

**Final Report  
Hoover #61 Watershed  
Drainage Improvement Petition  
per Ohio Revised Code Sec. 6131  
March 13, 2024**

This report has been prepared for the final hearing on a drainage improvement petition filed by Tony C. Hill & Christy S. Hill and others on April 19, 2019. The original petition has been signed by 20 individuals representing 21 of the 147 parcels in the watershed.

The general location and course of the requested improvements are quoted from the petition as follows:

*"In Delaware County, Harlem Township within the Hoover #61 Watershed and generally following, but not limited to the course and termini of the existing watershed."*

The following is the nature of the work petitioned:

*"To generally improve the drainage, both surface and subsurface, to a good and sufficient outlet, by replacing, repairing or altering the existing improvements as required and/or creating new surface and subsurface drainage mains or laterals as requested, by this petition."*

The Hoover #61 watershed is approximately 1,488 acres. The watershed is 75% agricultural, 15% rural residential, 9% woods, and 1% road right-of-way.

### **Petition Process**

This petition has been submitted according to Ohio Revised Code Section 6131 which authorizes the Board of County Commissioners to act on behalf of benefited property owners to make drainage improvements. If the Commissioners decide to proceed with a project, the costs related to the improvements are collected via special assessment to the landowners in the watershed according to the benefit received. The construction assessments would be placed on the property tax bills of the benefited landowners, and can be spread over a maximum of 15 years with 30 semi-annual installments depending on the method of payment chosen by the Commissioners. Additionally, the improvements will be placed on the county drainage maintenance program per Ohio Revised Code Section 6137 with maintenance funds being collected semiannually similar to the original construction costs. These annual maintenance assessments are generally 2 to 5 percent of the construction assessment.

It should be noted that property owners are only assessed for those improvements that are located downstream from their properties. No property is assessed for improvements located “upstream” of a given parcel. In addition, units of government that hold rights-of-way for public roads are assessed for both construction and maintenance costs in the same manner as private property owners.

The decision to approve a petition is a 3-step process involving a viewing, an initial, or first, hearing, and a second, or final, hearing. A viewing of the proposed improvements was conducted on July 15, 2019 by the Commissioners to familiarize themselves with the location and condition of the existing improvements. Next, the first hearing was held on October 10, 2019. At the first hearing, the Commissioners found in favor of the petition. They requested the Delaware County Engineer and the Delaware Soil and Water Conservation District to proceed in the development of engineering plans and specifications and the schedule of assessments. It is this information that is before the Board of Commissioners for consideration at this second and final hearing.

### **Project Scope**

The proposed project has been divided into sections to better reflect the areas and costs as well as the request of the petition. These sections, described in detail below, are as follows: Hoover #61 Main, Woodtown Lateral, McElwee #324 Section 1, McElwee #324 Section 2, McElwee #324 Lateral #1, Crabill #589 Main, Crabill #589 Lateral #1, and Crabill #589 Lateral #2.

The Hoover #61 Main will begin at the outlet of the ODOT road culvert on the west side of State Route 605 approximately 1,240 feet south of Woodtown Road and extend approximately 1 mile downstream. The primary items of work will include open channel restoration and clearing and snagging. All disturbed areas will be returned to their preconstruction condition or seeded and mulched.

The Woodtown Lateral will begin at the junction with the Hoover #61 Main approximately 380 feet west of State Route 605 and will extend upstream to Woodtown Road and to the west to meet the request of the petitioners. The primary items of work will include clearing and snagging, installation of subsurface drain pipe, construction of surface drain, and installation of a grade stabilization structure. All disturbed areas will be returned to their preconstruction condition or seeded and mulched.

The McElwee #324 Section 1 will begin at the junction with the Hoover #61 Main approximately 2,100 feet northwest of State Route 605 and extend upstream to the outlet of the ODOT road culvert on the west side of State Route 605. The primary items of work will include clearing and snagging, open channel restoration, installation of subsurface drain pipe, construction of surface drain, the installation of rock lined channel, and the installation of a blind inlet. All disturbed areas will be returned to their preconstruction condition or seeded and mulched.

The McElwee #324 Section 2 will begin at the inlet of the ODOT culvert on the east side of State Route 605 and extend upstream approximately 3,700 feet to meet the request of the petitioners. The primary items of work will include clearing and snagging, and installation of subsurface drain pipe. All disturbed areas will be returned to their preconstruction condition or seeded and mulched.

The McElwee #324 Lateral #1 will begin at the junction with the McElwee #324 Section 1 Main approximately 915 feet northwest of State Route 605 and extend upstream approximately 425 feet. The primary item of work will be the installation of subsurface drain pipe. All disturbed areas will be returned to their preconstruction condition or seeded and mulched.

The Crabill #589 Main will begin at the junction with the Hoover #61 Main approximately 600 feet from the downstream terminus and extend upstream to North Drive. The primary items of work will include clearing and snagging, construction of rock lined channel, installation of subsurface drain pipe, and construction of surface drain. All disturbed areas will be returned to their preconstruction condition or seeded and mulched.

The Crabill #589 Lateral #1 will begin at North Drive and extend approximately 600 feet to the south along Rich Drive. The primary item of work will be the installation of subsurface drain pipe. All disturbed areas will be returned to their preconstruction condition or seeded and mulched.

The Crabill #589 Lateral #1 will begin at North Drive and extend approximately 1,325 feet primarily paralleling State Route 605 to a terminus on the south side of High Street. The primary item of work will be the installation of subsurface drain pipe. All disturbed areas will be returned to their preconstruction condition or seeded and mulched.

**Project Estimate**

**Hoover #61 Main**

|   |                     |
|---|---------------------|
| Construction                              | \$ 23,405.00        |
| Administration, Planning and Inspection   | \$ 1,981.36         |
| 1 <sup>st</sup> Year Drainage Maintenance | \$ 1,269.32         |
| <u>Contingency</u>                        | <u>\$ 3,510.75</u>  |
| <b>TOTAL ESTIMATED COST:</b>              | <b>\$ 30,166.43</b> |

**Woodtown Lateral**

|   |                      |
|---|----------------------|
| Construction                              | \$ 117,871.42        |
| Administration, Planning and Inspection   | \$ 5,209.83          |
| 1 <sup>st</sup> Year Drainage Maintenance | \$ 6,154.06          |
| <u>Contingency</u>                        | <u>\$ 17,680.71</u>  |
| <b>TOTAL ESTIMATED COST:</b>              | <b>\$ 146,916.02</b> |

|   |                      |
|---|----------------------|
| <u>McElwee #324 Section 1</u>             |                      |
| Construction                              | \$ 185,365.33        |
| Administration, Planning and Inspection   | \$ 6,802.01          |
| 1 <sup>st</sup> Year Drainage Maintenance | \$ 9,608.37          |
| Contingency                               | \$ 27,804.80         |
| <b>TOTAL ESTIMATED COST:</b>              | <b>\$ 229,580.51</b> |

|   |                      |
|---|----------------------|
| <u>McElwee #324 Section 2</u>             |                      |
| Construction                              | \$ 89,969.30         |
| Administration, Planning and Inspection   | \$ 4,551.61          |
| 1 <sup>st</sup> Year Drainage Maintenance | \$ 4,726.05          |
| Contingency                               | \$ 13,495.39         |
| <b>TOTAL ESTIMATED COST:</b>              | <b>\$ 112,742.35</b> |

|   |                    |
|---|--------------------|
| <u>McElwee #324 Lateral #1</u>            |                    |
| Construction                              | \$ 6,536.62        |
| Administration, Planning and Inspection   | \$ 642.40          |
| 1 <sup>st</sup> Year Drainage Maintenance | \$ 358.95          |
| Contingency                               | \$ 980.50          |
| <b>TOTAL ESTIMATED COST:</b>              | <b>\$ 8,518.47</b> |

|   |                      |
|---|----------------------|
| <u>Crabill #589 Main</u>                  |                      |
| Construction                              | \$ 146,425.78        |
| Administration, Planning and Inspection   | \$ 5,383.43          |
| 1 <sup>st</sup> Year Drainage Maintenance | \$ 7,590.46          |
| Contingency                               | \$ 21,963.86         |
| <b>TOTAL ESTIMATED COST:</b>              | <b>\$ 181,363.53</b> |

|   |                     |
|---|---------------------|
| <u>Crabill #589 Lateral #1</u>            |                     |
| Construction                              | \$ 18,698.68        |
| Administration, Planning and Inspection   | \$ 1,370.33         |
| 1 <sup>st</sup> Year Drainage Maintenance | \$ 1,003.46         |
| Contingency                               | \$ 2,804.79         |
| <b>TOTAL ESTIMATED COST:</b>              | <b>\$ 23,877.26</b> |

|   |                      |
|---|----------------------|
| <u>Crabill #589 Lateral #2</u>            |                      |
| Construction                              | \$ 38,648.80         |
| Construction Layout & Supervision         | \$ 1,840.96          |
| 1 <sup>st</sup> Year Drainage Maintenance | \$ 2,024.49          |
| Contingency                               | \$ 5,797.32          |
| <b>TOTAL ESTIMATED COST:</b>              | <b>\$ 48,311.57</b>  |
| <br>                                      |                      |
| <b>TOTAL PROJECT ESTIMATED COST:</b>      | <b>\$ 781,476.14</b> |

**Calculation of Assessments**

The Ohio Revised Code instructs the County Engineer to calculate the assessments to individual property owners based on the benefits received from the improvements for the various properties in the watershed. The ORC further defines benefited land as:

*“Lands that have been removed from their natural state by deforestation, cultivation, artificial drainage, urban development, or other manmade causes shall be considered as benefited by an improvement required to dispose of the accelerated flow of water from the uplands.”*

Assessments to individual parcels have been calculated using the following formula, a rationale that is widely used throughout the state of Ohio.

$$(\text{Acres Benefited}) \times (\text{Land Use Factor}) \times (\text{Percent of Improvement Used}) \times (\text{Remote Factor}) = (\text{Individual Parcel Assessment Factor})$$

Each parcel’s assessment is then determined by:

$$(\text{Individual Parcel Assessment Factor}) / (\text{Total of all Individual Assessment Factors}) \times (\text{Total Construction Cost}) = (\text{Parcel Assessment})$$

**Explanation of Factors:**

- **Acres Benefited**  
Total number of acres within a given parcel that contribute drainage to the improvement.
- **Land Use Factor**  
The relative benefit to parcels of drainage based on the amount of increased storm water runoff resulting from the land use of the parcel.
- **Percent of Improvement used**  
The point at which drainage from a given parcel enters the improvement. Parcels are only assessed for the portion of the improvement that lies downstream of the parcel.

- **Remote Factor**

The remote factor is based upon a parcel's distance from the improved section of the drainage course, and is typically established in ½ mile increments. Parcels that are most "remote" from the actual improvement receive the greatest reduction on their assessment.

### **Benefits versus Cost**

One of the primary factors set forth for consideration in the approval or dismissal of a petition request is the actual benefit of the proposed improvements to the watershed in question. The following analysis examines this factor from the standpoint of land productivity for the agricultural acres as well as the value of drainage to residential parcels.

A publication by The Ohio State University Extension titled "Returns to Farm Drainage" details several studies, conducted by Ohio State researchers, on the effects of drainage on crop yields. The studies show that fields with good drainage will produce higher yields than fields that have poor drainage. A recently completed 25-year study showed that subsurface drainage increased corn yields by 24%-39%, and increased soybean yields by 13%-46%. This produces average yield increases of 31% and 29% respectively. The benefits of drainage will thus equal this increased yield multiplied by the market price.

Overall, approximately 1,113 acres of the 1,488-acre watershed is agricultural land. The 2022 through 2018 average market price for corn and soybeans in Ohio, as reported by the USDA National Agricultural Statistics Service is \$4.94 per bushel for corn and \$11.41 per bushel for soybeans. The average estimated yield increases for the soil types present in the watershed, given appropriate drainage improvements are in place, equal 46 bushels per acre for corn and 14 bushels per acre for soybeans.

For these examples, we will assume that cropland acres are distributed equally between corn and soybeans.

### **Crop production benefit examples:**

#### **Hoover #61 Main**

- 1,113 acres of agricultural land
- Corn:  
(46 Bushel per acre increase in yield) X (\$4.94 per bushel) X (1,113 acres) = \$252,918.12 increase annually.
- Soybeans:  
(14 Bushel per acre increase in yield) X (\$11.41 per Bushel) X (1,113 acres) = \$177,790.62 increase annually.
- Average annual benefit = \$215,354.37
- Potential 20-year return = \$4,307,087.40

#### McElwee #324

- 355 acres of agricultural land
- Corn:  
(46 Bushel per acre increase in yield) X (\$4.94 per bushel) X (355 acres) = \$80,670.20  
increase annually.
- Soybeans:  
(14 Bushel per acre increase in yield) X (\$11.41 per Bushel) X (355 acres) = \$56,707.70  
increase annually.
- Average annual benefit = \$68,688.95
- Potential 20-year return = \$1,373,779.00

#### Crabill #589

- 77 acres of agricultural land
- Corn:  
(46 Bushel per acre increase in yield) X (\$4.94 per bushel) X (77 acres) = \$17,497.48  
increase annually.
- Soybeans:  
(14 Bushel per acre increase in yield) X (\$11.41 per Bushel) X (77 acres) = \$12,299.98  
increase annually.
- Average annual benefit = \$14,898.73
- Potential 20-year return = \$297,974.60

While these examples do not take into consideration individual farm management practices, they do illustrate the fact that good agricultural drainage is a key factor in farm profitability and would reflect positively when considering a cost/benefit analysis for the individual sections of this project as well as the project as a whole.

The increased value or benefit for residential parcels is typically found in two ways: the increased marketability of the home and functionality of the home sewage treatment system and associated drainage needs. An inadequate subsurface drainage outlet can dramatically deteriorate the condition of household sewage treatment systems potentially limiting the value of the home for resale. Locally, the cost to construct an alternate sewage treatment system, should the existing system fail, ranges from \$15,000 to \$25,000 on average. Other benefits that are commonly perceived as a result of suburban drainage improvements focus on quality of life and positive neighborhood perception. Watersheds that have planned and maintained drainage infrastructures generally have higher resale values than those communities that are known to have a history of drainage problems. Approximately 135 acres of the land use in the watershed is residential in nature. When evaluating the cost of providing adequate drainage outlets for residential properties, we find that for new construction, developers or homebuilders spend on average \$8,700 per lot to attain adequate drainage infrastructure within a development. Given this consideration, the residential benefits to the watershed can be considered as follows:

- Main: 84 residential parcels X \$8,700 = \$730,800 average benefit
- Woodtown Lateral: 7 residential parcels X \$8,700 = \$60,900 average benefit
- McElwee #324: 34 residential parcels X \$8,700 = \$295,800 average benefit
- Crabill #589: 44 residential parcels X \$8,700 = \$382,800 average benefit

The benefits to this proposed project will be realized well beyond the construction repayment term. As previously stated, the construction assessments would be placed on the property tax bills of the benefited landowners, and can be spread over a maximum of 15 years. Alternatively, assessments can be paid in full within 30 days after the close of the final hearing without paying interest. The long-term benefits will be realized by virtue of this project being placed on the County Drainage Maintenance Program in perpetuity per Ohio Revised Code Section 6137. O.R.C. 6137 requires maintenance funds to be collected semi-annually similar to the construction costs. These maintenance funds are applied to the annual inspection and maintenance of this specific project.

### Decisions

A decision on the Hoover #61 Main and Crabill #589 can be made independent of each other.

Approval of the Woodtown Lateral is contingent upon approval of the Hoover #61 Main.

Approval of the McElwee #324 is contingent upon approval of the Hoover #61 Main. Approval of the McElwee #324 Section 2 and McElwee #324 Lateral #1 are both independent of each other, however both are contingent upon approval of the McElwee #324 Section 1.

Approval of the Crabill #589 Lateral #1 and Crabill #589 Lateral #2 are both independent of each other, however both are contingent upon approval of the Crabill #589 Main.

Denial of the Hoover #61 Main will necessitate denial of the Woodtown Lateral, McElwee #324 Section 1, McElwee #324 Section 2, and McElwee #324 Lateral #1.

Denial of the Crabill #589 Main will necessitate denial of the Crabill #589 Lateral #1 and Crabill #589 Lateral #2.



**Recommendations**

Based on all of the information gathered and generated, I believe this project as proposed is technically feasible and would serve as an adequate outlet for the drainage needs of the watershed. Furthermore, the parcel assessments for this project are within the range of assessments that can be expected for a project of this scope. The testimony brought to the Board of Commissioners by the landowners as to whether the benefits of this project exceed the costs, should be given significant consideration in the decision to move forward with this project.

A resolution affirming the order to proceed for each section, confirming the schedule of assessments, and ordering the project to be advertised for competitive bid, per Section 6131 of the O.R.C., will be necessary. The resolution by the Board of Commissioners shall also determine how long a period of time, in semi-annual installments, as taxes are paid, shall be given the owners of land benefited to pay the construction assessments.

If the Board of Commissioners chooses to dismiss the Petition in whole or in part, I would recommend a resolution reflecting that decision, and that the costs for the proceedings, including the costs incurred by the Board of Commissioners, the County Engineer and the Delaware Soil and Water Conservation District in making surveys, plans, reports and schedules be distributed to the benefiting landowners in the same ratio as determined in the final estimated assessments presented at this hearing. This amount is estimated at \$15,000.

Prepared by,

Approved by,



Bret Bacon  
Bret Bacon  
Deputy Administrator  
Resource Conservation Program Coordinator  
Delaware Soil and Water Conservation District



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