

Lebanon Valley Conservancy, Inc.

770 Cumberland St. Suite A
Lebanon PA 17042
717-273-6400

December 20, 2022

RA-EPSCROWATERSHEDGR@pa.gov
David Burke, Watershed Manager
Department of Environmental Protection
Southeast Regional Office
909 Elmerton Avenue | Harrisburg, PA 17110

Subject: C990000639, Submission of Project Closeout

RE: Grant Final Report/ Project Closeout Snitz Creek # 2 C990000639 Quittapahilla Watershed, and Final Application for Reimbursement, LVC

Dear Mr. David Burke:

Enclosed please find LVC/QWA's Final Project Report. The Final Application for Reimbursement has been submitted separately on 12/22/22 for the period 07/01/22 to 12/22/22 and is also included in this submittal for project Close Out. Included are the following:

1. Progress Report for 4th Quarter 2022
2. Technical Report
3. Goals and Accomplishments Worksheets
4. Permit Package has been submitted on file with PADEP and not included in this submittal.
5. Financial Report-Final Application for Reimbursement
 - o Submittal letter
 - o Work Progress report
 - o Clear Creek Consulting narrative for the period.
 - o Application for Reimbursement Form-one page for signature
 - o Application for Reimbursement Form-supplemental sheet
 - o LVC Project Accounting Spreadsheet
6. Project Summary

If you have any questions, please contact me at 717 821 2021 or email me.

Sincerely;



Edward B. Gibble P.E., LVC BOD member and Project Manager

Work Progress Report (Complete for Each Deliverable – Including those with no activity)

DEP Project Advisor: David Burke Report Period: 10/01/22 to 12/20/22

Grantee: Lebanon Valley Conservancy Inc. Document Number: C990000639

Project Name: Snitz Creek No. 2, Quittpahilla Watershed

This Progress Report completed by: (name): Edward Gibble

Deliverable #: 1 Deliverable Title: Snitz Creek Project #2-Design and Permitting

Deliverable % Complete and Status:

Deliverable % complete: 100%. All Task are completed. Final Design Plans have been completed and submitted. Hydraulic Modeling report has been approved by Twsp. Approval letter has been received for Final Design Plans and Sediment Control Permit by LCCD on 11/3/22.

Deliverable #: 1 continued Deliverable Title: Snitz Creek Project #2-Design and Permitting

Deliverable % Complete and Status:

Chapter 105 and 404 Joint Permit Application was submitted to PADEP and Army Corps of Engineers on 10/19/22. On 11/1/22 we received from PADEP confirmation that the Application is complete and moving forward for Technical review. This Progress report is included in the Closeout Reort dated 11/22/22.

Deliverable #: N/A Deliverable Title: _____

Deliverable % Complete and Status:

Deliverable #: N/A Deliverable Title: _____

Deliverable % Complete and Status:

**If the project has more than four deliverables, this page may be duplicated.

Proposed Activities for Next Quarter: Clear Creeks Consulting will continue to coordinate with PADEP on questions and comments until final approval of submittals. We anticipate that will take three to four months.



CLEAR CREEKS CONSULTING

1317 Knopp Road, Jarrettsville, Maryland 21084

(410) 692-2164

November 22, 2022

Mr. Ned Gibble
The Lebanon Valley Conservancy
752 Willow Street, Suite E
Lebanon, PA 17046

Re: Snitz Creek 2 Stream Restoration and Floodplain Project Status Report

Dear Mr. Gibble:

This Status Report will update you on the work completed for the period including, September 30, through November 21, 2022. The attached invoice shows services provided and percent completed. The following is a summary of tasks completed as reflected on the invoice.

Task 5.0 – Final Design and Final Design Report

1. Final Design Plans and Final Design Report have been completed.
2. H&H Report was completed and included in the Design Report.

Task 6 – Local, State and Federal Permitting

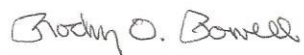
1. As noted in the last report, we received a letter from Jeff Steckbeck, P.E. indicating the Hydrologic and Hydraulic Modelling Report was acceptable and the project meets the Borough Floodplain Management regulations.
2. The Final Design Plans and Erosion and Sediment Control Permit Application was submitted to the Lebanon County Conservation District (LCCD) staff for their review and approval on Monday October 10, 2022. On October 20, 2022, comments were received from LCCD requesting several minor revisions to the notes on the plans. The revised plans were submitted on October 28, 2022. On November 3, 2022, we received the Approval Letter and Stamped Plans from LCCD.
3. Since the Cornwall Borough is the applicant for this project, all application forms requiring signature were forwarded to Cody Rhoads, Borough Manager. After receiving the signed forms, the Chapter 105 and 404 Joint Permit Application was finalized and submitted to the Pennsylvania Department of Environmental Protection (PADEP) and the US Army Corps of Engineers (USACOE via the On-Line submission process on October 19, 2022. On November 1, 2022 we received a letter from PADEP confirming that our application was complete and was moving forward for technical review.

With the attached invoice of \$25,047.80 Clear Creeks Consulting has billed a total of \$151,139 or 100% of the total Design and Permitting Phase budget for services for the Snitz Creek 2 Stream and Floodplain Restoration Project.

Although this will close out our contract and budget, we will continue to coordinate with PADEP to address all of their comments and prepare any required plan revisions until all permits have been approved. We anticipate that will take an additional three to four months.

Please let me know if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Rocky O. Powell".

Rocky Powell

Enclosure: Invoice #2022-19

**Snitz Creek 2 – Stream and Floodplain Restoration, Quittapahilla Watershed
Water Quality Improvement Projects Grant: Water Quality Projects along MEII Pipeline**

Final Report

Prepared for

Grantee - The Lebanon Valley Conservancy

**Grant Document Number – C990000639
Application ID Number – 201806207885**

Prepared by

Clear Creeks Consulting LLC

in collaboration with

The Lebanon Valley Conservancy

December 7, 2022



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A. Technical Report

1. Narrative Description of Project

a. Project Purpose

The Snitz Creek 2 Stream and Floodplain Restoration Project is the second ranked project on the priority list for the Snitz Creek watershed as outlined in the Quittapahilla Watershed Implementation Plan. It is located on a tributary to Snitz Creek in the Cornwall Borough, Lebanon County, Pennsylvania.. The tributary, known locally as Elizabeth Run, is an intermittent stream carrying baseflow for eight to nine months each year. The project received funding from a Water Quality Improvement Projects along the Sunoco Mariner East 2 Pipeline Corridor Grant Program in 2019. After significant delays in land acquisition, design plan development has been completed and the permitting process has begun.

The project area for this restoration effort includes the 2,025 linear feet of Elizabeth Run stream reaches from the culvert outfall downstream of the Lebanon Valley Rail Trail to the culvert upstream of Culvert Street. The center of project site is located at 40°17'00.92"N Latitude and 76°24'36.84"W Longitude. The upper project reach includes the residential neighborhoods along Cedar Street, Juniper Street and Oak Street along the left floodplain and the cultivated fields on the Krall Farm along the right floodplain. The land use along the lower project reach includes two large residential parcels on either side of the channel.

The results of a geomorphic assessment indicated that the stream reaches along the entire project area are laterally and vertically unstable due to meander redevelopment and the presence of earthen flood berms along the banks separating the channel from its floodplain and confining stormflows to the channel. Stability problems include high width to depth ratio, significant bank erosion, debris jams, heavy sedimentation, aggradation (lateral and mid-channel bars) and active head cuts. Undercut trees are falling into the creek creating debris jams which further accelerates the bank erosion and aggradation. The increased sedimentation has significantly degraded in-stream habitat resulting in few, shallow pools and riffles that are highly embedded with fine sediments. The bank and bed erosion is a source of sediment to downstream reaches along Snitz Creek, Quittapahilla Creek, as well as Swatara Creek. This section of Snitz Creek also receives direct stormwater runoff from agricultural cultivated fields along the right floodplain and urban runoff from the residential neighborhoods along the left floodplain.

The restoration design objectives are to create a stable gently sinuous E4 stream channel along the upper project reach and a stable gently sinuous B4c along the lower project reach. The channel will generally follow the existing alignment. However, some adjustments were made along the upper reach shifting it away from the subdivision to avoid a landowner not participating in the project and shifting away from the farm field into larger lots of participating landowners to provide more space for wetlands creation adjacent to the farm field. Floodplain restoration along the upper reach will include the creation of a 1.0 acre emergent and scrub-shrub wetland along the adjacent right floodplain to capture and provide water quality treatment for direct runoff from the adjacent cultivated agricultural fields as well as urban runoff carried into the channel when storm flows overtop the restored banks. Along the lower reach the channel was shifted away from the private driveway along the right floodplain where bank erosion is threatening to undermine it.

The project received funding for the Design and Permitting Phase from a Water Quality Improvement Projects along the Sunoco Mariner East 2 Pipeline Corridor Grant Program in 2019.

b. Actual Accomplishments

The following tasks were completed with the funding provided by the PADEP WQ Improvement Grant:

1) Existing Conditions Survey and Base Map Preparation

A field-run topographic survey was conducted to provide detailed channel and floodplain topography along 2,025 feet of Elizabeth Run from upstream of the culvert section at Lebanon Valley Rail Trail and downstream through the culvert section at Culvert Road. Base maps including plan view, profile and cross-sections were developed of the project corridor from field run survey for use in developing restoration designs.

2) Hydrologic and Hydraulic Analysis

The HEC-HMS Hydrologic Model was used to develop the peak discharge rate for the 1-, 2-, 10-, 50- and 100-year 24-hour storms under existing conditions for the project reach. The model was calibrated to regional regressions and/or the FEMA 100-year published flow data so as to serve as the basis for analyzing in the following flood plain modeling effort. Utilizing the peak discharges developed from the hydrologic analysis and regional regressions as input the HEC-RAS Hydraulic Model was used to conduct existing and proposed hydraulic analyses for the project reaches.

3) Field Studies and Design Criteria

A detailed Geomorphic Assessment was conducted to characterize existing morphological conditions and evaluate overall channel stability. A sediment transport analysis was conducted to evaluate the stability of the proposed design. Based on the assessment and analysis the appropriate design dimensions were developed for the bankfull channel and adjacent floodplain.

4) Preliminary Design

Preliminary design plans were prepared. The plans included: plan view sheets, representative cross-section sheets, structure typical details, and preliminary landscape plans for the Elizabeth Run corridor. A Community Meeting was held to present the plans to all of the participating landowners. Several follow-up meetings were conducted with individual landowners to address specific comments and questions.

5) Final Design and Construction Documents

Final restoration design plans were prepared. The plans included: proposed grading plans, cross-section sheets, profile sheets, in-stream structure typical details and final landscape plans.

A Final Design Report was prepared, summarizing the results of the field studies, existing/proposed conditions hydrologic and hydraulic analysis, sediment transport analysis, and supporting engineering computations for the restoration/stabilization of Elizabeth Run project reaches.

Erosion and Sediment Control Plans were prepared that included: sequence of construction; stockpile and staging areas, clean water diversion, sediment and erosion control measures, Quantity estimates for earth work (i.e., cut and fill) and other construction materials.

6) Local State and Federal Permit Applications

Environmental and Cultural assessments required for permitting including wetland delineation, archeological, historical, RET, etc. were completed.

A pre-application field meeting with the local, state and federal permitting agencies was conducted to present the preliminary design plans, discuss overall project goals and objectives and site specific constraints.

The Erosion and Sediment Control package was submitted to the Lebanon Count Conservation District for review and approval. A Chapter 105/404 Joint Permit Application package was prepared and submitted to PADEP via the On-Base Permit Application website. Written responses and minor plan revisions were prepared to address agency comments and/or questions.

c. Successes

See detailed explanation of Problems Encountered and Solutions to Original Issues.

d. Problems Encountered and Solutions to Issues

a. Primary Project Landowner Backs Out

The Lebanon Valley Conservancy was notified by PADEP on May 15, 2019 that funding had been awarded for the project. After receiving an executed contract on May 31, 2019, Clear Creeks Consulting initiated work on the project. By July 2019 nearly all of the field work - topographic survey, geomorphic assessment and environmental and cultural assessments had been completed.

By mid-July, all landowners had signed the Landowner-Grantee Agreement except Glen and Linda Krall. They informed the QWA that they had changed their minds about participating in the project. They indicated that they had decided not to participate unless they were compensated for the two acres they had agreed to donate for floodplain restoration and wetlands creation. Because they own the major portion of the land along the upper and middle reaches of the Snitz Creek 2 Project and all of the proposed wetland creation area, all work on the project was put on hold.

In the intervening months, the QWA and DFTU began coordinating with the Lebanon County office of USDA-NRCS to determine if the Krall Farm would be eligible for compensation under one of their conservation programs. Based on their discussions, it appeared that compensation would be limited to \$250 per acre annually. This was insufficient compensation to satisfy the Krall family.

As an alternative, Mr. Rocky Powell, Clear Creeks suggested that compensation might come from funding provided by the Cornwall Borough. Like other municipalities, the Cornwall Borough must meet MS4 pollutant reduction requirements. QWA and DFTU were already planning to approach the Borough for matching funds at the time they applied for construction grants. Prior to approaching the Borough about purchasing a permanent easement or buying the land outright, Mr. Powell wanted to determine the amount of MS4 credits they could potentially obtain and whether this approach could be approved by PADEP's Clean Water Program. After initially corresponding with PADEP by email, Mr. Russ Collins, Doc Fritchey Chapter of Trout Unlimited and Mr. Powell met with PADEP staff on October 2, 2019. They presented the Snitz Creek 2 Stream and Floodplain Restoration Project Concept Plans and outlined a

detailed project description. As a result of the meeting DEP staff were enthusiastic about the project and saw no impediments for this project receiving MS4 credits.

During the same period, Clear Creeks began developing alternative designs and contacting PADEP's Grants Center for feedback on the design alternatives. The original proposed project concept submitted with WQ Improvement grant application involved the acquisition of more than two acres of farm field along the upper and middle project reaches. This concept showed the restoration of the upper and middle project reaches would involve reestablishing a meandering channel along a restored floodplain and two acres of created wetlands on either side of the new channel. The restoration concept for the lower reach showed some adjustments of channel alignment along tight meanders and away from the driveway along the right floodplain, excavation of a prone area and bankfull bench and bank stabilization with rock outcrops.

Clear Creeks developed two alternative designs for the upper and middle reaches. The first alternative required the least amount of land and involved stream channel restoration that generally followed the existing alignment. No created wetlands were included under this scenario. The second alternative involved stream channel restoration that generally followed the existing alignment with some adjustments along tighter meander bends. One acre of farm field would be acquired and almost one acre of wetland created adjacent to the restored channel. Both scenarios were presented to PADEP for comment. DEP staff indicated that the wetland creation had weighed heavily on their decision to approve the grant. While they acknowledged the loss of the additional acreage was unfortunate, the stream restoration only alternative could not be approved. However, they supported the reduced wetland area, scenario.

In November 2019, Mr. Collins and Mr. Powell presented their MS4 Credit proposal to the Cornwall Planning Commission and the Cornwall Borough Council. They saw a benefit in participating in the project and voted to acquire the land and contribute matching funds toward construction. As a result, the Cornwall Borough joined the watershed group to help finalize this effort.

The Borough made a formal compensation offer of \$31,000 to the Krall family in February 2020. Two years later the Krall Family finally signed a sales agreement for the land, and it closed on April 22, 2022. The Borough now owns the land along the stream corridor including the channel and a portion of the adjacent farm fields. They established a 2.13 acre restoration easement (Fig. 8) that includes the stream channel, riparian buffer and a portion of the cultivated along the right floodplain. This easement will allow the project to be completed and protected in perpetuity. The Borough is also contributing \$100,000.00 as match for the Growing Greener Grant funding that will be requested for project construction. As a consequence, the Borough will have contributed a total of \$131,000.00 towards the project. The Borough is functioning as the applicant on all local, state and federal permits required for the project. Because the Borough will obtain MS4 credits for the project they will be responsible for the long-term maintenance of all project components.

Therefore, after a very long period of negotiations with the landowners and the purchase of the land by Borough, the stream restoration and reduced wetland area alternative moved forward to design.

b. Avoiding Private Utilities

As part of the preliminary design process Clear Creeks had coordinated with the Cornwall Borough to identify all public utilities along the project reaches. That information was included on the base maps so that they could be avoided. However, it was only after presenting the Preliminary Design to the participating landowners that Clear Creeks became aware of private utilities (i.e., telephone, electric and internet cable) that crossed under channel along the upstream end of the lower project reach.

As a follow-up, Clear Creeks located the utility terminus boxes on either side of the channel utilizing GPS. They were added to the plans. Given their location and shallow depth, they would have been exposed by construction of a proposed pool. Accordingly, the plans were revised by adjusting the channel profile to shift the pool downstream and installing a riffle over the utilities to protect them from exposure.

c. 100-Year Floodplain Encroachment

Reconnecting the channel with an active floodplain will allow the larger storms to over top the banks and spread across the restored floodplain. This will greatly reduce stress on the streambanks and stream bed, while creating a riparian zone with ecologically diverse plant communities along the restored Elizabeth Run. However, some of the landowners along the upper and middle reaches were very concerned to learn that the restoration would involve removal of the flood control berms on their property. It was pointed out that lowering the streambanks and floodplain along their yards and along the cultivated field would create a wide, low floodway that would contain the 100-YR storm flows within the Restoration Easement owned by the Cornwall Borough along the upper and middle project reaches thereby reducing its impact on their yards.

The FEMA maps indicate that under existing conditions sections of the two properties along the lower reach are also in the 100-YR floodplain. Our HEC-RAS hydraulic model again confirmed that some areas of these properties were impacted by the 100-YR storm event. These landowners were also concerned with how the project would affect them. It was pointed out that the streambanks and a parallel section of the floodplain along their yards would be lowered to create a wide, low floodway that would contain the 100-YR storm flows within its limits.

Our design goals included the creation of an ecologically and geomorphologically functioning floodway that contains the 100-YR storm flows along the entire Project Area. To achieve this goal required six design iterations. With the exception of the area immediately upstream of Culvert Road the 100-YR storm water surface elevations are contained within the designed floodway. The area immediately upstream of Culvert Road floods under existing and proposed conditions because of the undersized culvert beneath the road.

d. Loss of Screening Vegetation

Removal of the flood berms, lowering of the floodplain and grading unstable stream banks requires that nearly all of the vegetation along the stream corridor be removed. Almost all of the landowners along the project area expressed concern about the loss of the vegetation that screened them from the agricultural fields or their neighbor across the stream. Reassurances that the streambanks and floodplain would be

replanted with trees and shrubs did little to satisfy their concerns. Accordingly, a landscape plan was developed that incorporates a variety of evergreen trees and shrubs, as well as trees that are larger in diameter and height. All landowners were consulted on the final landscape plan and were satisfied their concerns had been addressed.

e. Additional Efforts Planned

DFTU will be sponsoring the project during the Construction Phase. Clear Creeks will prepare Construction Specifications and Bid Documents after all permits have been obtained in January 2023. Shortly thereafter, DFTU will forward a Request for Bid Proposal to a list of Pre-Qualified Construction Contractors. In March 2023, Clear Creeks will conduct a Pre-Bid Site Walk with the interested contractors to orient them to the project and introduce them to the design plans and construction specifications. They will provide their bids to DFTU no later than April 2023. After DFTU selects the winning bidder, we will utilize the winning construction budget and the funding match provided by the Borough to complete the Task and Deliverable Budget Worksheet required for the construction grant application we plan to submit in June, 2023. If we are successful in obtaining grant funding construction of the Snitz Creek 2 project will start in Spring 2024. It is anticipated that construction would be completed by Summer 2024.

f. Dissemination of Results

The Final Design Plans, Final Design Report, Construction Specifications and Permit Application Packages will be posted to the Quittapahilla Watershed Association's website. In addition, LVC and DFTU update their membership on projects via their newsletters.

g. Spending vs Budget Request

Our budgets generally do not cover the work effort required to implement a successful project. For example, in order to successfully compete for grant funding we routinely include the many hours required for the following tasks as in-kind services match:

- Preparing all grant application forms and work plans, maps, aerials and other exhibits, project description narratives, conducting preliminary site assessments, photo-documentation of existing conditions, developing concept design plans;
- Coordinating with multiple landowners, our client (LVC, QWA, DFTU, etc.) and grant staff.

If awarded grant funding we provide additional in-kind services as match:

- Providing Project Management (Tracking Project Schedule & Budget, Processing subcontractors' invoices, Preparing Team invoices for submission to LVC and DFTU);
- Coordinating and Attending Team Meetings and Site Visits;
- Coordinating with LVC/DFTU/QWA, Township and Borough staff and representatives, and County Planning staff;
- Preparing Power Presentations and Attending Community Meetings;
- Preparing Project Status Reports & Final Reports;
- Preparing OM&R Plans;
- Preparing Bid-Documents and Conducting Pre-Bid Site Showings for Contractors.

Although the work effort is the same, to remain competitive for grant funding the budgets we request are based on lower rates than typically charged for identical projects funded by municipal capital improvement programs.

2. Existing Conditions Photographs

1. Reach 2A – Existing Channel Stations 0+00 – 12+25

Reach 2A starts at the culvert beneath the Lebanon Valley Rail Trail adjacent to Cedar Street Cul-de-sac and ends immediately upstream of another old railroad crossing.

Existing Stations 0+00 to 0+25

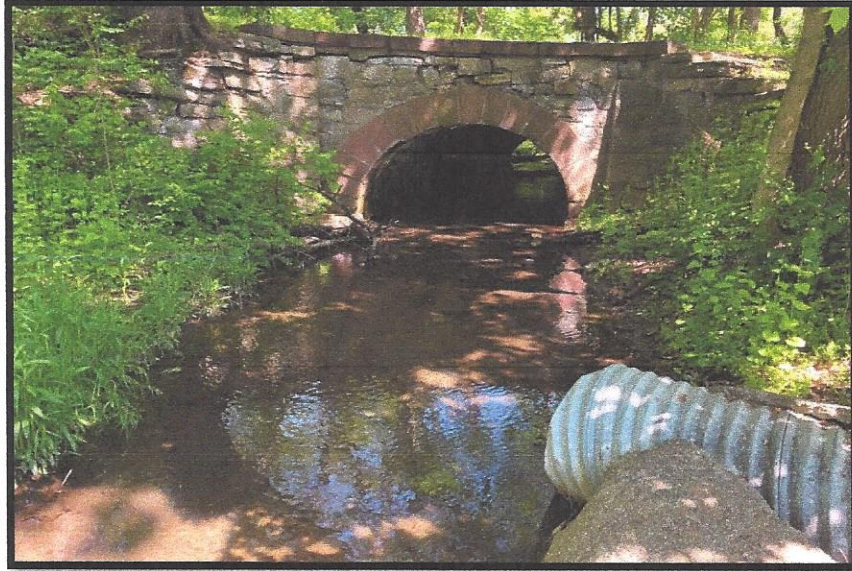


Photo 1 – Culvert under Lebanon Valley Rail Trail.

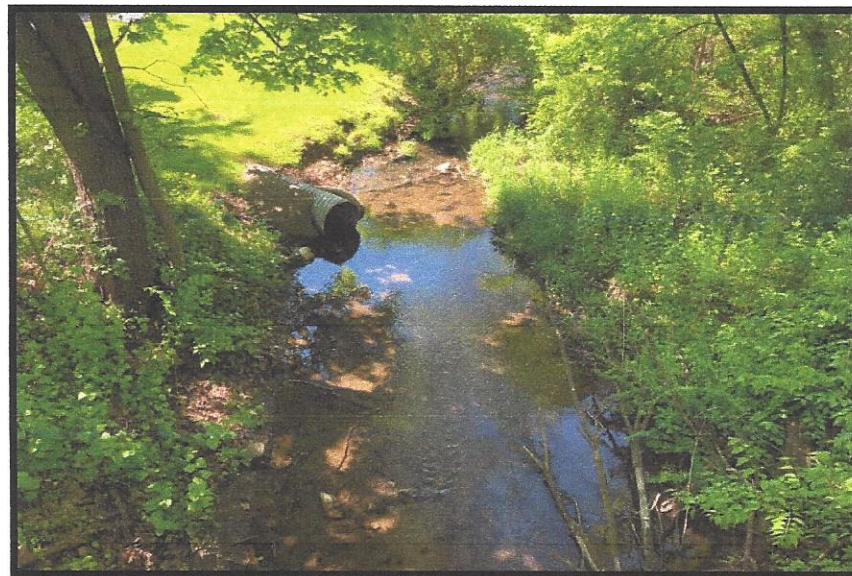


Photo 2 –View of downstream from Lebanon Valley Rail Trail.

Existing Stations 1+00 to 0+300



Photo 3 – Bank erosion at Cedar Street Cul-de-sac.



Photo 4 – Bank erosion along upper Reach 2A. Sump pump outfall pipe exposed by erosion. When first installed, only 6 inches of the pipe was exposed.

Existing Stations 3+00 to 0+700



Photo 5 – Bank erosion, undercut tree, small debris jam and sedimentation



Photo 6 – Bank erosion and sedimentation



Photo 7 – Bank erosion, undercut tree and mid-channel bar



Photo 8 – Bank erosion, fallen tree, and large debris jam that includes old tires

Existing Stations 7+00 to 12+25)



Photo 9 – Bank erosion and undercut trees



Photo 10 – Multiple head-cuts at upstream end of lower section



Photo 11 – Multiple head-cuts at upstream end of lower section

2. Reach 2B – Existing Station 12+25 – 20+25

Reach 2B starts immediately upstream of the second old railroad crossing and ends immediately upstream of the culvert at Culvert Street.

Existing Station 13+00 – 14+25



Photo 12 - Stone abutments along old railroad crossing at upstream end of Reach 2B



Photo 13 – Bank erosion and undercut trees along overwide section

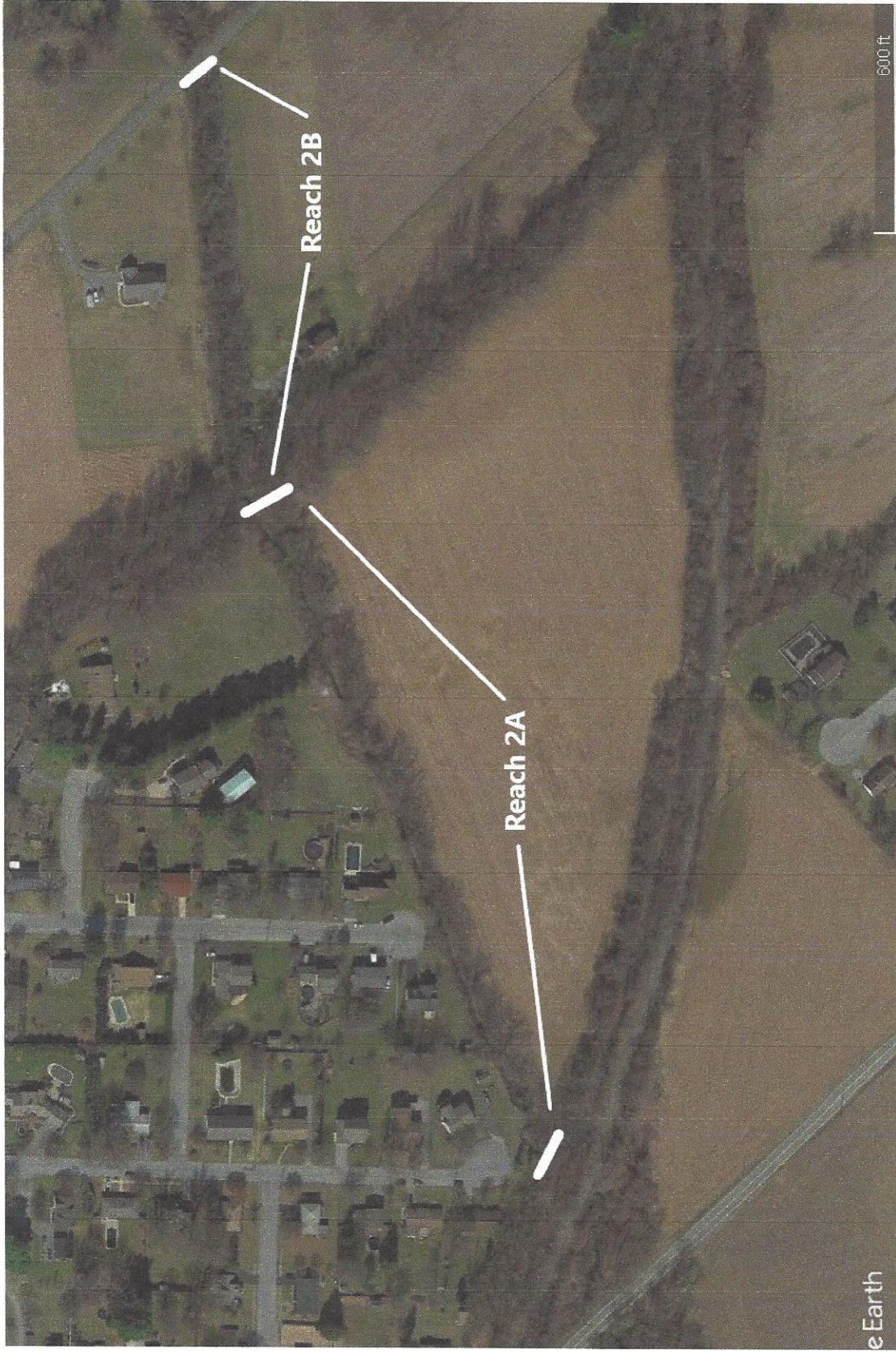
Existing Station 15+00 – 18+25



Photo 14 – Bank erosion and undercut trees



Photo 15 – Bank erosion Reach 2 at upstream end of Brummel Property



Snitz Creek 2 - Project Reach Limits

B. Goals and Accomplishments Form