Viewpoints on Sediment Problems

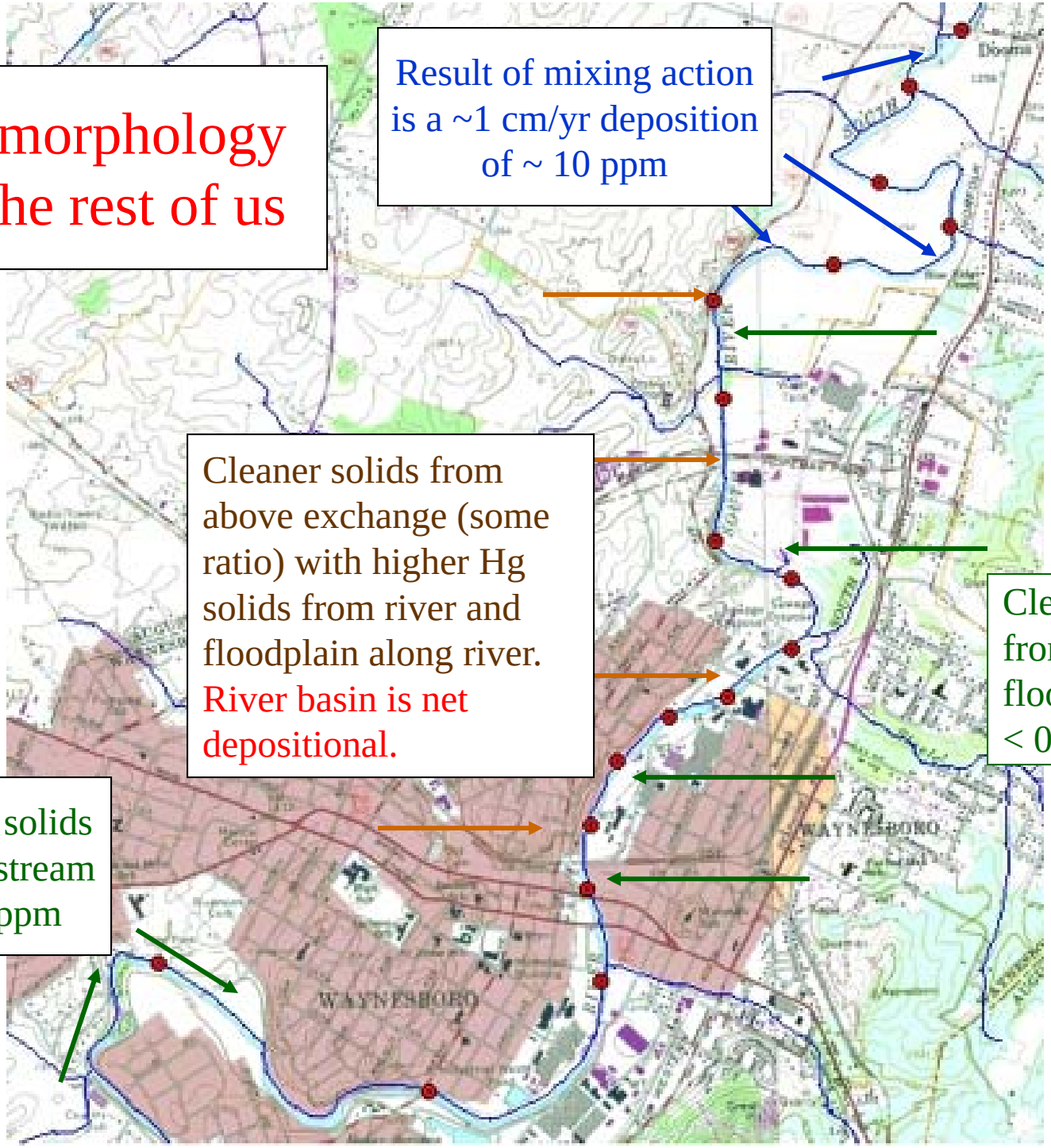
Two ends of the spectrum
All sites and all "techies" lie somewhere on this scale

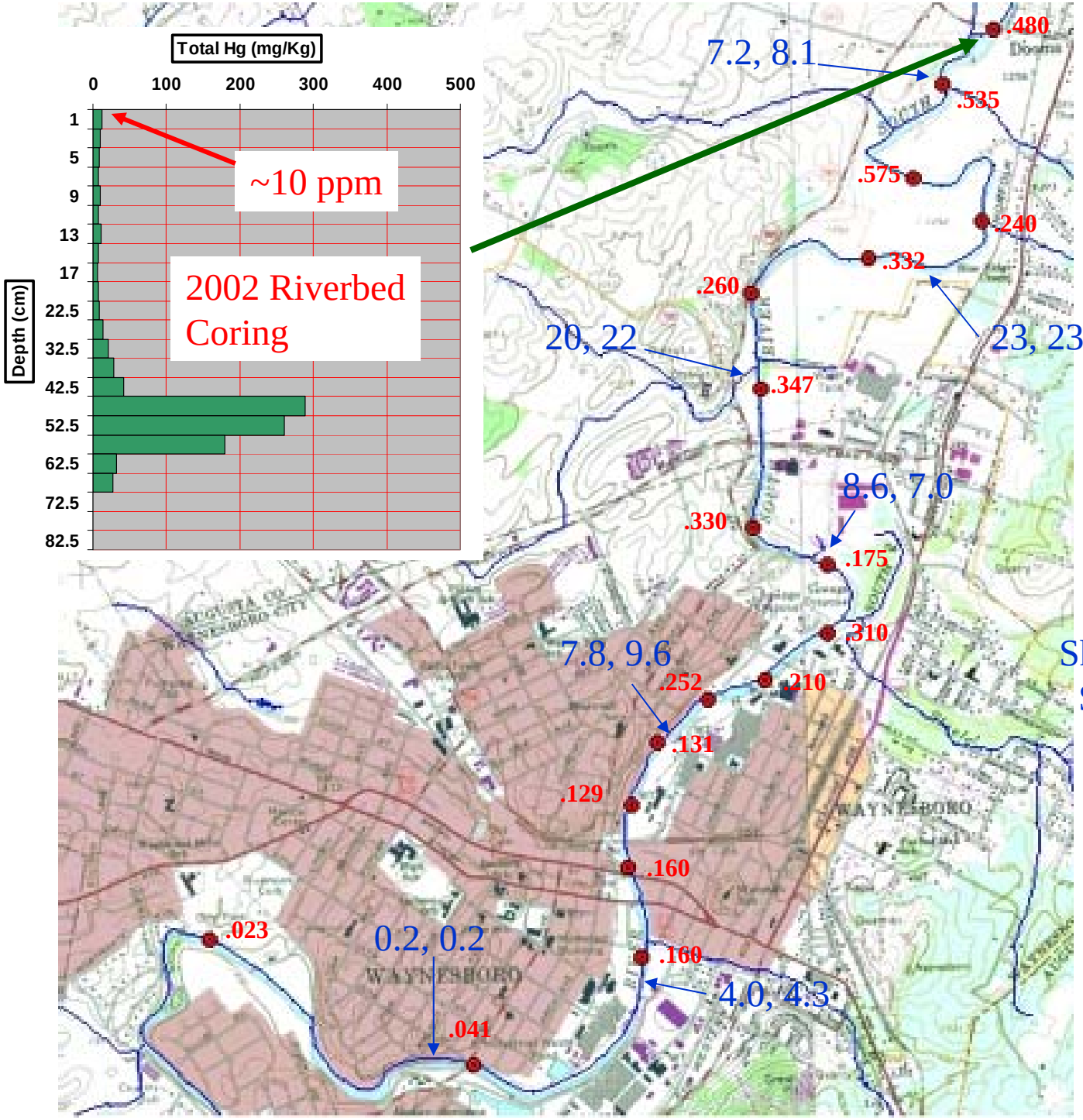
- Bottom, looking up
  - Established early, leadership, SETAC
  - Biological view
  - Focus > current conditions
  - LEL, MCL, all the Ls
  - 3 steps
    - Sample sediment
    - Compare to criteria
    - If flunk, take action
- Whole watershed view
  - Later development
  - Geological view - watershed, floodplain, riverbed dynamics
  - Focus > natural processes, halting external sources, future conditions
  - Conceptual models
  - Sediment levels most important in refining conceptual models

Where are SR and SRST?

- SR has huge watershed, important floodplain, and almost no “sediment”
- Yet there are problems with sediments and biology, so both very important
- *Current speaker (and several others) are “dyed-in-the-wool” whole-watershedders!*

Geomorphology for the rest of us





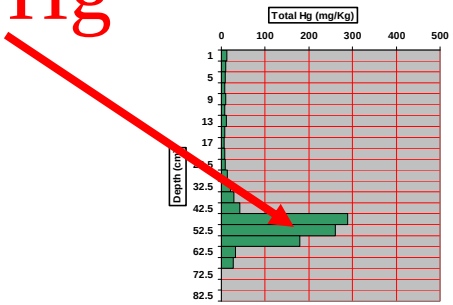
Bowles' Clam Values ppm Approximate

Shallow Floodplain Soils ppm, ~1980 dupl, composites Loc: Approx

Hypotheses

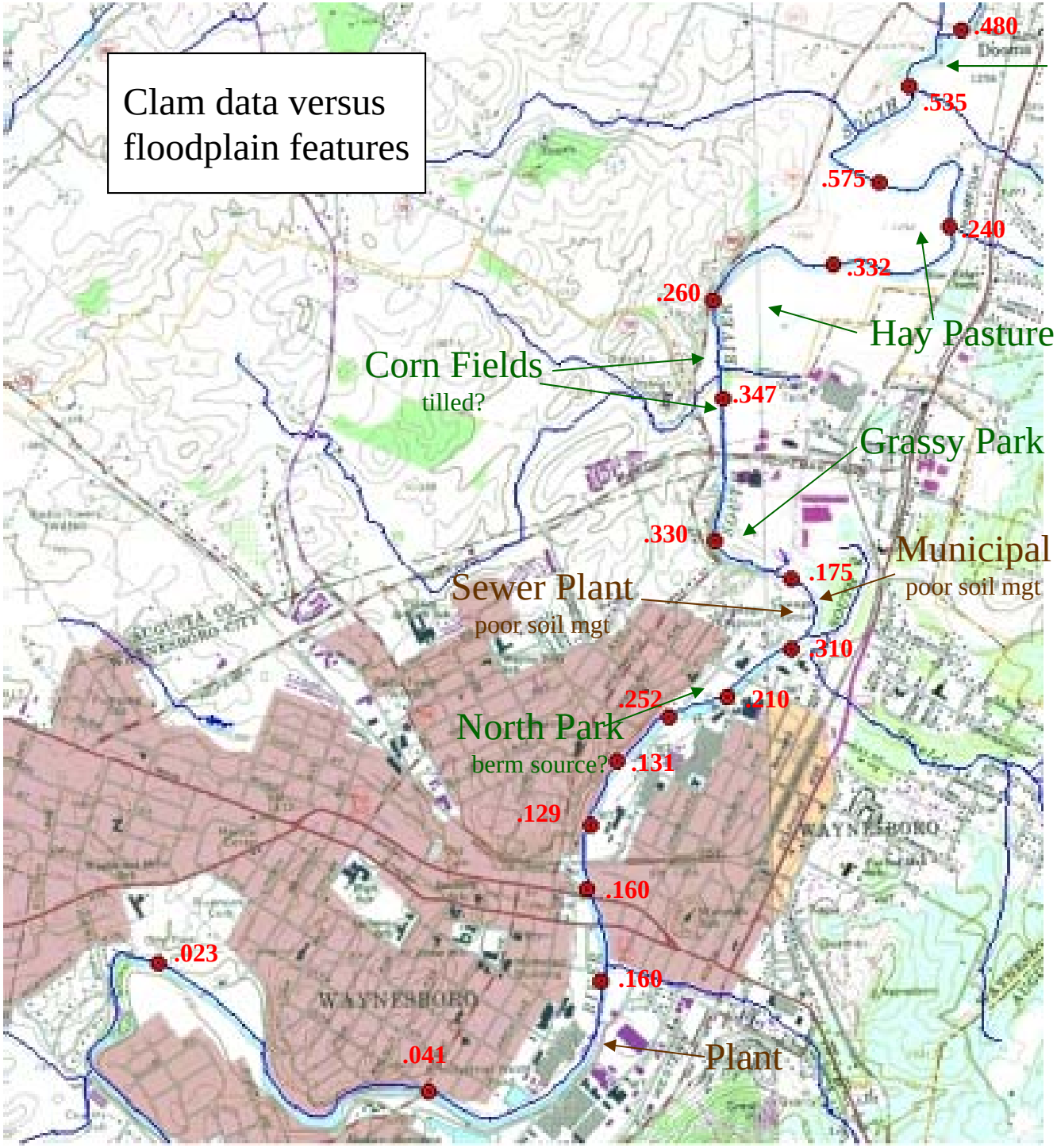
What's supplying ~10 ppm 1 cm/yr shallow Hg?*

- Storm Sewers?
  - May 2003 storm sampling
- Groundwater into riverbed?
  - 2002/2003? intensive water sampling
  - Search for inputs, thermal, etc.
- High Hg under riverbed, mainly near plant?
  - Sampling? "Panning for Hg?"
- Outcropping/sloughing of high Hg floodplain soils?
  - May 2003 bridge/trib sampling
  - Floodplain soil sampling



Some simple mixing math...

- Mix ratio = 1c :1d
  - 5 ppm > 2.5 ppm
  - 10 ppm > 5 ppm
  - 20 ppm > 10 ppm
  - 50 ppm > 25 ppm
  - 100 ppm > 50 ppm
  - 300 ppm > 150 ppm
- Mix ratio = 20 c :1d
  - 10 ppm > 0.5 ppm
  - 50 ppm > 2.4 ppm
  - 100 ppm > 4.8 ppm
  - 210 ppm > 10 ppm
  - 300 ppm > 14 ppm
  - 500 ppm > 24 ppm


Clam data versus floodplain features
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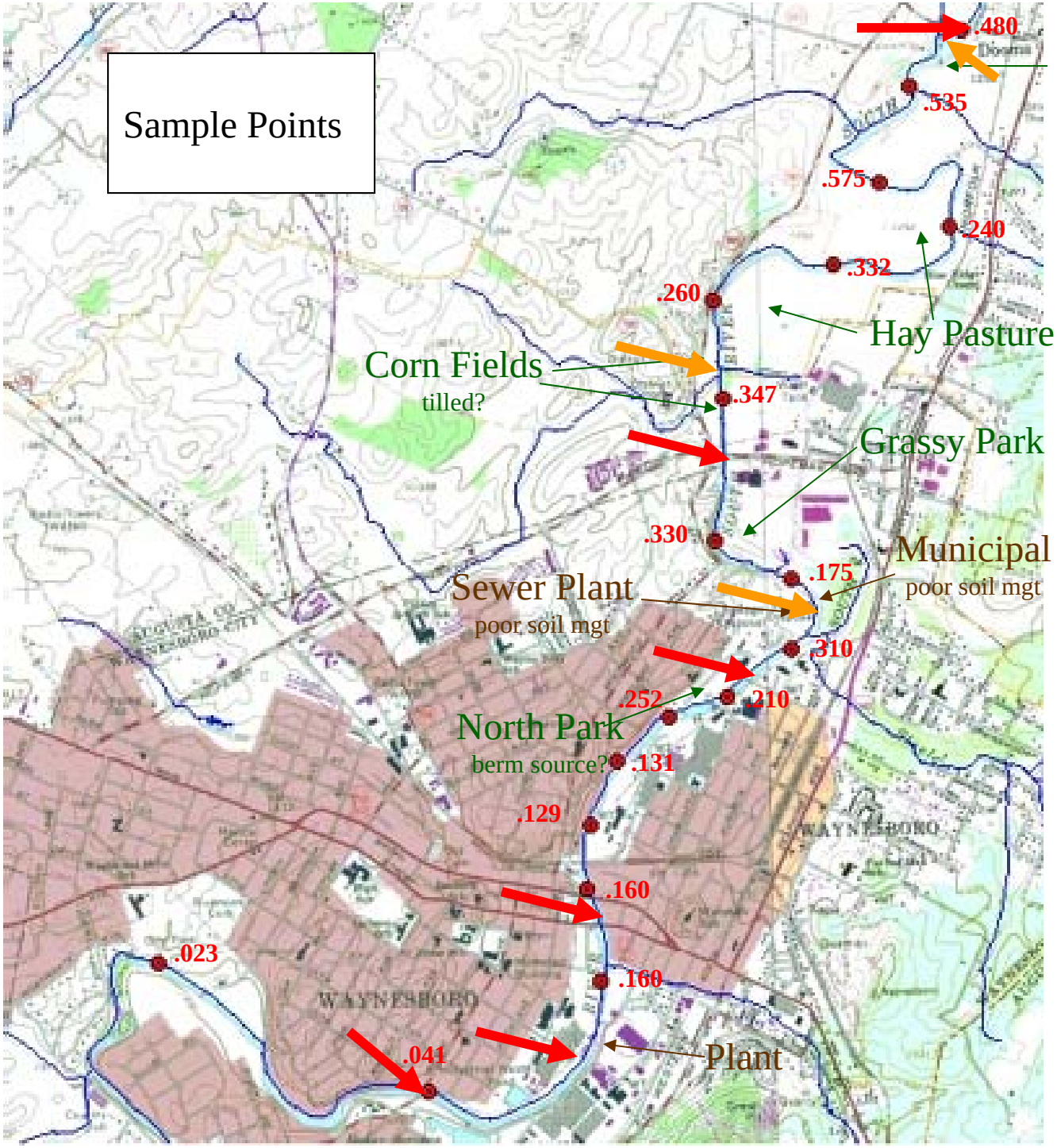
Pasture
.535
.575
.240
.332
.260
Hay Pasture
Corn Fields
tilled?
.347
Grassy Park
.330
Municipal
poor soil mgt
.175
Sewer Plant
poor soil mgt
.310
.252
.210
North Park
berm source?
.131
.129
.160
.023
.160
.041
Plant
WAYNESBORO
Bowles' Clam Values ppm Approximate

Bridge/Trib Sampling

highlights

- Water samples - total and dissolved Hg-t
- 6 bridges and 3 tribs
- Objective: Where do suspended solids jump from < 0.2 ppm to ~10ppm?
- Reason: Widespread ~10 ppm in shallow surface sediments and floodplain soils
- VA-DEQ will take samples
- Coordinate with plant storm sampling?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Main stream bridges
Tribs

Interesting New Learnings

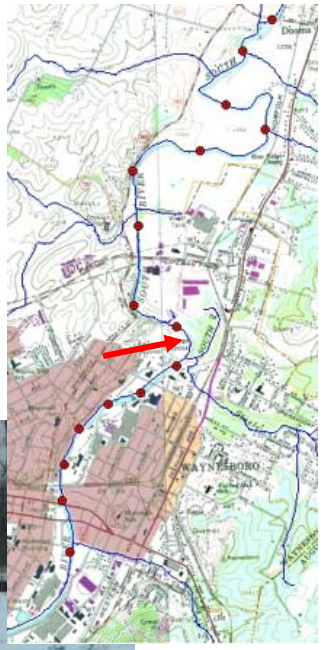
from existing data

- Shallow core segments (2002) order 10 ppm
- Ralph Turner's water data show suspended solids at ~10 ppm
- High intensity water sampling (2002) showed suspended solids at ~10 ppm
- Historic floodplain samples (shallow) above Dooms Dam on order ~10 ppm
- ***Learning: Doesn't depend on storms? Multiple sources/mechanisms?***

Analytical Method

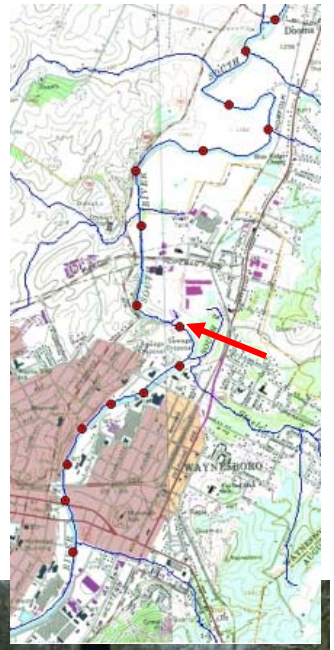
- Clean hands, low detection for filtered and unfiltered, EPA Method 1631.
- Reason:
  - Math says high detection marginal for ~10 ppm on suspended solids

Municipal Sewer Plant Laydown

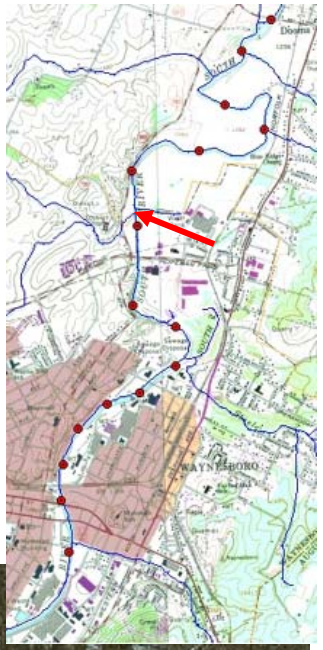


On Oxbow Island

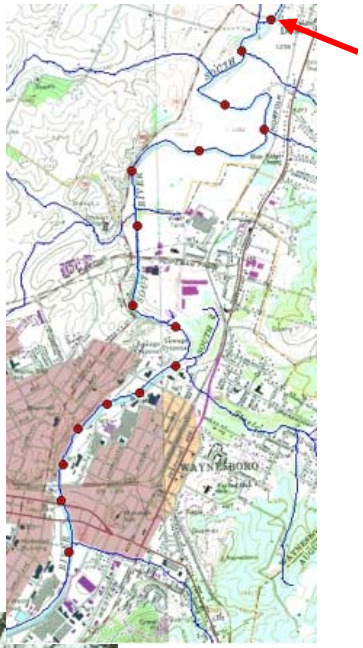
between old landfill and sewer plant



Genicom Drainage



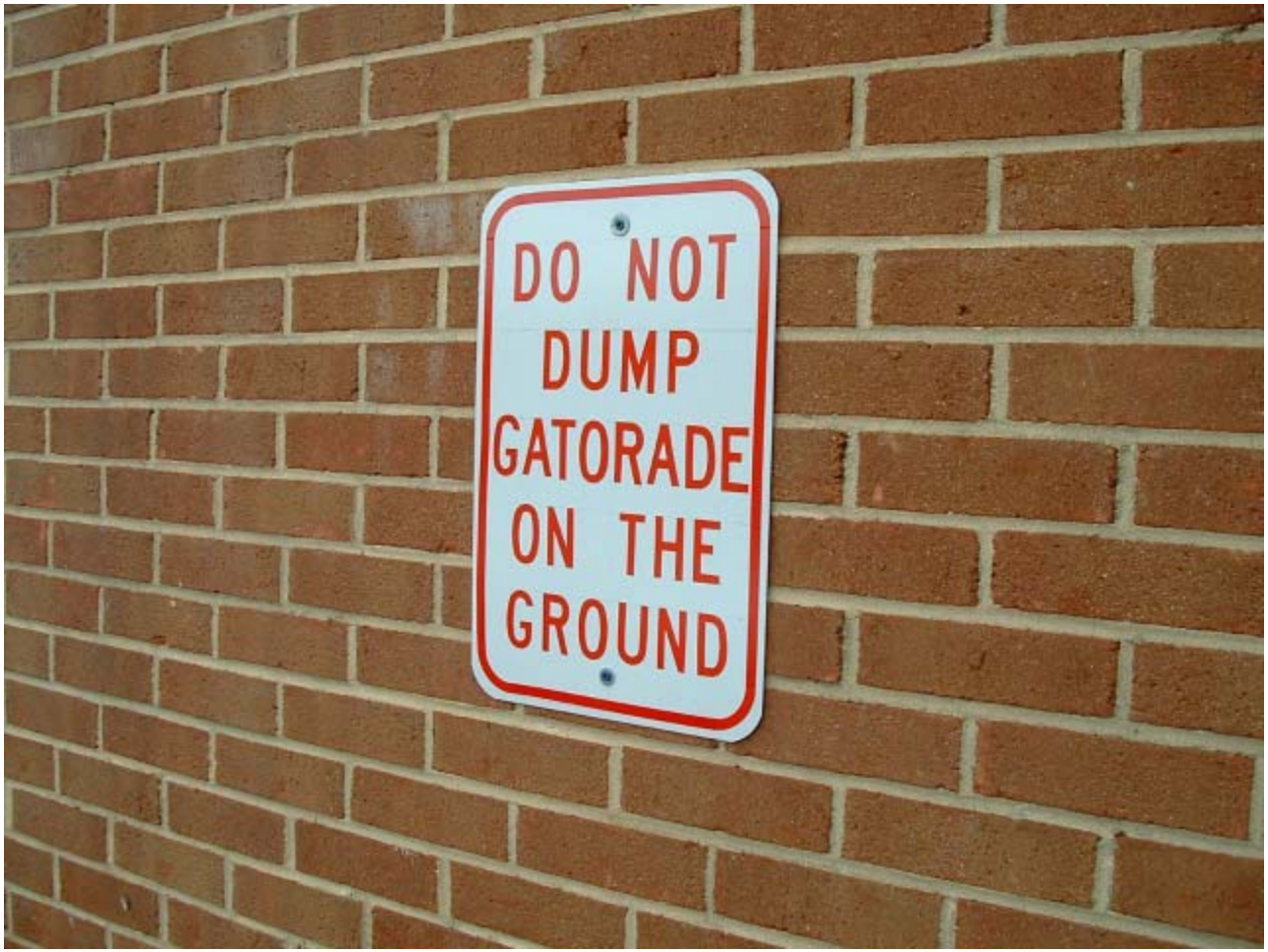
Dooms Pasture Drainage

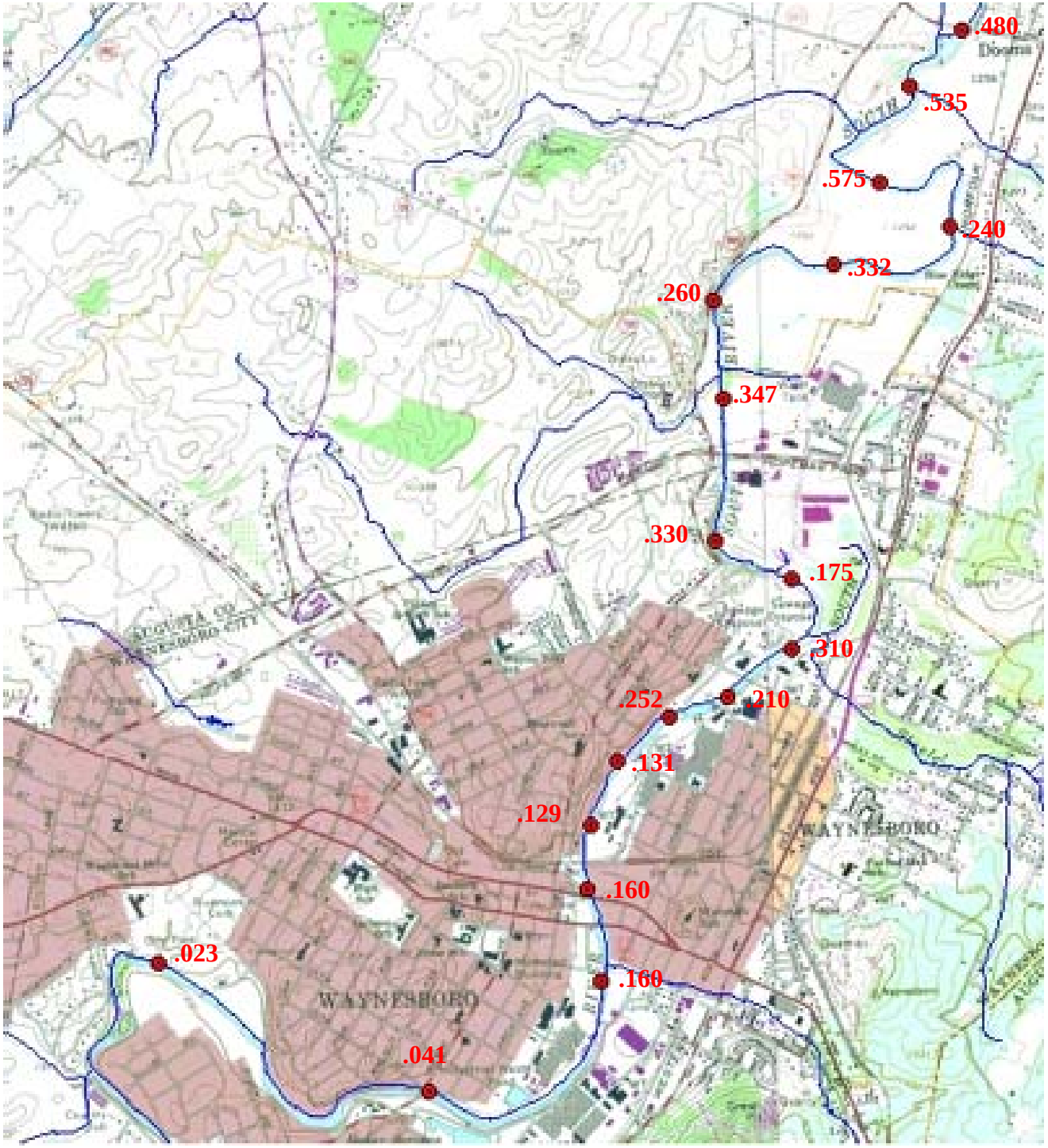


Cultivated Field near Hopeman

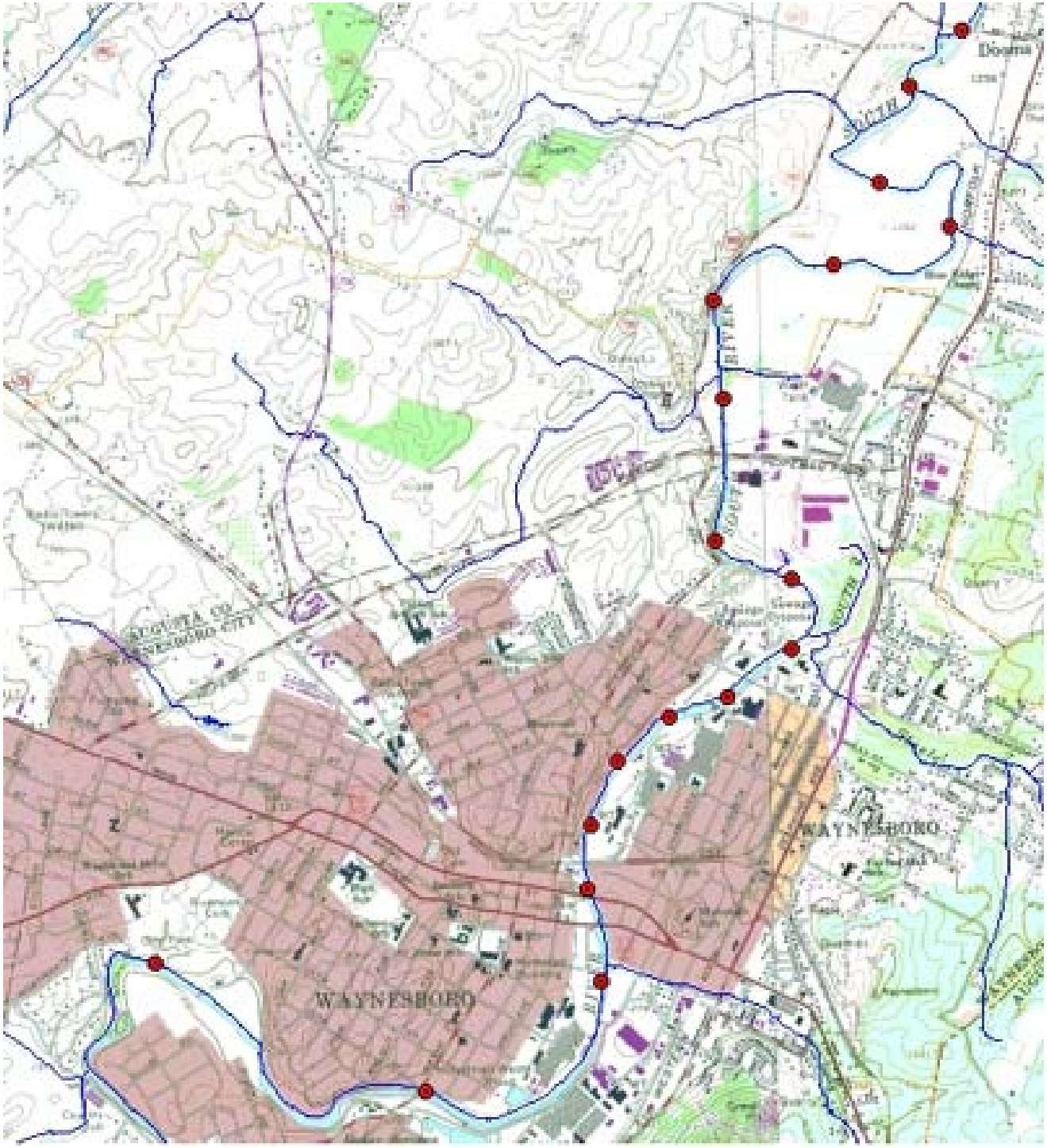
Safety and Environmental Quiz

Why this sign??





Clam Values
ppm
Approximate


WAYNESBORO
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