Stream Mitigation Work Group

Tiered Mitigation Approach:

BMP's to Protect Downstream Uses

Vision Statement

To develop a scientifically sound and predictable methodology for assessing impacts to stream ecosystems and associated compensatory mitigation proposals under review by Ohio EPA through the 401 Water Quality Certification Program.

Meeting Goals and Objectives

- Review concepts of a tiered mitigation approach for stream impacts
- Evaluation of the use of BMP's to provide on-site mitigation for impacts to ephemeral streams (Class I PHWH) and other Limited Quality Waters

Weighting Factors Model

- **Model developed based upon a draft stream mitigation system used by the Savannah District of the Army Corps of Engineers.**
- **Model "Ohio-ized" to reflect Ohio EPA methodologies, anti-degradation categories, aquatic life use designations, and other important measures of stream resource integrity.**

Weighting Factors Model

- **Scoring of weighting factors based upon relative importance of characteristic to stream resource integrity and anti-degradation considerations.**
- **Base scores based upon "average case" criteria established in the policy for each weighting factor. Ratio of the sum of factors for impacts vs. mitigation set to equal 1.5 (relates to current practice).**

Weighting Factor Assessment Overview

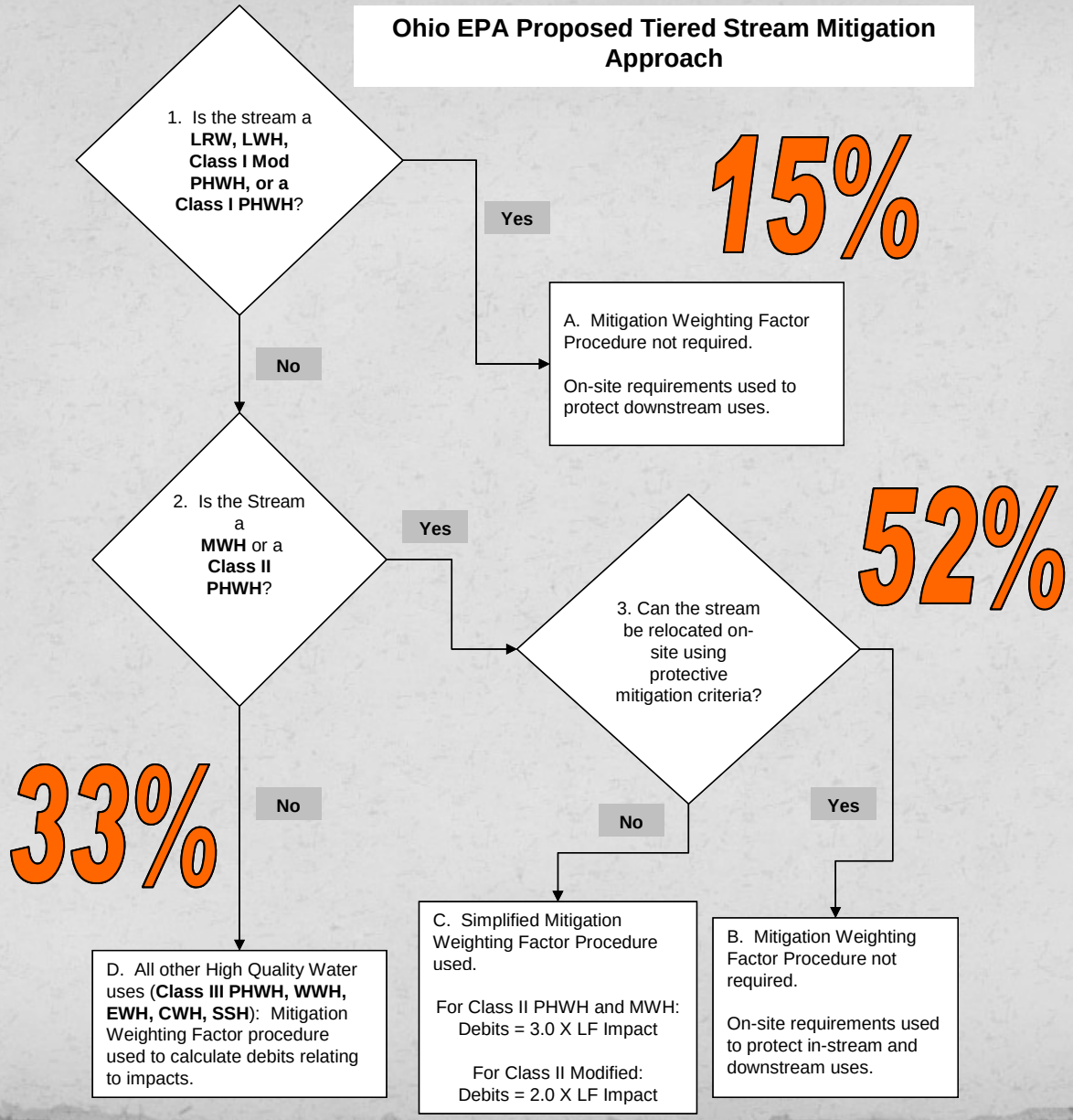
Impact weighting factors:

- Existing Aquatic Life Use
- Existing Habitat Quality
- Priority Area
- Existing Geomorphic Integrity
- Existing Flood Plain Quality
- Impact Category

Mitigation Weighting Factors:

- Stream Restoration / Relocation Design
- Riparian/Floodplain Preservation
- Riparian Restoration and Enhancement
- Resulting Aquatic Life Use
- Resulting Habitat Quality
- Priority Area
- Watershed Location
- Control
- Impact/Mitigation Relationship
- Implementation Schedule
- Supplemental Water Quality Activities
- Threat to Stream Segment

Tiered mitigation approach



BMP Approach:

- Goal is to insure that existing stream functions are not lost from the watershed.
- Extreme caution needed – design must be constructed with the downstream use in mind.
- Protection of groundwater recharge and discharge paramount where downstream use is Class III PHWH or CWH
- How can the toolbox be made better?

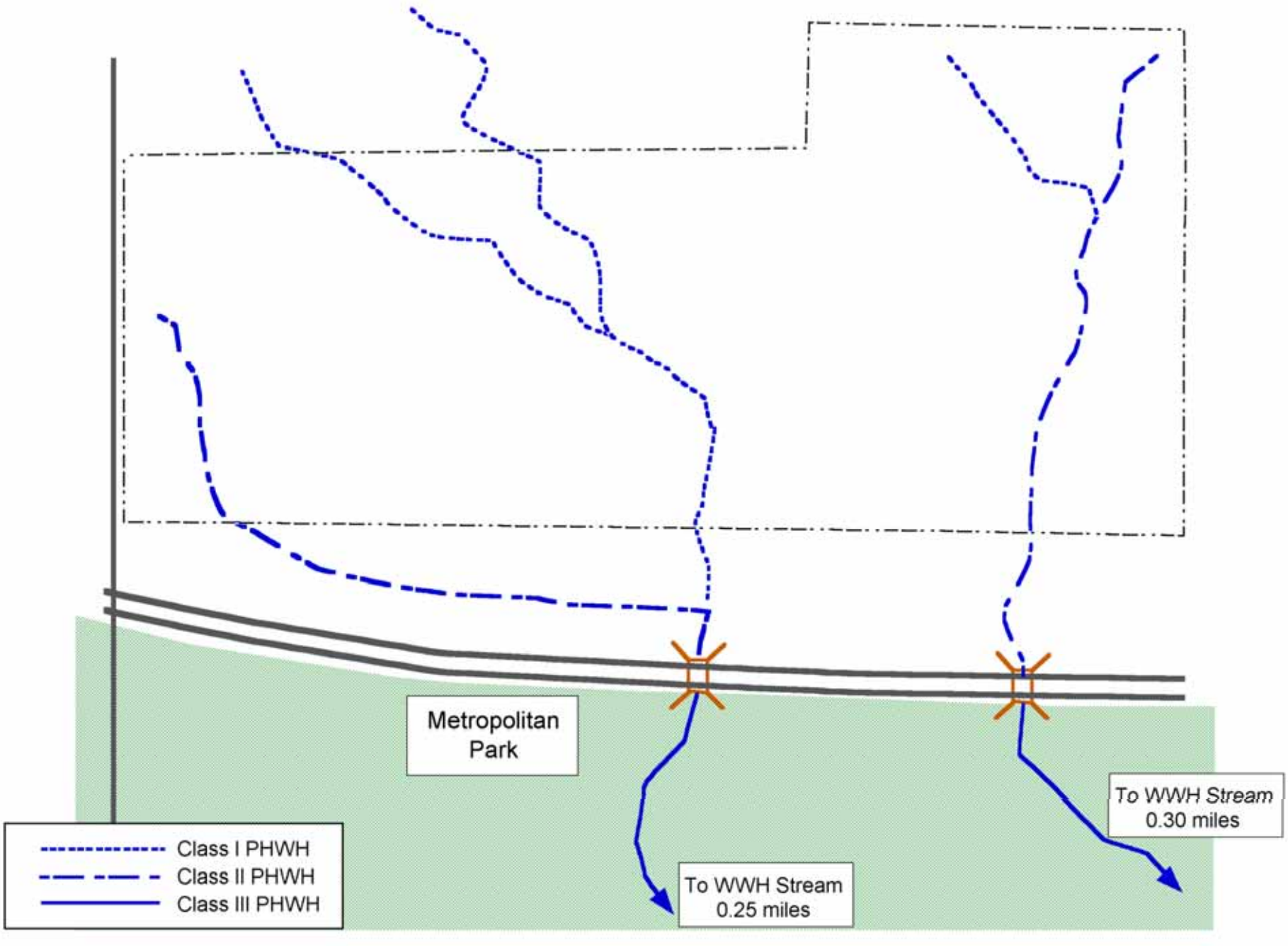
Feedback/Questions

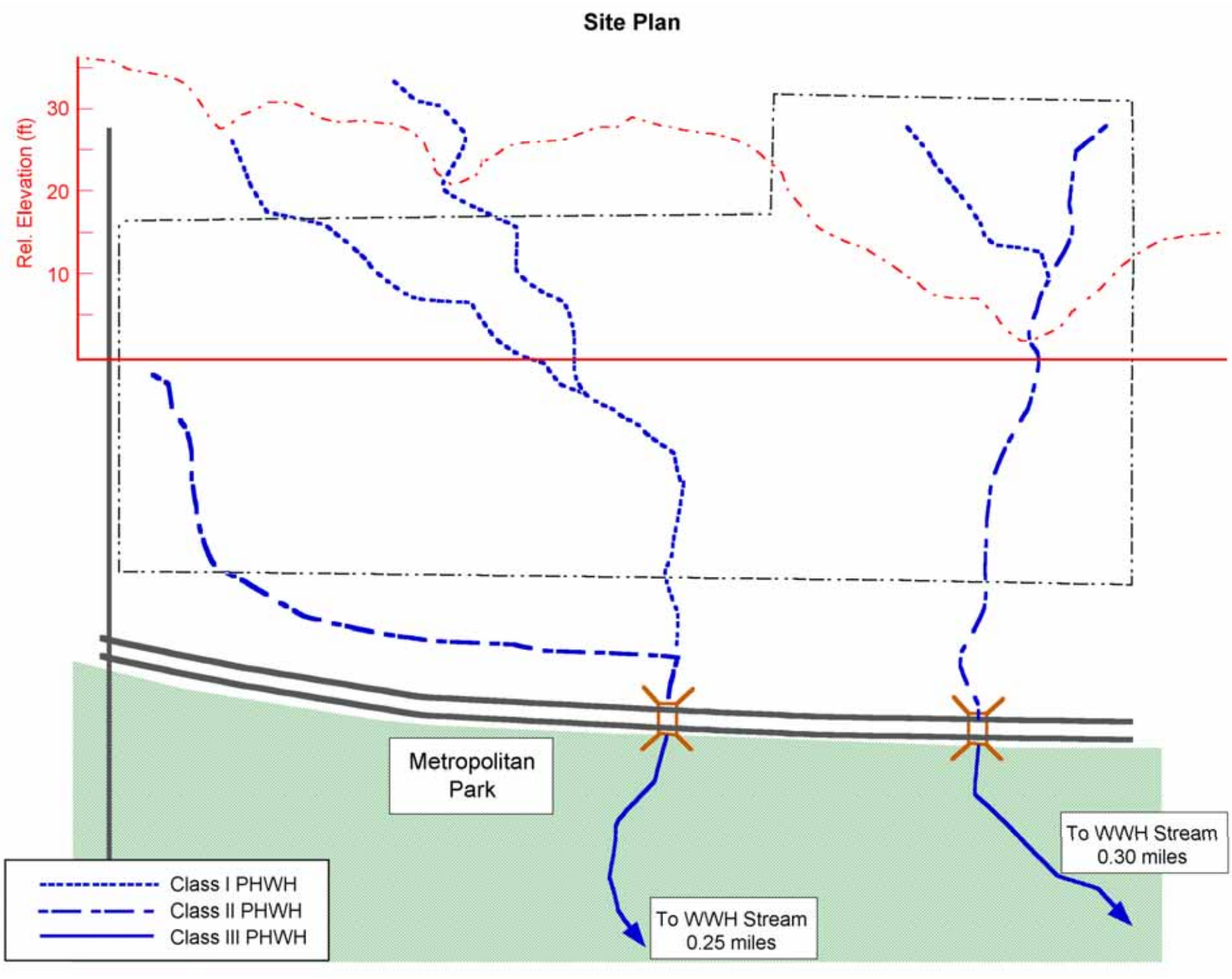
Handout Discussion Topics for “Box A”

Discussion Case Study

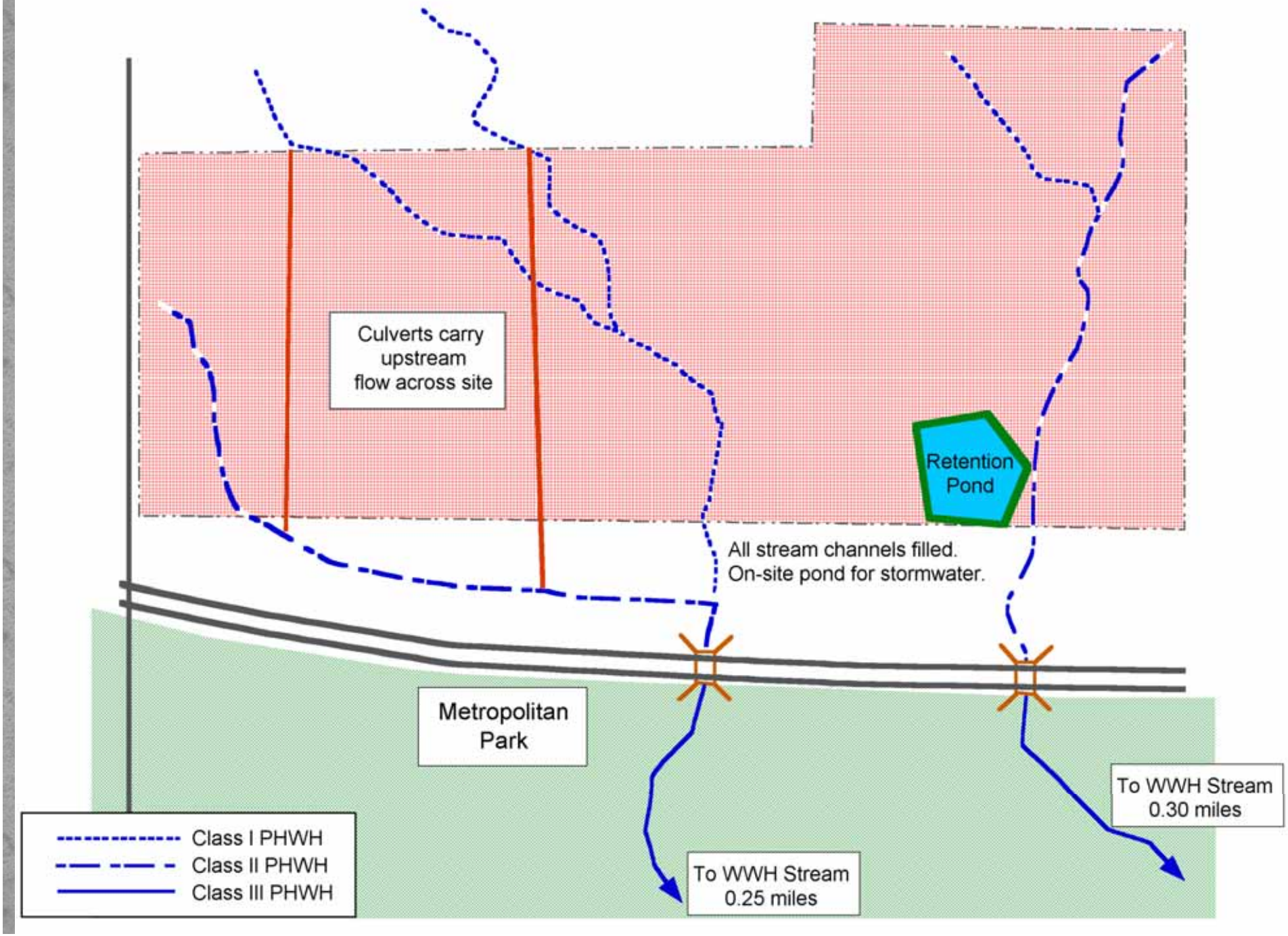
- Scenario:
  - Commercial Development
  - Impacts to ephemeral and intermittent streams (Class I and Class II PHWH)
  - Steep topography requires use of significant amount of fill
  - Downstream uses are a concern
    - Class III streams in metropolitan park
    - WWH river in close proximity
  - Site soils are thin deposits of sands and clays over shale bedrock.

Site Plan


Metropolitan Park
To WWH Stream 0.25 miles
To WWH Stream 0.30 miles
Class I PHWH
Class II PHWH
Class III PHWH


Site Plan
Rel. Elevation (ft)
30
20
10
Metropolitan Park
To WWH Stream 0.25 miles
To WWH Stream 0.30 miles
Class I PHWH
Class II PHWH
Class III PHWH

Preferred Alternative



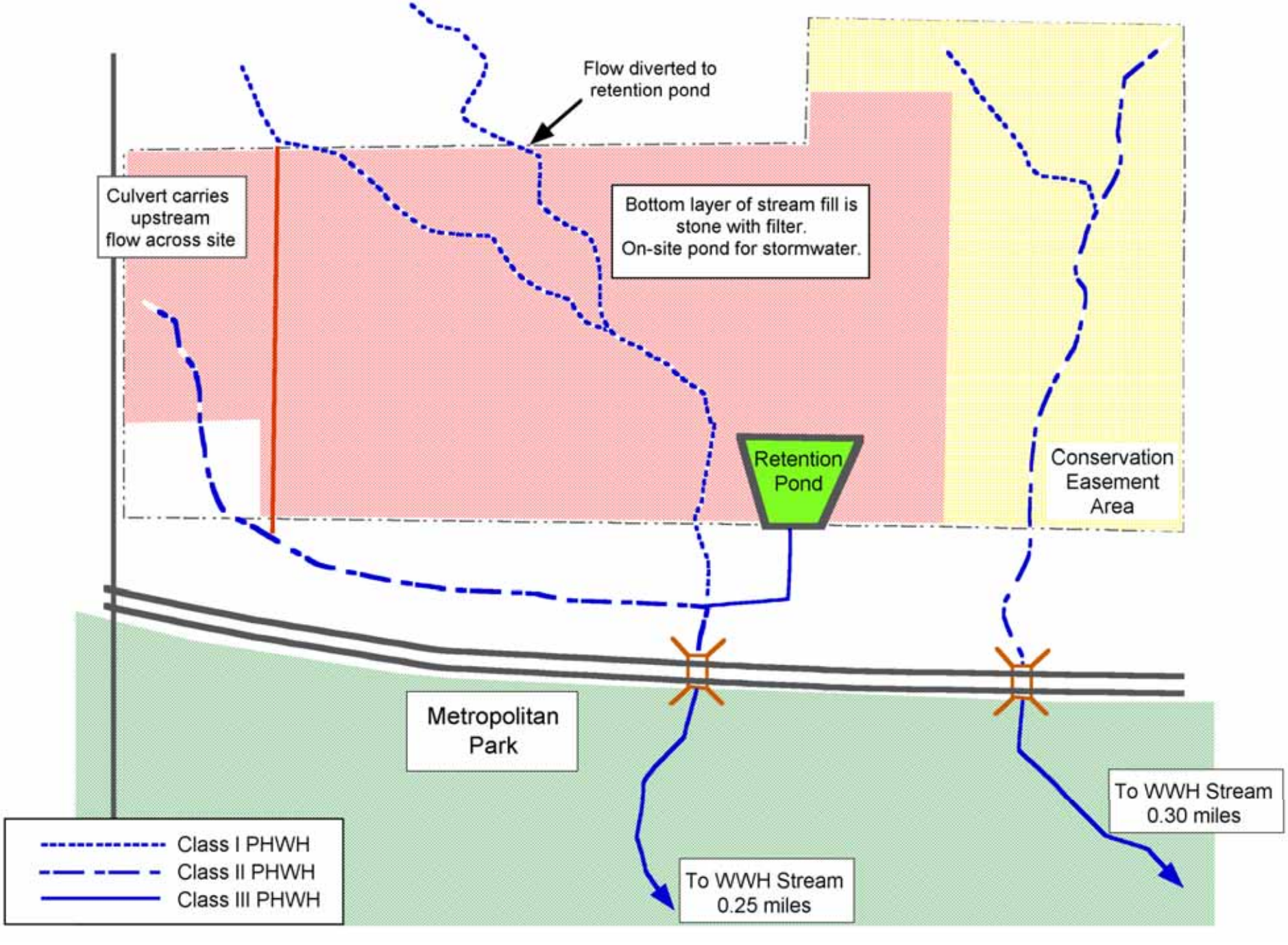
Case Study: Preferred Alternative

- Fill all stream channels for development
- Culvert all upstream flows through the site
- Meet applicable stormwater BMP requirements for on-site runoff
- Stormwater retention via four-bay wet basin

Case Study: Preferred Alternative

- Impacts:
  - 1,050 feet Class I PHWH
  - 650 feet Class II PHWH
- Mitigation:
  - Off-site: 2,200 feet headwater streams (preservation) + 300 ft WWH (restoration/enhancement)
  - Same HUC 11
  - 14 miles upstream from site

Minimal Degradation Alternative



Case Study:
Minimal Degradation Alternative

- Minimize impact to one Class II stream, provide easement for second Class II stream
- Place layer of permeable fill and filter along impacted stream channels prior to filling
- Provide stormwater retention for 25% of upstream flows, culvert the remainder through the site
- Meet applicable stormwater BMP requirements for on-site runoff
- Stormwater retention via four-bay wet basin

Case Study:
Minimal Degradation Alternative

- Impacts:
  - 850 feet Class I PHWH
  - 100 feet Class II PHWH
- Mitigation:
  - Off-site: 475 feet headwater streams + 300 ft WWH (restoration/enhancement)
  - Same HUC 11
  - 14 miles upstream from site
  - On-Site: 450 feet Class II + 200 feet Class I preservation in conservation easement

Case Study: Discussion

- Does the preferred alternative meet the anti-degradation requirements?
- Does minimal degradation alternative protect downstream uses?
- Should the attainment status of the WWH river in vicinity of the impact vs. that near the upstream mitigation site affect the antidegradation decision?
- What practices should be considered to use on-site to protect downstream uses?
  - If these practices are implemented would off-site mitigation still be necessary?

Implementation

- Downstream Use Considerations
  - Aquatic Life Use
    - Temperature and Water Quality
  - Importance of Distance
  - Existing Conditions
  - Special considerations:
    - AMD, maintained drainageways, etc.
- Available Control Measures
  - What is better than a BMP?
  - When are special conditions warranted (or conversely, not needed)?

Implementation

- Integration with stormwater permitting
  - Can the on-site mitigation requirements be implemented through a stormwater NPDES permit?
    - What would it include?
  - How will 401 and stormwater requirements be coordinated?
  - What are the advantages and disadvantages for the applicant? …for the agency?
  - Who would review the documentation?

Next Steps

Additional Information:

- www.epa.gov/npdes/training
- February 6, 2008 webcast: "BMP Performance"
  - 12:00 – 2:00 EST
- Webcasts are later archived for viewing via the U.S.EPA web site.