



Remedial Investigation Findings and Remedial Evaluation

**828 Martin Luther King Jr.
Bldv Chapel Hill, NC**

Nov. 2, 2018

Outline

- **Introduction**
- **Site History/Terminology**
- **Coal Combustion Products (CCP) Information**
- **Previous and Recent Assessment Activities**
- **Results of Assessment Activities**
- **Remedial Options**

Introduction

- **Role of Hart & Hickman**
 - **Technical Advisor to Town, Town Staff, and Town Council**
 - **Assist Stakeholders with Making the Best Decision for the Town**

Site History/Terminology



Area Where
CCPs Placed

“Elevated Area”

“Embankment”

“Lower Area”

MARTIN LUTHER KING, JR. BOULEVARD

BOLINWOOD DRIVE

RESIDENTIAL

RESIDENTIAL

STORMWATER POND

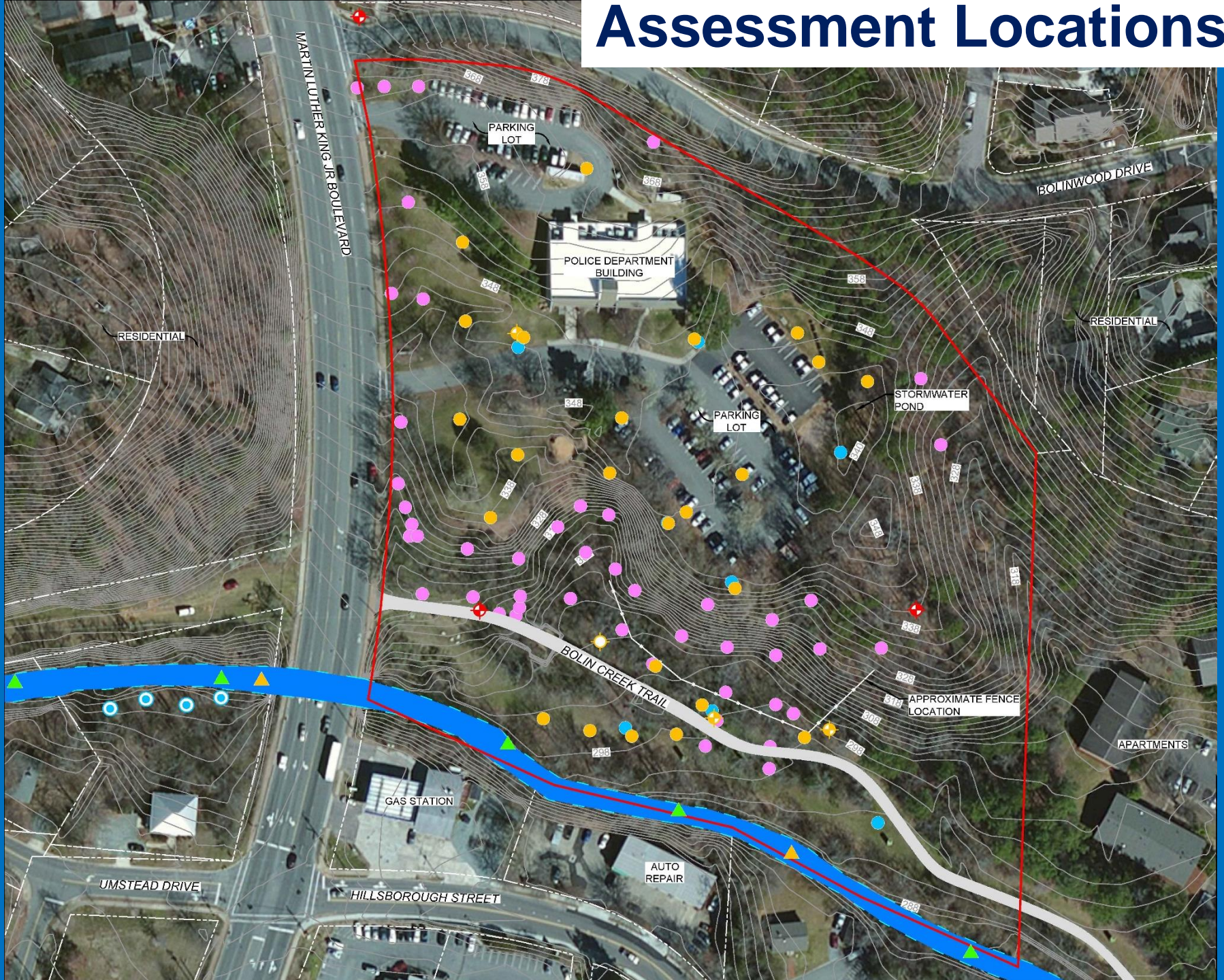
BOLIN CREEK TRAIL

APPROXIMATE FENCE LOCATION

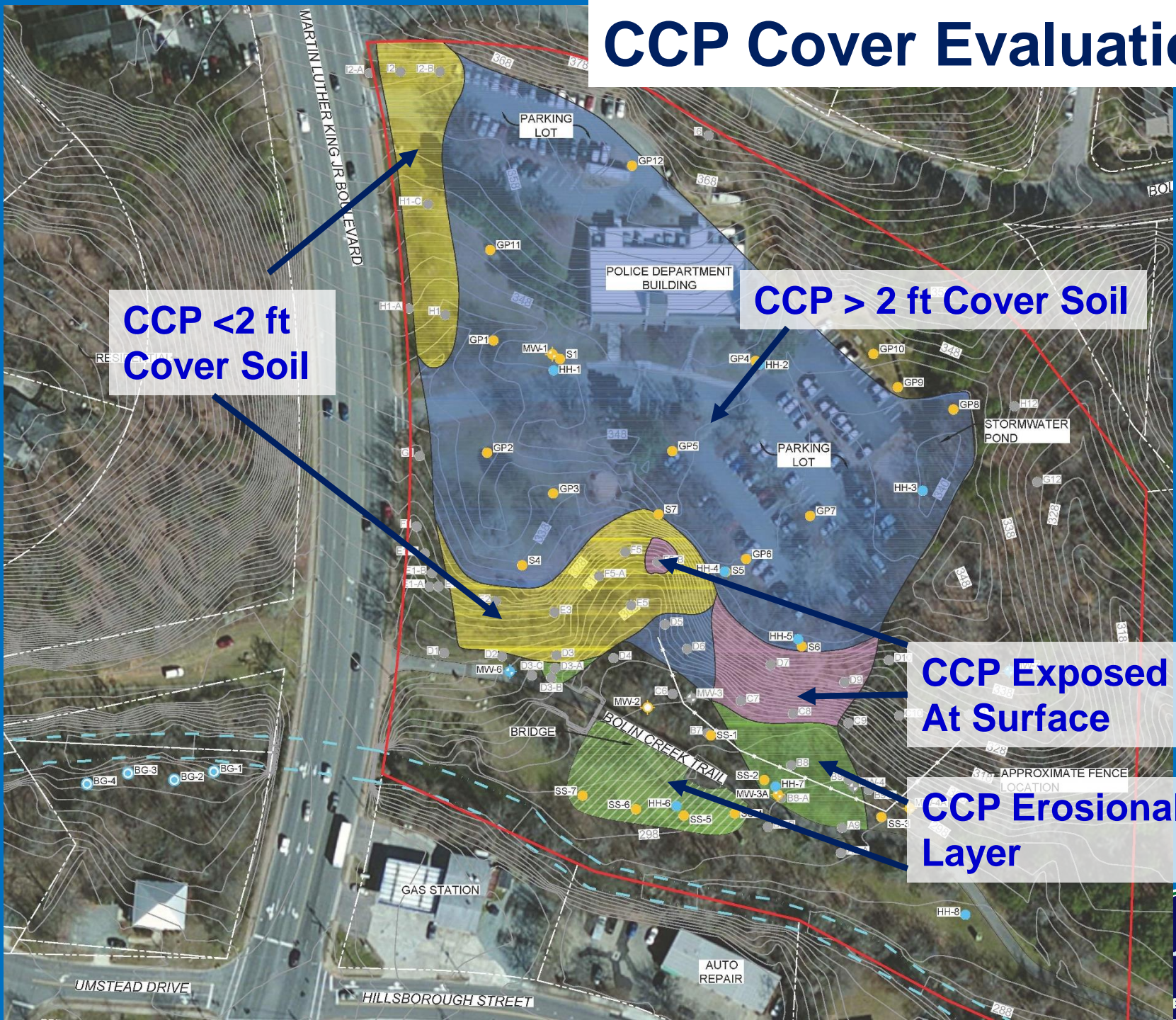
GAS STATION

APARTMENT

Assessment Locations



CCP Cover Evaluation



**CCP <2 ft
Cover Soil**

CCP > 2 ft Cover Soil

**CCP Exposed
At Surface**

**CCP Erosional
Layer**

Coal Combustion Product Cover Evaluation



CCP <2 Ft Cover

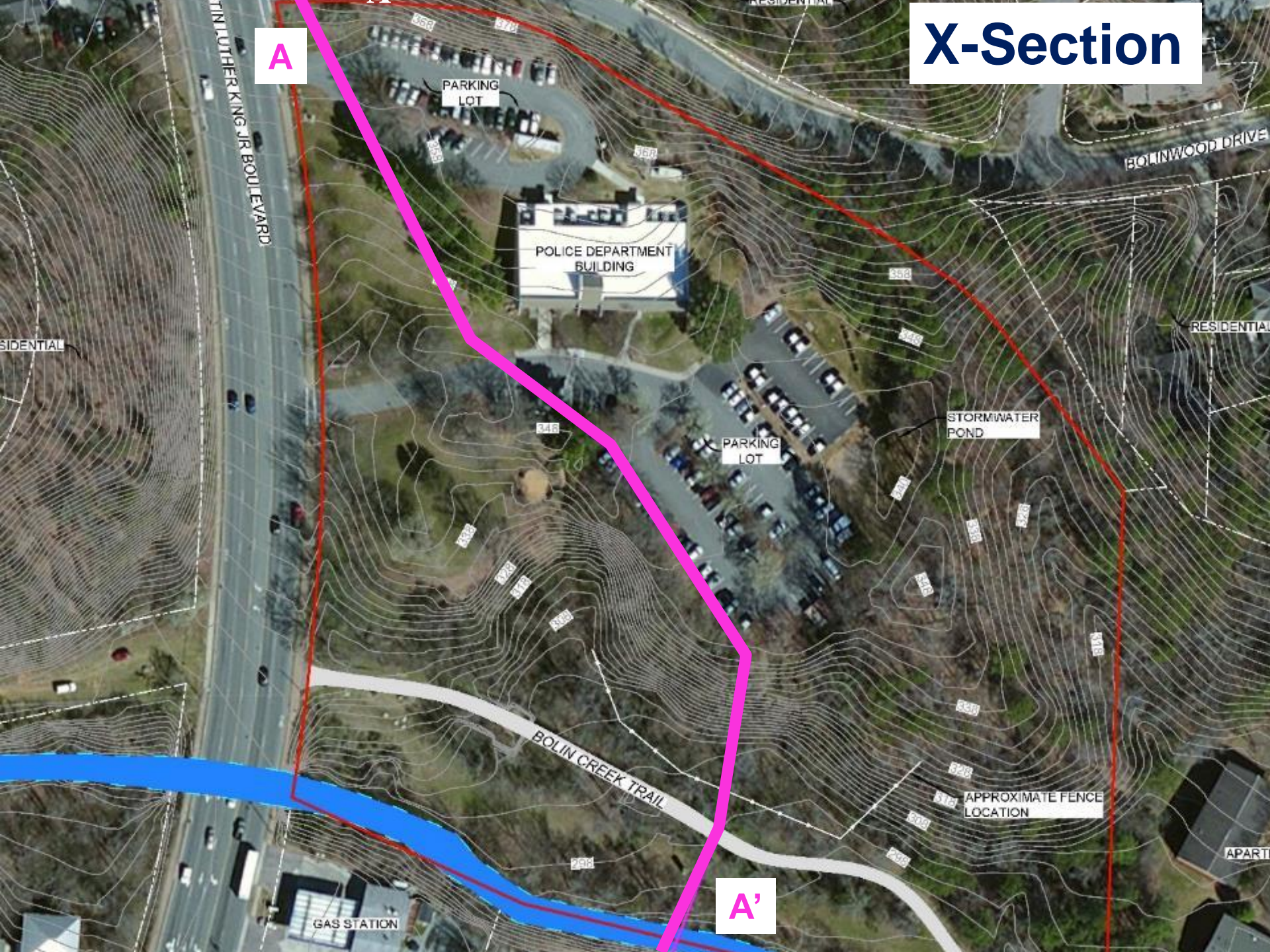


CCP Exposed At Surface



CCP Erosional Layer

X-Section



A

PARKING LOT

POLICE DEPARTMENT BUILDING

X-Section

BOLINWOOD DRIVE

TIN LUTHER KING JR BOULEVARD

RESIDENTIAL

RESIDENTIAL

STORMWATER POND

PARKING LOT

246

APPROXIMATE FENCE LOCATION

BOLIN CREEK TRAIL

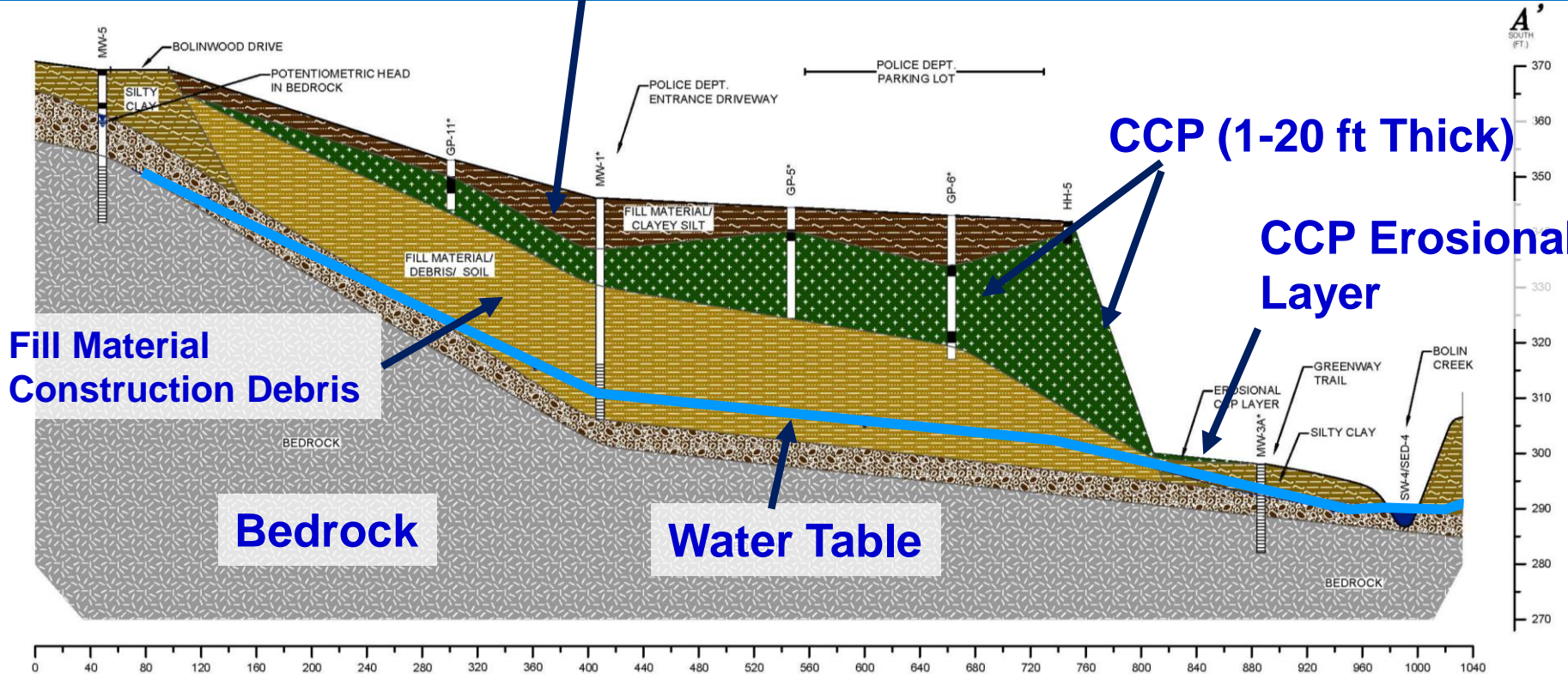
APARTMENT

GAS STATION

A'

X-Section

CCP Cover Soil



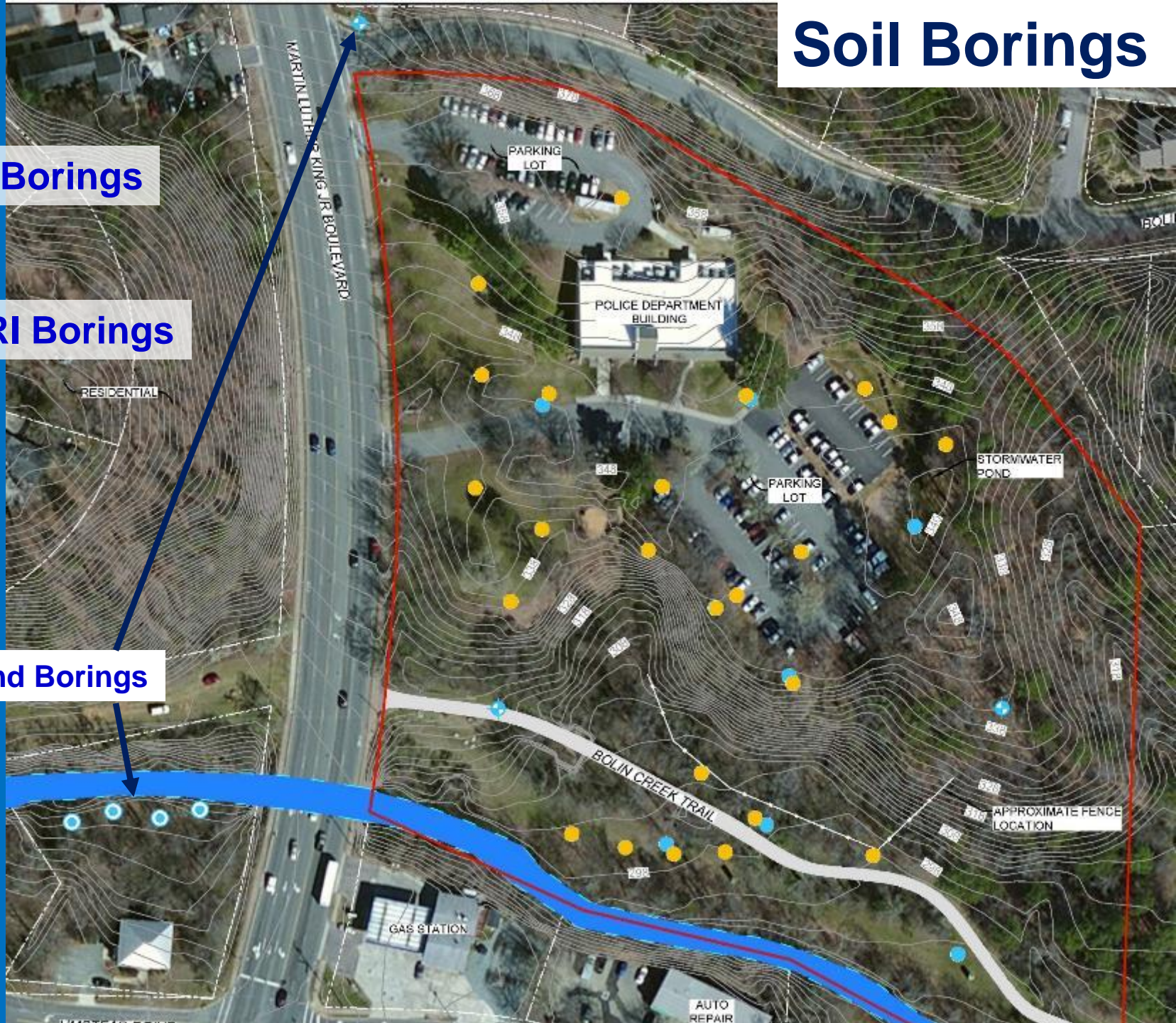
Vertical Exaggeration = 4 times

Soil Borings

Previous Borings

Phase II RI Borings

Background Borings



Soil Data Summary

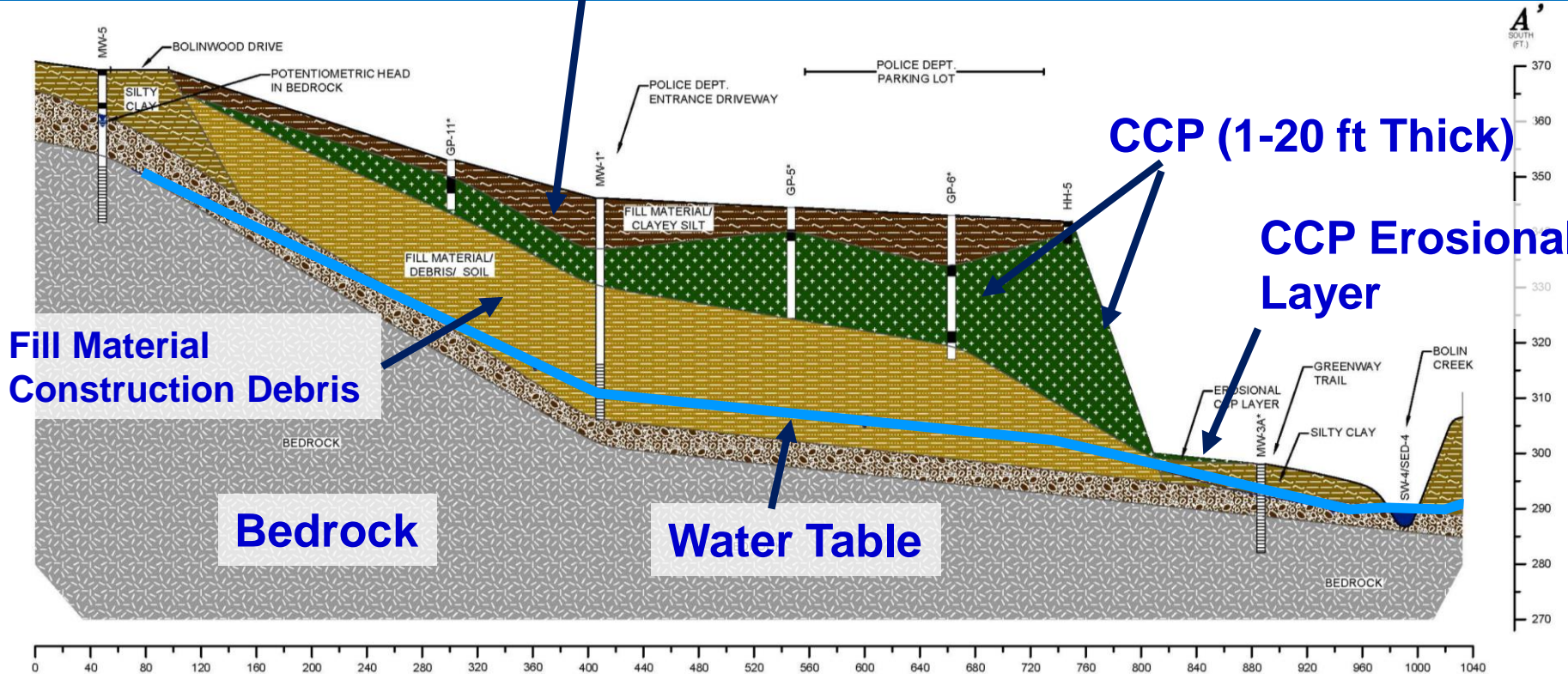
- **Primary Compound Present in CCP is Arsenic (up to 72 ppm)**
- **Primary Compound Detected in Cover Soil and Along Bolin Creek Trail is Arsenic (up to 9.9 ppm)**
- **DEQ Risk Evaluation Indicated Acceptable Risk for Use of Trail and Construction Along Trail**
 - **Recreation Scenario (110 days/yr, 1 hr per visit, Child 6 yrs and Adult 20 years, 100-200 mg/day soil intake)**
 - **Construction Worker (250 days for 1 yr, 330 mg/day soil intake)**

Groundwater



X-Section

CCP Cover Soil



Vertical Exaggeration = 4 times

Groundwater

MW-5

MW-1

COBALT	6.0
MANGANESE	8,000
VANADIUM	1.2 J

MW-7

VANADIUM	1.1 J
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MW-6

CHROMIUM	29
MANGANESE	2,500
VANADIUM	1.2 J

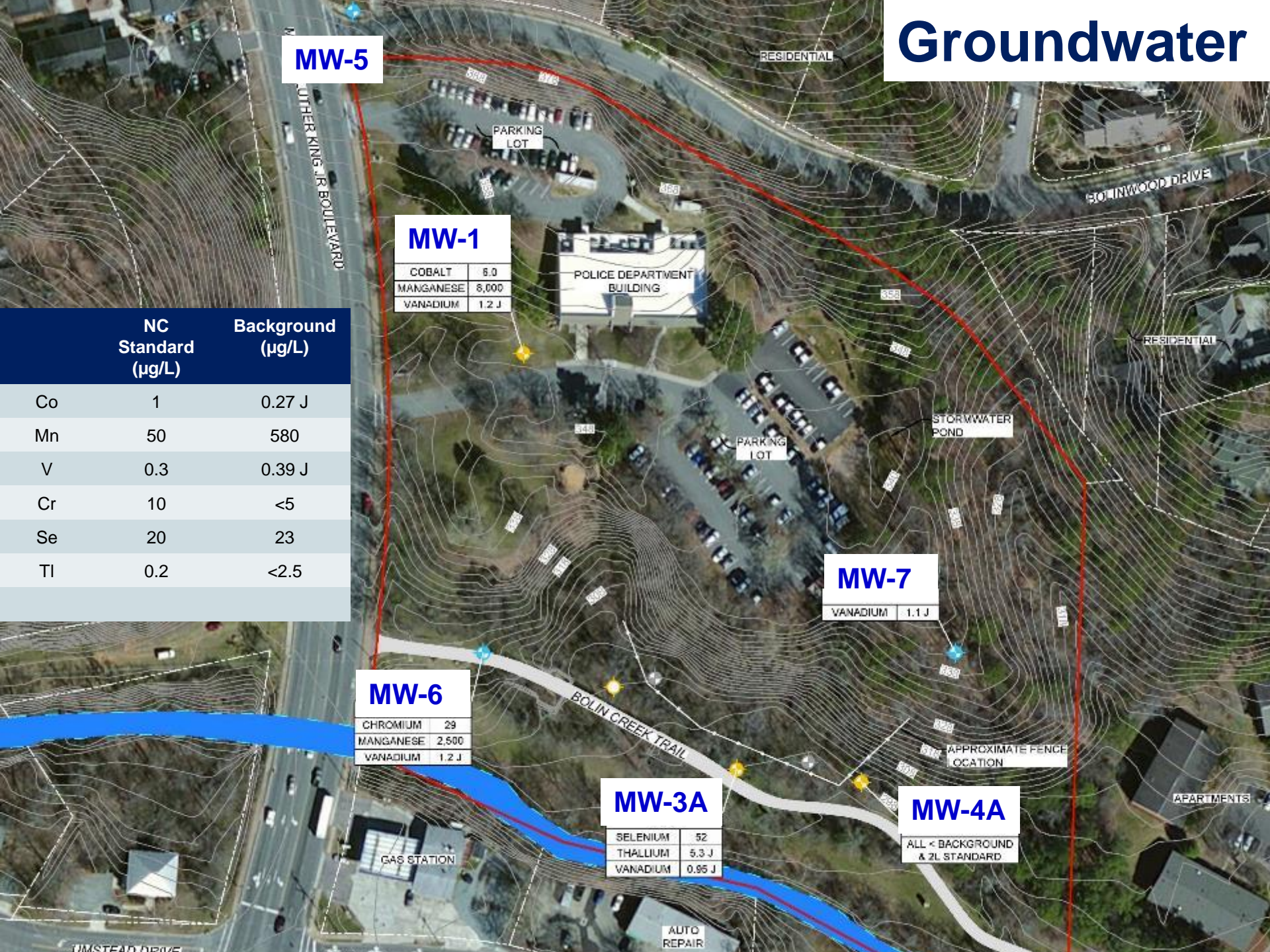
MW-3A

SELENIUM	52
THALLIUM	5.3 J
VANADIUM	0.95 J

MW-4A

ALL < BACKGROUND & 2L STANDARD

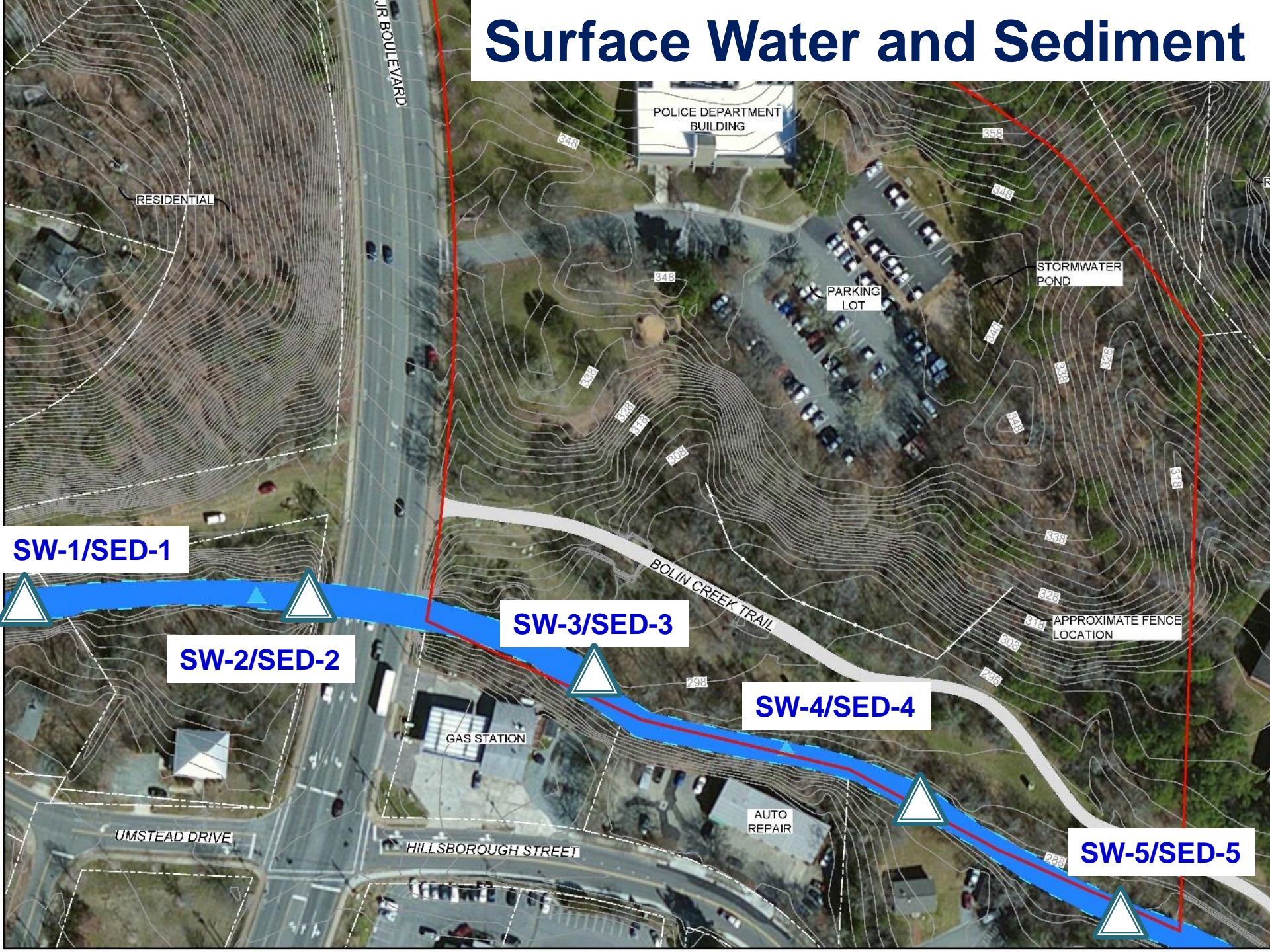
	NC Standard (µg/L)	Background (µg/L)
Co	1	0.27 J
Mn	50	580
V	0.3	0.39 J
Cr	10	<5
Se	20	23
Tl	0.2	<2.5



Groundwater Data Summary

- **Groundwater Impacts Present Below CCP Fill Area**
- **Primary Compound Present in Groundwater is Manganese**
- **Metals Migration Appears to be Limited**
- **No Groundwater Users in Area**
- **Bolin Creek is Potential Receptor for Groundwater Discharge**

Surface Water and Sediment



Surface Water & Sediment Analytical Data

- **Surface Water - Slightly Elevated Levels of Manganese (up to 34 ppb) Compared to Background (up to 11 ppb) but Below EPA Surface Water Screening Criteria (93 ppb)**
- **Sediment in Bolin Creek Primarily Large Gravel and Boulders**
- **Sediment - Concentrations of Metals Consistent with Background Sediment or Soil Samples**

Site Assessment



Remedial Options

Remedial Options Evaluated

- **Option 1 - Removal of CCPs (~90,000 tons) and Overlying Soil (~30,000 tons)**
 - **Possible Disposal Options**
 - Republic Upper Piedmont Landfill – Rougemont (40 mi)
 - Republic Uwharrie Landfill – Mt Gilead (80 mi)
 - **Length of Time ~1 Yr**
 - **\$13.4MM to \$15.9MM**

Remedial Options Evaluated

- **Option 1 - Removal of CCPs**

Advantages

- **Full Removal**
- **Likely Leads to Quicker Groundwater Concentration Reduction**

Disadvantages

- **Truck Traffic (~20,000 trips)**
- **Increased Short Term Exposure Risk**
- **Water Management in Open Excavation**
- **Could Mobilize Metals to Groundwater During Excavation**

Remedial Options Evaluated

- **Option 2 - Removal of CCPs Along Greenway (~1,000 tons), Construction of Retaining Wall (~2 to 20 ft), Backfill Behind Wall and Additional of Cover Soil**
 - **Same Possible Disposal Options**
 - **Length of Time ~0.5 Yr**
 - **\$1.6MM to \$3.5MM**

Remedial Options Evaluated

- **Option 2 - Removal of CCPs Along Greenway Retaining Wall, and Cover Soil**

Advantages

- **Minimizes Stormwater Contact with CCPs**
- **Less Disturbance**
- **Less Truck Traffic (~2,000 Truck Trips) and Short Term Exposure Risk**

Disadvantages

- **Does Not Remove Source**
- **Longer Time for Groundwater Concentration Reduction**
- **Contingent Remedy for Protection of Bolin Creek (?)**
- **Future Maintenance (?)**

Remedial Options Evaluated

- Other Options?



Discussion