Dealing with Road Drainage
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Obstructing Waterways
Discussion Topics

1. Storm Water Runoff
Obstructing Waterways

Discussion Topics
1. Storm Water Runoff
2. Ohio Drainage Law
3. OEPA Regulations
4. Roadside Options
Storm Water Runoff

Runoff concerns:

- Pesticides
- Herbicides
- Sediments
- Nutrients i.e. fertilizers
- Fodder/Trash/Debris
- Volume
- Flow Rate i.e. velocity

Storm Water Runoff

Water runoff due to:

- Rain
- Melted snow
- Irrigation

Storm Water Runoff

- Watersheds incorporate an entire area of land draining into a catch basin, ditch, stream or river.
- The intentions are to prevent localized flooding, however, when an obstruction is preventing excess storm water to flow through, the effects can be seen upstream.
- Ditch maintenance is critical in the efficiency of waterflow in rural areas as it is the primary mean of drainage.
Storm Water Runoff

- Obstructed waterways can result in various unfortunate situations, including but not limited to:
  - Flooding
  - Septic system failures
  - Delays in planting and harvesting
  - Soil compaction
  - Softening roadway subgrades

- Problem may originate a few miles away

Ohio Drainage Law

- What happens when an obstruction is found?
- Ohio Laws and Rules; Code 5589.06 Obstructing ditch, drain, or watercourse – duty of superintendent.
  - Township Highway Superintendent
  - Townships Trustees
  - Written notice to person/firm/corporation/agent in charge of property.
  - Proceed to remove obstruction within 5 days
  - Should be done within reasonable time.

Ohio Drainage Law

Ohio follows “Reasonable Use” legal doctrine

Applies to drainage and subsurface water disputes

Landowner may make reasonable use of their land
- Flow of waters can be altered
- Waters can cause harm
  - Not liable for harm unless harm is deemed unreasonable
Ohio Drainage Law

“Reasonable” vs “Unreasonable”
Case by case basis
- Balance harm against need and usefulness
- Extent of harm caused
- Fairness of requiring the victim to endure harm
- Suitability and social value of drainage use and harmed property
- Practicality of avoiding harm

Ohio Drainage Law

Unreasonable Surface Drainage Change
- Little social value
- Not suited to the area
- Causes extensive harm to a property use that is suitable to the area
- Easily remedied to avoid the harm

Violation of Ohio’s Reasonable Use Law

Ohio Drainage Law

Water Disputes
Solved by one of two methods
1. Cooperation
2. Civil Litigation
   - Judge decides harm
     - Reasonable
     - Unreasonable
Ohio Drainage Law

2003: Drainage Mitigation Law

- Prevent drainage interferences caused by new development
- Avoid negative impacts on existing drainage
- Proactively prevents drainage conflicts between landowners

Ohio Revised Code Section 307.37

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Ohio Drainage Law

Group Drainage Projects

Landowner files a petition with either

1. Soil and Water Conservation Service
   - OR -
2. County Commissioners

- County Commissioners can levy assessments whether filed with Soil and Water or Commissioners

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Ohio Drainage Law

Each County is directed to create a Ditch Maintenance Fund

Used exclusively for:
- Upkeep
- Repair
- Maintenance

Any drainage improvements constructed through either ditch petition process

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Ohio Drainage Law

Landowners can do drainage projects privately

Cooperation with affected neighbors

Written agreements for cost and upkeep of drainage infrastructure

Ohio Drainage Law

- Petition filed to Board of county commissioners
- The Board may deem a ditch improvement as necessary when it appears to be the best course of action.
- Ditch improvements include relocate, reconstruct, straighten, deepen, widen, etc.

Ohio Drainage Law

- The process of filing a petition
  - Ohio Revised Code 6131:
  - The petition is filed to the clerk of the Board of Commissioners.
  - The project is reviewed by the commissioners.
  - Hearing is held for the public input.
  - County Engineer ordered to prepare plans and schedules and report to the commissioners.
  - A final hearing must be conducted. Once held, bids can be received, and construction can take place
  - Project goes on maintenance
Ohio Drainage Law

• Keep in mind the project objectives.
  • Provide a modern and feasible drainage outlet for residential drainage, as well as agricultural drainage.
    • Landscaping and tree locations relative to the improvement.
    • Known and anticipated future connection to the improvement.
    • When in areas of residential development, provide house drain connections and maintenance access.
  • A maintenance program will need to be generated to easily and efficiently maintain the improvement.

Ditch No. 2134

Royalton Township Trustees
Ditch No. 2134: Branch 7d North Branch Bad Creek

• Single County Petition
• 150 Acres Drained
• 28 Parcels

Past Projects in the Area

➢ 1902 Ditch Petition – Tile and open ditch
➢ 2005 Outlet Ditch Petitioned – Branch 7 NB
➢ 2012 SWCD Wetland Outlet
Problems Observed

- Random blind house drain connections
- Trees and other landscaping close to drain
- Reports of ongoing drainage maintenance issues for the Township
- Recent ag drainage improvements that may not have an adequate outlet

Project Objectives

- Provide a modern outlet for residential drainage
- Provide an adequate drainage outlet for agricultural drainage
- Establish a maintenance program
Ditch No. 2134

Work Proposed
- Checked the existing drainage outlet to determine the adequacy of the outlet
- Install new tile along the east side of Road 11-2
- Install catch basins and inline inlets for surface drainage, maintenance access, and to facilitate house drain connections
- Restore disturbed lawns, fields, and pavements

Project Costs = $129,236.54

Project Assessments
- House Lots: $2,100 - $6,310 per Lot
- Tillable: $500/acre
- Right-of-Way: $600 - $4,000/acre
OEPA Regulations

• US EPA mandated storm water pollution control
• Delegated authority to oversee the program to the individual states – i.e. Ohio EPA for us
• Regulated through the National Pollutant Discharge Elimination System Permit (NPDES)

OEPA Regulations

• Objectives of the NPDES Permit
  • Erosion and sediment controls
  • Controlled storm water volume and velocities
  • Controlled storm water discharges
  • Minimizing soil exposed during construction
  • Minimizing disturbance of steep slopes
  • Minimize sediment discharges from the site
  • Preserve natural buffer around surface waters
  • Minimize soil compaction
  • Soil stabilization

OEPA Regulations

• Post Construction BMP’s (Best Management Practices)
  • Wet extended detention basins
  • Constructed Extended Detention Wetland
  • Dry Extended Detention Basin
  • Permeable Pavement
  • Underground Storage
  • Sand and media filtration
  • Bioretention Cells
  • Infiltration Basin
  • Infiltration Trench
OEPA Regulations

- Intercept pollutants and manage other environmental concerns via:
  - Riparian buffers
  - Filter strips
  - Grassed waterways
  - Shelterbelts
  - Windbreaks
  - Snow fence
  - Etc.

Water Quality Volume

- Drainage Area – Area to the BMP
- Impervious area within the Drainage area
- Precipitation – 0.90 in rainfall event

\[ WQv = Rv \cdot P \cdot A / 12 \]
\[ Rv = 0.05 + 0.9i \]
OEPA Regulations

Example:

- ODOT Locations and Design Manual II
  - Not even ODOT is exempt
  - File NOI (Notice of Intent) for 1 or more acres of disturbance.
  - Routine Maintenance
    - Abutment repairs, brush removal, ditch cleanout, etc.
  - Erosion Control
  - Post Construction BMP's

Roadside Options

Urban Areas
Roadside Options

Rural Areas

1. Acquire more Right-of-Way
2. Channel lining
   1. Rock
   2. Concrete
3. Storm Sewers
4. Retaining Walls
Options (Continued)

4. Retaining Walls
   1. Sheet Pile
   2. Soldier Pile and Lagging
   3. Geosynthetic Reinforcement
   4. Gabion Baskets
   5. Cast-in-Place Concrete
   6. Modular Block
   7. Mechanically Stabilized Earth

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Questions ???

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