Mud Mapping and Floodplain Survey

Dick Jensen

South River Science Team

October 8, 2002

Mud Map Participants

Fall 2001

- Annette Guiseppi-Elie, DuPont
- Don Kain, VA-DEQ
- Ted Turner, VA-DEQ
- Larry Carpenter, VA-DEQ
- Dick Jensen

MeHg areas/causes??

Partial Hypothesis List

- External, ongoing source/water column
- Muddy accumulation areas
  - Mud mapping in anticipation this could be significant accumulation/methylation - and limited in area/volume
- Wetlands (dry/wet cycling areas)
- River banks
- Sand/gravel/moss on/between cobbles
- Loose fluff on all surfaces
- Floodplains - slow return/cycling to/from main channel

Purposes of Mud/Wetland Mapping

- Verify general nature of river and bottom

Then by difference...

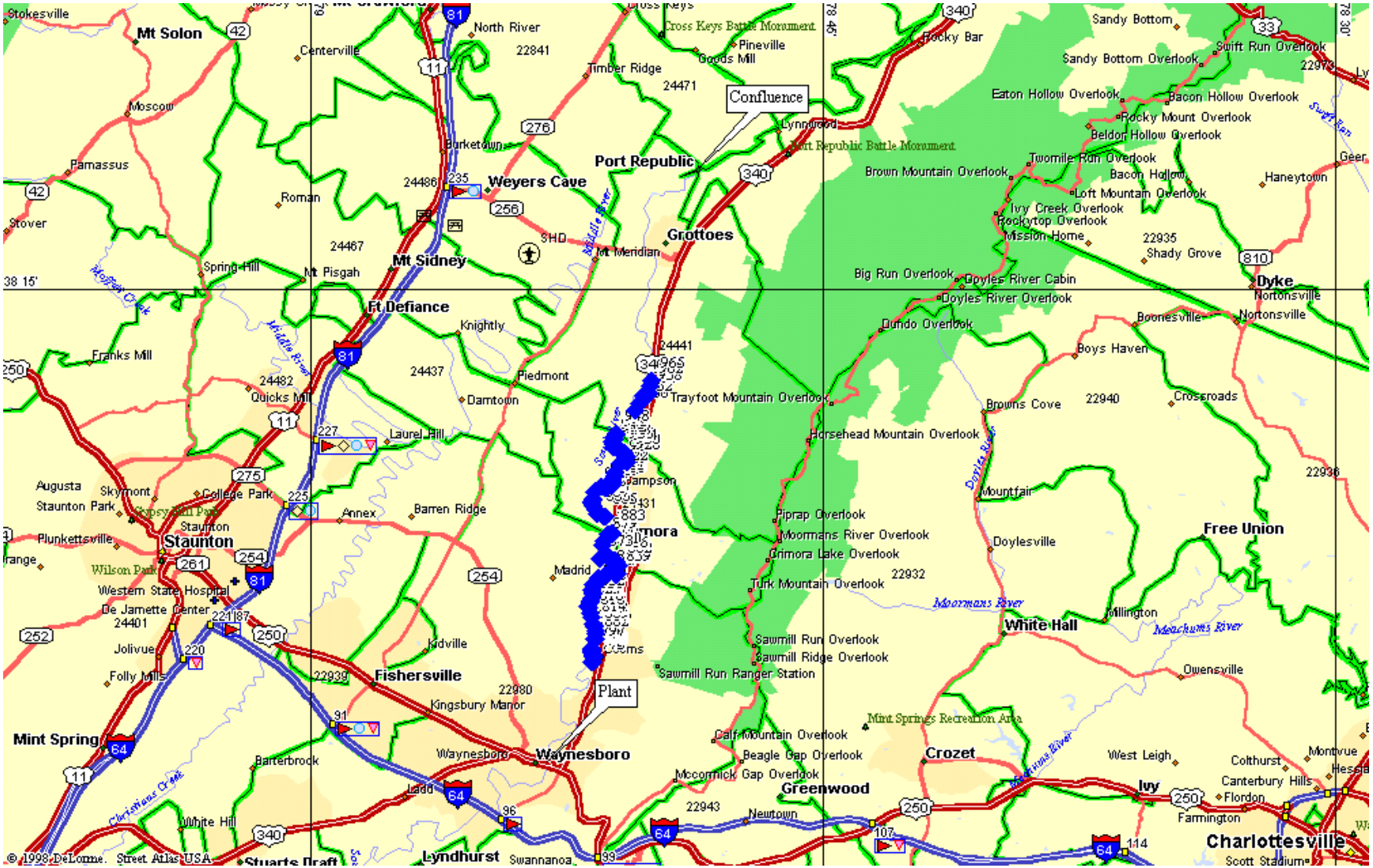
- Map locations of heavy mud deposits
- Map locations of wetlands (wet/dry cycling)
- Identify candidate locations for sampling, testing, other investigations
- More thorough photo survey

Methodology

- GPS - Lat/Long and time stamp
- Digital camera with Date/Time stamp
- Bottom Probing - time stamped results
- Micro-cassette recorder - waypoint/time stamp
- Report: Narrative, maps, photos

South River Mud Map Range

Waynesboro to Port Republic



Common Bottom Character

Stir-able Mud Layer

Record-able Wetland Area

wet-dry cycling

Typical Muddy Area

Return of Mill Race Near Dooms

Typical Cobbley Island

Beneath Waynesboro RR Bridge

Bovine Influences

Findings

South River

- 95+% of river bottom cobble or bedrock
  - Ample/varying amounts of sand/gravel
  - Leaf accumulations - seasonal
  - Muddy “fluff” over all surfaces (low water)
  - Well oxygenated
- Rock/soil banks
- Some tribs/mill races/cutbacks have muddy, organic, sulfury sediments (mapped)
- Mud accumulations above dams, behind islands, in wetlands (mapped)
- Deep areas have hard bottoms

Additional Findings

- Don’t bet on the topo quads!
- Heavy construction areas
- Agricultural areas/damage
- Island/tributary documentation
- Other...

Recommended Locations

very tentative!!

- Heavy, sulfurous mud accumulations
  - River right, 500-750 ft above Dooms Dam Chosen
  - N38 10.5741 W078 51.1660, pocket by old footbridge below Crimora
  - N38 17.1942 W078 49.7562, pocket behind island below Grottoes, above Port Republic
- Wetlands
  - River right, 500-750 ft above Dooms Dam, beside major mud accumulation Not chosen

Mud Map Report

- Written Report - 15 copies
- CD-ROM
  - Written report in .pdf format
  - Interactive topo map with all photos and observations
  - Tables of data/observations, etc.
  - Tables of earlier LMS study

South River Floodplain Survey

March 2002

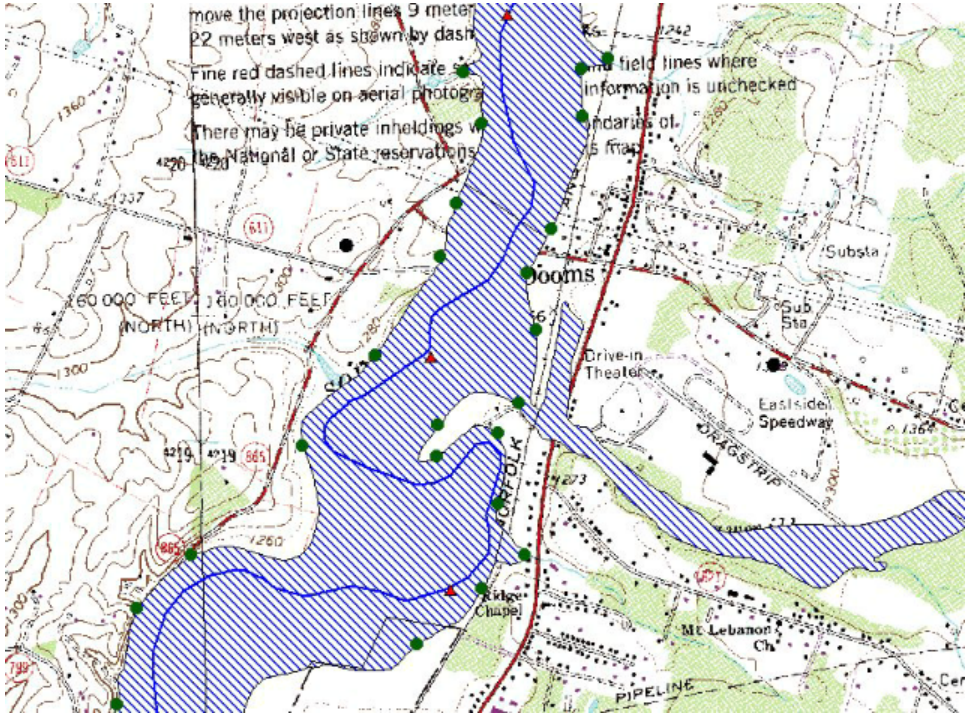
Annette Guiseppi-Elie, Dick Jensen

Purposes of Survey

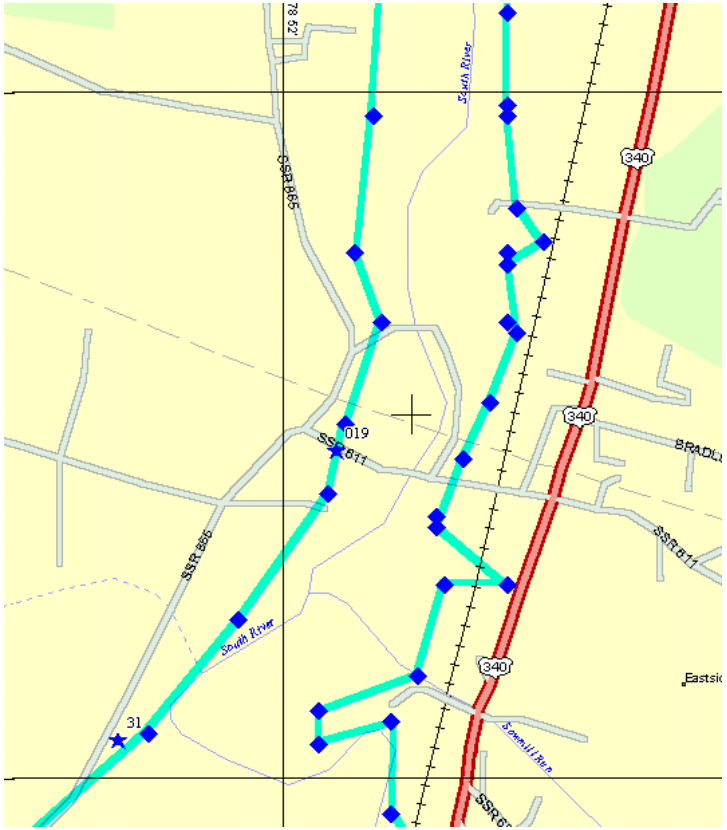
- Groundproofing - checking the maps
- View/record residential floodplain areas
- Play areas, private gardens, parklands
- Limited survey of rural areas: homes, fields

Survey Method

Help from Adam Bachman, URS



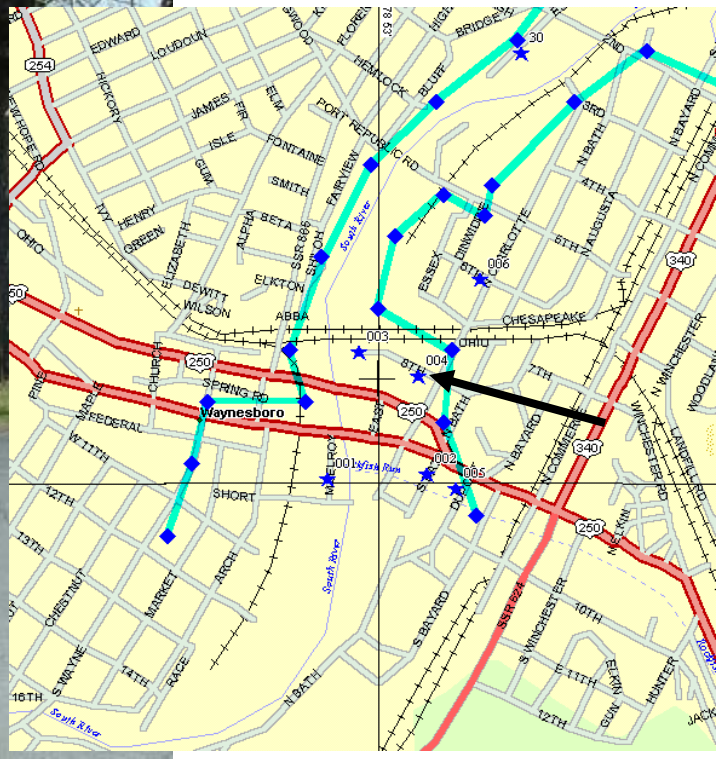
Points transferred from GIS to



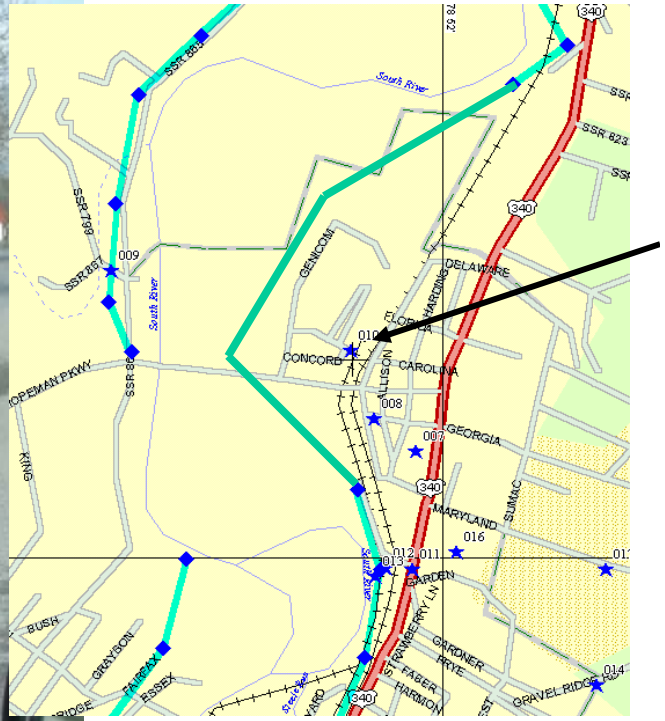
GPS Roadmap

Flooding Near Plant

In “wash” from plant?

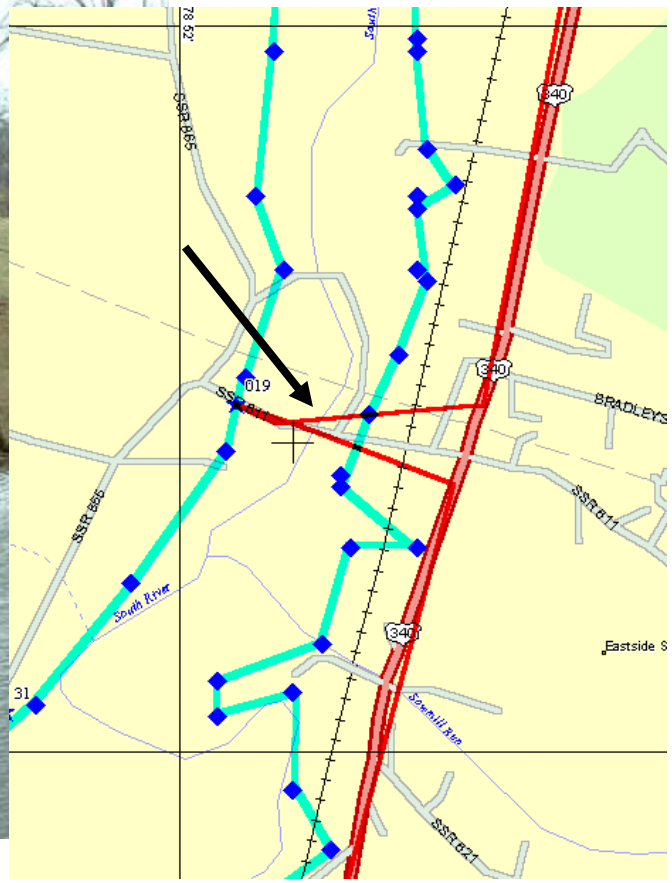


Neighborhood Probably Not in Floodplain

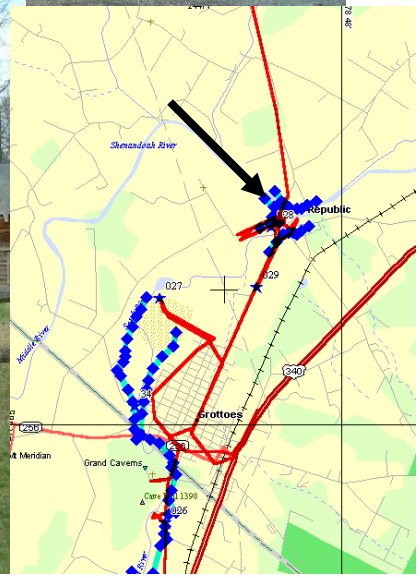


Floodplain Pasture

At Dooms



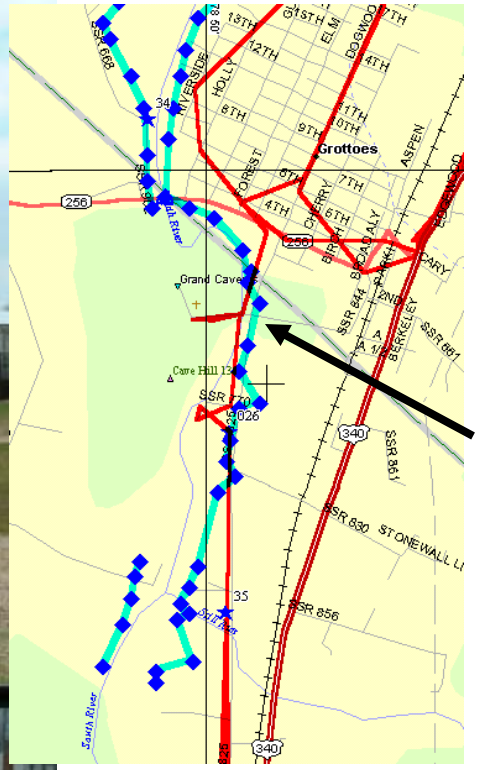
Flooded Port Republic Homes



Floodplain Garden Plots

Not very many...

Some Areas Need Questioning



Parks in Floodplain

North Park
in Waynesboro

Port Republic

Also 2 Grottoes parks and by Grand Caverns in Grottoes

Floodplain Findings

- Central Waynesboro flooded areas not “down range” of plant.
- Residential exposure “down range” is limited. A few 10s of homes.
- Grottoes well laid out. Port Republic less so.

Above floodplain

- Very few vegetable gardens.
- Some areas require survey of locals re actual flood extent.