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Elwood Wilson Drain, Sam Craig – John Holleran Arm Hydraulic Study

Hamilton County, Indiana
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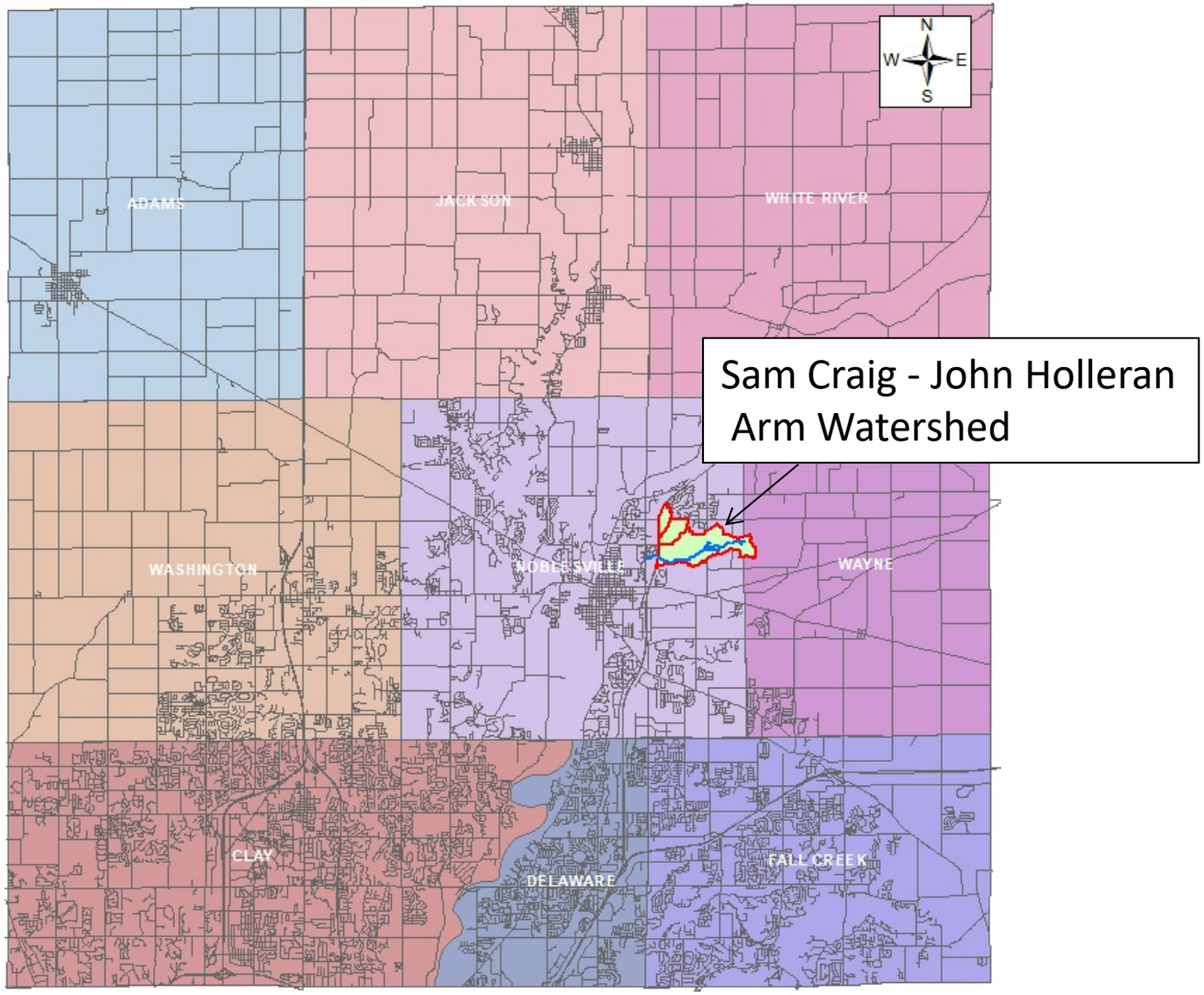
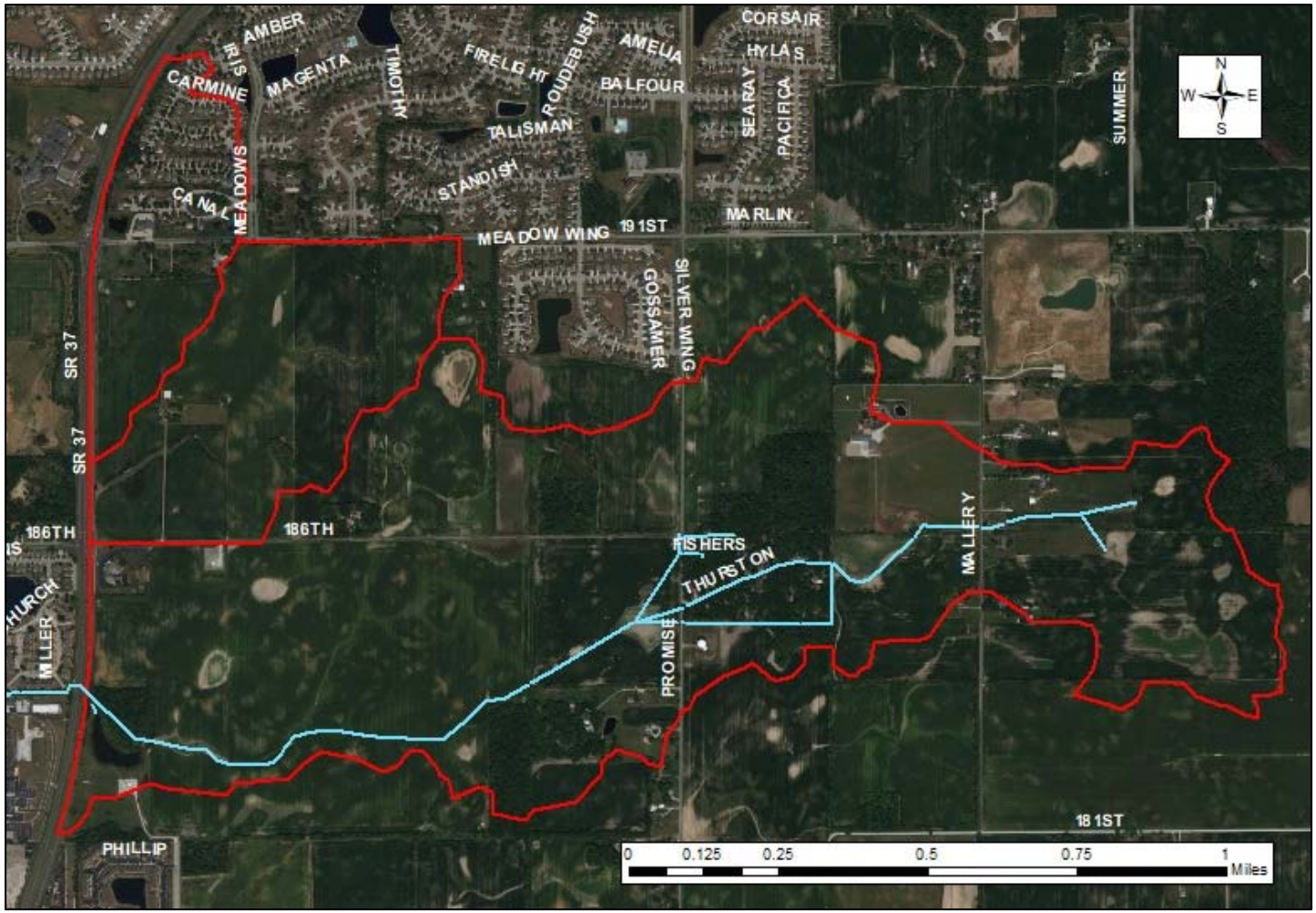
Agenda

- Watershed Location
- Purpose
- Hydrologic/Hydraulic Modeling
- Known Flooding Problems
- Alternative Solutions
- Recommendations

Sam Craig-John Holleran Arm Watershed



Sam Craig – John Holleran Arm Watershed



Purpose of Watershed Planning

- Evaluate the existing watershed
- Identify existing stormwater issues
  - Capacity restrictions
  - Structures in need of repair
  - Undersized culverts, drains
- Recommend solutions
- Program improvement projects
- Establish master plans for development

Hydraulic Study

Topography

Related Studies

Land Use / Field Investigation

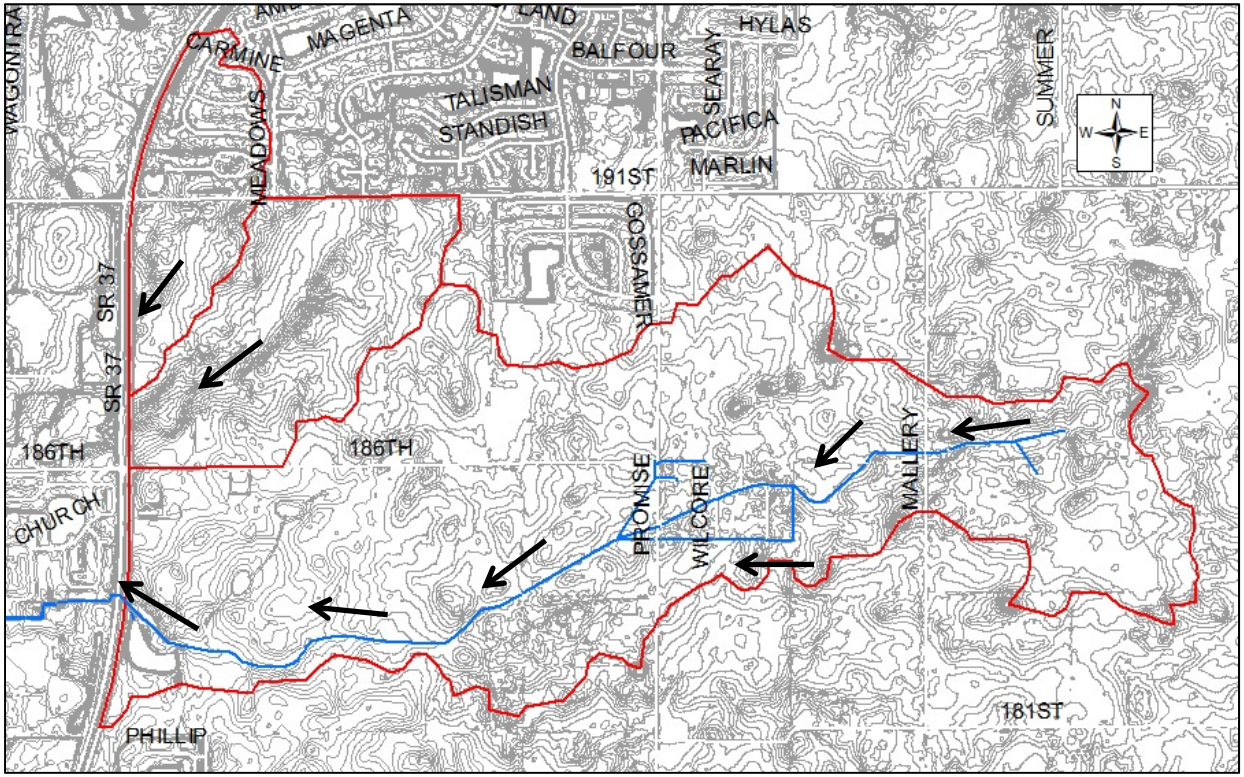
Future Development

Soils

Stakeholders Interests

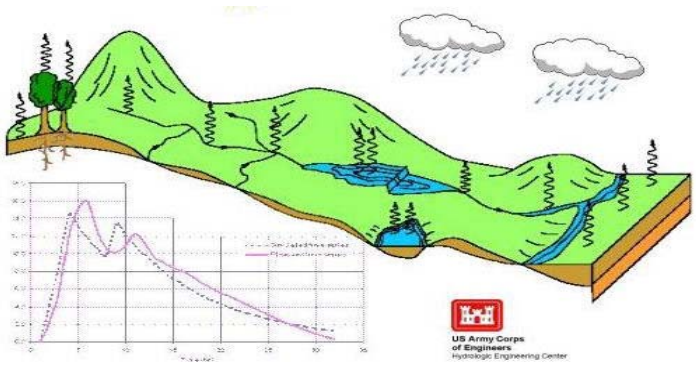
Topography in the Watershed

- Drains West
- Maximum Elevation ~ 821 feet
- Minimum Elevation ~ 778 feet



Flood Analysis and Modeling

- Flood Analysis
  - Define the contributing watershed
- Hydrologic Model (HEC-HMS)
  - Calculate peak flow for storm events
- Hydraulic Model (HY-8)
  - Evaluate the capacity of culverts



Identify Existing Problems

- The existing Drain does not have enough capacity downstream to convey flow during large storm events
- Fishers Oak Wood Residential Development has a history of flooding problems
- Water ponds on private property following large rain events
- Large storm events result in water overtopping road
- Existing road culverts are undersized

Conveyance Alternatives Investigated

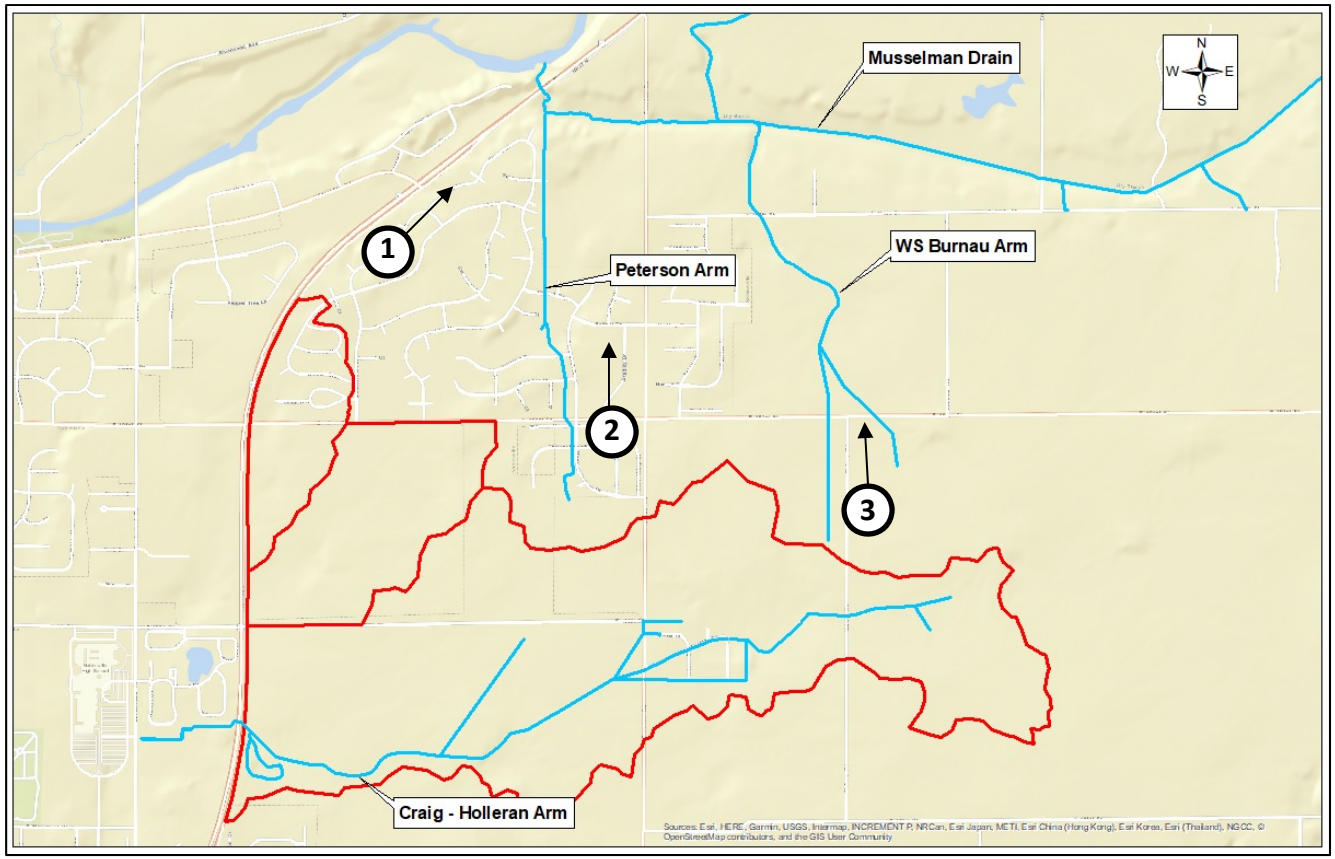
- Alternative 1 – Replace the existing regulated drain with an open channel
- Alternative 2 – Replace the drain with a combination of closed pipe and open channel
- Alternative 3 – Replace the drain with an open channel over an underdrain pipe

Detention Storage Alternatives Investigated

- Six sites were identified to potentially locate regional detention basins

Flow Diversion Investigation

- Flow diversion north to the Musselman Drain was investigated at 3 locations.



Recommendations

- Conveyance Alternative 2 is recommended for the drain improvement
- Regional Detention Site 1 is recommended
- Regional Detention Site 6 is recommended
- Flow Diversion is not a viable option
- Total project cost of the recommended improvements is approximately $3,200,000
- Constructing additional detention basins as the watershed develops will provide flood protection above and beyond the recommended improvements

Future Development

- Development zoning for area – mixed density and single family residential
- Proposed solution will allow any future development to connect by gravity to the Sam Craig – John Holleran Arm
- Proposed solution with result in better outlet for agricultural fields and allow full service to fields in the watershed.
- Improvements will be necessary for any future development of the watershed.

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QUESTIONS