PRELIMINARY REPORT

CUFFLE DRAINAGE PROJECT #23-03

Washington Township

Defiance County, Ohio

March 2024

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CUFFLE DRAINAGE PROJECT #23-03
WASHINGTON TOWNSHIP, SECTION 36, DEFIANCE COUNTY, OHIO

This Preliminary Report regarding the proposed drainage improvements for the **CUFFLE DRAINAGE PROJECT #23-03** is submitted for your consideration in accordance with a request received at the *Defiance Soil and Water Conservation District.* The Ohio Department of Agriculture and the Defiance Soil and Water Conservation District have investigated the area and associated concerns. This report presents the information that we have at the present time, together with our assessment of the proposed project. Keep in mind that this is only a Preliminary Report and not a final engineering plan nor a final cost estimate. This report is based on preliminary field surveys and is not meant to be inclusive, but to serve only as a basis for the Defiance Soil and Water Conservation District's Board of Supervisors to decide whether or not to proceed with final project survey and engineering in addition to determining project cost estimates, damages, and landowners' estimated assessments.

A petition has been received from two Defiance County landowners with properties adjacent to the proposed improvement. The petitioners' primary goal is to address the failing subsurface drainage system that flows through the Cuffle property and then continues through the center of the residential properties to its outlet near the intersection of State Route 15 and Glenburg Road. In addition, it has been petitioned to reconstruct the ditch that crosses the Wirtner property. This reconstructed ditch would then convey surface water across the Cuffle property and downstream through the residential properties. After flowing across the residential properties, this surface water drains into the existing ditch along State Route 15 near Glenburg Road.

The watershed for this project has a cumulative drainage area of approximately 343 acres and includes 106 parcels.

ENVIRONMENTAL SETTING

Soils and Topography

NRCS has developed a soil classification system that consists of four groups, identified as A, B, C, and D. Soils are classified into one of these categories based upon their minimum infiltration rate. The approximate hydrologic soil group classification breakdown for the Cuffle Drainage Project watershed is:

Hydrologic Soil Group	Percent of Watershed
A	0.0
B	0.0
C	0.0
D	100.0

Soil characteristics associated with each Hydrologic Soil Group are generally described as follows:

Group A: Soils with low runoff potential due to high infiltration rates, even when thoroughly wetted. These soils consist primarily of deep, well to excessively drained sands and gravels with high water transmission rates (0.30 in./hr.). Group A soils include sand, loamy sand, or sandy loam.

Group B: Soils with moderately low runoff potential due to moderate infiltration rates when thoroughly wetted. These soils consist primarily of moderately deep to deep, and moderately well to well-drained soils. Group B soils have moderate water transmission rates (0.15-0.30 in./hr.) and include silt loam or loam.

Group C: Soils with moderately high runoff potential due to slow infiltration rates when thoroughly wetted. These soils typically have a layer near the surface that impedes the downward movement of water. Group C soils have low water transmission rates (0.05-0.15 in./hr.) and include sandy clay loam.

Group D: Soils with high runoff potential due to very slow infiltration rates. These soils consist primarily of clays with high swelling potential, soils with permanently high water tables, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious parent material. Group D soils have very low water transmission rates (0-0.05 in./hr.) and include clay loam, silty clay loam, sandy clay, silty clay, or clay.

All of the soils in the Cuffle Drainage Project watershed are of a type that require surface and subsurface drainage for efficient agricultural production and for residential drainage. The topography of the area is relatively level with an average watershed slope of 0.7%. Elevation change from the top of the watershed to the project terminus is approximately 28 feet. Annual rainfall for the area is about 33.5 inches.

Land Use

The watershed is predominantly agriculture with about 65% in cultivated crops, 18.6% residential, 9.8% woods, 5.3% roads and rights-of-way, and 1.3% grasslands. Some minor land use changes are possible with the construction of individual homes or farm buildings. This would represent only a small portion of the watershed area. Home construction in the watershed would depend upon individual type sanitary disposal facilities. It is imperative that these facilities not be tied into any subsurface drainage system unless the County Health Department approves it.

Fish and Wildlife Resources

There are no fish resources throughout the extent of the proposed project as the surface drainage system often does not hold water throughout the year. Limited wildlife would exist throughout the project area and would consist of both game and non-game species. These wildlife resources would largely be limited to the wooded area at the bottom end of the project. Work in this area would consist of ditch construction, ditch reconstruction, and possibly the installation of a subsurface drainage tile. These activities would require clearing of trees on each side of the drainage infrastructure and would have limited impact on the wildlife resources.

Recreational Resources

Recreational resources would be tied to residential lawn areas in addition to the limited possibility of activities, such as hunting, on the small woodlot at the bottom of the project. The potential of an open ditch through the residential properties would pose a slight reduction in lawn area but would be offset by better drainage and usability for the remainder of the lawn area. Only a portion of the woodlot would undergo clearing, having minimal impact on these resources.

EXISTING CONDITIONS

The Cuffle Drainage Project presents a complex drainage situation combining both agricultural and residential drainage and conveying this drainage through a residential setting. Two 12-inch clay drainage tiles pass through the Wirtner property and drain across the Cuffle residential property. These tiles predominantly carry water originating as subsurface drainage but have some surface water inletting into them ahead of the Cuffle property. This subsurface drainage system continues across the residential properties as a single 12-inch clay tile that then increases to a 15-inch clay tile before entering the woodlot. In addition, an 8-inch clay tile parallels the 12-inch clay tile to the north, and eventually combines with the 12-inch/15-inch clay tile main on the Kline property ahead of the woodlot. Finally, an 8-inch clay tile, a 6-inch clay tile, and a 15-inch clay tile enter into this tile main from each of the three catch basins along State Route 15. All of the clay tiles on the residential properties are failing, with numerous breakdowns observed. In addition, obstructions in the tile main are evident as a result of the water pushing out of the surface inlet on the Cuffle property. Inevitably, new, large tile breakdowns followed by extensive yard erosion will begin to occur in the near future. These breakdowns are impacting farm drainage above the residential area and are also restricting house drainage on the Cuffle property and potentially residential drainage downstream.

In addition to the subsurface drainage, extensive surface drainage also passes through the Wirtner property, onto the Cuffle property, and through the remaining residential properties. In total, over 232 acres drain across the residential properties. The depth of the surface ditch across the Wirtner property is currently inadequate to carry a minimum agricultural capacity and the ditch also lacks sufficient grade. To obtain capacity, the ditch on the Wirtner property must be deepened, also requiring the deepening of the surface drainageway through the residential properties to obtain adequate grade. Five residential driveways cross this grassed, surface water drainage way. Overtopping of the existing residential drives currently occurs periodically, especially for the two upper drives (Chapman's and Wiemken's). Given the size of the watershed and the required drainage capacities, all of the existing drive crossings are undersized to provide sufficient protection from overtopping. This is especially a concern given that this is a residential area.

RECOMMENDATIONS

Numerous alternatives were investigated in determining a viable solution to the drainage concerns presented. One option included reconstructing the ditch across the Wirtner property. This ditch across the Wirtner property would be deep enough to outlet all field tile into, thereby eliminating any tile replacement on the upper reach of the project. Upon reaching the southeast corner of the Cuffle property with the ditch, this drainageway would then be diverted to the south through a newly constructed ditch. This diversion ditch would also be deep enough to handle all tile drainage from the Cuffle property. This water would be carried in the newly constructed ditch along Chapman's west property line to the south. This ditch would then head east across the back property lines of the residential lots and would then cross the Lantow property, outletting into the State Route 15 road ditch near Glenburg Road. Outside funding through ODA's H_2Ohio program may be available to offset approximately $233,350.00 of this cost, provided that the newly constructed ditch be a self-forming channel, conservation ditch. Given the requirement to drain this ditch counter-grade for the southernly flowing section, this ditch will have a total depth of over nine feet in numerous areas.

In addition to the diversion ditch, a tile main would be installed to collect water from the three ODOT catch basins as well as a 6-inch tile outlet from each of the five downstream residences. The depth of the diversion ditch coupled with a required twelve-foot bottom width, the need for a tile main across the residential properties (which will need to be bedded in gravel since an excavator must be used to install), and the need to estimate/bid the project costs per prevailing wages, resulted in an estimated cost of just over $700,000.00. Even with ODA's potential funding of approximately $233,350.00, this option would still cost landowners over $466,000.00, which does not provide a favorable cost-benefit analysis.

As a result of the residential nature of the lower portion of the project, engineering design standards become more stringent than when dealing with typical agricultural drainage. What would traditionally be a Qb drainage curve capacity for agricultural ground, now requires a minimum of a Q2 but preferably a Q10 storm event. As a result, both surface drainage and subsurface drainage capacities are required to be significantly increased to meet engineering standards. As a result of the required design capacities, all of the existing residential drives do not currently meet these required drainage capacities. It is imperative that these drive culverts meet capacity, as reconstructing the ditch across the Wirtner property will bring water across the residential properties at a faster rate. With undersized pipes, this will result in more frequent topping of the drives, scouring of the drive surface, and under severe events, could wash out the entire drive. The Kline bridge does have a higher capacity than the upstream culverts, but still does not meet

design standards. In order to maintain the yard surface drainage as close to existing conditions, overall grade throughout the residences will need to be reestablished and the center of the drainage way will need to be deepened by approximately two feet to be able to install new crossings. To meet capacities with the shallow nature of the surface drainage through the residences, a minimum of 3' x 8'concrete box culverts would be required for each drive. The very high cost of these box culverts along with needed regrading of the properties, riprap at the outlet of the box culverts, and still needing a complete subsurface drainage system to handle field drainage, ODOT catch basin drainage, and house drainage comes in at a significantly higher cost than the project recommendation that follows.

Therefore, the recommended drainage improvement proposal that will address all of the concerns of the petitioners while ensuring that we are not creating further, frequent issues with residential drive pipe topping will require the construction of an open ditch across the Wirtner field, along the south property line of the Cuffle property, and through the residential properties all the way to Glenburg Road. It is also recommended to construct a lateral ditch along the Cuffle/Chapman property line from the new main ditch to the ODOT catch basin on the Chapman property. This lateral ditch will provide adequate capacity to address the drainage issues on the north side of State Route 15.

The proposed main ditch will be deep enough to outlet all 12-inch agricultural clay tiles as well as the remaining two tile coming from the ODOT catch basins along State Route 15. In addition, all house drainage tile south of State Route 15 will be able to drain into this ditch. This ditch would have a minimum bottom width of 4 feet and will have 2:1 side slopes. The ditch would have an approximate depth of 5 feet throughout the residential properties. This ditch would require the replacement of all residential drive pipes (and the Kline bridge) with 60-inch smooth wall pipe in addition to a riprap apron at the outflow of each drive pipe. This route will also require the clearing of trees on the Lantow property, adjacent to the ditch. The trees and brush removed will be piled on the Lantow property and it will be up to the landowner to dispose of. All spoil generated in the residential area, and likely the wooded area, will need to be hauled offsite. The spoil generated on/along the agricultural land will be spread to a thickness of 6-8 inches on adjacent farm ground.

The newly constructed ditch will be reseeded as construction progresses. All disturbed yards throughout the residential area will be reseeded with a residential lawn seed mix and will be mulched. For the woodlot area and the agricultural area, a permanent, 10-foot grass berm will be established on both sides of the ditch. This 10-foot grass berm is considered part of the drainage improvement and shall remain intact. The

berm area will be removed from the taxable valuation of the property. Maintenance access will be required from Glenburg Road as well as from Blosser Road along the existing Defiance County Blosser Road Ditch extension. An access drive pipe will be required at the Blosser Road access point.

In addition to the ditch construction, a riprap transition is proposed at the entrance to the wooded area to reduce grade in the ditch. There will also be a rock chute installed at the head of the channel on the Wirtner property along with the installation of a new 36-inch access drive on the Wirtner property. Numerous mini-rock chute structures are needed to prevent erosion from surface water draining into the side of the ditch. Several tile outlets will need replaced along with riprap protection being installed under all drainage tiles greater than 6-inch diameter.

In addition to the ditch work, new drainage tile will be installed from two of the three ODOT catch basins along State Route 15, (8-inch CPTS and 15-inch CPTS). Each residential property will also have a new tile installed (minimum of 6-inch CPTS) with an outlet into the new ditch. The remaining 12-inch clay tile that is not destroyed through ditch construction will be broken down at 50-foot intervals to prevent further breakdowns and erosion issues.

Note that all components constructed and installed as part of this project will be placed on Defiance County Ditch Maintenance. This will ensure that the infrastructure will remain fully operational into the future.

ENVIRONMENTAL IMPACT

Very limited environmental impact is expected to occur as a result of this project. In fact, addressing the lack of vegetation and lateral gully erosion on the existing ditch on the Wirtner property and the current and future erosion caused by the tile breakdowns on the residential areas will actually provide environmental benefits in the form of sediment reductions. All disturbed areas will be reseeded with cool season grasses upon completion of the project. It should be noted that hydric soils exist in the wooded area at the bottom end of the project. The wooded area is being evaluated by the U.S. Army Corps of Engineers and the Ohio EPA for potential wetland impacts.

PRELIMINARY COST ESTIMATE

Cuffle Drainage Project #23-03 Preliminary Cost Estimate	
Items	**Estimated Cost**
Clearing and Grubbing	$8,450.00
Excavating and Leveling	$21,087.00
Excavating and Hauling	$41,749.00
Seeding, Fertilizing, and Mulching	$16,000.00
Residential Access Drives and Riprap Aprons	$104,975.00
Wirtner Access Drive and Riprap Apron	$12,950.00
Rock Chute/Mini Rock Chutes/Riprap Grade Transition	$41,750.00
6-Inch CPTS Tile Installation	$6,970.00
8-Inch CPTS Tile Installation	$1,908.00
15-Inch CPTS Tile Installation	$2,451.25
Tile Outlets/Risers/Riprap Protection	$3,712.00
Maintenance Access Drive	$1,700.00
Breaking Down Remaining Clay Tile	$690.00
Contingency	$26,439.23
Interest, Legal, Administrative Costs	$48,278.03
Total	**$339,109.51**

BOARD OF SUPERVISORS PROJECT REVIEW

Having reviewed/inspected the project at the View conducted on January 11, 2024, in conjunction with the findings contained in this report, the Defiance SWCD's Board of Supervisors has provided the following comments in regards to the feasibility, favorable and unfavorable factors, and whether benefits exceed the estimated costs for this project.

Feasibility

This project has been deemed feasible. Factors contributing to this decision include:

1. The project is easily accessed from local roads and drives for construction. Maintenance access will require an access drive and extended easement on the Wirtner property and an access drive on the Lantow property.
2. Excavation can be performed with standard excavating equipment.
3. Sufficient ditch and tile flow lines can be excavated to facilitate drainage.

Favorable Factors

Favorable factors of this project include:

1. Improved drainage of ditch, field surface water, and subsurface drainage outletting into the ditch.
2. Improved drainage on the north side of State Route 15.
3. Improved surface and subsurface drainage through the residential area.
4. Eroding areas controlled or eliminated in ditch and above the failing clay tile.
5. Uniform method of sharing cost of project.
6. Project will be permanently maintained under the County Maintenance program.

Unfavorable Factors

Unfavorable factors of this project include:

1. Construction of open drainage ditch on residential properties.
2. Clearing of wooded areas and potential damage to crops and lawns during project construction.
3. Utilities exist through the residential properties.
4. Conversion of land for construction of the project.
5. Need for an additional easement to access the project for future maintenance.
6. Replacement of residential access drives/bridges to meet engineering design requirements.

Benefits / Cost

Given the preliminary cost estimates and the calculated benefits within the cost-benefit analysis (contained within this preliminary report), it is the Defiance SWCD's Board of Supervisors opinion that the benefits derived from this project are likely to exceed the estimated costs for the project.

Alternate Proposals

Multiple alternate proposals have been evaluated to address the drainage concerns presented. However, only one of the proposals can achieve all of the requested drainage improvements while meeting engineering standards and providing a favorable cost-benefit analysis. Therefore, there are no alternate proposals recommended by the Board of Supervisors.

LANDOWNERS

Parcel Number	Landowner	Acres Owned	Acres Drained
L15-0025-0-006-00	MEINE TIMOTHY ETAL	13.982	0.162
L15-0025-0-006-01	DEVRIES DEREK	1.392	0.218
L15-0025-0-007-00	RUPRIGHT DONNA C	49.000	1.105
L15-0025-0-007-01	RUPRIGHT DONNA C	1.000	0.129
L15-0025-0-008-00	RUPRIGHT DONNA C	112.940	39.849
L15-0025-0-008-01	RITTENHOUSE ROSEMARY A	5.000	1.616
L15-0025-0-008-02	RUPRIGHT NANCY	2.061	2.059
L15-0025-0-009-00	SMITH THOMAS W & BRIDGET D	1.988	1.988
L15-0025-0-010-00	SILER CYNTHIA E & MICHAEL A	64.466	50.466
L15-0025-0-010-01	CHRISTY NORMAN G & JUDITH A	5.000	5.000
L15-0025-0-010-02	MOCHERMAN SCOTT D	5.002	3.002
L15-0025-0-010-03	HETRICK PHILIP A & TRISHA	5.002	4.502
L15-0026-0-011-02	SHININGER LOUIS R & CHARETTE Y TRUSTEES	32.325	9.995
L15-0035-0-001-00	COOLMAN STEVEN A & BARBARA A	72.901	4.018
L15-0035-0-007-01	SHINACRE LLC	13.578	11.871
L15-0035-0-007-02	SHINACRE LLC	26.091	22.138
L15-0035-0-007-03	SHINACRE LLC	77.147	0.422
L15-0035-0-008-00	SHINACRE LLC	1.000	1.000
L15-0036-0-005-00	SHINACRE LLC	39.985	11.839
L15-0036-0-006-02	SHINACRE LLC	39.988	1.049
L15-0036-0-009-02	MORRIS WILLIAM G & AMANDA	13.000	1.680
L15-0036-0-010-00	MEYER FREDA L SUC TRUSTEE	30.762	8.439
L15-0036-0-010-01	BECKER BRIAN & JENNIFER	2.956	0.487
L15-0036-0-010-02	KUBACKI REVEREND MONSIGNOR % REV ROBERT J KILL	6.404	6.403
L15-0036-0-012-00	WIRTNER LINDA M & PHILIP A	30.196	30.196
L15-0036-0-012-01	NOTESTINE RODNEY R & MARGARET	5.460	5.460
L15-0036-0-012-02	PORTER WILLIAM J & BRENDA L	2.046	2.046
L15-0036-0-012-03	CUFFLE RICHARD F	2.298	2.291
L15-0036-0-013-00	SORG RICHARD A & REXANNA	5.000	4.978
L15-0036-0-013-01	HOLTSBERRY LISA A	40.066	39.561
L15-0036-0-013-02	BEMENT CHRISTOPHER J	10.000	9.932
L15-0036-0-013-03	NEWLAND R JEAN	4.000	4.000
L15-0036-0-013-04	RHODES RICKY A	5.000	5.000
L15-0036-0-013-05	HALL VIRGIL R & RANDI L	5.000	5.000
L15-0036-0-013-06	MARCH JANIE E	5.000	5.000
L15-0036-0-013-07	GRIMES ROBERT	5.000	5.000
L15-0036-0-013-08	NEWLAND R JEAN	1.000	1.000
L15-0036-0-014-00	BENDER DAVID S & JODY P	1.046	1.046
L15-0036-0-015-00	WYSE RICHARD J	1.500	1.500
L15-0036-A-001-00	LANTOW SCOTT	0.550	0.550
L15-0036-A-002-00	LANTOW SCOTT	0.490	0.490
L15-0036-A-003-00	LANTOW SCOTT	0.640	0.640
L15-0036-A-004-00	LANTOW SCOTT	0.770	0.770
L15-0036-A-005-00	KLINE DEREK M ETAL	0.920	0.920
L15-0036-A-006-00	KLINE DEREK M ETAL	1.080	1.080
L15-0036-A-007-00	KLINE DEREK M ETAL	1.250	1.250
L15-0036-A-008-00	LASLEY NANCY K C/O NANCY K LASLEY-BUELL	3.100	3.000

LANDOWNERS

Parcel Number	Landowner	Acres Owned	Acres Drained
L15-0036-A-009-00	WIEMKEN BRENT A & CYNDI	1.753	1.753
L15-0036-A-010-00	CHAPMAN MATTHEW J & FRANKIE J	2.039	2.039
L15-0036-A-011-00	PORTER WILLIAM J & BRENDA L	0.382	0.382
L15-0036-A-012-00	WOLFF WANETTA M	0.246	0.246
L15-0036-A-013-00	WOLFF WANETTA M	0.258	0.258
L15-0036-A-014-00	KARNES RICHARD H & SUSIE	0.259	0.259
L15-0036-A-015-00	KARNES RICHARD H & SUSIE	0.261	0.261
L15-0036-A-016-00	NOTESTINE RICHARD W ETAL % EVELYN J NOTESTINE	0.263	0.263
L15-0036-A-017-00	COMDEN CHRISTINE K	0.264	0.264
L15-0036-A-018-00	COMDEN CHRISTINE K	0.266	0.266
L15-0036-A-019-00	COMDEN CHRISTINE K	0.133	0.133
L15-0036-A-019-01	KECK SANORA J	0.134	0.134
L15-0036-A-020-00	KECK SANORA J	0.269	0.269
L15-0036-A-021-00	KECK SANORA J	0.271	0.271
L15-0036-A-022-00	THOMPSON M DIANE	0.272	0.272
L15-0036-A-023-00	THOMPSON M DIANE	0.319	0.319
L15-0036-A-024-00	THOMPSON M DIANE	0.344	0.344
L15-0036-A-025-00	THOMPSON M DIANE	0.395	0.395
L15-0036-A-026-00	TRESSLER LARRY GENE & DIANA KAY	0.316	0.316
L15-0036-A-027-00	BOWDEN LLOYD L & RUTH E	0.138	0.138
L15-0036-A-027-01	TRESSLER LARRY GENE & DIANA KAY	0.138	0.138
L15-0036-A-028-00	BOWDEN LLOYD L & RUTH E	0.276	0.276
L15-0036-A-029-00	MCCOY NELLIE M	0.276	0.276
L15-0036-A-030-00	MCCOY NELLIE M	0.276	0.276
L15-0036-A-031-00	MARCH CHARLES L	0.138	0.138
L15-0036-A-031-01	MCCOY NELLIE M	0.138	0.138
L15-0036-A-032-00	MARCH CHARLES L	0.276	0.276
L15-0036-A-033-00	MARCH CHARLES L	0.276	0.276
L15-0036-A-034-00	ANDRIST TESSA	0.265	0.265
L15-0036-A-035-00	LUCAS MARY L	0.276	0.276
L15-0036-A-036-00	LUCAS MARY L	0.390	0.390
L15-0036-A-037-00	GARZA VINCENTE E JR & KAREN S	0.137	0.137
L15-0036-A-037-01	LUCAS MARY L	0.138	0.138
L15-0036-A-038-00	GARZA VINCENTE E JR & KAREN S	0.276	0.276
L15-0036-A-039-00	BONGIORNO TYLER & KARRIGAN	0.276	0.276
L15-0036-A-040-00	BONGIORNO TYLER & KARRIGAN	0.276	0.276
L15-0036-A-041-00	BONGIORNO TYLER & KARRIGAN	0.276	0.276
L15-0036-A-042-00	GOEBEL JEFFREY D	0.276	0.276
L15-0036-A-043-00	GONZALES ELENO M & GLORIA	0.276	0.276
L15-0036-A-044-00	GONZALES ELENO M & GLORIA	0.276	0.276
L15-0036-A-045-00	GONZALES ELENO M & GLORIA	0.276	0.276
L15-0036-A-046-00	SWARY VICKIE TOD	0.276	0.276
L15-0036-A-047-00	SWARY VICKIE L	0.276	0.276
L15-0036-A-048-00	NOTESTINE RICHARD W	0.276	0.276
L15-0036-A-049-00	NOTESTINE RICHARD W	0.138	0.138
L15-0036-A-049-01	DECOLA DOUGLAS E & PAULA	0.138	0.138
L15-0036-A-050-00	DECOLA DOUGLAS E & PAULA	0.313	0.313

LANDOWNERS

Parcel Number	Landowner	Acres Owned	Acres Drained
L15-0036-B-001-00	COMDEN CHRISTINE K	0.241	0.241
L15-0036-B-001-01	NOTESTINE RICHARD W ETAL % NOTESTINE EVLEYN J	0.202	0.202
L15-0036-B-002-00	KARNES RICHARD H & SUSIE	0.336	0.336
L15-0036-B-003-00	NOTESTINE RICHARD W	0.136	0.136
L15-0036-B-004-00	SWARY VICKIE L TOD	0.246	0.246
L15-0036-B-005-00	GONZALES ELENO M & GLORIA	0.446	0.446
L15-0036-C-006-00	MARCH CHARLES L	3.047	3.022
L15-0036-C-007-00	COMDEN CHRISTINE K	0.692	0.692
L15-0036-C-008-00	BOWDEN LLOYD L & RUTH E	2.129	2.129
L15-0036-C-009-00	MCCOY NELLIE M	0.500	0.500
STATE ROUTE 15	ODOT	0.000	10.390
GLENBURG RD	DEFIANCE COUNTY ENGINEER	0.000	1.040
BLOSSER RD	DEFIANCE COUNTY ENGINEER	0.000	10.250
FLICKINGER RD	WASHINGTON TWP - MAURY SIMS	0.000	1.850
GLENBURG RD	TIFFIN TWP - ANNE RETHMEL	0.000	0.240

ASSESSMENTS

Landowner assessments are calculated using a formula which takes into account factors such as: acres drained, land use, soil type, tile drainage, topography and percent of usage of the improvement. The following is a description of each of these factors:

Acres Drained – Only the physical acreage of each landowner's property within the actual watershed boundary is considered in determining assessments. This includes farmland, woods, pastures, house lots, parking lots, roads, etc.

Land Use – Each tract of land contributing runoff water to the proposed improvement is assessed according to the amount of water that is actually being generated from that tract of land. High runoff areas such as roads, parking lots, residential areas, etc., are assessed at a higher rate than lower runoff areas such as farm ground and woodland regions, due to the fact that more runoff water is being produced from the more impervious areas.

Soil Type – The soil type of the land draining into the project is determined using the Defiance County Soil Survey and is used to account for the amount of infiltration or runoff.

Tile Drainage – This takes into account whether the land in the watershed area is tiled and whether or not the tile drains to or away from the drainage improvement project.

Topography/Remoteness – The actual distance runoff water must first travel before even reaching the drainage improvement is a determining factor on how land is assessed. The longer the distance it takes for the water to reach the improvement, the lower that ground is assessed.

Use of the Ditch Improvement – Landowners only help share the cost of the drainage improvement that their runoff water travels through. They will have no responsibility to help share the cost of construction upstream from where your water enters the project.

WATERSHED BENEFITS

Benefits are defined in the drainage improvement sections of the Ohio Revised Code as advantages to land and owners, public corporations and to the state resulting from drainage, conservation, control, and management of water and from environmental, wildlife, and recreational improvements.

According to the Code, factors relevant to whether a property will benefit from an improvement include:

1. *Area of land affected by the improvement;*
2. *The volume of water draining into the improvement and the amount of water contributed by each owner;*
3. *The use to be made of the improvement;*

Benefits may also include the following factors:

1. *Elimination or reduction of damage from flooding;*
2. *Removal of water conditions which jeopardize public health, safety of welfare;*
3. *Increased land value resulting from the improvement;*
4. *Use of water for irrigation, storage, regulation of stream flow, soil conservation, water supply, or any other incidental purpose;*
5. *Providing an outlet for the accelerated runoff from artificial drainage whenever a stream, watercourse, channel or ditch under improvement is called upon to discharge functions for which it was not designed by nature; it being the legislative intent that upland property that has been removed from its natural state by deforestation, cultivation, artificial drainage, urban development, or other human methods shall be considered as benefited by an improvement requirement to dispose of the accelerated flow of water from upland property.*

Benefits can be divided into two types. Obligation benefits are the first type and are based upon the need for an outlet for drainage resulting from deforestation, artificial drainage, and urban development. Upper owners have a right to improve their drainage outlets, thus accelerating their drainage runoff. However, they are responsible or obligated to share in the cost of an outlet downstream that is adequately sized to handle their accelerated runoff.

Accelerated runoff is the difference in runoff under present conditions and what it would have been under natural vegetative conditions before being cleared and cultivated / developed.

The second benefit is from a decrease in saturated conditions/flood potential of land along the improvement area. By decreasing this flood potential, land will be able to be farmed better and will produce higher yields while residential areas will also benefit from this reduced flooding potential.

Other benefits that will be gained from this project are:

1. Reduced frequency of residential drive pipe overtopping and scouring.
2. Reduction of standing water in field and on residential properties on north and south side of SR 15.
3. Improved field and residential tile drainage.

COST-BENEFIT ANALYSIS

The Cost-Benefit Analysis for this project was calculated from the potential property value increases that result from this drainage improvement and its future maintenance. Upstream landowners have benefitted through accelerated runoff with the conversion of wetlands and forests to cropland and residential development. Landowners adjacent to the project will also benefit through improved drainage as a result of the drainage improvement and its permanent maintenance. In addition, land within the project watershed will have the potential for crop yield increases. Both factors are quantified below.

Yield Increase Benefit – It is estimated that there would be at least 223 acres affected by decreased yields due to flooding/saturated conditions. Crops in the area would be estimated at 20% wheat, 40% corn, and 40% soybeans, with a very conservative yield increase due to improved drainage of 5 bushels per acre for wheat, 10 bushels per acre for corn, and 5 bushels per acre for soybeans. Using these yield increases at current grain prices this would mean an annual increase of $9,493.25. This breaks down as follows:

45 acres of Wheat @ 5 bu. /ac. X $5.01/bu. = $1,127.25
89 acres of Corn @ 10 bu. /ac. X $3.72/bu. = $3,310.80
89 acres of Soybeans @ 5 bu. /ac. X $11.36/bu. = $5,055.20

This annual increase of $9,493.25 over the projected 10-year lifespan of the project (before significant maintenance would be needed) amounts to a total benefit of $94,932.50.

Property Value Benefit – Rural residential and agricultural properties will benefit from improved drainage by increasing or maintaining their property values. According to local real estate sources, as a general rule, properties suffering from standing water over a large area are often judged to be devalued as much as 20% to 30%. Properties with some standing water could be devalued by as much as 10% to 20%. Areas that suffer even the stigma of standing water could be devalued by 5% to 10%. According to information from the County Auditor, the market value of all property within the project watershed (343 acres), both residential and agricultural, is approximately $6,797,308.08. Using a conservative value increase of 5.0%, this would provide a potential increase in property values of $339,865.40.

Benefit Summary – Therefore, combining both the yield increase and property value increase, a total of $434,797.90 worth in benefits can be realized over the projected lifespan of the project. This compared to an estimated project cost of $339,109.51 gives this project a favorable cost-benefit ratio.

COST / BENEFIT CONCLUSIONS

Most every property owner in the watershed (agricultural land, rural housing, streets, and roads) has in some way or another increased the natural flow of water to this drainage project. While each will see a different need, the fact exists that everyone in the watershed uses the improvement to carry water discharged from their properties faster than it was 20, 50, or 100 years ago.

A few landowners on the drainage improvement have done some work on their own to help improve drainage; unfortunately, this work has limited impact on improving the overall drainage of the project to keep up with the demands that are placed on it. Anyone with water draining from his yard or has a blacktop driveway or has a roof somewhere has increased the flow rate and has put increased demands on the drainage way. The same is true for agricultural land, as wood lots were cleared, fencerows removed, and field tile installed, thus increasing the flow.

Therefore, it is the opinion of the Defiance SWCD's Board of Supervisors that this proposal is the best and most cost-effective method to address the demanding drainage needs of the surface and subsurface drainage systems and the benefits of this project are likely to exceed the costs of this project as shown above.

DITCH MAINTENANCE

As noted above, if this project is completed, it would be necessary according to state law to have the project put on the *"County Maintenance Program"*. As prescribed by law, every landowner involved would be subject to permanent maintenance. Maintenance assessments are collected as a special assessment on real estate taxes and would be collected usually at the rate of 10 percent of a landowner's construction assessment for the first two years after the project is completed to establish the fund. After the first two year's collections, landowners are only assessed as needed when maintenance work is done. This means that maintenance assessments may or may not be collected each year after the first two years and the amount collected may vary depending upon the needs of the improvement, but will never carry more than twenty percent in the maintenance fund for this project.

To properly maintain drainage improvement projects, permanent maintenance easements are required. For the reconstructed portions of the ditch project, there will be a maintenance easement of 25 feet, measured at right angles from the top of bank on the side(s) of the ditch that is reconstructed. There will also be a maintenance easement of 25 feet on each side of any tile installed as part of the project.

CONCLUSION

To continue this process, sufficient interest in constructing the project must be expressed by the landowners involved. Provided this is done, the *Ohio Department of Agriculture* along with the *Defiance Soil and Water Conservation District*, shall complete the engineering plans. The County Engineer, prior to bidding and construction, must approve the plans. *Invitation to Bid* notices will be sent out to contractors and a successful bidder will be hired. The *Soil and Water Conservation District* and the *Natural Resources Conservation Service* office would supervise construction and certify completion of this project.

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