A photograph of a green kayak with a red seat navigating through white-water rapids. The kayak is positioned in the center of the frame, moving from left to right. The water is turbulent and white with foam. The background shows a rocky riverbed and some greenery on the banks.

# Safety RCG SCE&G Rising Water Early Warning System

April 9, 2008  
James R. Devereaux, P.E

**-WARNING-**

**HORN SIGNAL and  
FLASHING LIGHTS  
INDICATE RISING WATER**

**-CAUTION-**

**ABSENCE of HORN SIGNAL or  
FLASHING LIGHTS DO NOT ASSURE  
CONSTANT WATER LEVEL**



# Before



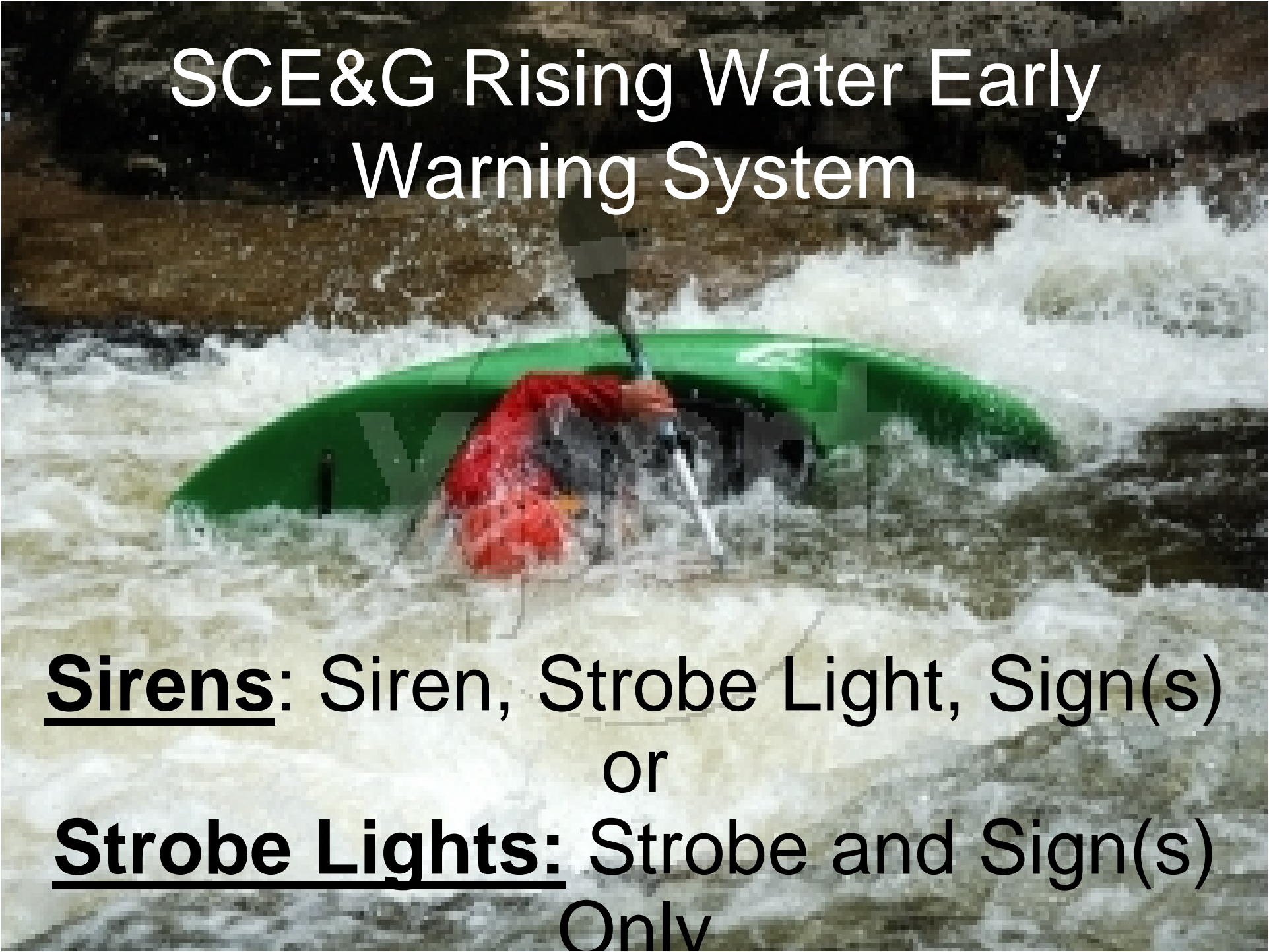


10,000 cfs Later





# SCE&G Rising Water Early Warning System

A photograph of a green kayak with a red paddle in turbulent white water rapids. The kayak is partially submerged, and the water is churning with white foam. The background is dark and rocky.

**Sirens**: Siren, Strobe Light, Sign(s)  
or  
**Strobe Lights**: Strobe and Sign(s)  
Only



# SIRENS



- Arrayed from 1 to 3 horns
- Voice Chip Capability
- Located to maximize coverage
- Sound output level determined by direct measurement
- Output level: 12dB over Ambient (FEMA Guidelines)
- All Activations Recorded CSOC







# Early Warning System SIRENS

## FACTORS AFFECTING SIREN OUTPUT

- Background (ambient) noise
- Attenuation from foliage
- Neighbors



# Background Noise







# Early Warning System Foliage





# Early Warning System Meander





# Early Warning System SIRENS

## ACTIVATION CRITERIA

- Presently 2 triggers (pressure transducers)
- Time delayed activation
- Activates on Water Level Rate of Rise; 3 min.  
sustained
- 3 minute duration; every 3 minutes during rise in water level

# STROBES

- **1 Per Location**
- **White Light, 1,000,000 candlepower**
- **Activates With Siren**
- **Continues flashing for 15 min after siren silences**





# SIGNS

**- WARNING -**  
HORN SIGNAL and  
FLASHING LIGHTS  
INDICATE RISING WATER

**- CAUTION -**  
ABSENCE of HORN SIGNAL or  
FLASHING LIGHTS DO NOT ASSURE  
CONSTANT WATER LEVEL



# SIGNS

**-WARNING-**  
HORN SIGNAL and  
FLASHING LIGHTS  
INDICATE RISING WATER

**-CAUTION-**  
ABSENCE of HORN SIGNAL or  
FLASHING LIGHTS **DO NOT** ASSURE  
CONSTANT WATER LEVEL





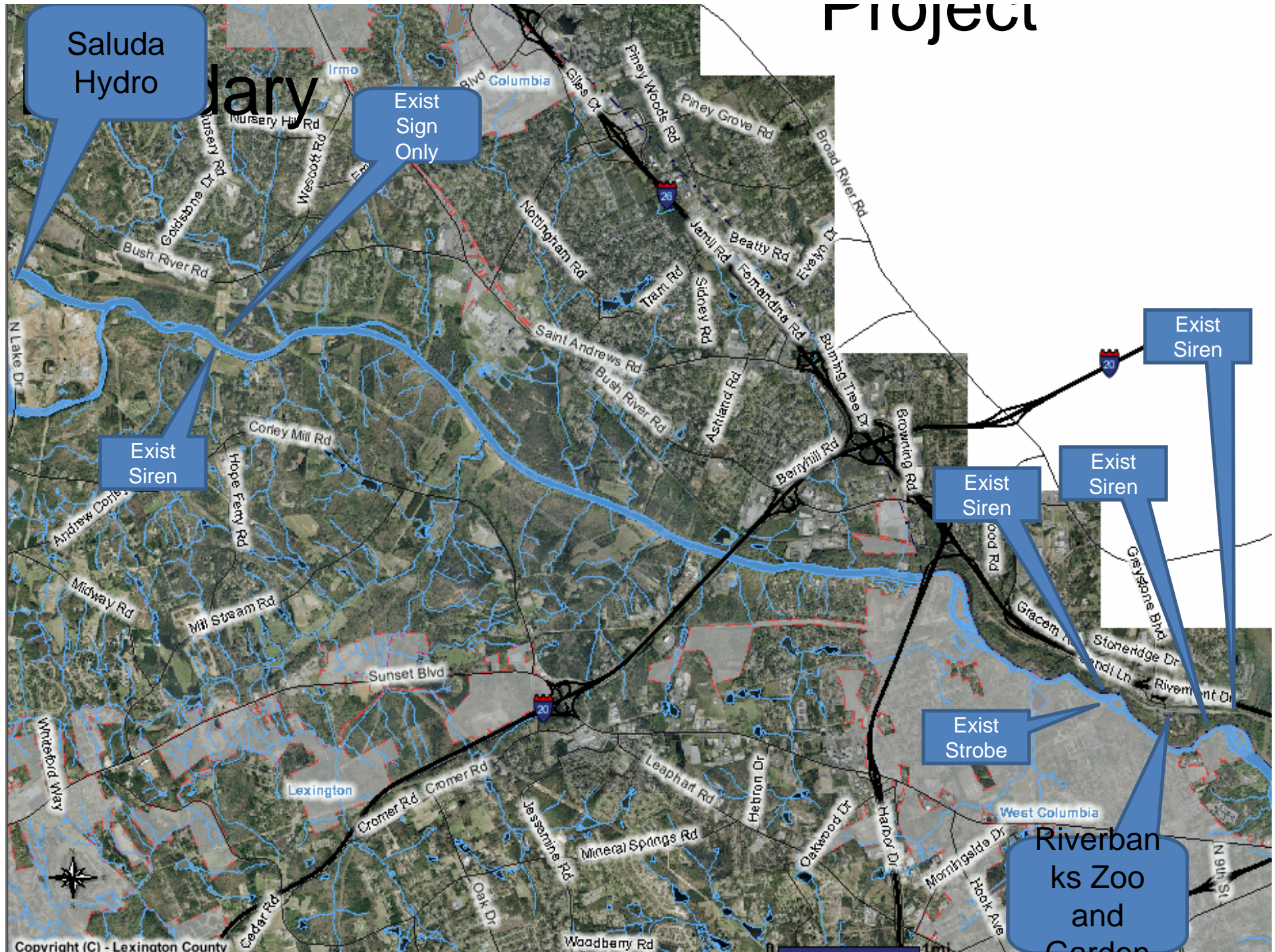
# SIGNS

- At least 1 Per Location
- With or Without Sirens
- Maximum Visual Exposure



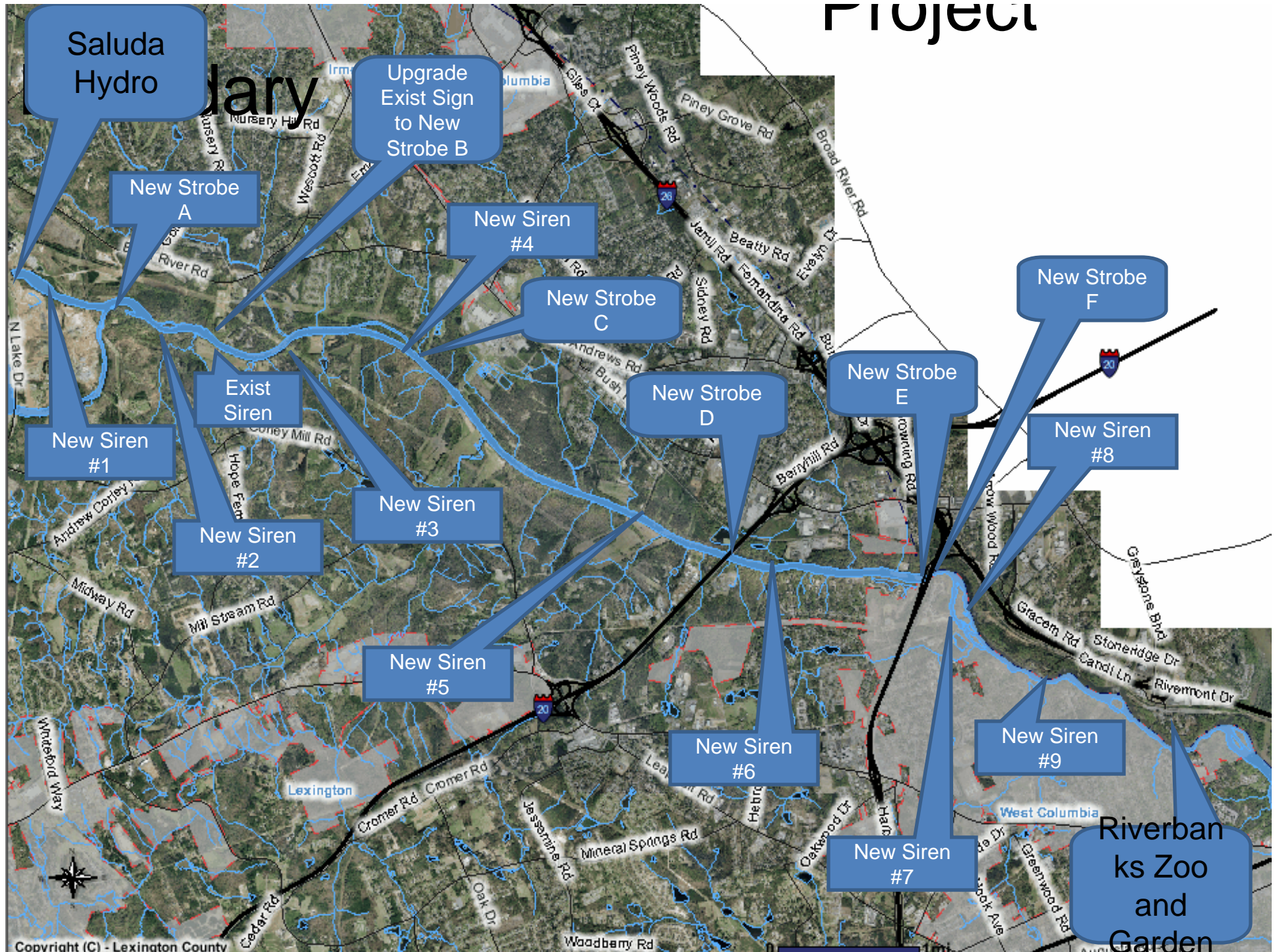


# Project





# Project





# Early Warning





# Early Warning System

Existing  
Siren

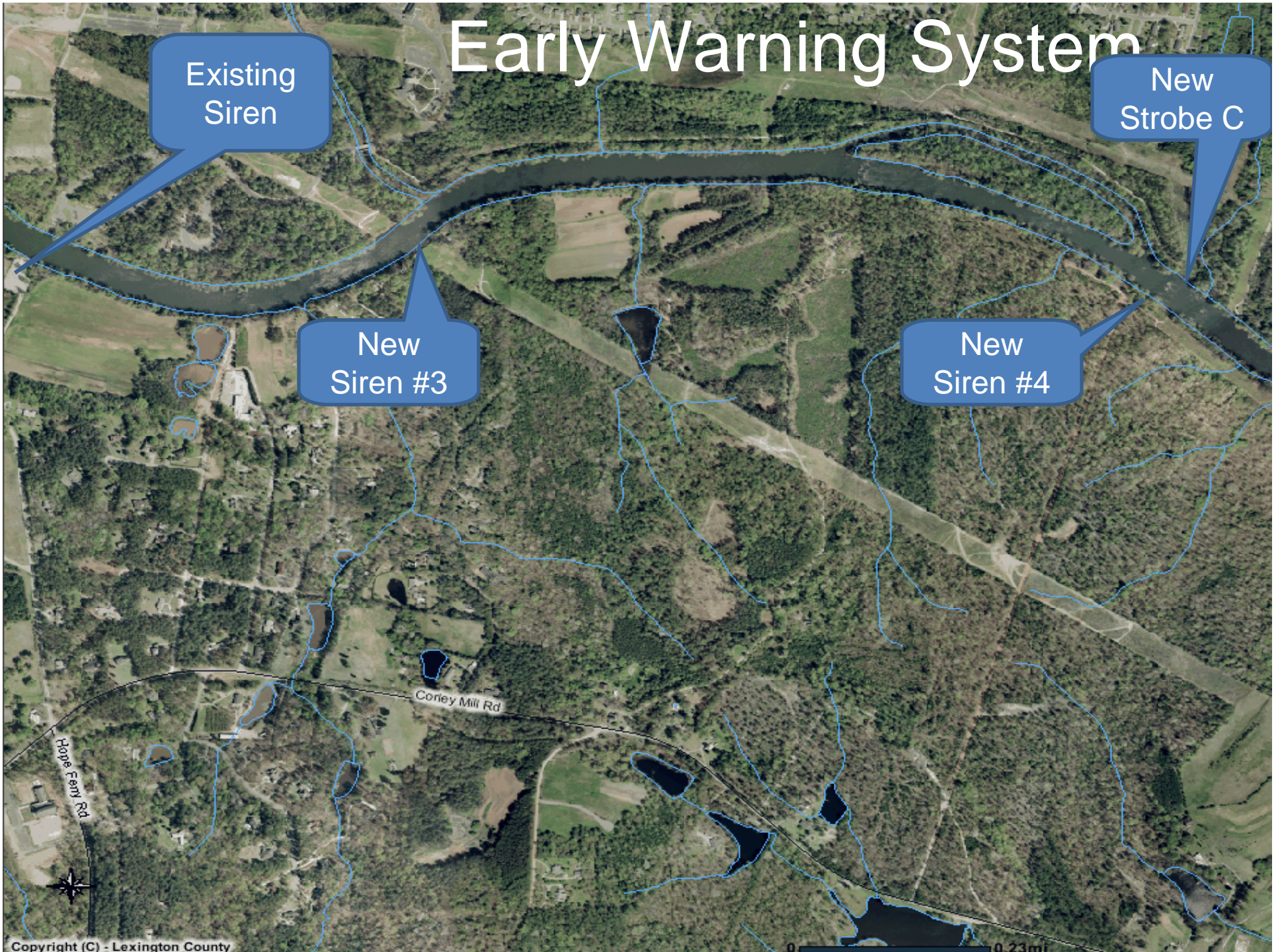
New  
Strobe C

New  
Siren #3

New  
Siren #4

Coney Mill Rd

Hope Ferry Rd





# Early Warning System

New  
Strobe C

New  
Siren #4

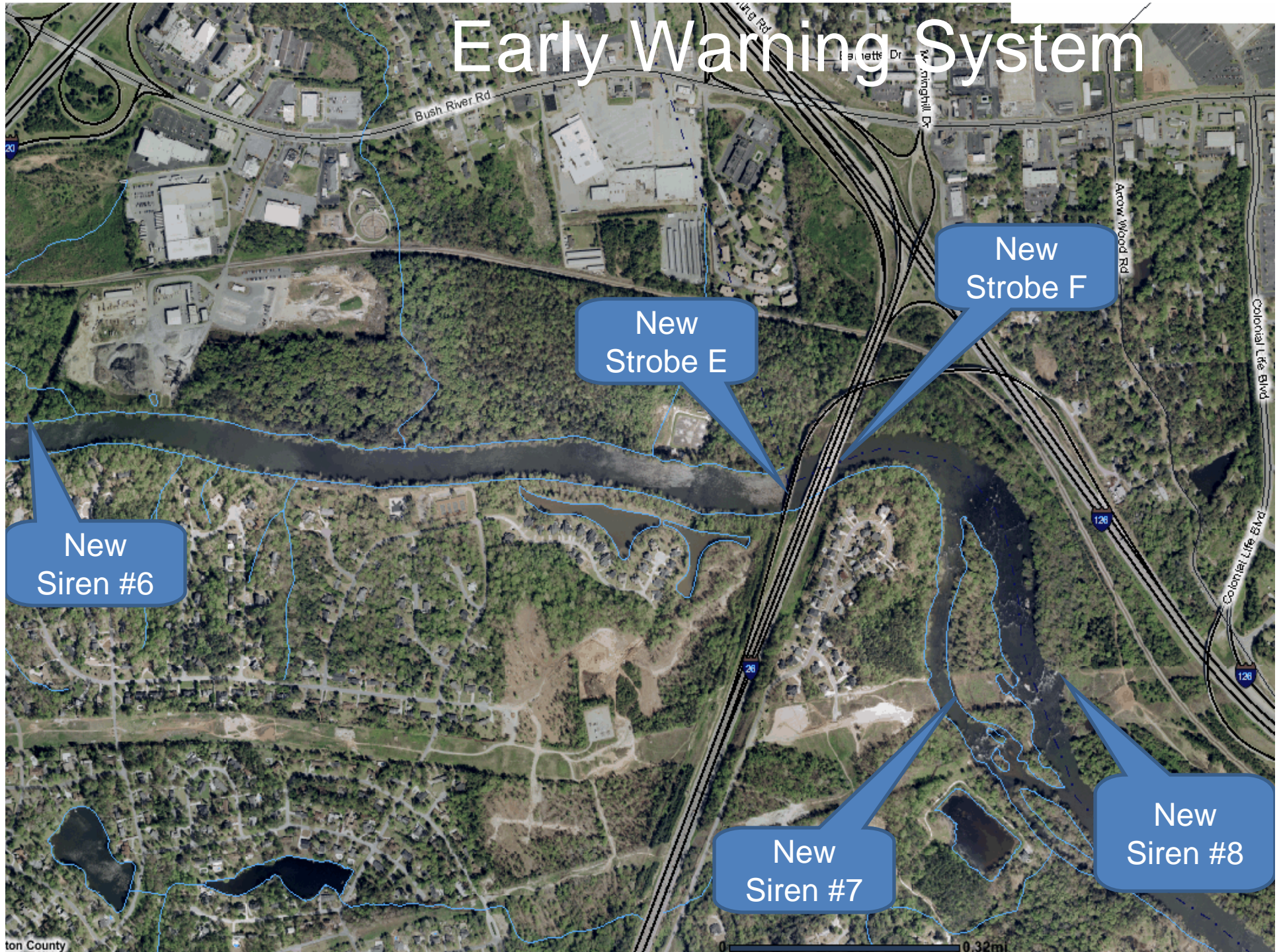
New  
Strobe D

New  
Siren #5

New  
Siren #6

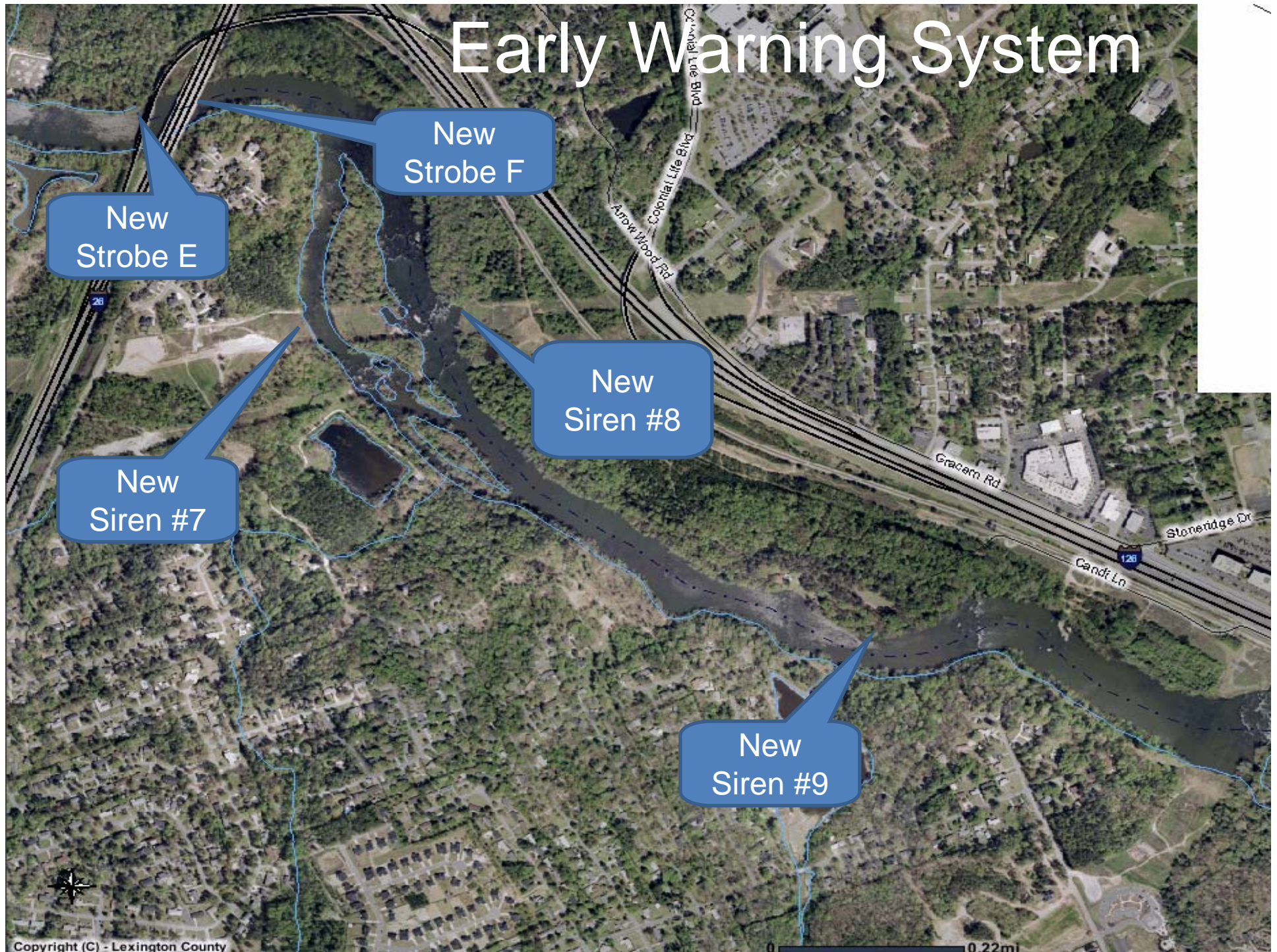


# Early Warning System





# Early Warning System





# Boundary

# Project

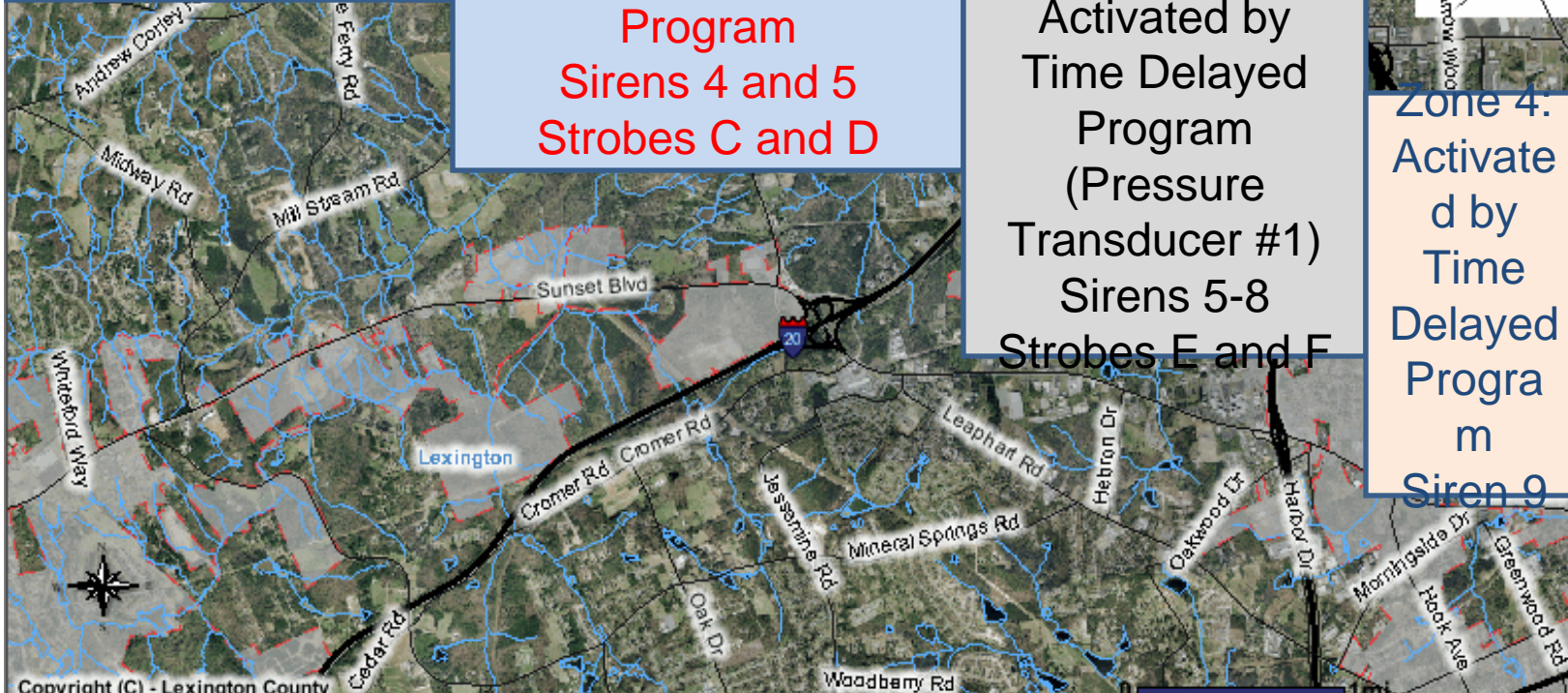
Zone 1: Immediate  
Activation with  
Generation  
Sirens 1-3  
Strobes A and B  
Existing Strobe

Zone 2: Activated by  
Pressure Transducer  
#1  
and Time Delayed  
Program  
Sirens 4 and 5  
Strobes C and D

Zone 3:  
Activated by  
Time Delayed  
Program  
(Pressure  
Transducer #1)  
Sirens 5-8  
Strobes E and F

Zone 4:  
Activated by  
Time  
Delayed  
Program  
Siren 9

Zone 5:  
Activated by  
Pressure  
Transducer  
#2  
and Time  
Delayed  
Program  
3 Sirens





# Early Warning System

A wide waterfall cascading over a rocky ledge. The water is captured in a long-exposure shot, creating a smooth, silky texture as it falls. The background shows some green foliage and a clear sky.

— **Questions?**  
**Comments?**