



DRAFT Duck & Otter Creeks Data Gap Investigation Update

October 25, 2011

PROJECT PARTICIPANTS

- Joint Project – USEPA GLNPO and Duck & Otter Creek Industry Partners (BP Husky, Chevron, Pilkington, Sunoco)
- Principal Contractors:
 - Cardno ENTRIX
 - Environ
 - Weston Solutions
- Key Stakeholders – Duck & Otter Creek Partnership, Ohio EPA

BACKGROUND

- Data Gap Investigation (DGI)
 - Great Lakes Legacy Act
 - Project Agreement and Statement of Work: GLNPO & Duck and Otter Creek Industry Partners
- Confluence Area Investigation: GLNPO –Weston Solutions
- 2007 Duck & Otter Creek Sediment Sampling: Duck and Otter Creek Partnership – SulTRAC/TetraTech

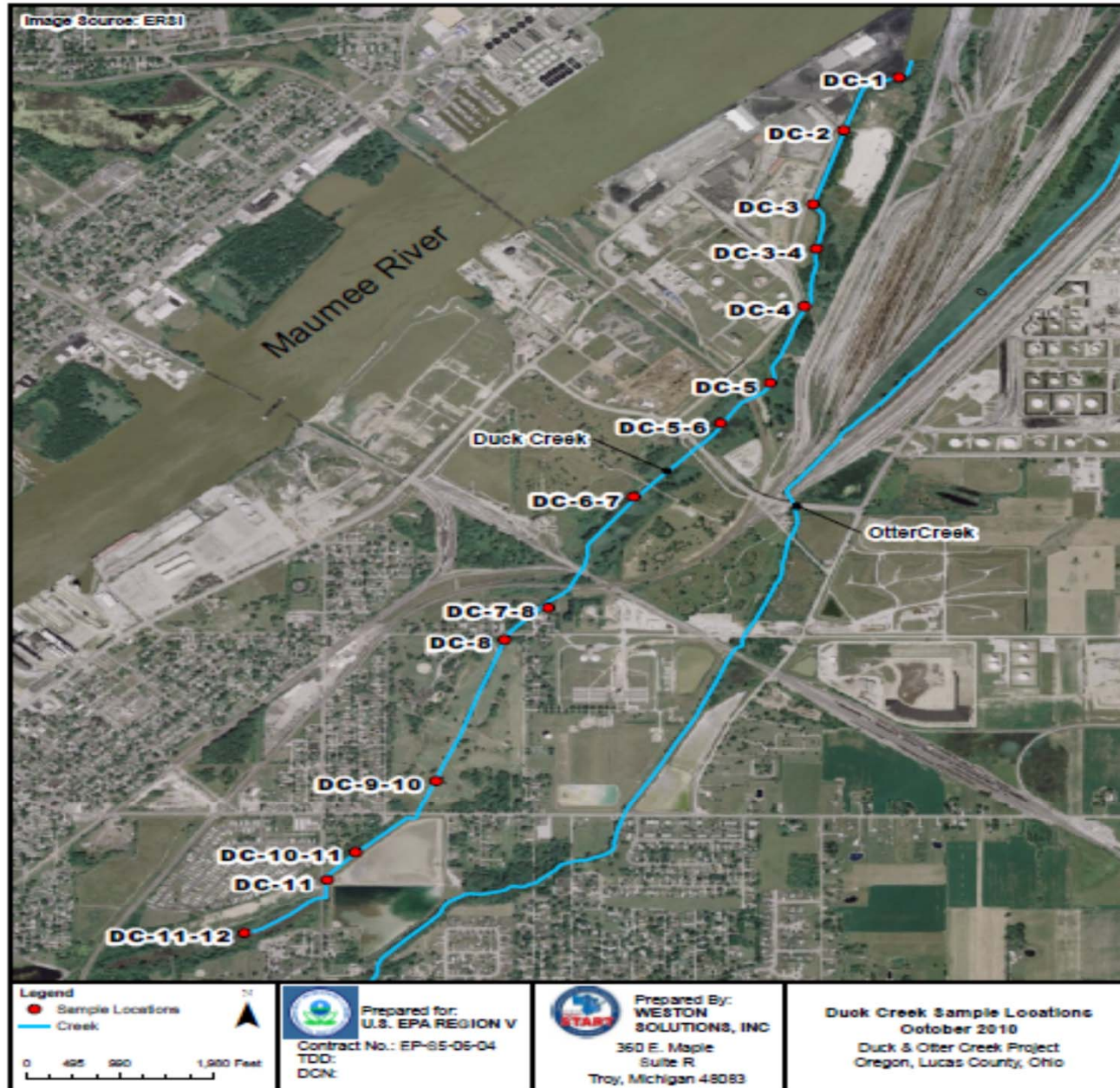
DGI OBJECTIVES

Overall Objective – develop information needed to fill certain data gaps to support future environmental decisions

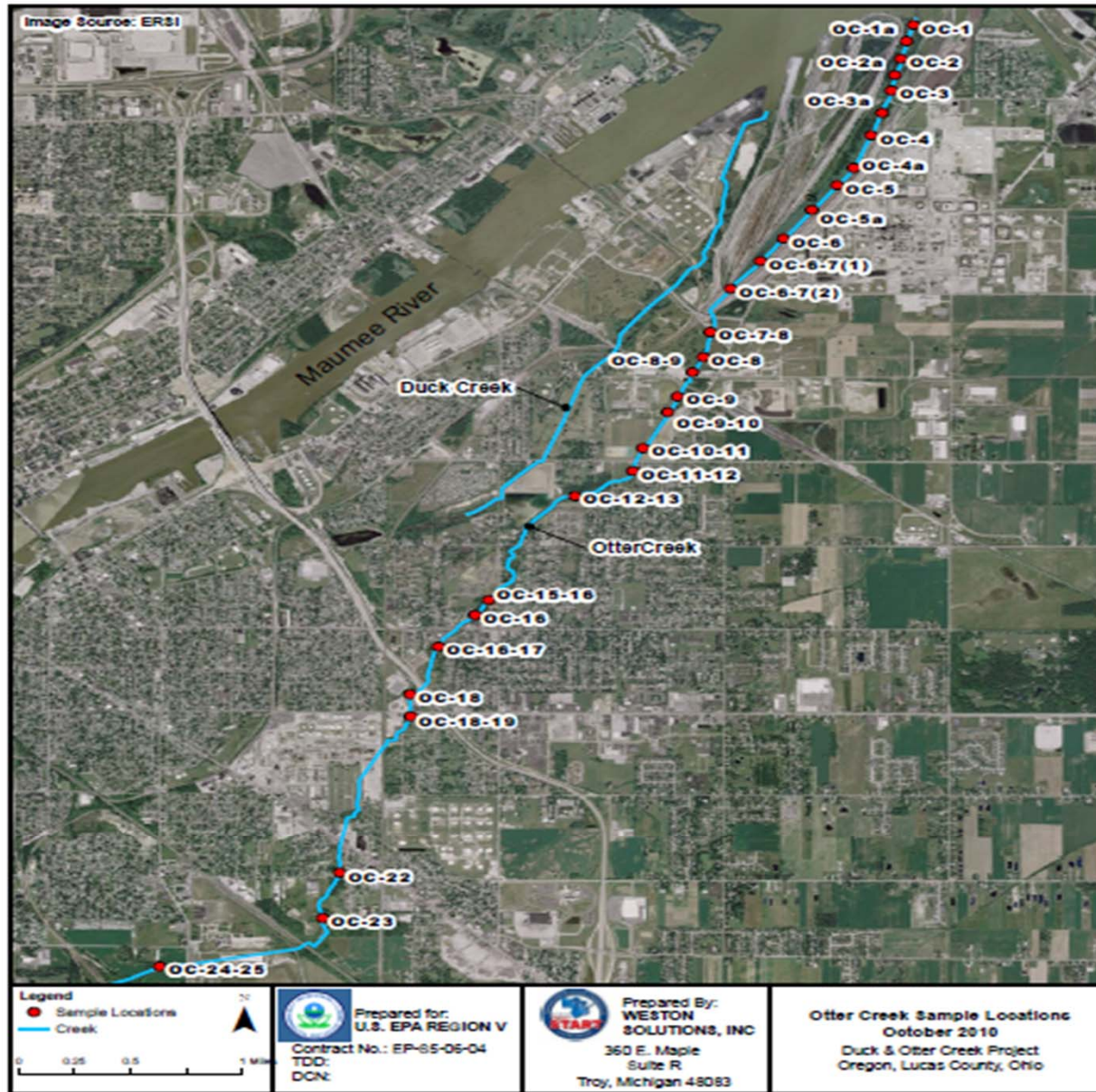
Specific objectives include:

- Determining the extent of contamination in both surface and subsurface sediments;
- Verifying sediment toxicity and identify cause(s), to the extent practicable within the constraints of this DGI;
 - Evaluating whether sediment contaminants are bioaccumulating in benthic invertebrates and fish at levels likely to contribute significantly to the degradation of benthos and fish populations
- Evaluating habitat resources
 - Collecting data to support development of a feasibility study (evaluation of remedial and restoration options to protect human health and the environment) if one is found to be necessary, and to advance progress toward delisting of beneficial use impairments.

DUCK CREEK SAMPLE LOCATIONS



OTTER CREEK SAMPLE LOCATIONS



Preliminary Data Summary Slides

- Habitat Quality
- Benthic Community Structure
- Toxicity Test
- Chemistry (Selected Constituents)
 - PAH
 - TPH
 - PCB
 - Lead
 - Arsenic

Watershed Habitat Quality

- Land Use
- Riparian corridor
- Impervious Surface
- Wetlands
- Stormwater outfalls

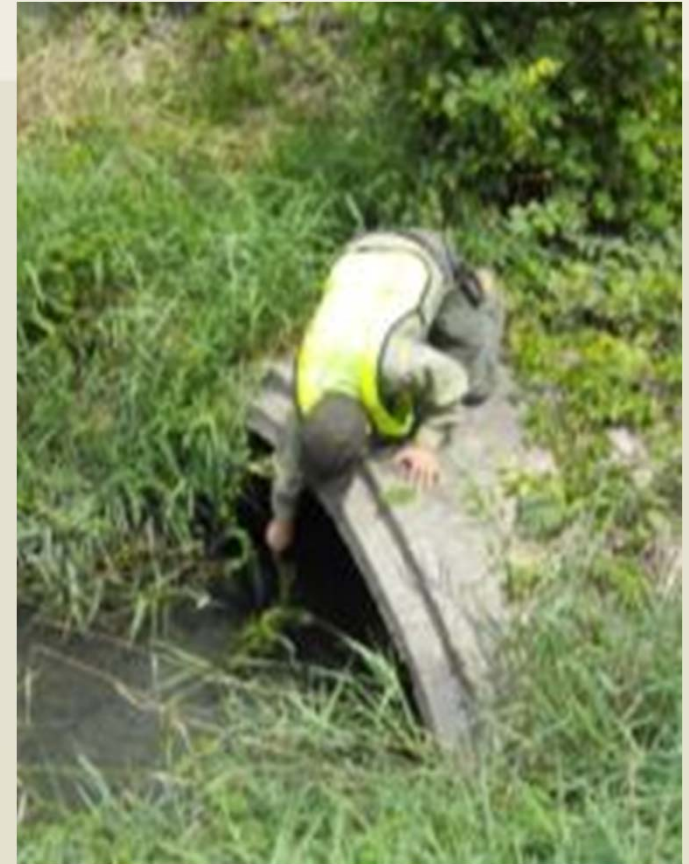


Land Use



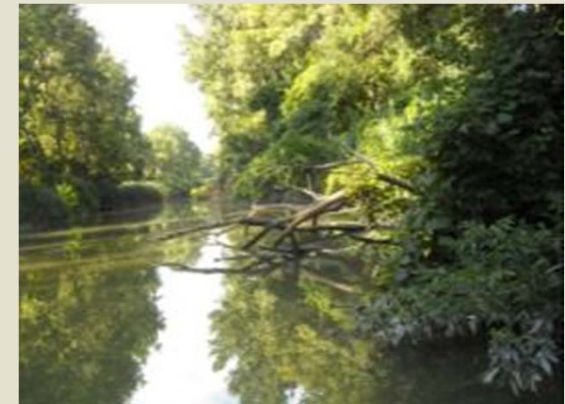
Watershed Habitat Quality – Stormwater Outfalls

Stream Segment	Duck Creek	Otter Creek
A	2	0
B	3	5
C	2	29
D	1	22
E	0	0



In-stream habitat summary: “very poor” to “poor”

Category	Possible Score	Urban Comparison	Duck & Otter
Substrate	20	2.5 to 4.5	2.5 to 4.5
Instream cover	20	2 to 6	5 to 13
Channel morphology	20	6 to 9	6 to 10
Bank erosion & riparian zone	10	3.5 to 6	3.5 to 7.5
Map gradient	10	4 to 6	3 to 6
Pool/glide & riffle/run quality	20	3	2 to 11
total	100	23 to 32.5	23.5 to 42

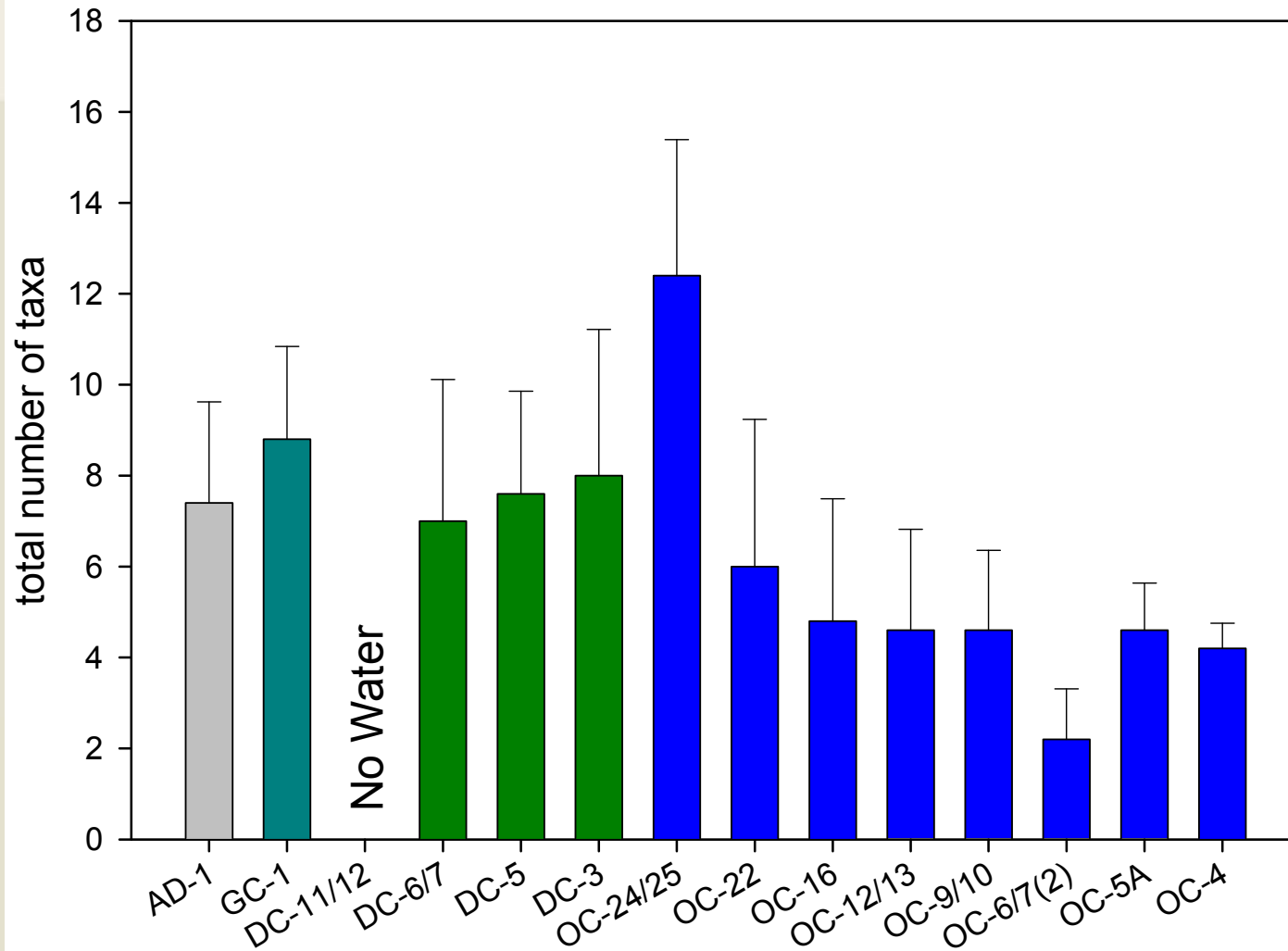


Preliminary Data Summary Slides

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Preliminary Benthic Biodiversity (taxa richness) triad locations only



Preliminary Data Summary Slides

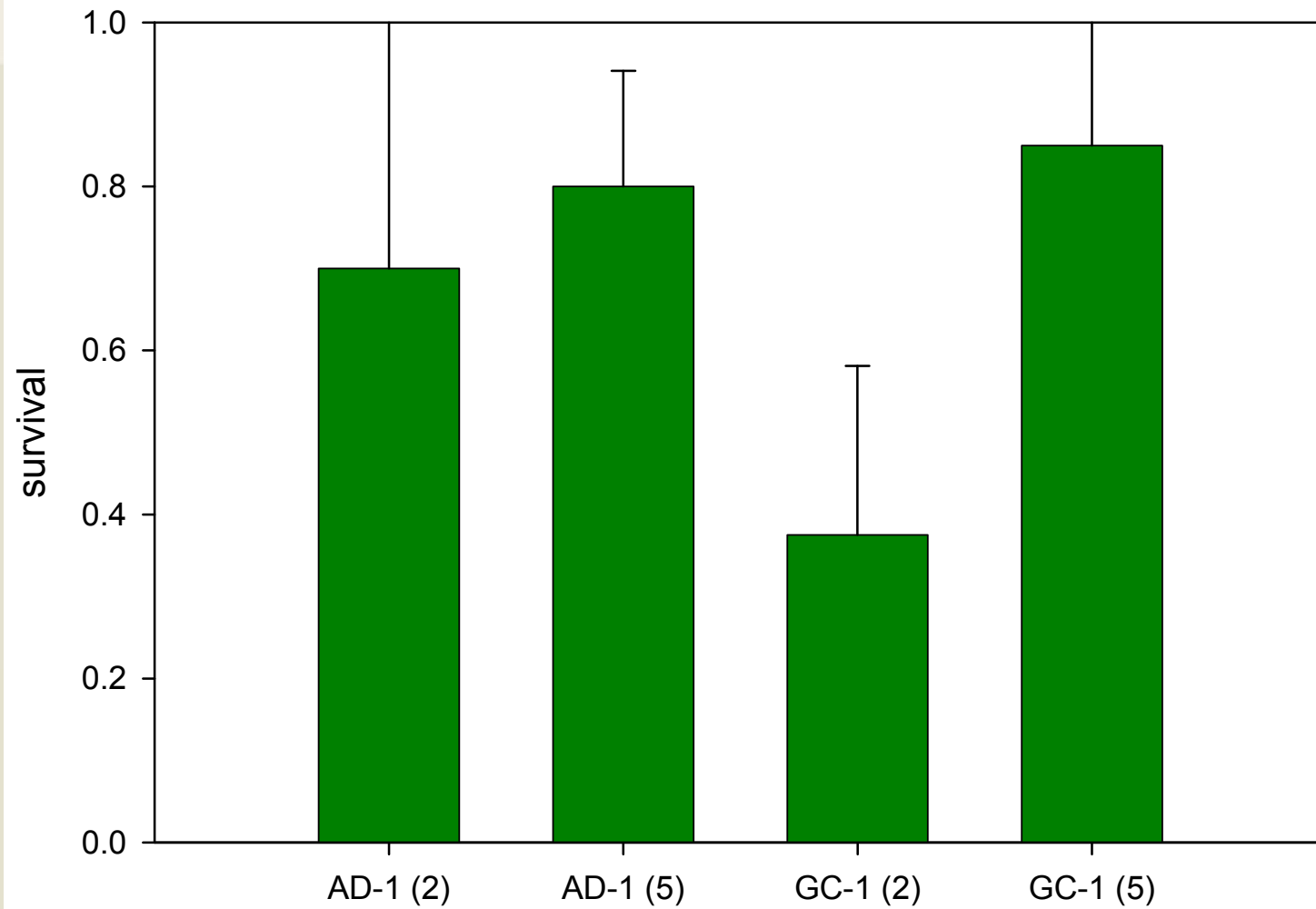
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Summary of Toxicity Tests

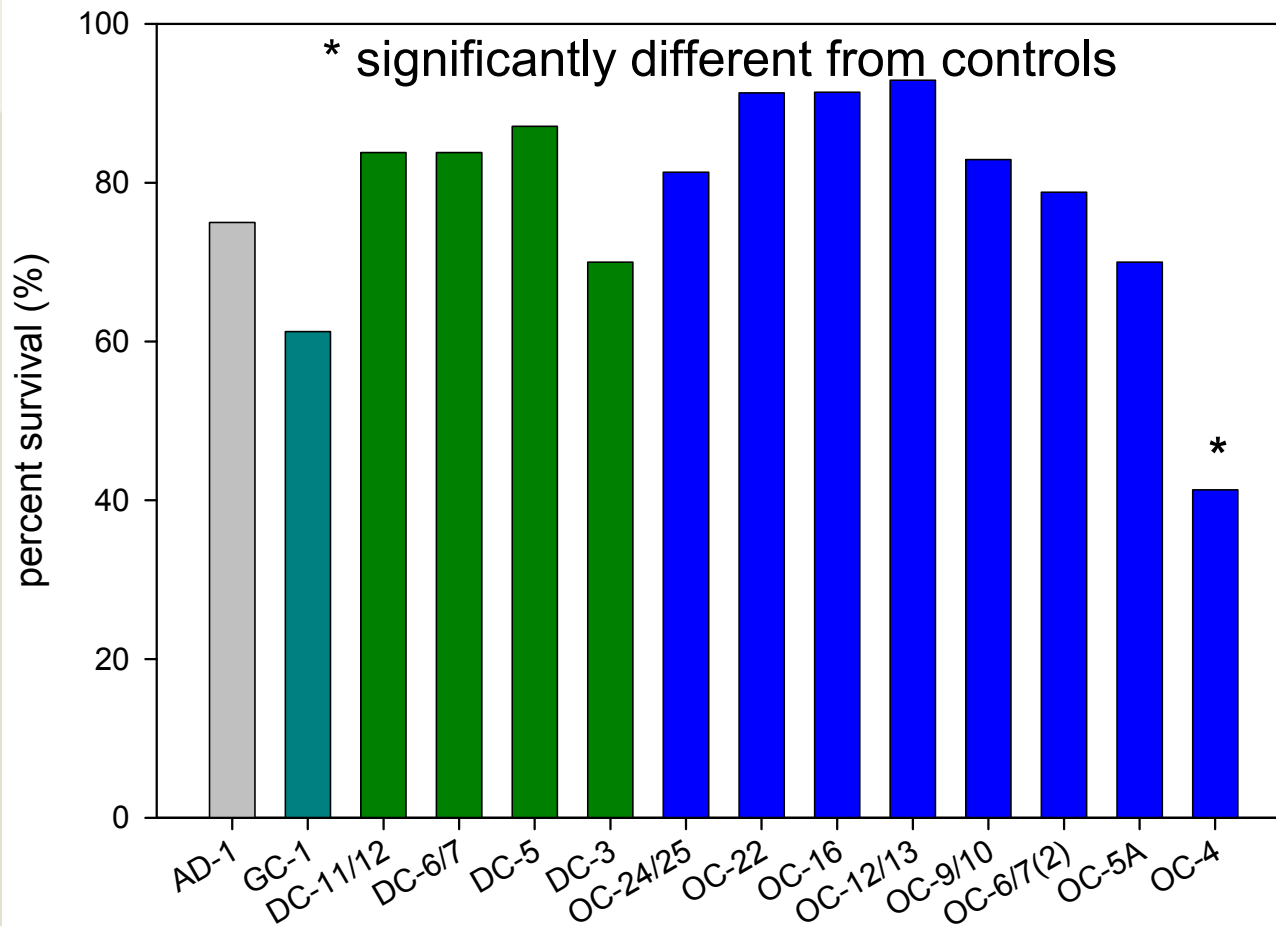
- Control Survival ranged from 82.5% to 93.8%
- Indigenous organisms affected survival of test organisms
 - 2 of 2 Urban comparison stream locations - retested
 - 2 of 4 Duck Creek locations
 - 5 of 8 Otter Creek locations
 - Overall 9 of 14 locations



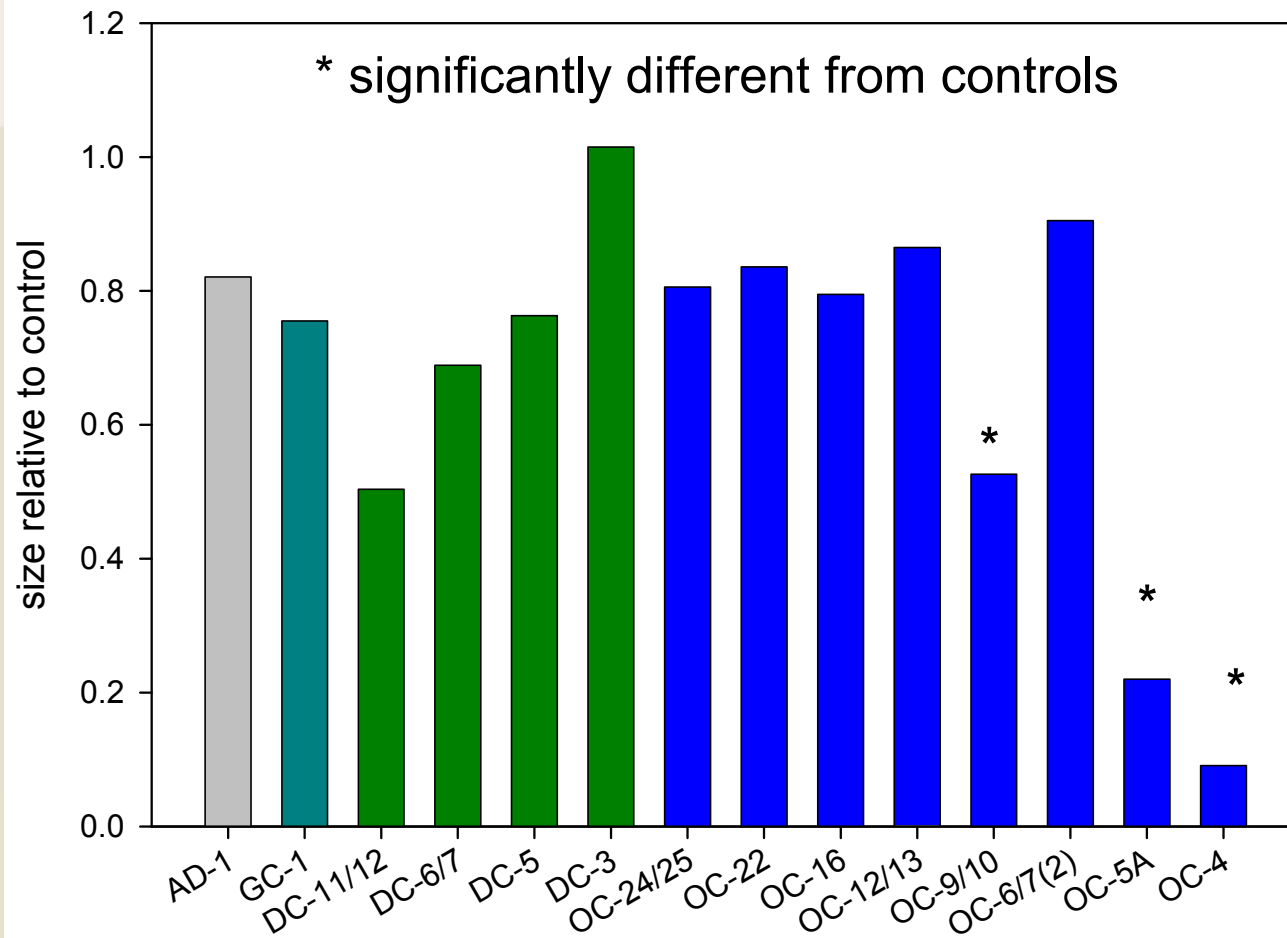
Urban Comparison Stream survival: 37.5% to 85.0%



Toxicity Test: Midge Survival – triad locations only



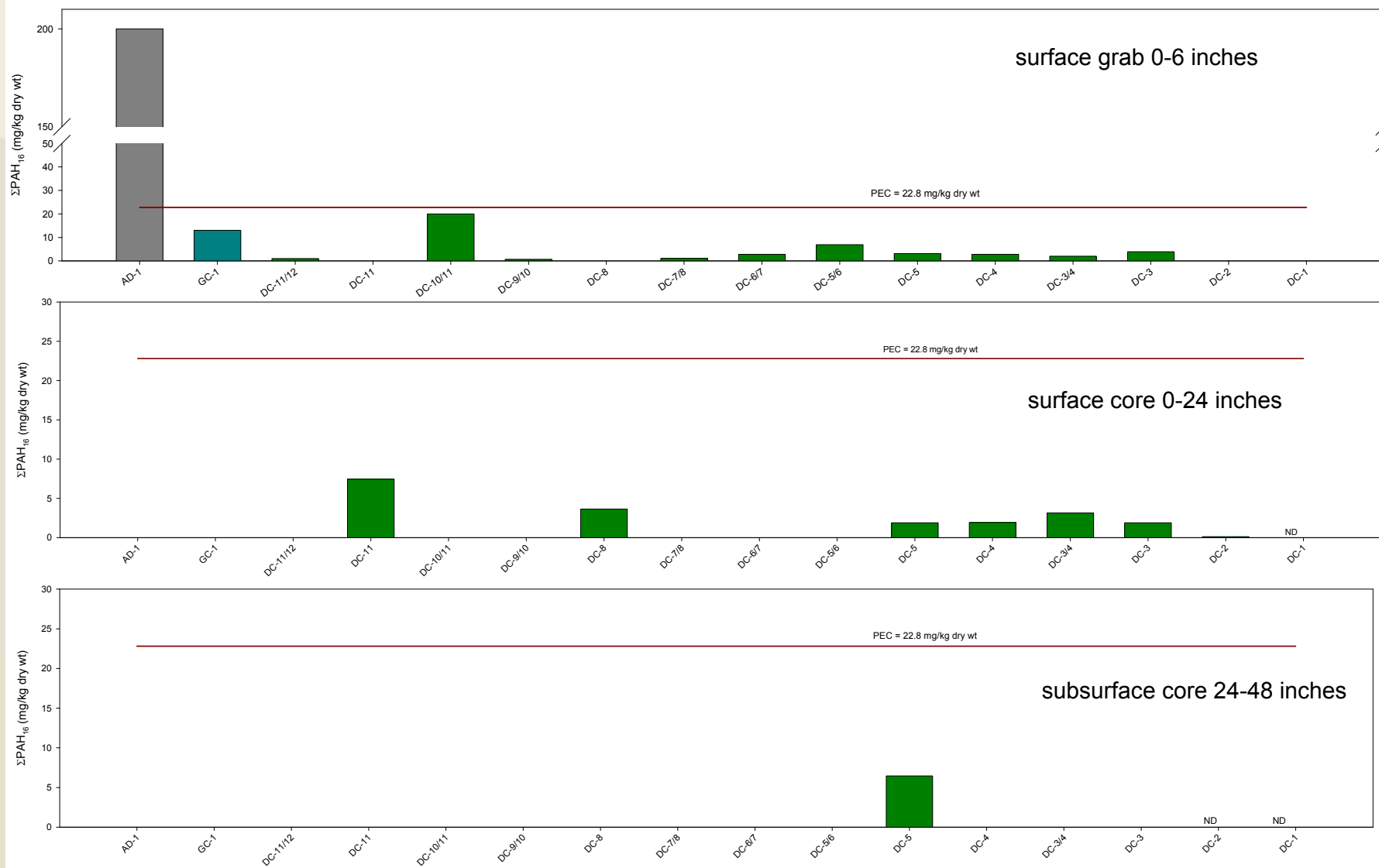
Toxicity Test: Midge Growth – triad locations only



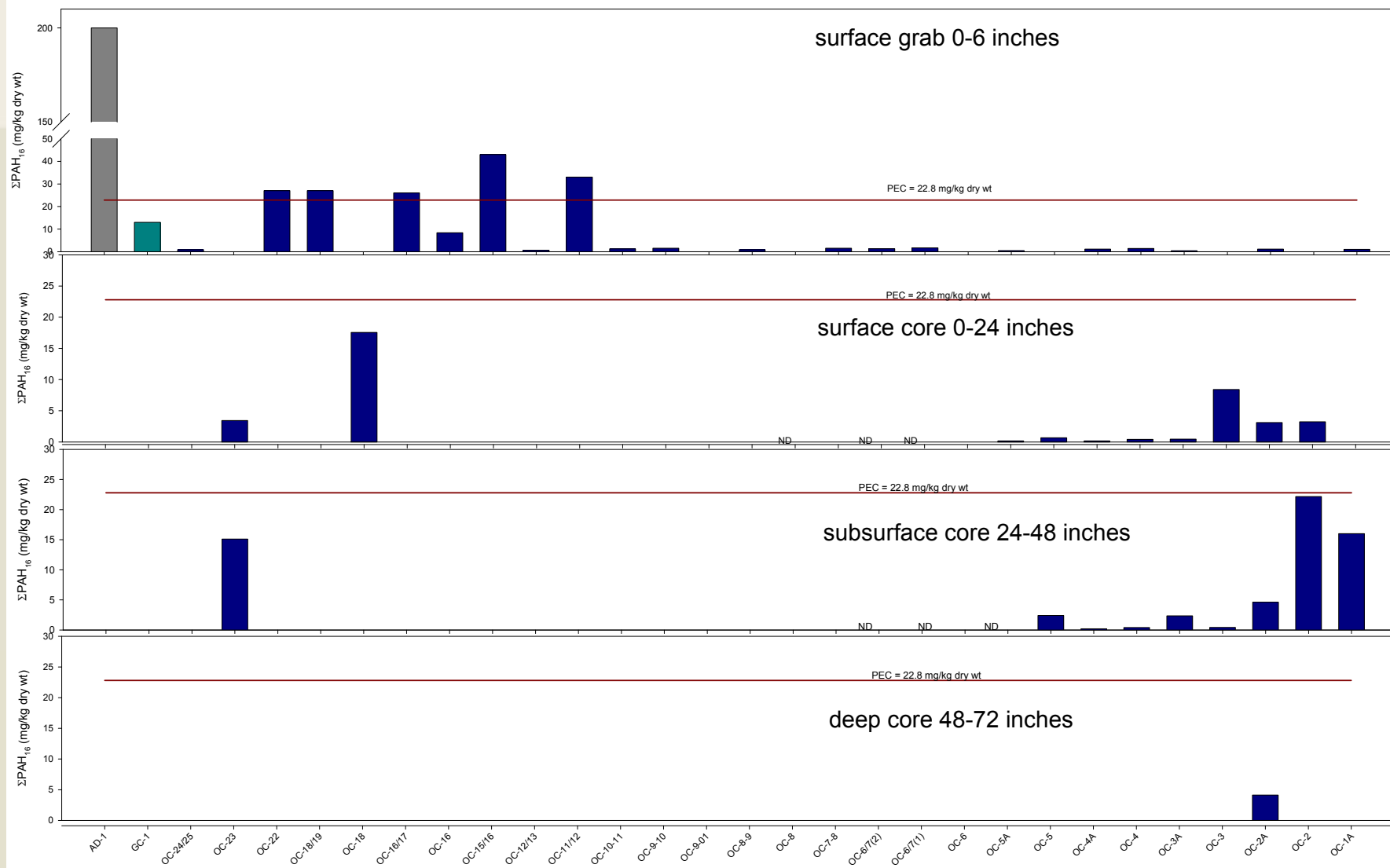
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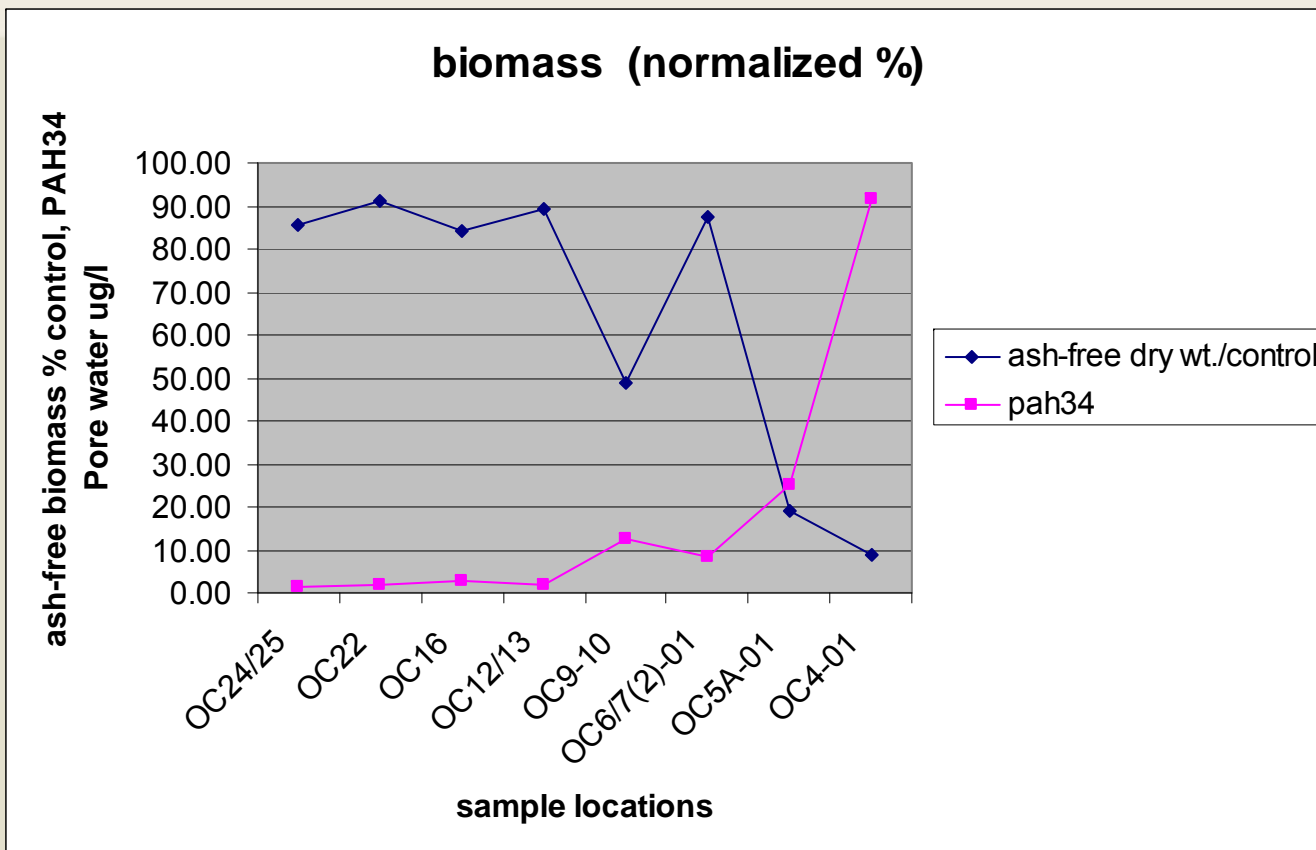
DRAFT ΣPAH_{16} – Duck Creek sediments



DRAFT Σ PAH₁₆ – Otter Creek sediments



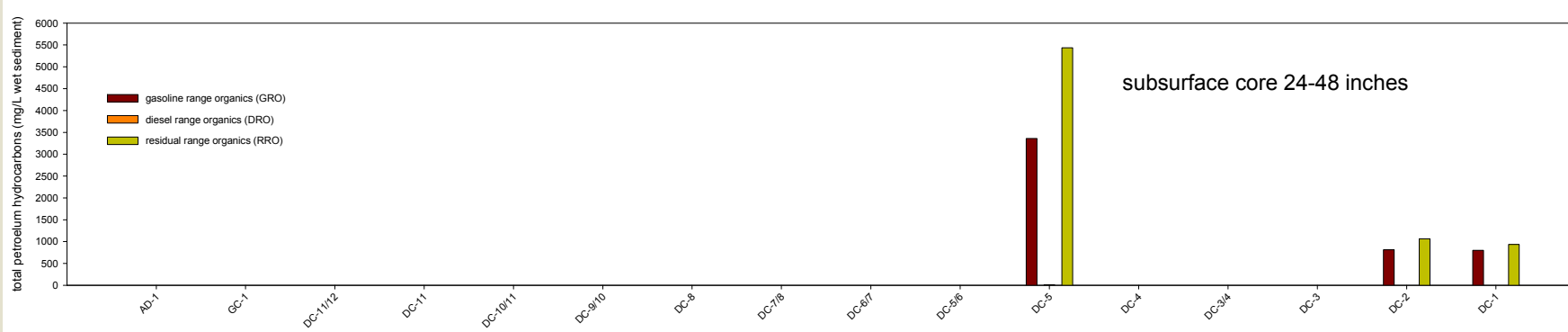
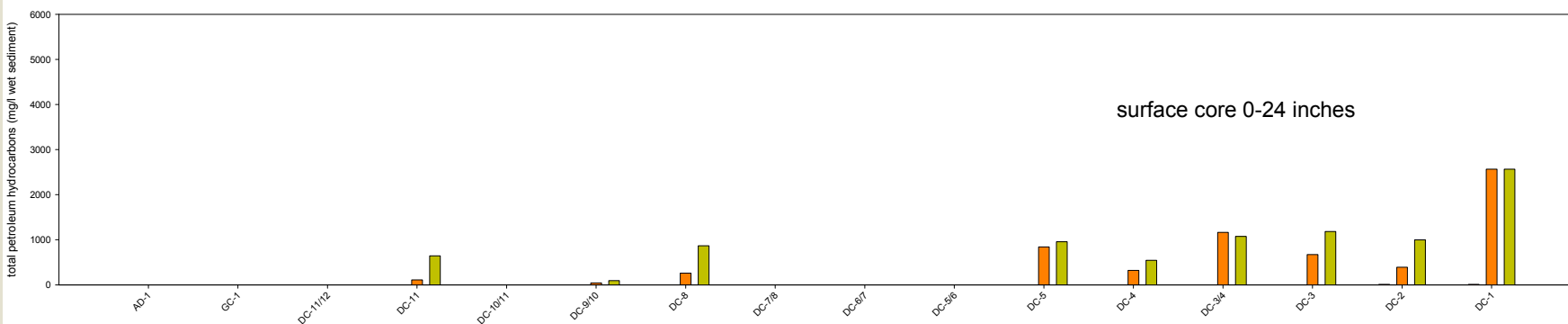
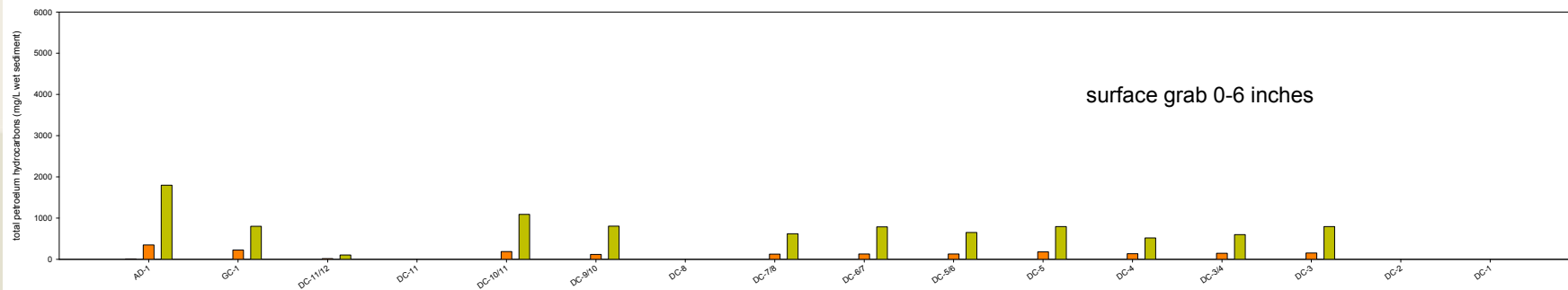
SEDIMENT PORE WATER PAH vs. TOXICITY (GROWTH)



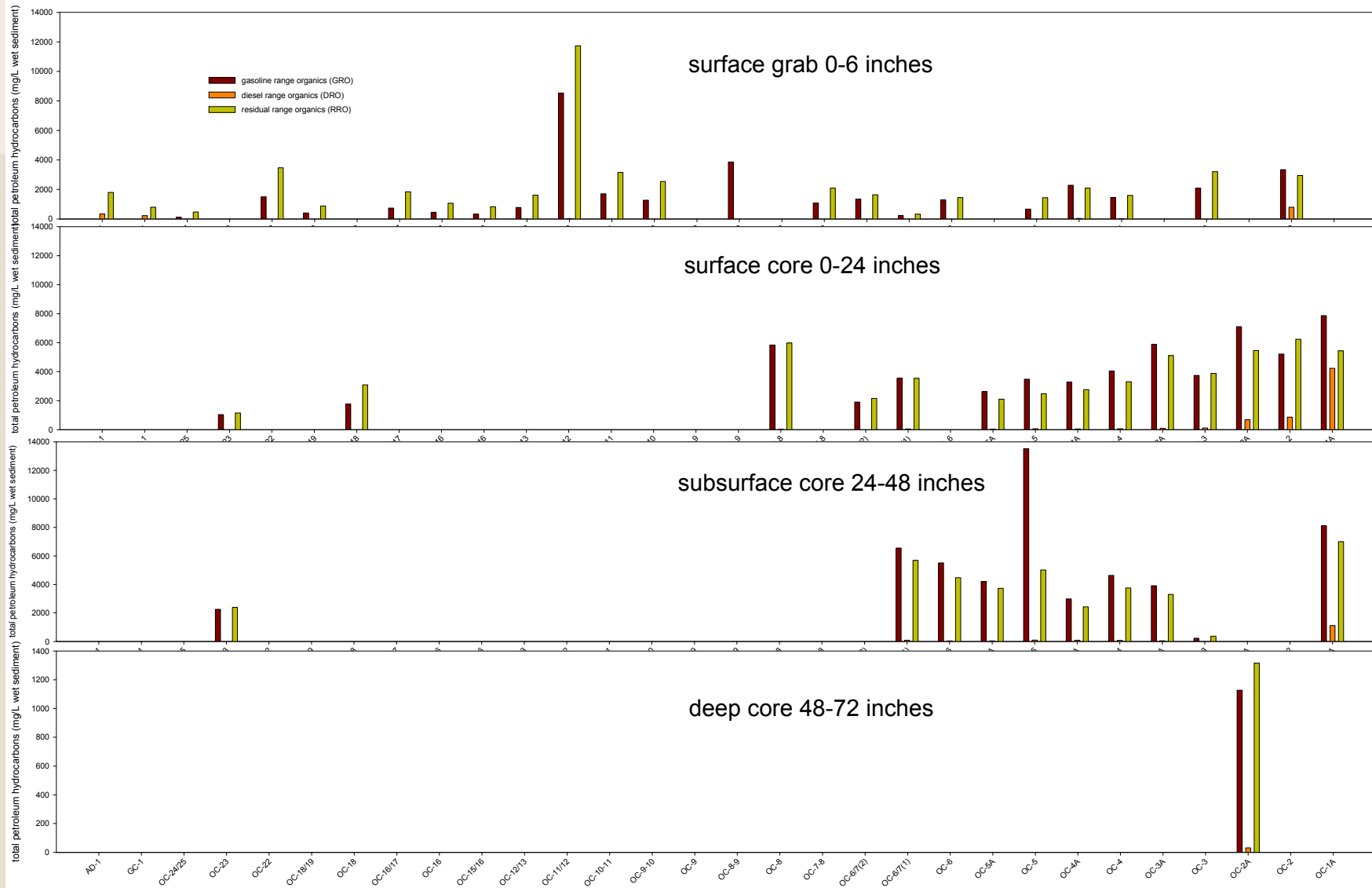
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DRAFT TPH – Duck Creek sediments



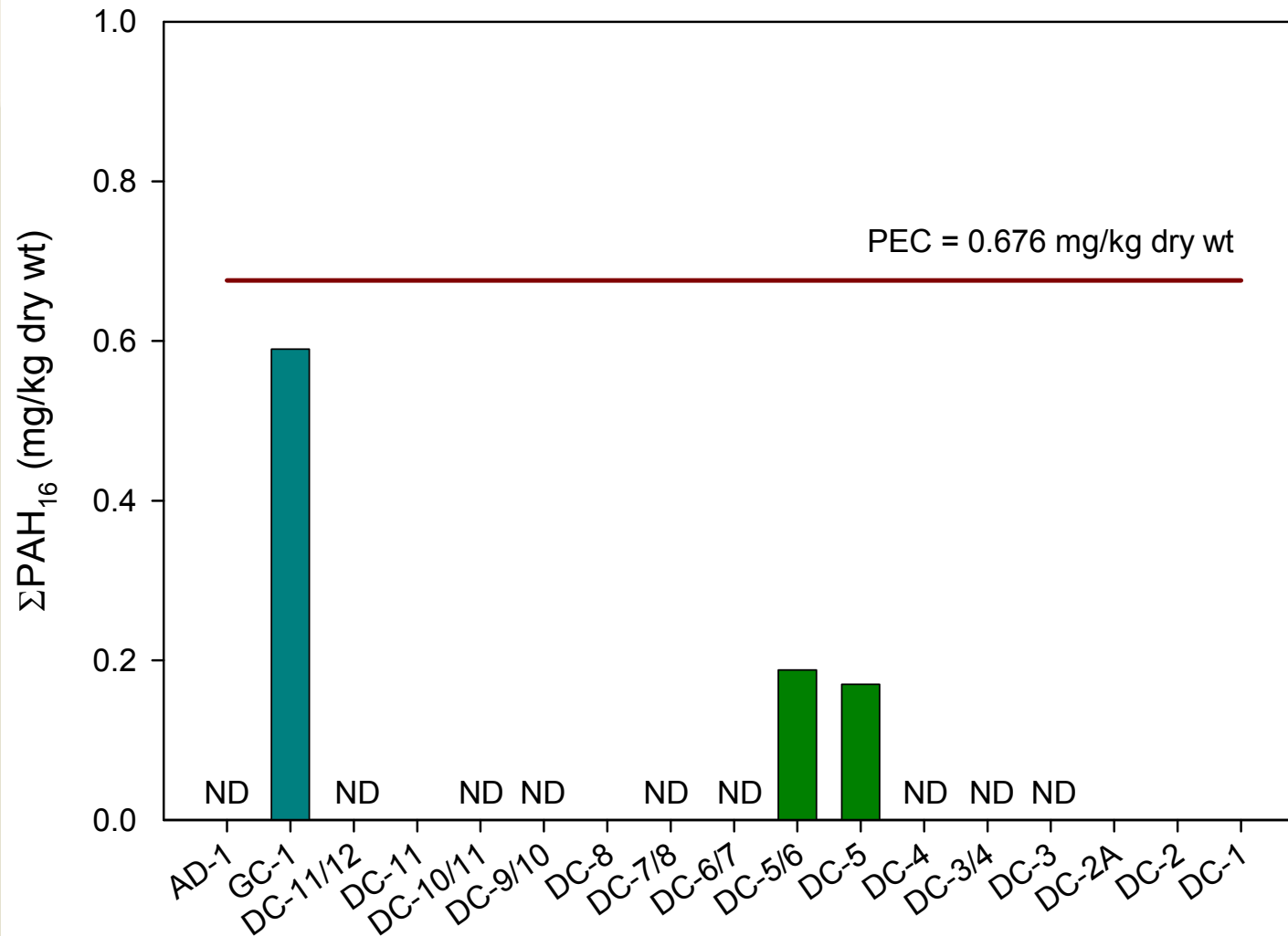
DRAFT TPH – Otter Creek sediments



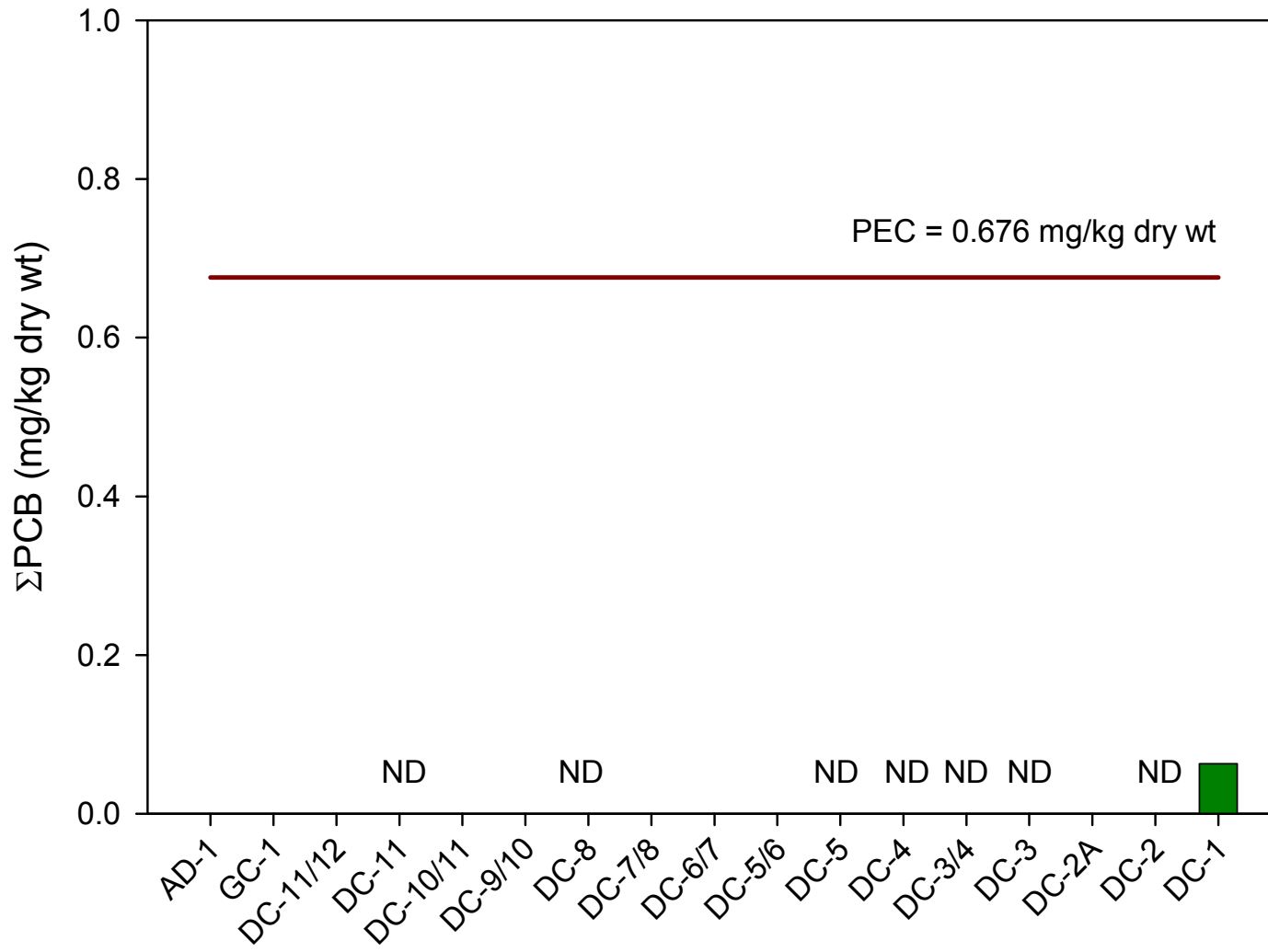
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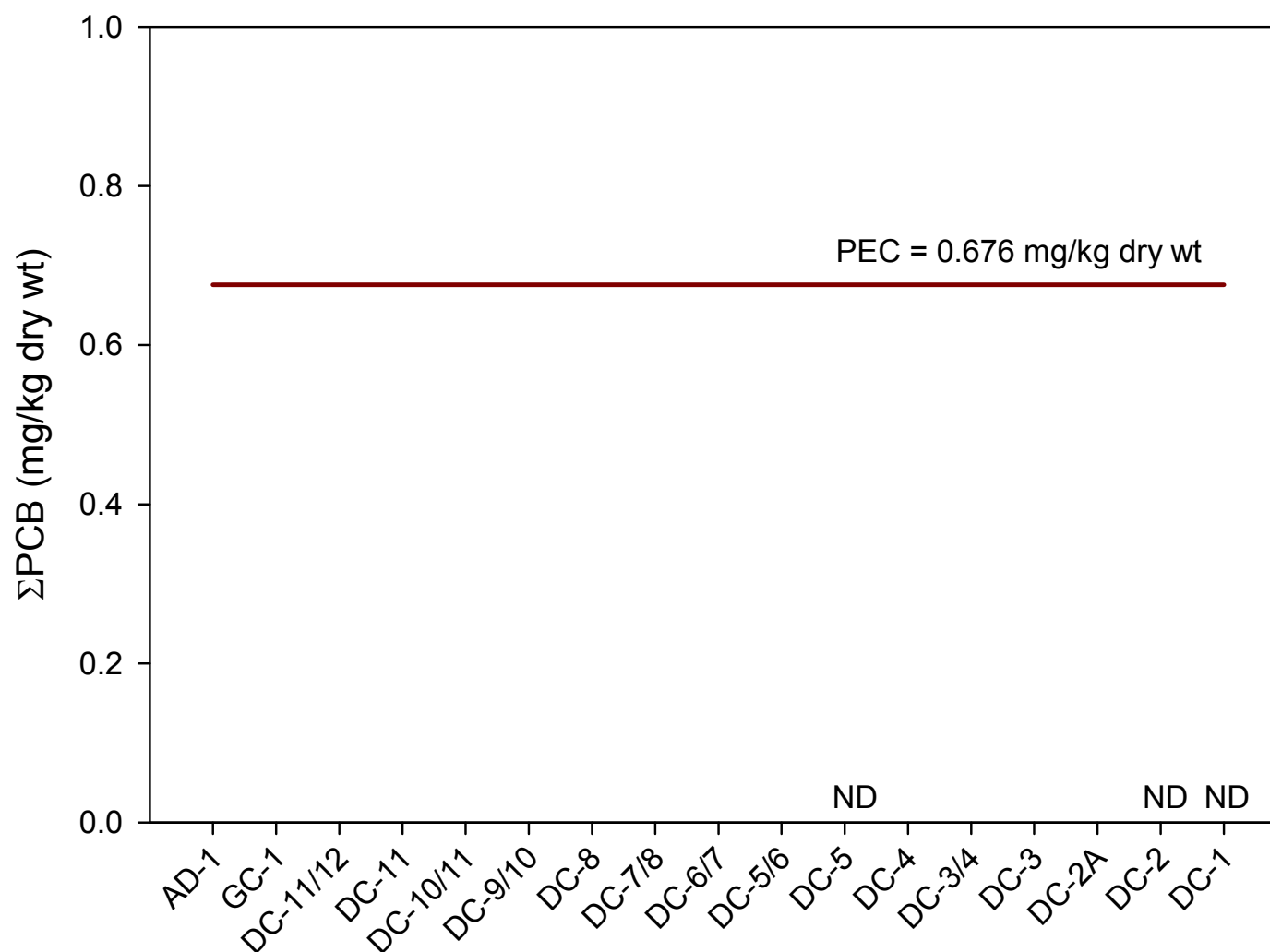
DRAFT Σ PCB – Duck Creek surface (0-6 inches)



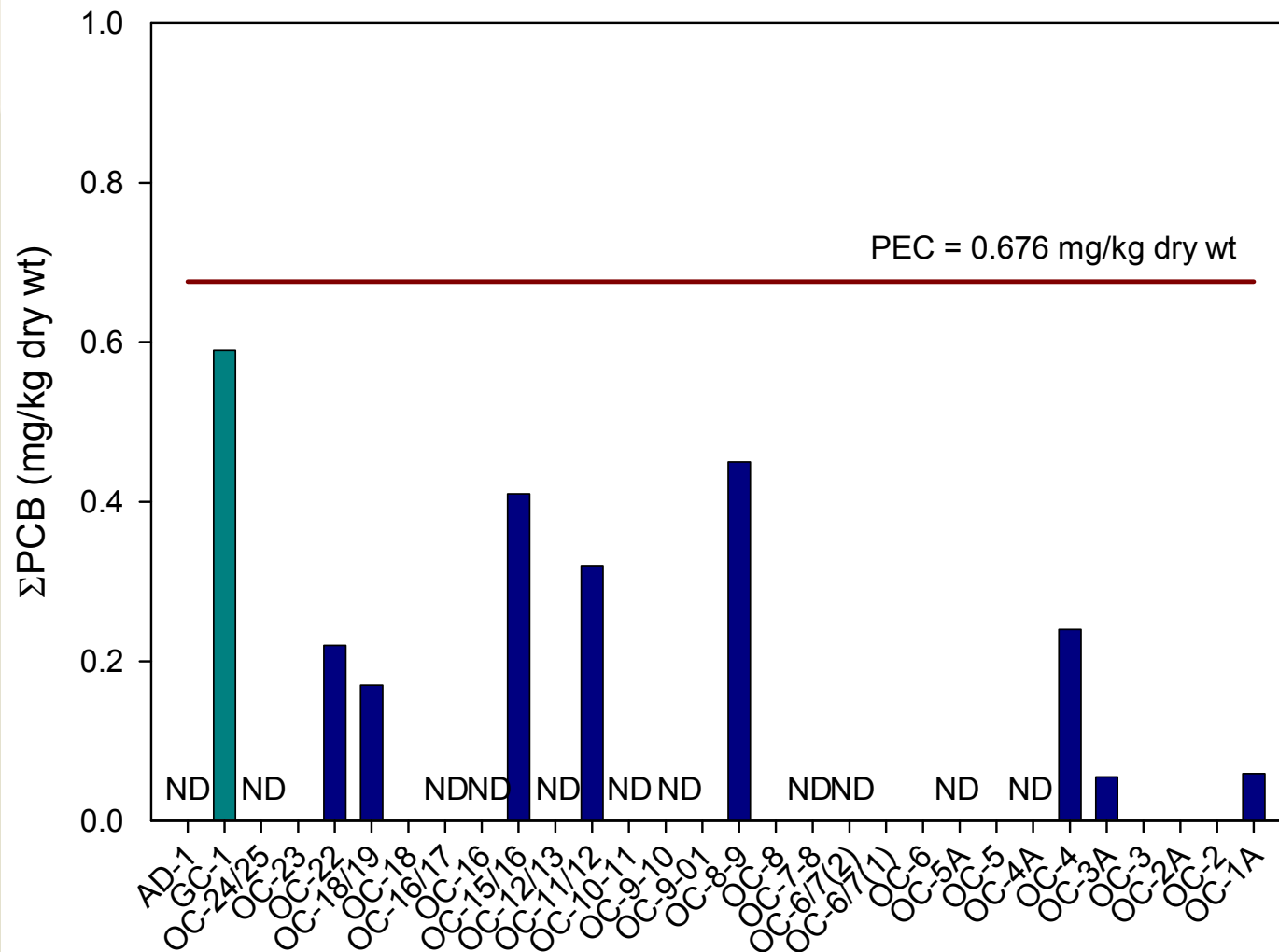
DRAFT Σ PCB – Duck Creek cores (0-24 inches)



DRAFT Σ PCB – Duck Creek cores (24-48 inches)



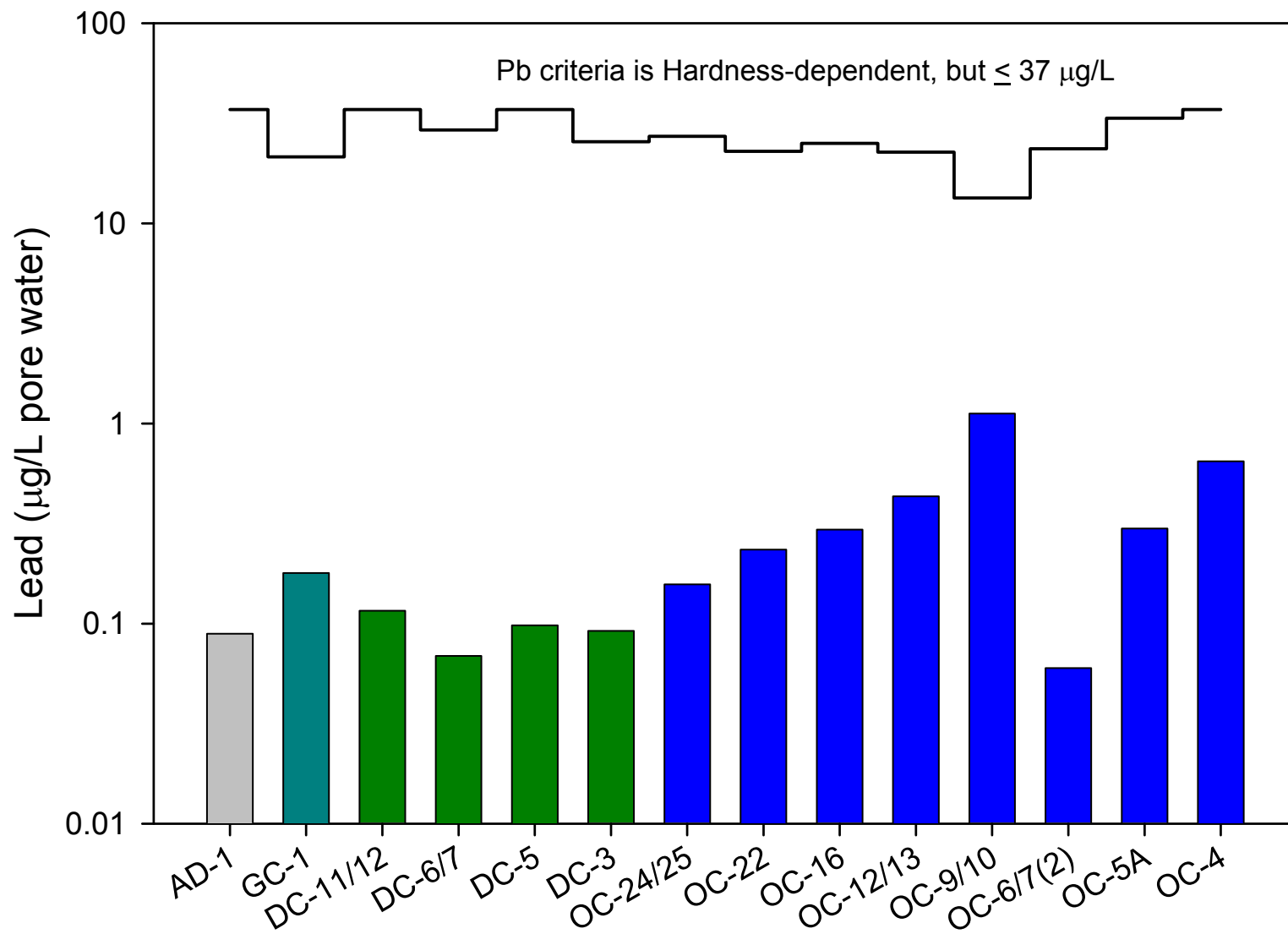
DRAFT Σ PCB – Otter Creek surface (0-6 inches)



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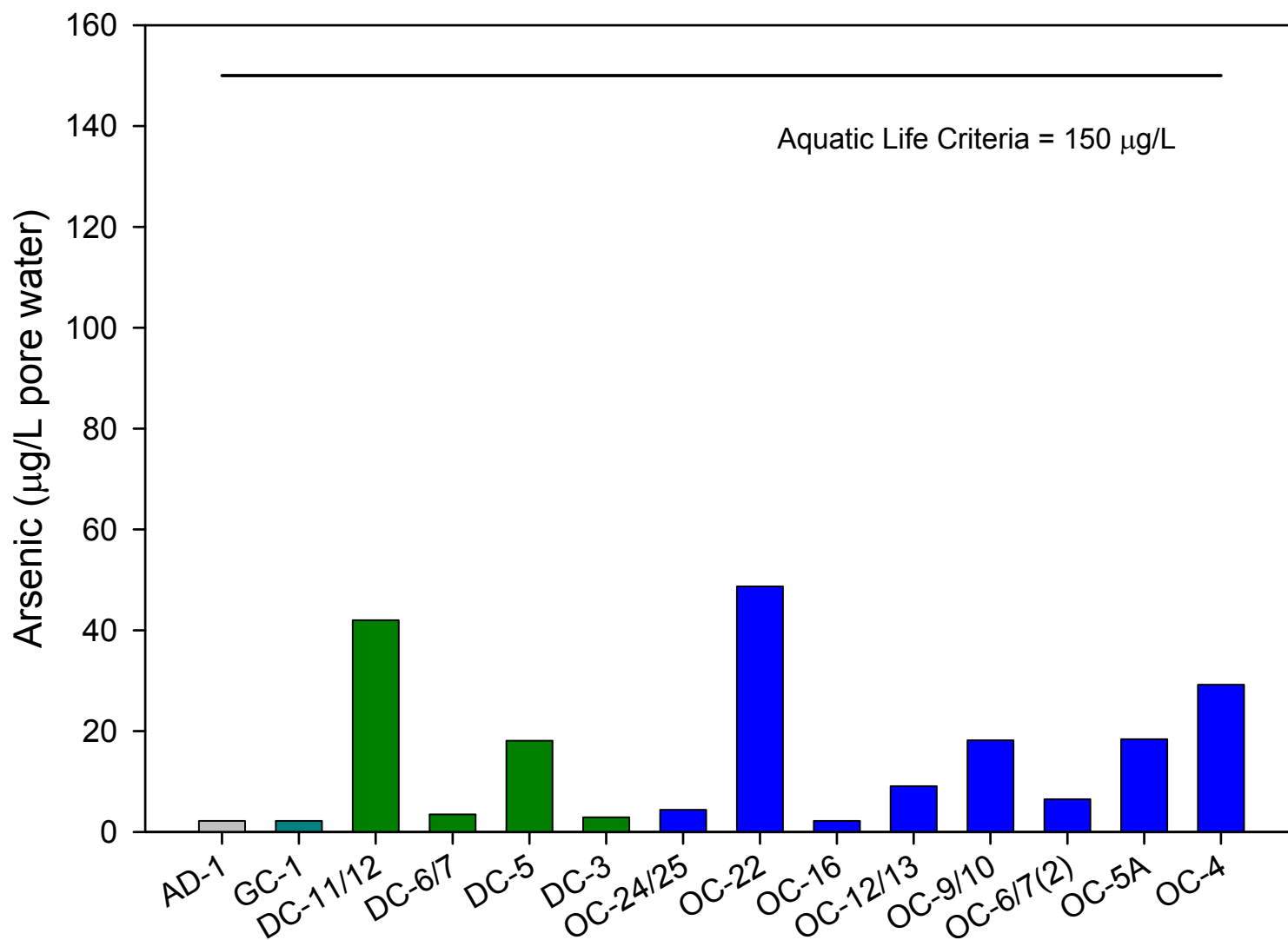
DRAFT Lead in sediment pore water (0-6 inches)



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DRAFT Arsenic in pore waters (0-6 inches)



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Preliminary Executive Summary

Draft Conclusions

- 1) Metals, PCBs, pyrethroid pesticides, and non-PAH SVOCs can be ruled out as sources of toxicity in the 2010 Data Gap Investigation data set because these classes of contaminants generally are not elevated in sediments, or are not bioavailable.
- 2) Generally poor habitat quality within the study area makes it difficult to discern between the potential influence of chemical contamination versus the influence of physical habitat modifications on the benthic communities of Duck and Otter Creeks.
- 3) Otter Creek, downstream (north) of Millard Avenue, differed from the other stream reaches of Otter Creek, the Duck Creek segments, and the urban comparison streams Grassy Creek and Amlosch Ditch.
- 4) 2010 data does not indicate there are issues with Duck Creek and the other stream segments of Otter Creek.

Preliminary Executive Summary

Draft Recommendations

- 1) Further evaluate potential remedies for Otter Creek, north of Millard Avenue, in a subsequent phase of the project
- 2) Further evaluate the combined 2007 and 2010 data sets for the remaining stream sections in a subsequent phase of the project.