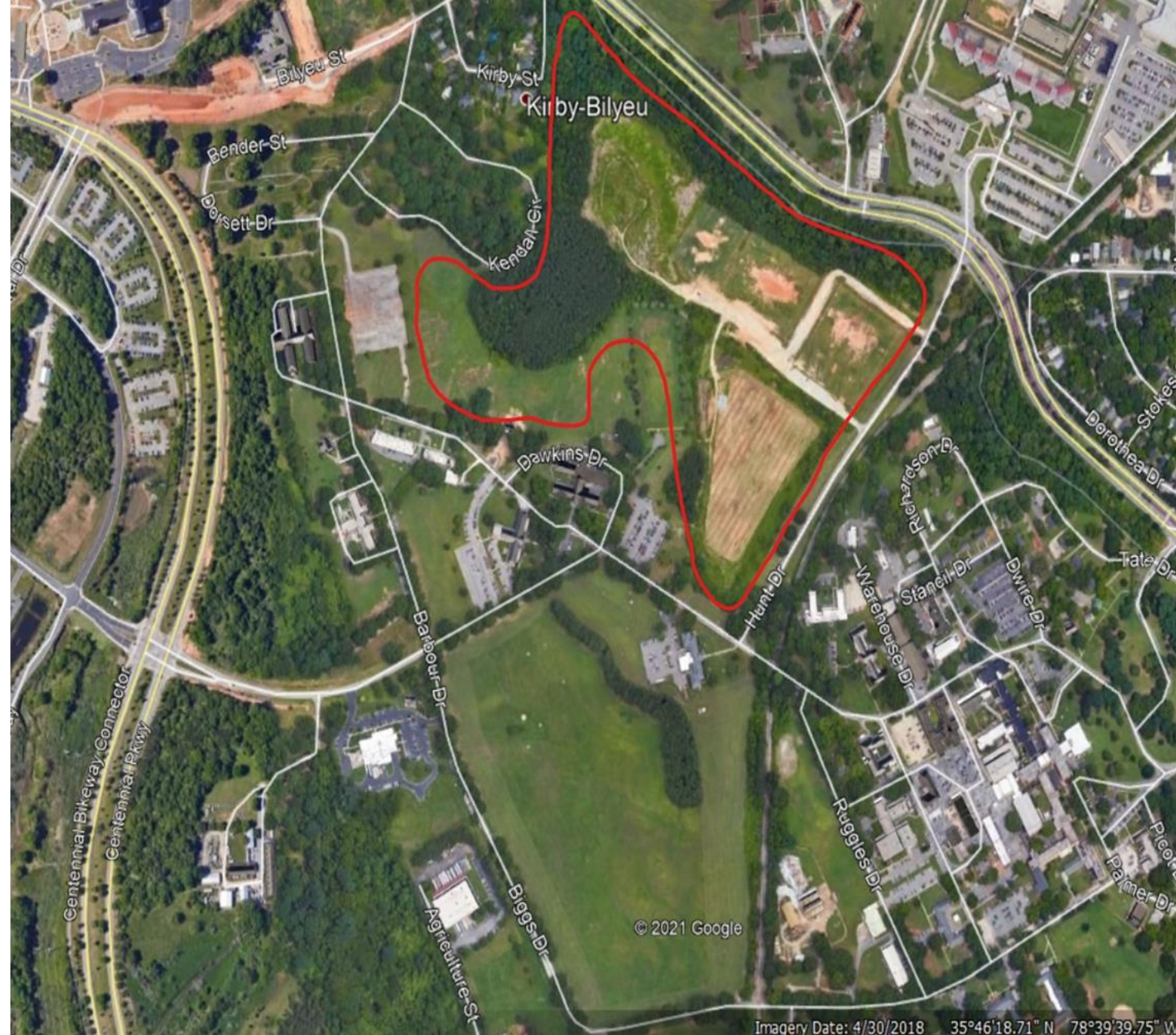
Old Raleigh LF #11 Dorthea Dix Park Raleigh, Wake County

Site Location: 2105 Umstead Drive

Directions: Take I-40 East to Exit 297 for Wheeler Road. Take Wheeler Road to Centennial Parkway. Take Centennial Parkway to Umstead Drive.

Remedial Action Plan: Development pending

Current Use: Park



Central Park Winston-Salem, Forsyth County

Site Location: Intersection of South Main Street and Salem Avenue

Directions: Take I-40 W to Silas Creek Parkway in Winston-Salem. Take exit 193C from I-40W. Take S Main Street to Central Park.

Remedial Action Plan: Waste remains in place with cover.

Current Use: Park



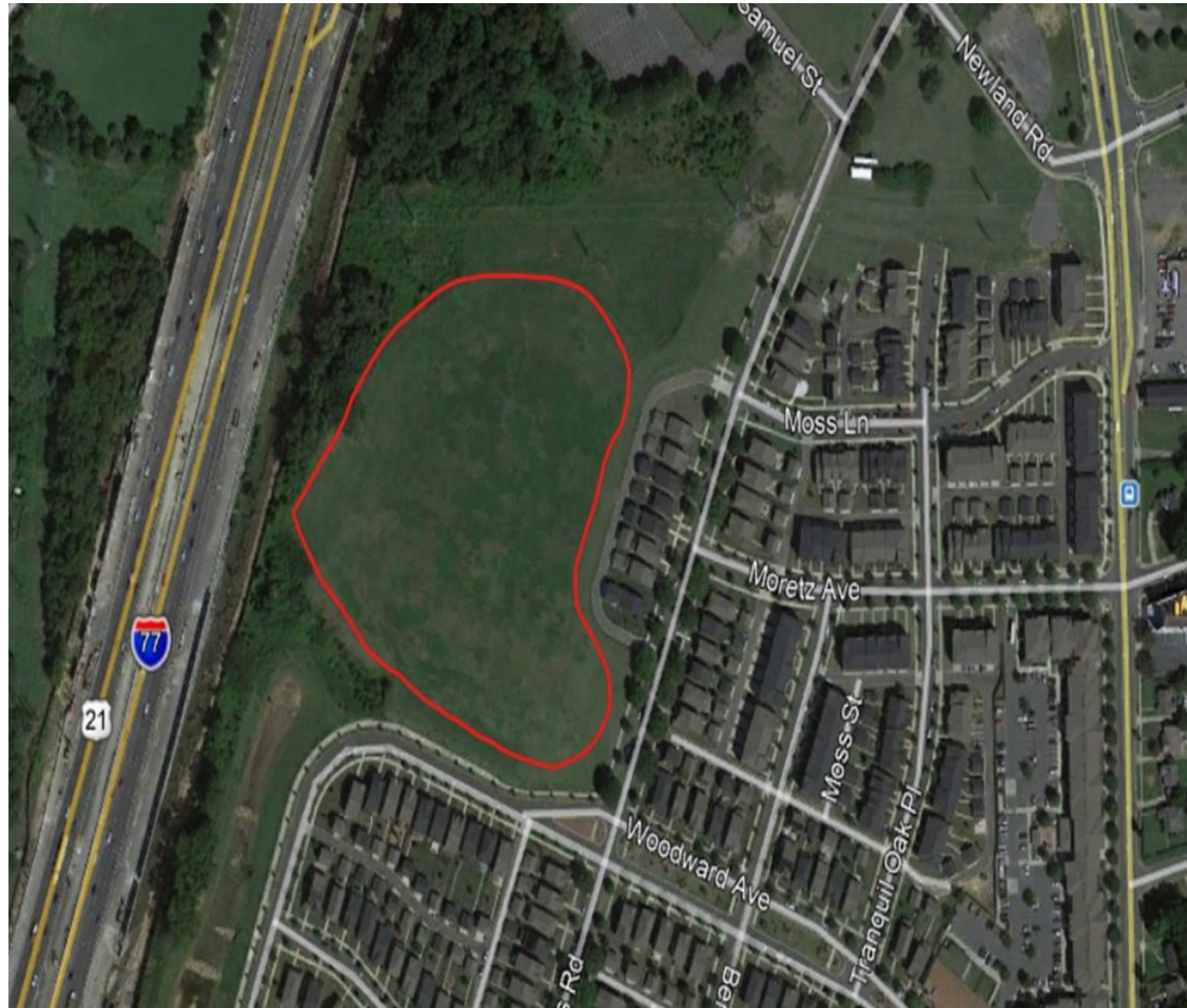
Double Oaks Charlotte, Mecklenburg County

Site Location: Intersection of Double Oaks Road and Moss Lane

Directions: Take I-85 to Statesville Avenue. Use Exit 39 from I-85 South. Continue on Statesville Avenue to Newland Road then to Double Oaks Road.

Remedial Action Plan: Waste remains in place with cover

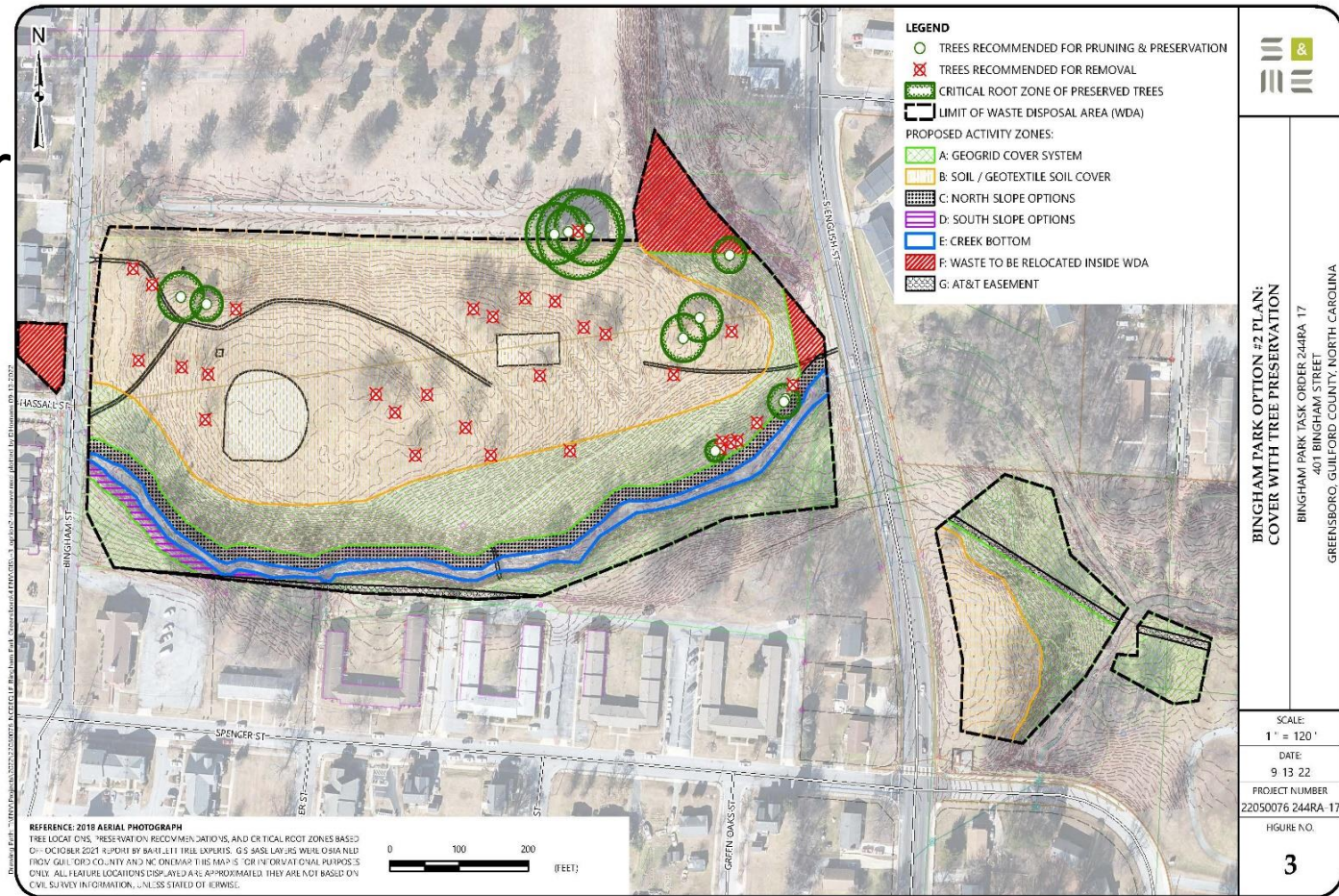
Current Use: Park



Option 2 – Cover System while protecting existing trees

Option 2 Cover System while protecting existing mature trees

- Install a cover system over the waste disposal area consisting of geofabric and geocells while maintaining existing mature trees on site. The stream stabilization in Option 1 is also included in Option 2. This option includes installation of limited park amenities.



Option 2 – Cover System while protecting existing trees

Option 2 Cover System while protecting existing mature trees

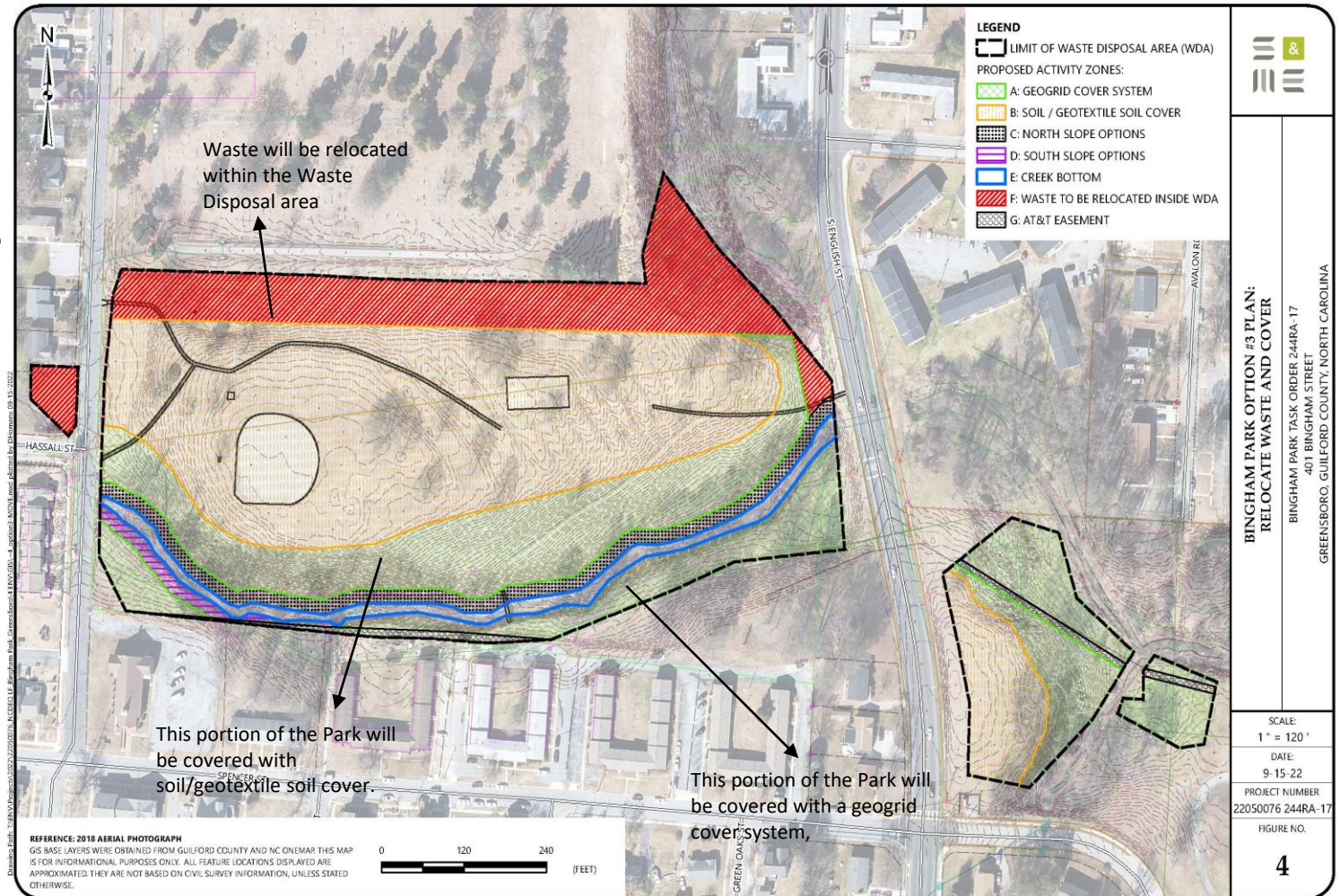
- Install a cover system over the waste disposal area consisting of geofabric and geocells while maintaining existing mature trees on site. The stream stabilization in Option 1 is also included in Option 2. This option includes installation of limited park amenities.



Option 3 – Cover System, waste consolidation and tree restoration

Option 3 Cover System, waste consolidation, and tree restoration

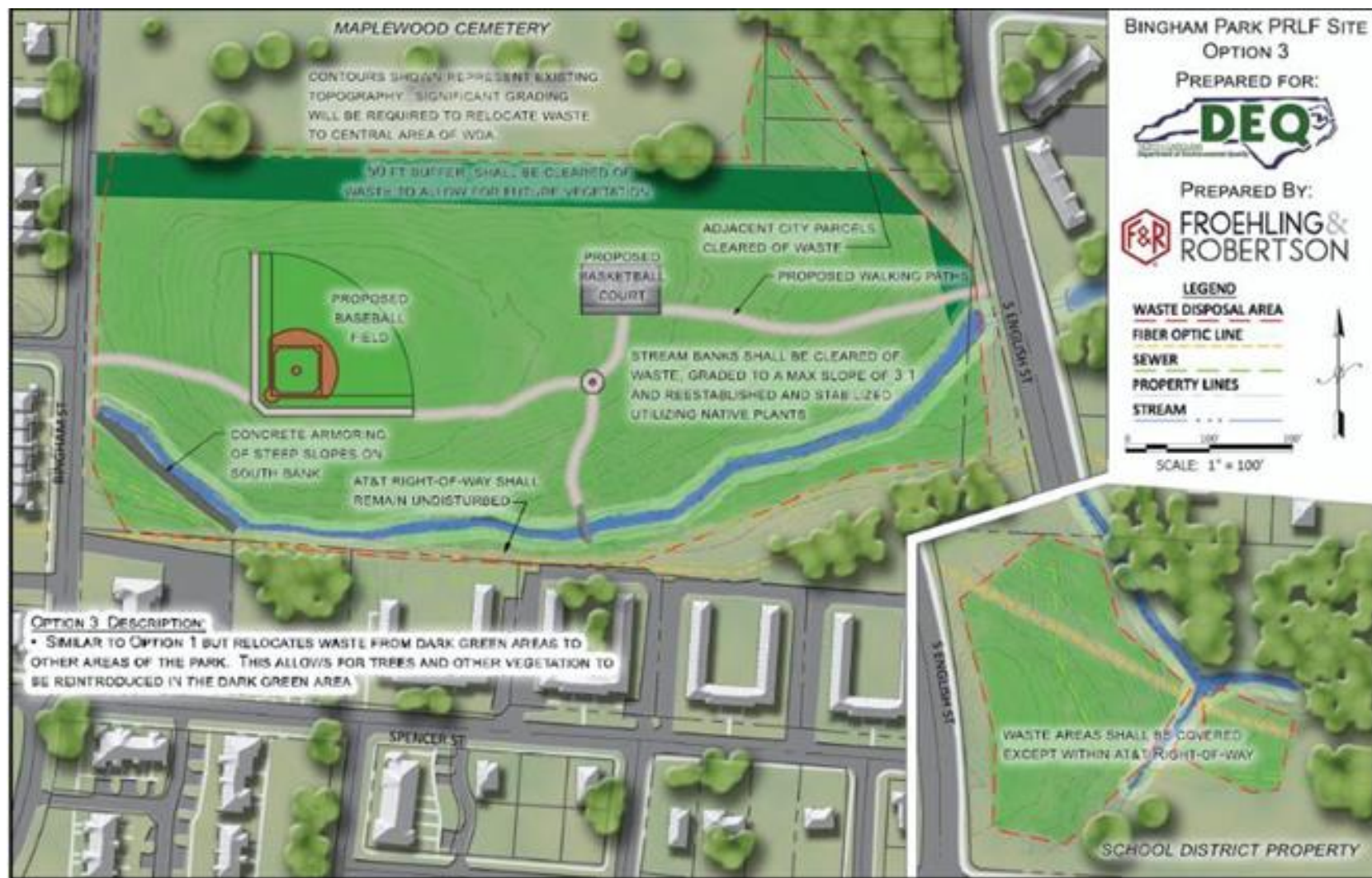
- Relocate waste from areas around the waste disposal area where waste is thinner and consolidating that waste in other areas of the waste disposal area. A cover system would then be installed over the waste disposal area. Areas where waste was removed could then be revegetated and utilized and natural areas within the park. The stream stabilization in Option 1 is also included in Option 3. This option also includes removal of all trees and installation of park amenities in designated areas.



Option 3 – Cover System, waste consolidation and tree restoration

Option 3 Cover System, waste consolidation, and tree restoration

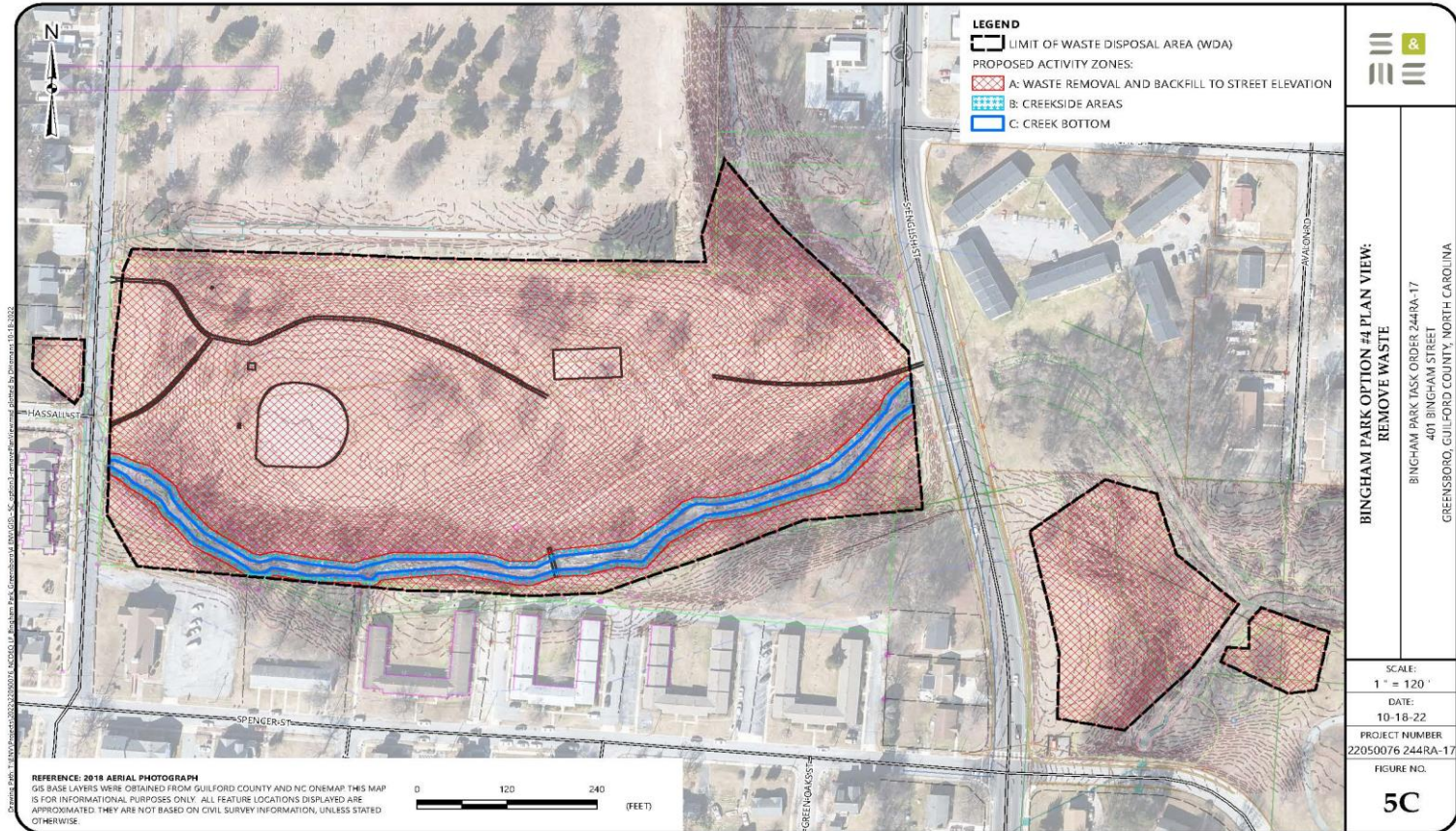
- Relocate waste from areas around the waste disposal area where waste is thinner and consolidating that waste in other areas of the waste disposal area. A cover system would then be installed over the waste disposal area. Areas where waste was removed could then be revegetated and utilized and natural areas within the park. The stream stabilization in Option 1 is also included in Option 3. This option also includes removal of all trees and installation of park amenities in designated areas.



Option 4 – Full Waste Removal

Option 4 Full Waste Removal

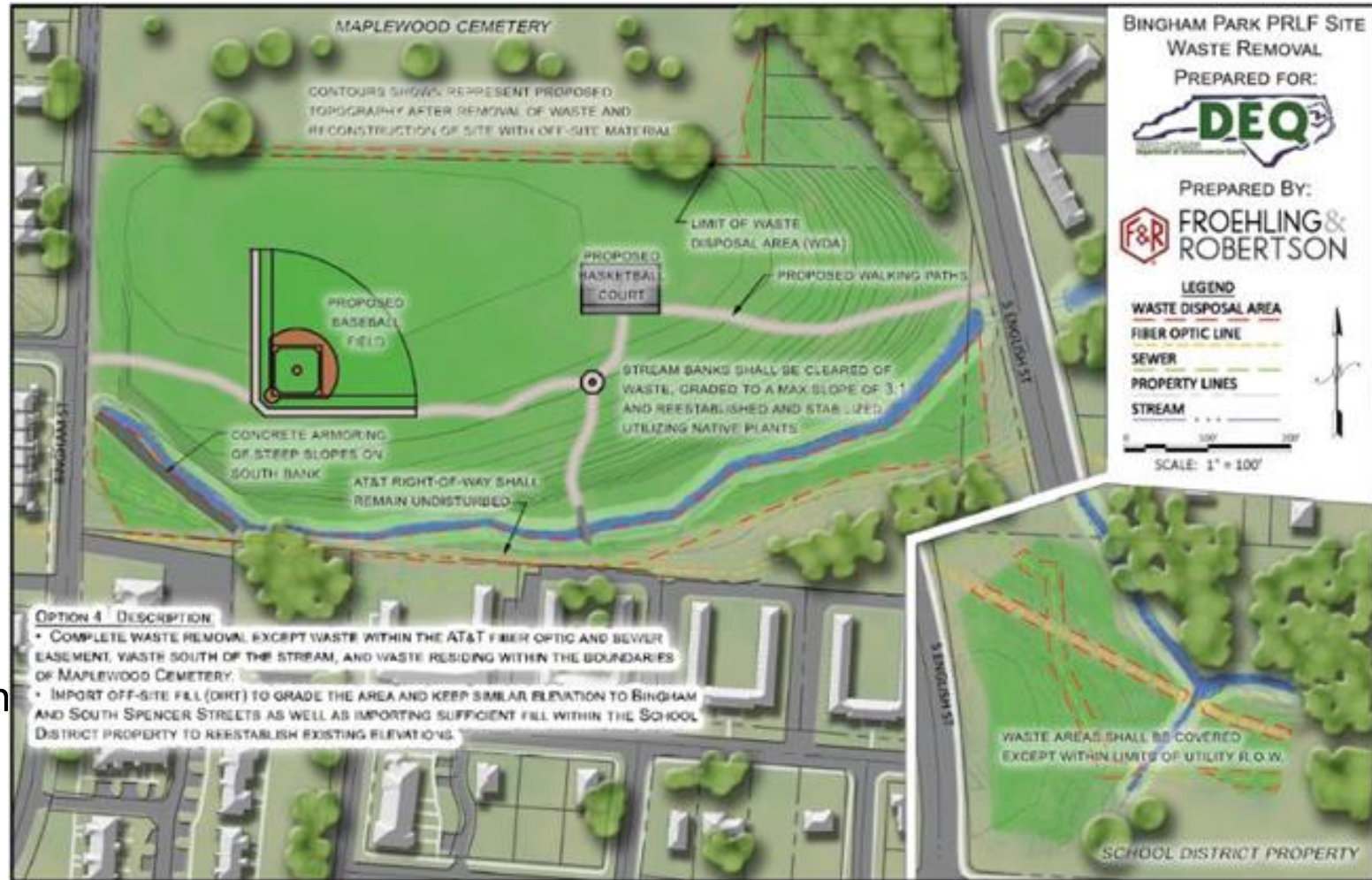
- Full waste removal from the site including Bingham Park, Maplewood Cemetery, and Board of Education property. Includes excavation, loading, transportation and disposal of waste at an approved MSW Landfill.
- The former Waste Disposal Area will then be backfilled and covered with topsoil and vegetated. The site will be restored to approximately match the street elevations of Bingham Street and English Street.
- The stream will be rebuilt to its original flow path. Large trees will be installed, and all park amenities will be rebuilt which could including paved walking paths, baseball field, and basketball court or other amenities identified through community engagement.



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Option 4 Full Waste Removal

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Preliminary Remediation Costs

TABLE 1
Construction Cost Estimate Summary & Schedule
Bingham Park
Greensboro, Guilford County, North Carolina

Prepared: December 2022

Option #1 Limited Waste Relocation, Cover System & Stabilize Streambanks		
35 Workdays	Mobilization / Set-Up / Erosion & Sedimentation Control, Haul Roads	
Waste Relocate & Backfill 66 Workdays	Excavate, Load, Onsite Waste Relocate 20,000 Cubic Yards 1,400 Trucks 70 Trucks Per Day 9 Trucks Per Hour Install Geogrid & Geotextile	Backfill & Compaction 19,000 Cubic Yards 1,300 Trucks 34 Trucks Per Day 5 Trucks Per Hour
	50 Work Days	Site Restoration, Build Park Amenities, Remove E&SC Features, Demobilization
\$6,691,434 9 3/4 Work Months 174 Workdays (with 15% contingency)		

Option #2 Limited Waste Relocation, Protect Trees, Cover System & Stabilize Streambanks		
35 Workdays	Mobilization / Set-Up / Erosion & Sedimentation Control, Haul Roads	
Waste Relocate & Backfill 71 Workdays	Excavate, Load, Onsite Waste Relocate 20,000 Cubic Yards 1,400 Trucks 70 Trucks Per Day 9 Trucks Per Hour Install Geogrid & Geotextile, Protect Trees	Backfill & Compaction 19,000 Cubic Yards 1,300 Trucks 34 Trucks Per Day 5 Trucks Per Hour
	50 Work Days	Site Restoration, Build Park Amenities, Remove E&SC Features, Install Trees, Demobilization
\$6,859,612 10 Work Months 179 Workdays (with 15% contingency)		

Option #3 Waste Consolidation, Cover System, Install Trees & Stabilize Streambanks		
35 Workdays	Mobilization / Set-Up / Erosion & Sedimentation Control, Haul Roads	
Waste Relocate & Backfill 76 Workdays	Excavate, Load, Onsite Waste Consolidation 30,000 Cubic Yards 2,050 Trucks 70 Trucks Per Day 9 Trucks Per Hour Install Geogrid & Geotextile, Install Trees	Backfill & Compaction 34,000 Cubic Yards 2,320 Trucks 34 Trucks Per Day 5 Trucks Per Hour
	50 Work Days	Site Restoration, Build Park Amenities, Remove E&SC Features, Install Trees, Demobilization
\$8,054,420 10 1/4 Work Months 185 Workdays (with 15% contingency)		

Option #4A Full Waste Removal, Backfill to Street Levels & Rebuild Streambanks		
35 Workdays	Mobilization / Set-Up / Erosion & Sedimentation Control, Haul Roads	
Excavation & Backfill 131 Workdays	Excavate, Load, Transport & Dispose Waste 206,000 Cubic Yards 14,100 Trucks 130 Trucks Per Day 16 Trucks Per Hour 6 1/2 Work Months	Backfill & Compaction 168,000 Cubic Yards 11,455 Trucks 94 Trucks Per Day 12 Trucks Per Hour
	50 Work Days	Site Restoration, Build Park Amenities, Remove E&SC Features, Install Trees, Demobilization
\$39,859,526 13 3/4 Work Months 248 Workdays (with 15% contingency)		

Work Days = Actual On-Site Work Days

Work Weeks = Work Days ÷ 5 (e.g. 28 work days = 5.6 work weeks)

Work Months = Work Days ÷ 18 (e.g. 151 work days = 8.4 work months)

18 workdays per month accounts for weekends, Holidays and no-work days (e.g. weather or other). NCDOT estimates their projects with 18 workdays per month.

Next Steps

- The City will hold engagement sessions with the community to select remediation options and provide input on park amenities.
- Once a remediation option is selected NCDEQ and its contractor will design a Remedial Action Plan.
- The Remedial Action Plan will be made available to the public to review and discuss via public comment process let by NCDEQ.
- A timeline for project completion will be determined based on the final plan once approved and funded.

Discussion and Questions