

# H.B. 2579 Selenium Study: Precursor to State-Specific Aquatic Life Criteria for Selenium



**West Virginia Department of Environmental Protection**

# HB 2579

Revision of water quality criteria (aquatic life) for selenium

## Summary

- Adopted by WV Legislature during 2013 Regular Session; Effective July, 2013
- Requires WVDEP to establish an implementation plan within six months
- Mandates WVDEP to propose new selenium criteria within two years for legislative approval
- Requires implementation of criteria as a threshold standard
- Prescribes a monitoring plan, including water chemistry and fish population studies
- Results of studies to be used by WVDEP to develop state-specific criteria
- Does not change existing criteria in the interim

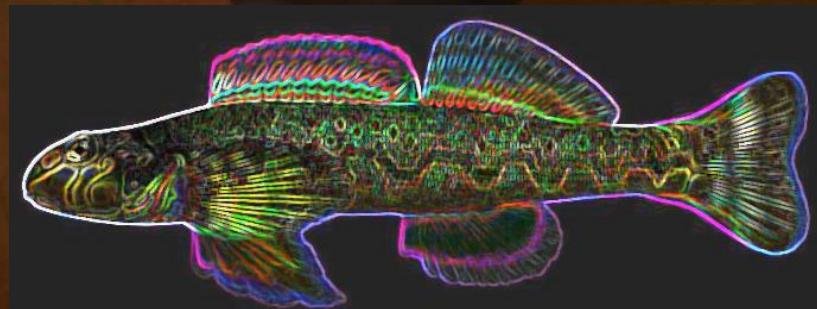
# KY's Example: Revision of Aquatic Life Selenium Criteria

- Proposed revision to acute and chronic aquatic life criteria February, 2013; Approved November, 2013
- Literature-based exercise incorporating relevant studies involving native fish species
- Studies must include a toxicological endpoint and comparable tissue conc. (e.g., larval deformity rate vs egg/ovary conc.)
- EPA approved revision to chronic criterion, but not acute
- New standard is tissue-based = 8.6 ppm whole body when water column > 5 µg/L

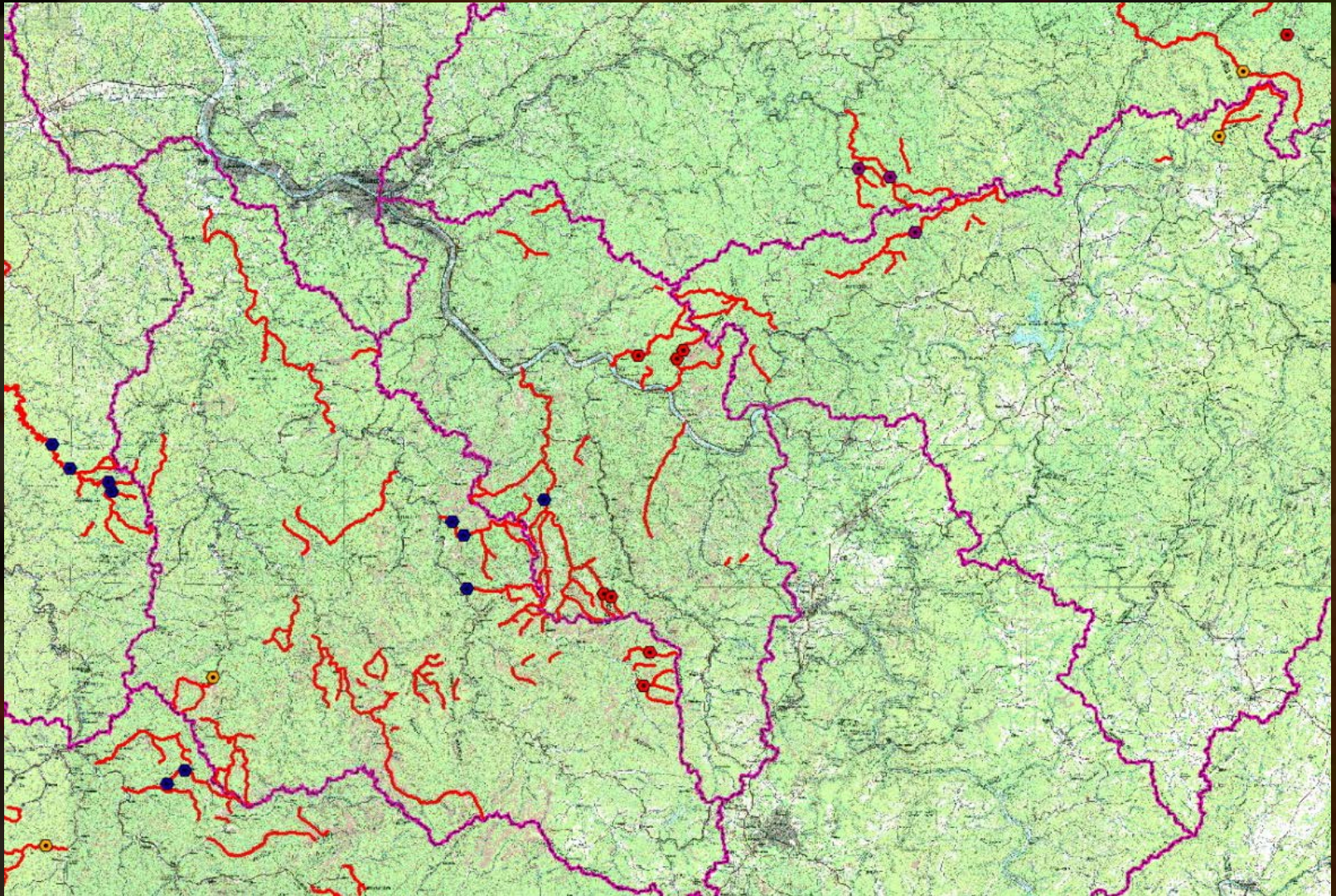
# WV Selenium Monitoring Plan

## Major Components

- Water chemistry monitoring and speciation analyses
- Fish tissue monitoring
  - Whole body
  - Egg/Ovary
  - Stomach contents
- Early life stage evaluations
  - Deformity rate determinations
- Criteria calculation



# WV Selenium Monitoring Plan

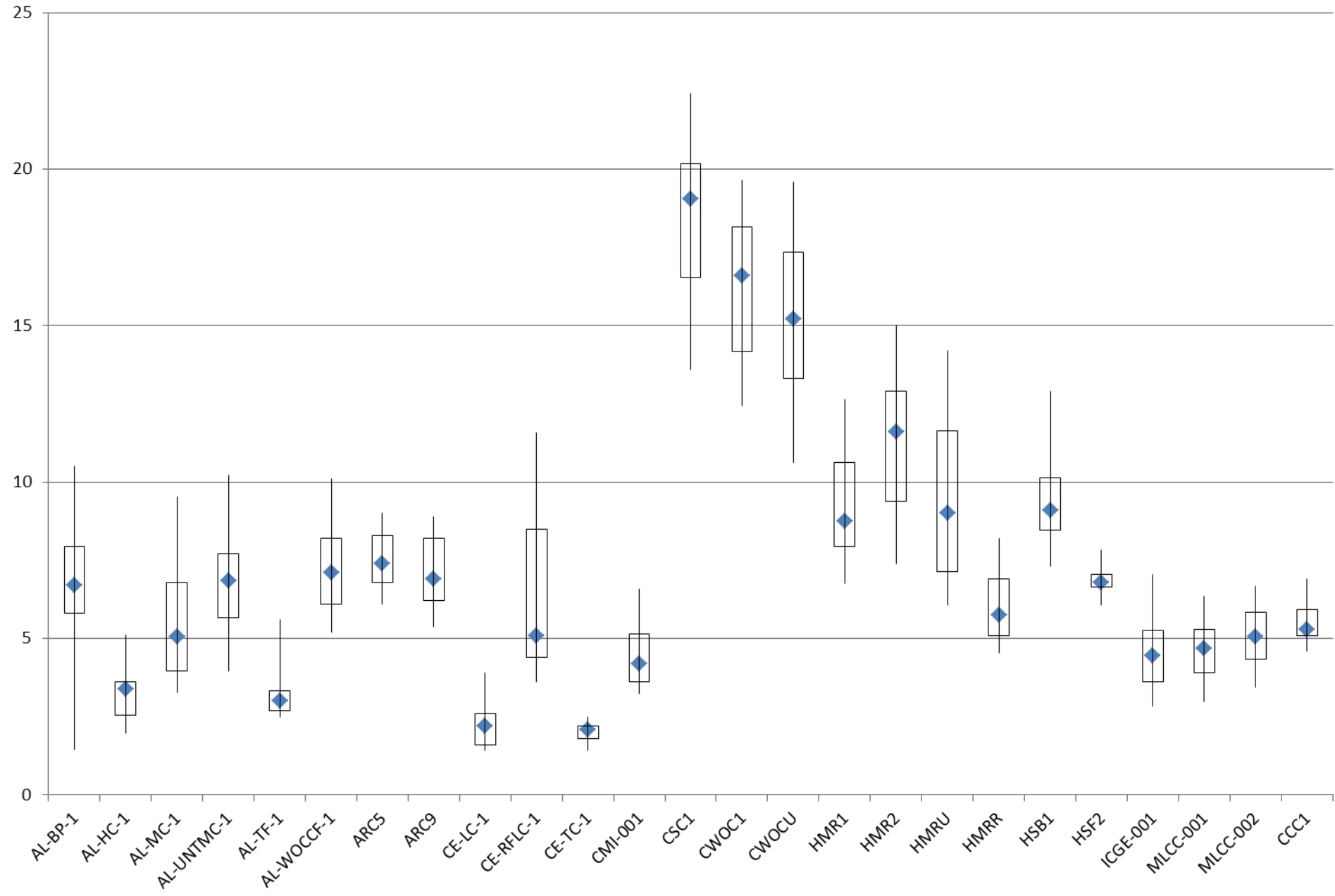


- 21 Lotic (perennial, wadeable) and 3 Lentic sample locations
- Flow sufficient to support fish spawning

# 2015 work

- WVDEP effort
- Sutton Lake
  - lentic reference
  - CYCA, MISA, and LEMA tissue and larvae
- Mud River
  - Tissue, MOER larvae
- Mud Lake
  - CYCA and MISA tissue and larvae

# Water Column Selenium Concentrations ( $\mu\text{g/L}$ )



































Project: FISHNET  
Project # 21-0000-000  
Site: CASCA ACQ II  
Date Collected: 01/20/17

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Project: FISHNET  
Date: 01/20/17























**Fish Sample – label for inside of jar**

Stream Name HMRI - Mud R.

Site ID HMRI-CAAN-WB-1

Date 5/9/14 Project Se

















**APPALACHIAN  
REGIONAL  
REFORESTATION  
INITIATIVE**









Several sheets of paper are pinned to the wall on the left side of the room. One sheet appears to be a checklist or a data table with multiple columns and rows. The other sheets contain text, possibly instructions or protocols.

INDIVIDUAL  
SM-14  
RL-07  
LY-08  
WB-46  
JF-15  
LE-18  
JD-14  
JM-8  
CW-7  
BB-4  
JR-12  
SE-13  
4/1/14









MOUNTAINERS  
FOOTBALL





WEST VIRGINIA  
MOUNTAINEERS  
FOOTBALL

NO 8HP BOAT  
MOTOR LIMIT

UISHER

RESEARCH VESSEL  
SOUTH HOOK









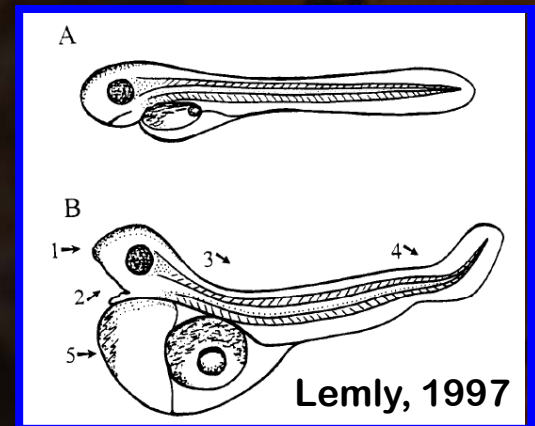
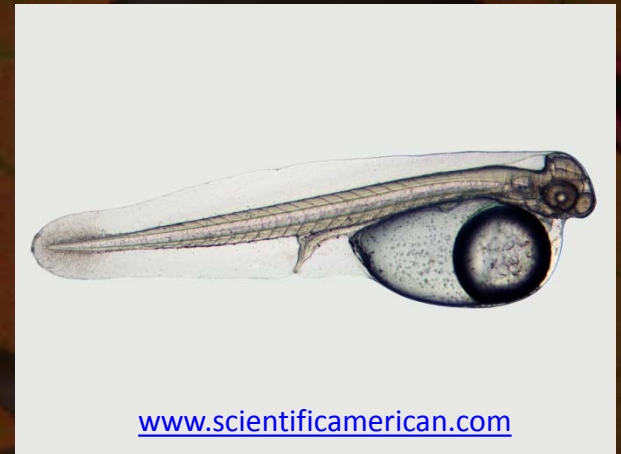


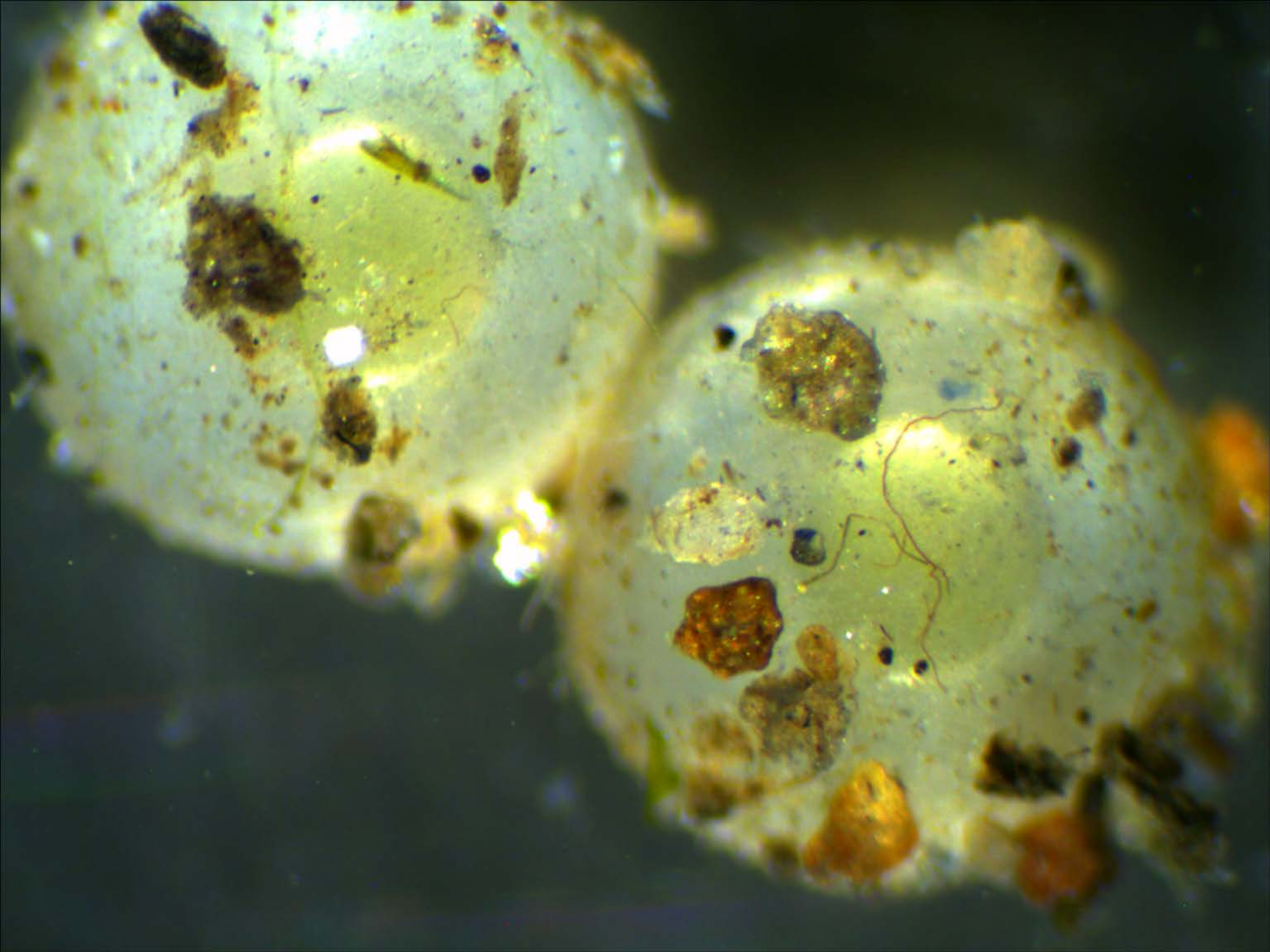


# WV Selenium Monitoring Plan

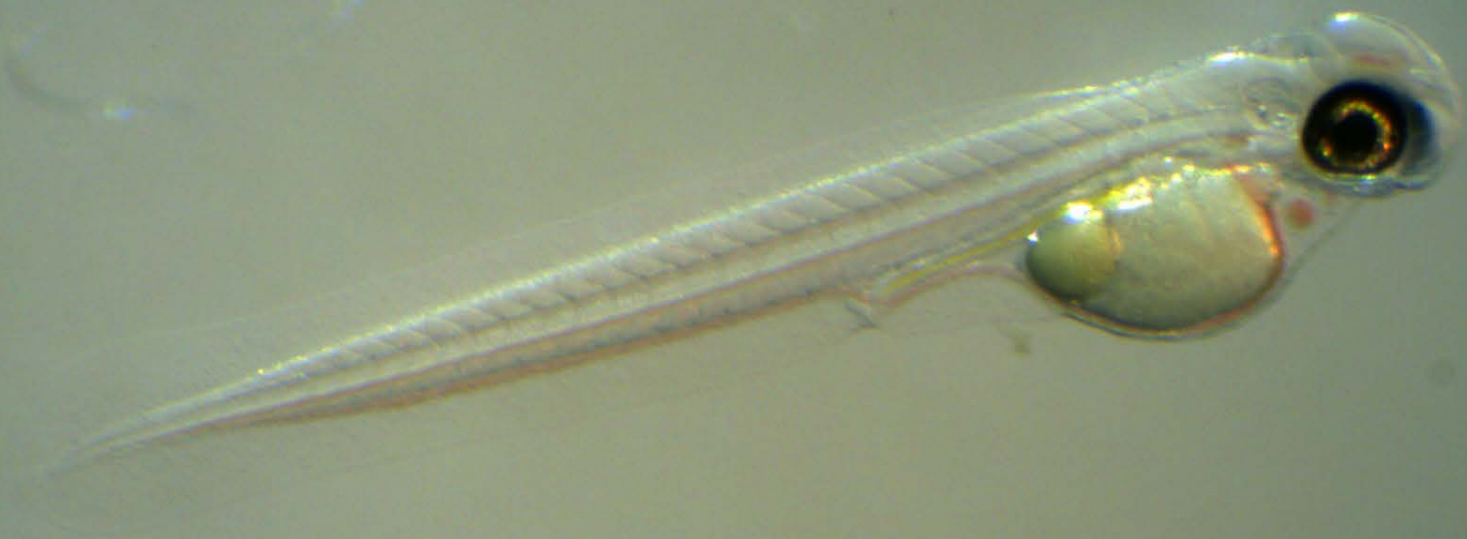
## Early Life Stage Fish Evaluation

- Measure of larval deformity rates among populations examined
- Compared directly to egg/ovary tissue concentrations and maternal tissue matrices

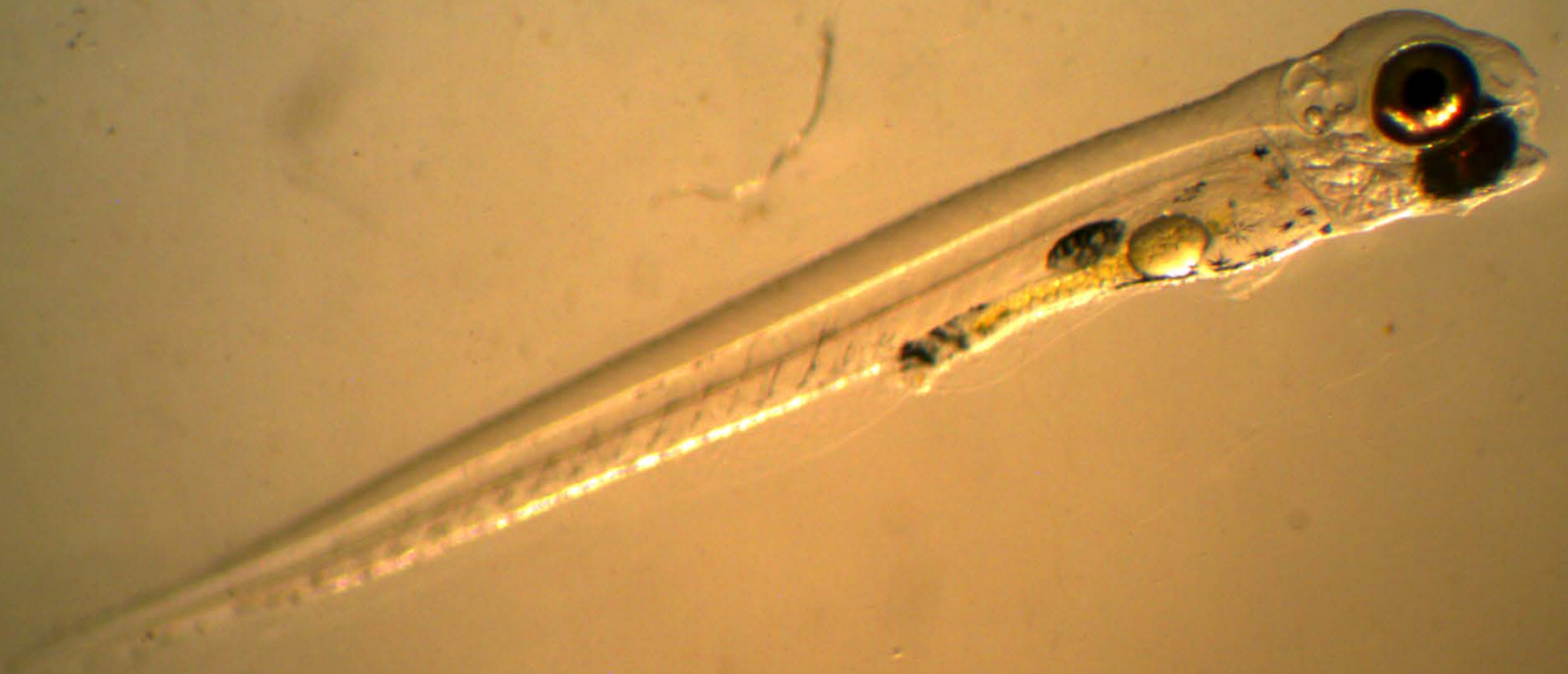






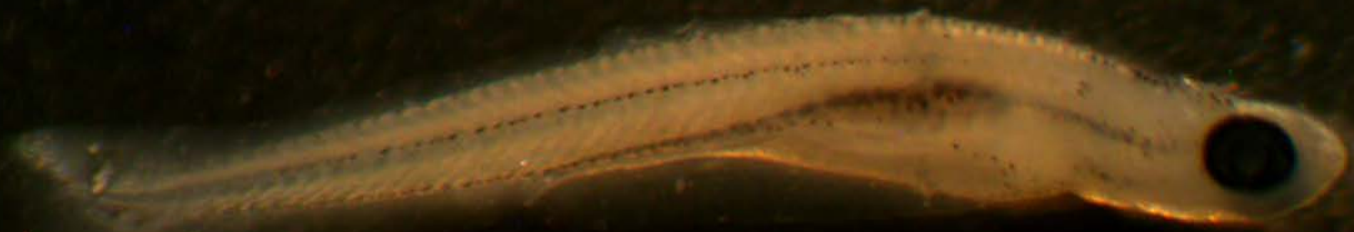




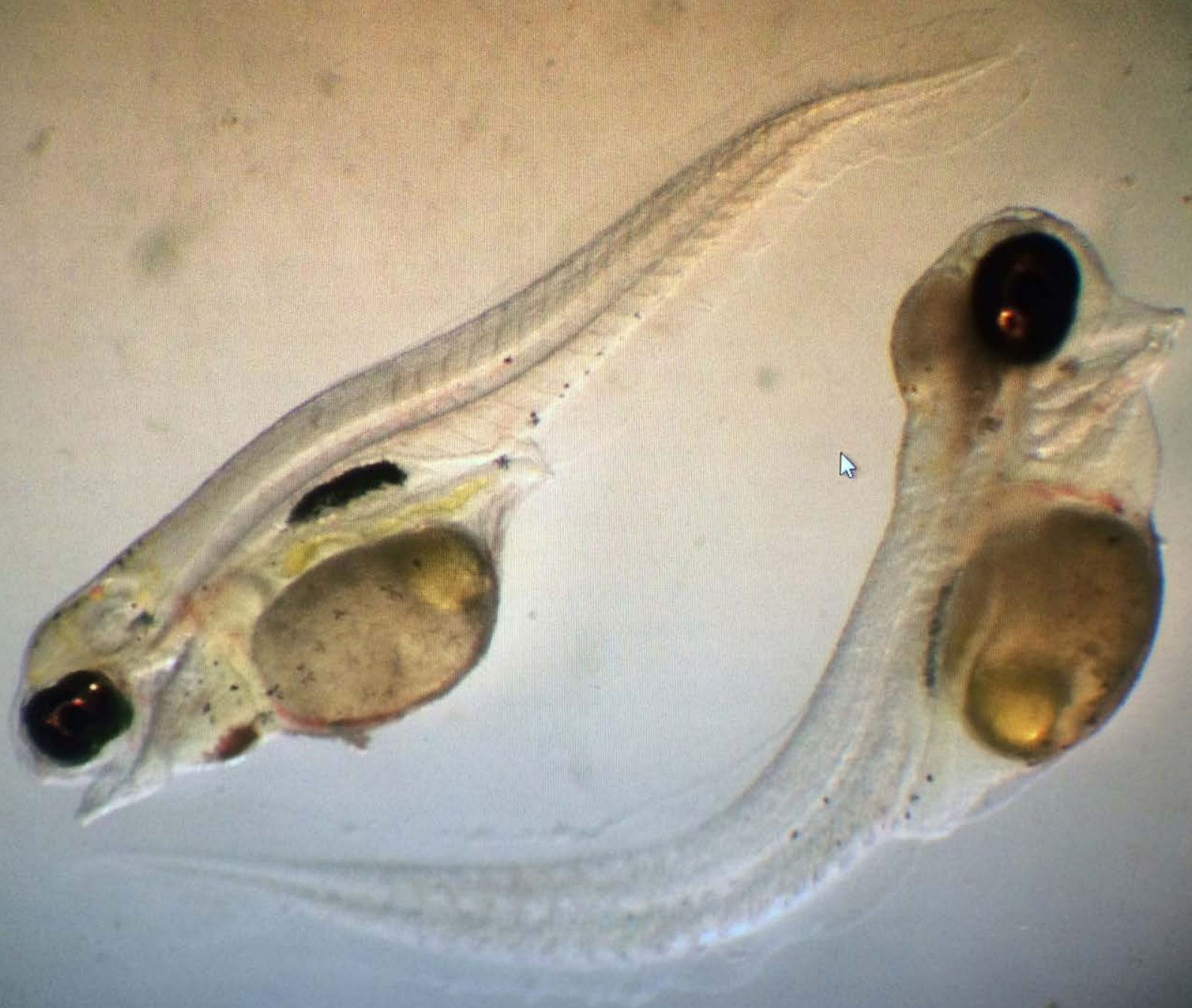








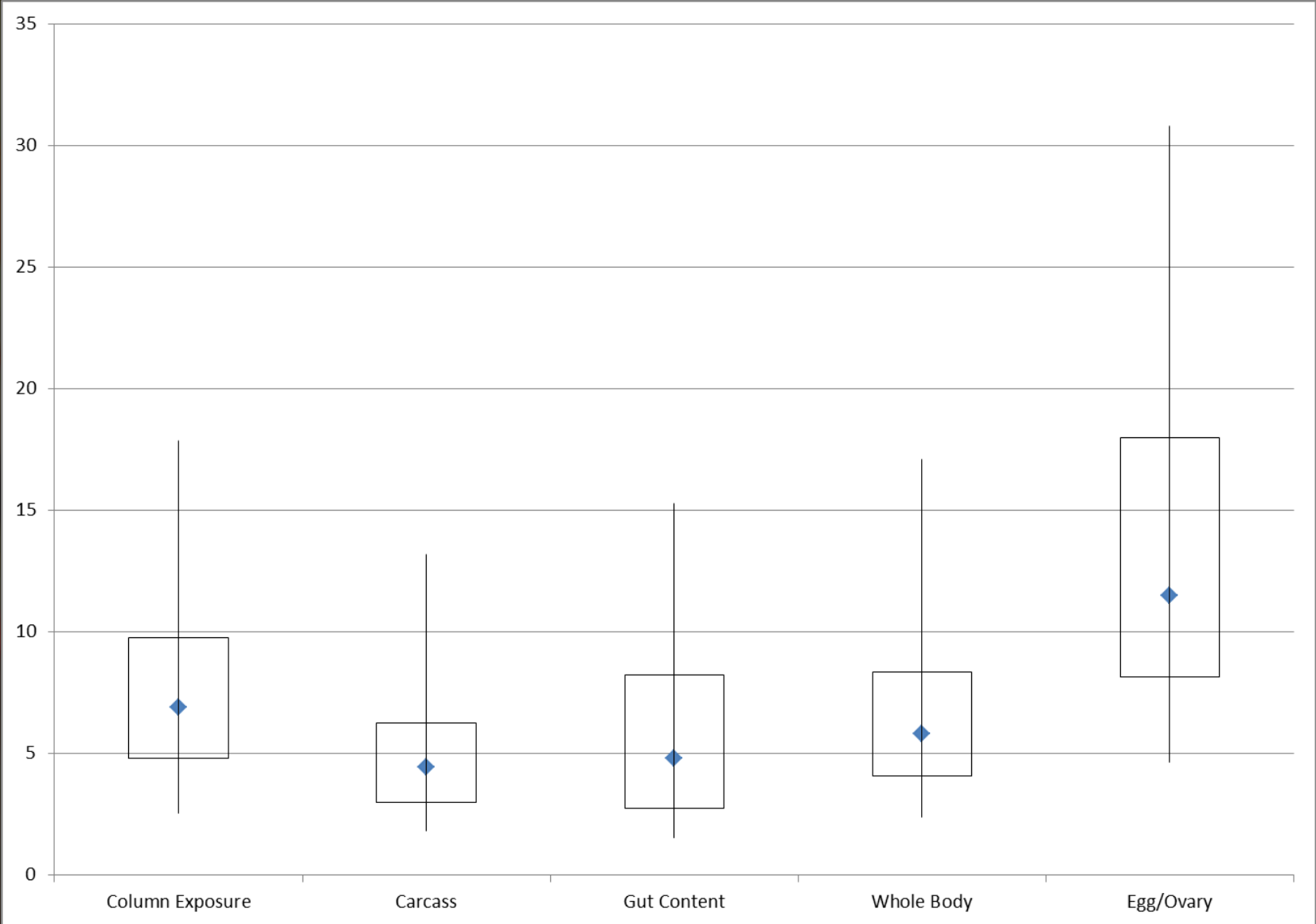






# Tissue Summary: All Sites/Exposures

Selenium Conc. ppm/dry





# WV Selenium Monitoring Plan

## Data Reporting and Criteria Calculation

- **Thresholds for tissue matrices (whole body or egg/ovary) based on levels @ EC<sub>10</sub> larval deformity rates**
- **Data for individual studies compiled with existing information**
- **5<sup>th</sup> percentile of established tissue thresholds becomes criterion—protective of population**
- **Water column translation based on dietary uptake, information for stomach content analyses**



OLYMPUS

2.1m / 7ft SHOCKPROOF  
15m / 50ft WATERPROOF

E2.0

Questions???

