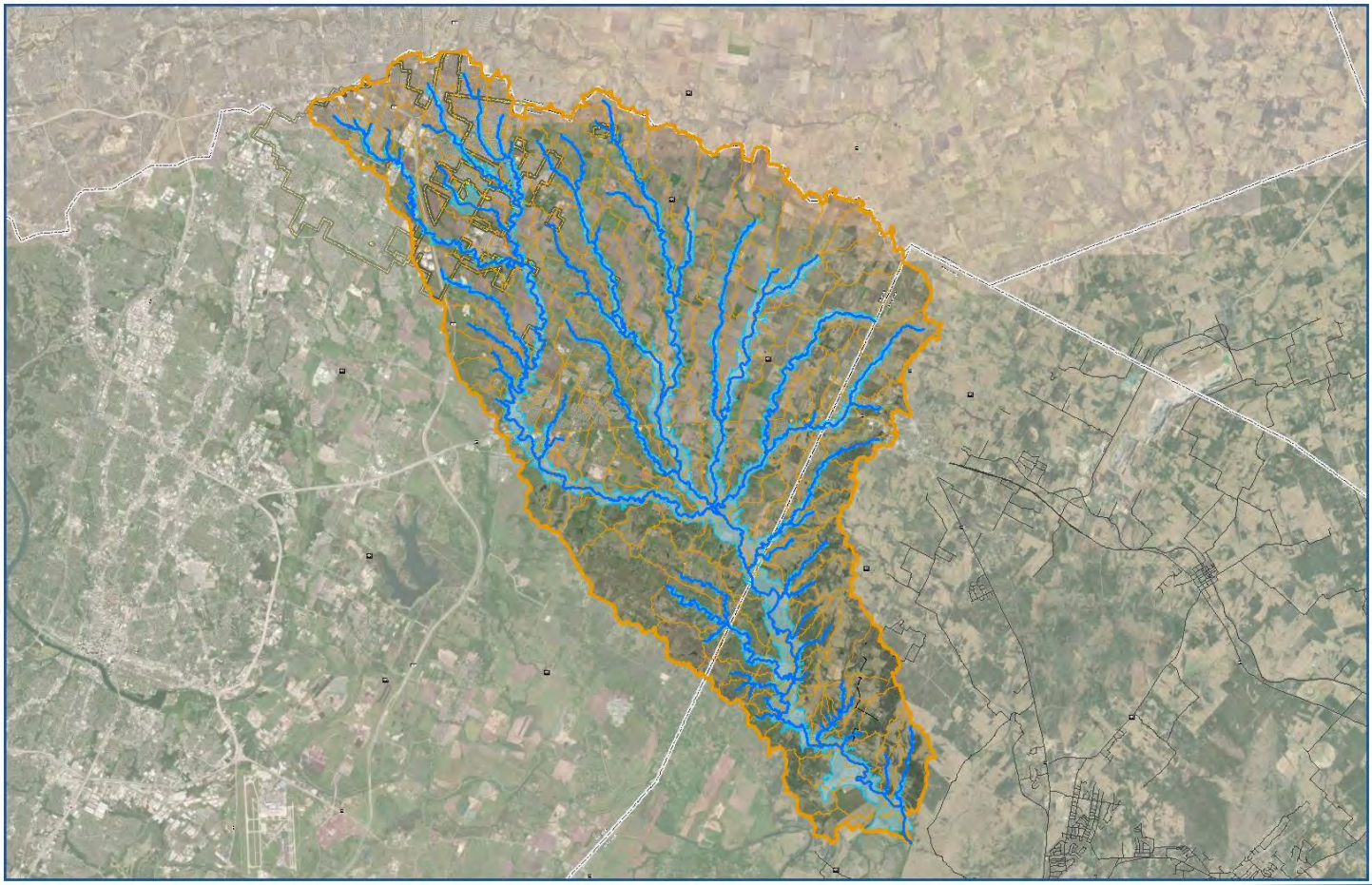
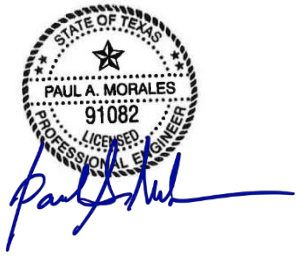
Contract No. 1800012308
Final Report
Received: September 29, 2021



WILBARGER CREEK WATERSHED STUDY
BASTROP COUNTY, TRAVIS COUNTY & CITY OF PFLUGERVILLE, TEXAS
BASTROP COUNTY FLOOD PROTECTION PLANNING GRANT

Prepared for
Bastrop County, Travis County, City of Pflugerville

27 August 2021



Prepared by
Halff Associates Inc.

TBPELS Engineering Firm #312
9500 Amberglen Blvd., Bldg. F, Ste. 125
Austin, TX 78729

August 27, 2021

August 27, 2021 AVO 35837

Michael Vielleux, P.E.
Engineer III River Science Program - Texas Water Development Board
1700 North Congress Ave.
Austin, Texas 78711-3231

Sent via email.

RE: Bastrop County Flood Protection Planning Study - Wilbarger Creek Watershed Study - Draft Report Comment Responses
TWDB Contract 1800012308

Dear Mr. Vielleux,

Halff Associates, Inc. (Halff) is submitting this letter in response to Texas Water Development Board (TWDB) review comments for the Draft Bastrop County Flood Protection Planning – Wilbarger Creek Watershed Study report for the above referenced TWDB contract. The following TWDB review comments were received by the County on July 21, 2021 and are included for reference along with Halff's response. In addition, Halff received review comments from each of the participating communities and these comments are included for in this letter below.

TWDB Draft Report Comments:

1) **List of Acronyms and Abbreviations**, page vi; TNRIS is the Texas Natural Resources Information System not the Texas Natural Resource Service. Please update as applicable.
Response: Corrected.

2) **List of Acronyms and Abbreviation**, page vi; The following acronyms and abbreviation do not appear in the report nor the appendices: ac-ft, CAPCOG, DTM, and sq. mi. Please update as applicable.
Response: Updated.

3) **2.1 Public Meetings**, page 3; It is indicated in this section that public meeting number 1 was held on October 16 and 17, 2020 while the information in **Appendix B** and our records indicate that these two meetings were held on the same dates in 2019. Please update this section as applicable.
Response: Public Meeting #1 was corrected to 2019, however two meetings were held on October 16 and 17, 2019 at the Pflugerville Library and Manor Council Chambers respectively.

4) **Section 3.7 Channel Routing**, page 11; The hydrologic modeler used the Modified Puls and Muskingum-Cunge hydrologic routing techniques. The HEC-HMS generated hydrographs could have been routed in HEC-RAS using the more accurate and descriptive 1-D unsteady flow option. The 1-D unsteady flow option is beneficial when the events being modeled are very dynamic with respect to time (i.e., dam-break flood waves; flash floods; river systems in which the peak flow comes up very quickly, stays high for a very short time, and then recedes quickly). Please provide

a discussion in the report why the Modified Puls and Muskingum-Cunge hydrologic routing techniques were chosen rather than the more accurate HEC-RAS 1-D unsteady flow option.
Response: Modified Puls channel routing was selected for use where detailed hydraulic models were developed. Muskingum Cunge channel routing was used along reaches where detailed hydraulics models were not available. This channel routing methodologies were used by the USACE Fort Worth District who developed the hydrologic modeling for the initial Bastrop Co. FPP watershed studies. Also, both of these channel routing methodologies were used in the previous Wilbarger Creek hydrologic analysis and are both acceptable channel routing methodologies specified in the City of Pflugerville and Travis County drainage criteria manuals. Discussion was added to Section 3.7.

5) **Chapter 3.0 Hydrologic Modeling**; The hydraulic model development section of the Scope of Work states inclusion of fully developed 100-yr watershed conditions, but no mention of it appears to be in the report. Effects of future development could impact anticipated flood risk and proposed alternatives. Please include this information or provide a discussion of why this was excluded in the report.
Response: Our scope of work with Bastrop County and the participating communities' states that existing conditions in the watershed would be developed. This was discussed with the communities with no objection.

6) **Section 4.1 Manning's Roughness Coefficients, Table 4-2: Existing Land use Classifications Manning n-Values**, page 14; A Manning's n-value of 1.0 for open water is too high. Open water Manning's n-values of 0.04 or smaller are found in the literature for areas with sparse vegetation. Please provide the reference and an explanation for the use of Manning's n-value of 1.0 for open water in the report.
Response: Agreed. Table 4-2 revised to reflect 0.025 for areas with open water. The existing conditions hydraulic models have been verified to utilize a n-value of 0.025 for open water.

7) **Section 4.5 Floodway Analysis**, page 15; Please add an explanation of why floodways were modeled as part of this report and what, if any, future actions are proposed for floodways.
Response: Floodway analysis was included as part of our scope with Bastrop County and the communities. The proposed floodways were adjusted slightly to smooth the floodways. No future actions are proposed for the floodways.

8) **Section 4.7 Hydraulic Results**, page 16, 2nd paragraph, last sentence; Please check that 61 road crossings are overtopped during a 2-year event (50% ACE). If there are 61 road crossings in the watershed that are overtopped during the 2-year event (50% ACE), please add in the report some additional explanation on the confidence level of this count and some explanation on why this count is so high (older design criteria, recent higher flood risk, etc.).
Response: The majority of the roads that are overtopping during the 2-year event are rural roads located in the county and are built at grade. Additional discussion added to Section 4.7.

9) **Section 5.2.2 Urgency Rating Evaluation, Tables 5-1 (page 18), 5-2 (page 19), and 5-3 (page 19): Bastrop County, Travis County, and City of Pflugerville Roadway Crossing Urgency Rating**; Please add some explanation in the report of the equivalent rainfall depth (in) and if it should relate to the Annual Chance of flooding. Based on the data in the table, there does not seem to be a direct relationship. The term is first used in Section 5.2.2, then somewhat explained in Section 6.1. We recommend defining it when first introduced. Also, consider an alternate term that is more self-explanatory like "minimum rainfall causing flooding."

Response: Discussion added to Section 5.2.2 to describe how the equivalent rainfall depth was determined. Changed term to "Minimum Rainfall causing Overtopping (in.)". Tables updated to show correlation to Atlas 14 rainfall depth.

10) **Chapter 5 Flood Mitigation Evaluation and Appendix H: Alternative Analysis**; This chapter and appendix presents the cost for replacing three road crossings in Bastrop county, three in Travis county, and three in the city of Pflugerville. However, the report does not offer the same detail for the economic and other benefits of the proposed work. It can be reasonably expected that reducing the road overtopping probability from the 50% ACE to 0.2% ACE would have a positive impact. The three Bastrop county road crossing replacements where overtopping is reduced from 50% ACE to the 20% ACE is not as intuitive. Additional data should be provided to ensure the project has a positive impact. Also, the Wilbarger Creek Tributary 200 Kennemer Drive crossing should also be examined to determine positive benefits. The Scope of Work calls for performing a BCA for each alternative, please provide an explanation of why the BCA was not performed and/or explain the reasoning behind the approach taken in the report.
Response: The road crossing improvement benefits are based on increasing the level of service for traffic mobility allowing safe passage during large storm events. Typically, these road crossing improvements do not remove homes from the floodplain and placing an economic value to ease of mobility is difficult using the BCA methodology presented in the report. At this planning/conceptual level a simplified BCA was used. As the project progress, a more detailed BCA can be conducted at that time.

11) **Section 5.2 to 5.3-5.5 transition**; It is understood that the communities reviewed the urgency rating and selected certain roadways to prioritize from the top 10 urgency rating lists. At the beginning of the 5.3-5.5 sections, some explanation is provided how the communities selected their highest priorities. However, to the general public reader, this brief explanation will likely seem vague and incomplete. Please provide some additional explanation in the report why the highest urgency ratings were not used (e.g. TxDOT roads part of longer term TxDOT upgrade plan and thus not selected here, urgency rating is approximate and not meant as an absolute priority, etc.).
Response: As discussed on our call, the participating communities that are funding this study identified their top three road crossing based on the prioritized list. Halff recommends that the participating communities provide the studies prioritized list to other agencies/jurisdictions to assist in future potential road crossing improvements. The report is revised to add clarification.

12) **Section 5.3 Road Crossing Alternatives – Bastrop County, Section 5.4 Road Crossing Alternatives – Travis County, and Section 5.5 Road Crossing Alternatives – City of Pflugerville;** The proposed flood mitigation evaluations discusses how the proposed modification to the existing infrastructure would change the water surface elevation at the site, assuming the flow would remain the same before and after the proposed structural improvements were made. This is highly unlikely because there is a high probability the existing structure is acting as a downstream control point, and removing that control will most likely result in increased flow rates at the structure's location and increased flow to areas downstream of the structure while lowering stages and increasing slope and flow velocities upstream of the structure. One problem commonly experienced is that downstream bridges and crossings overtop at lower frequency floods and experience deeper flooding depths because the upstream control has been removed. Replacing upstream control points such as bridges and culverts can change the timing of hydrologic events and increase stress placed on downstream structures. Channels upstream of the new larger structure should be analyzed to ensure the new flow regime doesn't increase

sediment erosion and channel degradation. Increased channel erosion often causes channel bank instability. Lower flowlines, i.e., a lower stage-discharge relationship in the main channel, can result in head cutting in the tributaries. Head cutting starts at the mouth of the tributary and proceeds upstream and results in channel widening and unstable channel banks. Downstream of the modified bridge or culvert, depending on the channel's geomorphologic state, the channel may be subject to erosion but more often subject to sediment deposition and loss of flood flow conveyance. Depending on how much the new bridge changed the hydrologic regime of the channel, the downstream channel may begin to form some different meander bends, resulting in channel bank instabilities. While the specifics of this risk and potential mitigation will likely be addressed in preliminary and final design, it is important during this current conceptual design phase to consider whether additional ROW or easements may be needed to provide this mitigation and their approximate cost. Please update the report to included how these issues will be addressed in the preliminary and final designs.
Response: The report will be revised to include overall discussion of items that need to be further evaluated as projects advance to preliminary and final designs.

13) **Sections 5.6.1, 5.6.2, and 5.7.1**; These sections describe proposed drainage improvements where the BCA is very low (0.35, 0.02, and 0.00). These sections also explain that certain benefits were excluded but leave the reader uncertain what the report recommendation is. Should additional analysis be performed to develop additional benefits? Should different alternatives be examined? Or, are these proposed solutions not considered viable in the engineer's opinion and thus no action is proposed? Please provide some additional explanation in the report. Also, the BCA for Sec 5.7.1 does not appear in Appendix H. Either clarify if it was intentionally not included since the BCA was 0.00 or include it in the report.
Response: Additional clarification is added recommending further detailed BCA analysis as the projects advance into design.

14) **Chapter 5.0, Geomorphic Changes**; Additional watershed modeling is necessary to analyze hydraulic, hydrologic, and geomorphic changes expected if the proposed modifications at the 9 locations are made. The required data to make these runs are already available from the existing HEC-HMS and HEC-RAS models. The HEC-RAS model can be run as a 1-D unsteady flow model with flows generated at the 253 subbasins in the current model or even a quick review of steady model results could indicate potential erosion concerns by simply reviewing changes in velocity. Please update the report to included how these issues will be addressed in the preliminary and final designs.
Response: The report will be revised to add discussion of issues that need to be further evaluated as the projects advance to preliminary and final designs.

15) **Chapter 5.0, Implementation and Phasing**; The scope states inclusion of recommendations for implementation and phasing, please add this discussion for recommended projects to the report.
Response: Phasing of Cele Rd. improvement and the Reserve at West Creek channel improvements are discussed in the report. The other proposed improvements are stand alone projects that do not really lend to being a phased project. The roadway urgency prioritized list provides an implementation plan that can be used by the communities. General implementation and phasing discussion is added to the report.

16) **Chapter 5.0, Implementation and Phasing**; From a hydraulic and channel stability design perspective, developing a phased implementation plan that replaces bridges and crossing from the downstream end of the channel working upstream would be worth considering. However, one

should always be aware that lowering the water surface elevation in the main channel will increase the tributaries' slope, requiring engineers to consider the possibility of head-cuts, channel degradation, and increased stream bank instabilities in tributaries. If head-cutting in the tributaries is determined to be a possibility, outflow structures can be placed at the confluence of the tributary and main channel. Please add this discussion to the report.
Response: General overall implementation and phasing discussion is added to the report.

17) **Chapter 5.0, Funding Sources**; The scope states funding sources will be identified for improvements. Please provide a section in report that describes common and/or planned sources of funding.
Response: A list of potential funding sources added to Section 5.

18) **Chapter 6.0 Flood Monitoring Evaluation**; This Chapter discusses that Flood monitoring and real-time gaging to either activate on-site safety measures or send alerts to emergency personnel and the public are common strategies used in the Flash Flood Ally. The report offers no reference on how effective these monitoring systems have been in preventing flood damages and loss of life. A paragraph or two should be added to the report discussing how effective monitoring systems have been in other flash flood ally areas and discuss the expected benefits of additional gages and a flood warning system in this area. The section should also provide data on the annual cost of maintaining the gaging system, as shown in figure 6.1.
Response: It is difficult to quantify how successful a specific monitoring system is in preventing flood damages and loss of life. These types of monitoring systems are part of the toolbox to provide emergency managers enough information to make decisions during a significant storm events. Discussion was added on the benefits of flood monitoring systems.

19) **All Appendices**; The appendices include numerous subsections (A1, A2, A3, etc.) that, depending on the number of pages in the appendix, may be difficult to page to. Please consider adding bookmarks (to digital report copies) and/or page numbers to the Table of Contents to make it easier for a reader to get to a specific appendix sub-section.
Response: Appendix bookmarks are added to the report.

20) **All Appendices**; Some appendices include comments from internal Halff QAQC, please ensure these comments are resolved and cleaned up for the final report.
Response: Noted.

21) **All Appendices**; Appendices referenced in the body of the document do not coincide with the naming convention found within appendices – i.e. Appendix G-2 versus Appendix G, Exhibit 2. Please consider updating the main text or the appendix/exhibit naming convention for consistency.
Response: Figures and maps are referenced as Exhibits and tables are referenced to their respective Appendix.

22) **Appendix B**; This appendix does not include information on public meeting number 3. Please include information for public meeting number 3 like what was provided for public meeting numbers 1 and 2.

Response: Public Meeting #3 was not completed when the draft report was submitted for review. Public Meeting #3 info will be included in the final report.

23) **Appendix F: Hydraulic Model Analysis, F-2 Hydraulic Results – HEC-RAS Results**; The existing water surface profile plots should include the left and right top bank elevations which is an indication of the frequency of water entering the floodplain. Please update the report or provide an explanation of why this was not done.
Response: As discussed on our call, channel bank are subjective and we prefer not to include them in the profiles. The contract only specifies flood profiles need to be provided and does not specify other items to be shown. In addition, the extents of the floodplain shown in the hydraulic work maps indicate the amount of flooding.

24) **Appendix F: Hydraulic Model Analysis, F-2 Hydraulic Results – HEC-RAS Results**; Wilbarger Creek Tributary 165 Existing Water Surface Profiles: The significant increase in stage for the 0.2% ACE downstream of Ring RD & Skimmer Run crossing needs some discussion. The 1%, 2%, and 10% ACE show the increase of stage occurring at the crossing as one would expect. Also, Wilbarger Creek Tributary 167 Existing Water Surface Profiles: The reason for the increase in stage downstream of Hwy 290 crossing should be explained. Normally one would expect the increase in stage to occur at the bridge. In addition to the above locations, a review of all water surface profile plots should be conducted. Sites of abnormal changes like those mentioned above should have the reason notated.
Response: In the case of Ring Rd. on Wilbarger Creek Tributary 165, the 0.2% ACE water surface elevation (WSEL) increase is due to the road being overtopped. This is also the case where the road is being overtopped at US 290 on Wilbarger Creek Tributary 167. Discussion is added to the report.

Participating Community Review Comments

Bastrop County Draft Report Comments:

1) Page 46, Section 6.0. Ally should be Alley.
Response: Ally was changed to Alley, in reference to Flash Flood Alley.

Travis County Draft Report Comments:

2) It appears that the FPP discharge is lower than the FIS discharge but later in the paragraph it says it is unclear why the published discharge is lower. I am taking that to mean the published discharge is the FIS discharge.?.
Response: The sentence in the report was written incorrectly. The sentenced was revised to state "It is unclear why the published discharge is higher, however given the similarities of the lake elevations and similar downstream floodplain extents, the FPP results are considered valid."

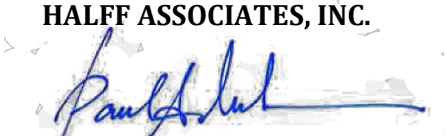
City of Pflugerville Draft Report Comments:

3) In regards to the Pflugerville road crossing 3 at Kennemer, we previously asked about this one. We asked for clarification that the model is really showing this road to overtop in the 2 year storm event, since we have not heard about this road flooding during storm events. Do you have any thoughts on why this may be? Also, is it possible to add a paragraph into the report discussing what would be needed to pass the 100 year storm (what size culverts and what length of roadway raised) along with explanation of why that is not feasible?
Response: Based on our model, which includes Atlas 14 rainfall, it slightly overtops for the 20% ACE, by a little more than 2 inches. Our proposed road improvement is constrained due to adjacent residential driveways on either side of the roadway crossing. Our analysis limits proposed improvements such that the driveways are not impacted. In order to pass the 100-year storm, approximately 430 linear feet of roadway profile changes with an elevation increase of 1.95 feet are needed. Driveways for three (3) homes on the north would be impacted and potentially one (1) home on the southern side.

4) In regards to the Highland Park subdivision improvement, can you confirm if just a berming solution was analyzed to hold back water or if excavation upstream to hold/slow water down was analyzed as a solution? If so, could a statement that these were evaluated and found to be insufficient be added into the report?
Response: I berm solution with no other improvements was investigated and the results showed no benefits and the two homes on the west bank were still in the 100-year floodplain. We also investigated excavation upstream and the results indicated overtopping of the roadway.

Please do not hesitate to contact me at (512) 777-4547 or email me at pMorales@halff.com if you have any questions. Halff appreciates working with Bastrop County and the TWDB on the Flood Protection Planning study which will help to reduce flood risk.

Sincerely,
HALFF ASSOCIATES, INC.



Paul Morales, PE, CFM, CPESC
Project Manager

Copy:

Robert Pugh, PE, CFM (Bastrop County)
Carolyn Dill, PE (Bastrop County)
Shawn Snyder, CFM (Travis County)
Trey Fletcher, AICP (City of Pflugerville)
Jenna Goolsby, PE, CFM (City of Pflugerville)

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DRAFT REPORT

CONTRACT #	CONTRACTOR	DATE/ INITIAL
1800012308	Bastrop County	
PCS Contract Specialist Martha Jasse	☐ Draft Report received; Date: 4/20/2021 ☐ Enter receipt of draft report in Worklog ☐ Date stamp and label with contract info (if not digital) ☐ Create DRAFT Report Folder under Active Contracts ☐ Request reviewers' names from CM ☐ Create a pdf of the SOW for the contract ☐ Create a Draft Report Review Memo and update applicable instructions (under Forms-Templates/Reports) ☐ Forward a copy of the Memo, SOW and the Draft Report to the reviewers ☐ Enter in CAS (on Contracts Reports tab) receipt of draft report; Upload Draft Report into CAS ☐ Calendar a reminder to check on the comments by the date in the memo	4/30/2021, MJ
PCS Contract Specialist Martha Jasse	Once comments are received from CM ☐ Prepare Draft Report Comment Letter and the Comments for routing; save as pdf documents ☐ Upload letter and comments into CAS under Contract Reports tab ☐ Scan route slip ☐ Create DocuSign for internal approval, including the Contractor as a "receives copy only" after DEA's execution ☐ Update the Worklog with dates of comments sent	7/1/2021
Cameron Turner	PCS Manager reviews and approves	7/7/2021
Michael Vielleux/Ivan Ortiz	Contract Manager reviews and approves MTV 7/7/2021	IO 7/8/2021
Kathy Hopkins	Division Team Lead or Manager reviews and approves	KCH 7/9/2021
☐ Larry French ☐ Carla Guthrie ☐ Temple McKinnon ☐ Darrell Thompkins ☑ Saul Nuccitelli ☐ Clay Schultz ☐ Mark Wyatt ☐	Division Director reviews and approves	SN 7/9/2021
Deputy Executive Administrator ☐ Edna Jackson ☐ Rebecca Trevino ☐ Richard Wade ☑ John Dupnik ☐ Jessica Pena	Deputy Executive Administrator reviews and approves	JD 7/12/2021

INITIAL IN DOCUSIGN:

MTV IO Michael Vielleux/Ivan O **Contract Manager**

KCH Kathy Hopkins **Team Lead / Manager**

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Texas Water Development Board

P.O. Box 13231, 1700 N. Congress Ave.
Austin, TX 78711-3231, www.twdb.texas.gov
Phone (512) 463-7847, Fax (512) 475-2053

The Honorable Paul Pape
Bastrop County
211 Jackson Street
Bastrop, Texas 78602

RE: Wilbarger Creek Watershed Study Contract No. 1800012308 with Bastrop Flood Protection Planning Study; Comments on Draft Report Entitled "Wilbarger Creek Watershed Study Bastrop County, Texas"

Dear Judge Pape:

Staff members of the Texas Water Development Board (TWDB) have completed a review of the draft report prepared under the above-referenced contract. ATTACHMENT 1 provides the comments resulting from this review. As stated in the TWDB contract, Bastrop County will consider revising the final report in response to comments from the Executive Administrator and other reviewers. In addition, Bastrop County will include a copy of the Executive Administrator's draft report comments in the Final Report. Bastrop County shall also submit one (1) electronic copy of any computer programs or models, and, if applicable, an operations manual developed under the terms of this contract. *Please note: The TWDB logo should not be used in the Final Report.*

Please further note, that in compliance with Texas Administrative Code Chapters 206 and 213 (related to Accessibility and Usability of State Web Sites), the digital copy of the final report must comply with the requirements and standards specified in statute. For more information, visit http://www.sos.state.tx.us/tac/index.shtml. If you have any questions on accessibility, please contact Cameron Turner with Procurement & Contract Services at (512) 936-6090 or cameron.turner@twdb.texas.gov. If you have any questions or need any further information, please feel free to contact Michael Vielleux of our Water Science and Conservation staff at (512) 936-8190 or Michael.Vielleux@twdb.texas.gov.

Sincerely,

John T. Dupnik, P.G.
Deputy Executive Administrator
Water Science and Conservation

Date: 7/12/2021

Attachment

c w/o att.: Michael Vielleux, TWDB

Our Mission

Leading the state's efforts in ensuring a secure water future for Texas and its citizens

Board Members

Brooke T. Paup, Chairwoman | Kathleen Jackson, Board Member

Jeff Walker, Executive Administrator

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ATTACHMENT 1

Bastrop County Flood Protection Planning Study
Bastrop County
Contract No. 1800012308
Texas Water Development Board Comments to Draft Wilbarger Creek Watershed Study

General Draft Report Comments:

Please conduct a final edit of the document for grammar, spelling, typographical errors, and inconsistent usage of acronyms, and abbreviations. Please spell out all acronyms, with the acronym in parentheses, the first time they are used. Please provide a single consolidated and file-compressed pdf as a final deliverable.

Specific Draft Report Comments:

1) **List of Acronyms and Abbreviations**, page vi; TNRIS is the Texas Natural Resources Information System not the Texas Natural Resource Service. Please update as applicable.
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10) **Chapter 5 Flood Mitigation Evaluation and Appendix H: Alternative Analysis**; This chapter and appendix presents the cost for replacing three road crossings in Bastrop county, three in Travis county, and three in the city of Pflugerville. However, the report does not offer the same detail for the economic and other benefits of the proposed work. It can be reasonably expected that reducing the road overtopping probability from the 50% ACE to 0.2% ACE would have a positive impact. The three Bastrop county road crossing replacements where overtopping is reduced from 50% ACE to the 20% ACE is not as intuitive. Additional data should be provided to ensure the project has a positive impact. Also, the Wilbarger Creek Tributary 200 Kennemer Drive crossing should also be examined to determine positive benefits. The Scope of Work calls for performing a BCA for each alternative, please provide an explanation of why the BCA was not performed and/or explain the reasoning behind the approach taken in the report.
11) **Section 5.2 to 5.3-5.5 transition**; It is understood that the communities reviewed the urgency rating and selected certain roadways to prioritize from the top 10 urgency rating lists. At the beginning of the 5.3-5.5 sections, some explanation is provided how the communities selected their highest priorities. However, to the general public reader, this brief explanation will likely seem vague and incomplete. Please provide some additional explanation in the report why the highest urgency ratings were not used (e.g. TxDOT roads part of longer term TxDOT upgrade plan and thus not selected here, urgency rating is approximate and not meant as an absolute priority, etc.).
12) **Section 5.3 Road Crossing Alternatives – Bastrop County, Section 5.4 Road Crossing Alternatives – Travis County, and Section 5.5 Road Crossing Alternatives – City of Pflugerville;** The proposed flood mitigation evaluations discusses how the proposed modification to the existing infrastructure would change the water surface elevation at the site, assuming the flow would remain the same before and after the proposed structural improvements were made. This is highly unlikely because there is a high probability the existing structure is acting as a downstream control point, and removing that control will most likely result in increased flow rates at the structure's location and increased flow to areas downstream of the structure while lowering stages and increasing slope and flow velocities upstream of the structure. One problem commonly experienced is that downstream bridges and crossings overtop at lower frequency floods and experience deeper flooding depths because the upstream control has been removed. Replacing upstream control points such as bridges and culverts can change the timing of hydrologic events and increase stress placed on downstream structures. Channels upstream of the new larger structure should be analyzed to ensure the new flow regime doesn't increase sediment erosion and channel degradation. Increased channel erosion often causes channel bank instability. Lower flowlines, i.e., a lower stage-discharge relationship in the main channel, can result in head cutting in the tributaries. Head cutting starts at the mouth of the tributary and proceeds upstream and results in channel widening and unstable channel banks. Downstream of the modified bridge or culvert, depending on the channel's geomorphologic state, the channel may be subject to erosion but more often subject to sediment deposition and loss of flood flow conveyance. Depending on how much the new bridge changed the hydrologic regime of the channel, the downstream channel may begin to form some different meander bends, resulting in channel bank instabilities. While the specifics of this risk and potential mitigation will likely be addressed in preliminary and final design, it is important during this current conceptual design phase to consider whether additional ROW or easements may be needed to provide this

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mitigation and their approximate cost. Please update the report to included how these issues will be addressed in the preliminary and final designs.

13) **Sections 5.6.1, 5.6.2, and 5.7.1**; These sections describe proposed drainage improvements where the BCA is very low (0.35, 0.02, and 0.00). These sections also explain that certain benefits were excluded but leave the reader uncertain what the report recommendation is. Should additional analysis be performed to develop additional benefits? Should different alternatives be examined? Or, are these proposed solutions not considered viable in the engineer's opinion and thus no action is proposed? Please provide some additional explanation in the report. Also, the BCA for Sec 5.7.1 does not appear in Appendix H. Either clarify if it was intentionally not included since the BCA was 0.00 or include it in the report.
14) **Chapter 5.0, Geomorphic Changes**; Additional watershed modeling is necessary to analyze hydraulic, hydrologic, and geomorphic changes expected if the proposed modifications at the 9 locations are made. The required data to make these runs are already available from the existing HEC-HMS and HEC-RAS models. The HEC-RAS model can be run as a 1-D unsteady flow model with flows generated at the 253 subbasins in the current model or even a quick review of steady model results could indicate potential erosion concerns by simply reviewing changes in velocity. Please update the report to included how these issues will be addressed in the preliminary and final designs.
15) **Chapter 5.0, Implementation and Phasing**; The scope states inclusion of recommendations for implementation and phasing, please add this discussion for recommended projects to the report.
16) **Chapter 5.0, Implementation and Phasing**; From a hydraulic and channel stability design perspective, developing a phased implementation plan that replaces bridges and crossing from the downstream end of the channel working upstream would be worth considering. However, one should always be aware that lowering the water surface elevation in the main channel will increase the tributaries' slope, requiring engineers to consider the possibility of head-cuts, channel degradation, and increased stream bank instabilities in tributaries. If head-cutting in the tributaries is determined to be a possibility, outflow structures can be placed at the confluence of the tributary and main channel. Please add this discussion to the report.
17) **Chapter 5.0, Funding Sources**; The scope states funding sources will be identified for improvements. Please provide a section in report that describes common and/or planned sources of funding.
18) **Chapter 6.0 Flood Monitoring Evaluation**; This Chapter discusses that Flood monitoring and real-time gaging to either activate on-site safety measures or send alerts to emergency personnel and the public are common strategies used in the Flash Flood Ally. The report offers no reference on how effective these monitoring systems have been in preventing flood damages and loss of life. A paragraph or two should be added to the report discussing how effective monitoring systems have been in other flash flood ally areas and discuss the expected benefits of additional gages and a flood warning system in this area. The section should also provide data on the annual cost of maintaining the gaging system, as shown in figure 6.1.
19) **All Appendices**; The appendices include numerous subsections (A1, A2, A3, etc.) that, depending on the number of pages in the appendix, may be difficult to page to. Please consider adding bookmarks (to digital report copies) and/or page numbers to the Table of Contents to make it easier for a reader to get to a specific appendix sub-section.
20) **All Appendices**; Some appendices include comments from internal Halff QAQC, please ensure these comments are resolved and cleaned up for the final report.
21) **All Appendices**; Appendices referenced in the body of the document do not coincide with the naming convention found within appendices – i.e. Appendix G-2 versus Appendix G, Exhibit 2. Please consider updating the main text or the appendix/exhibit naming convention for consistency.

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22) **Appendix B**; This appendix does not include information on public meeting number 3. Please include information for public meeting number 3 like what was provided for public meeting numbers 1 and 2.
23) **Appendix F: Hydraulic Model Analysis, F-2 Hydraulic Results – HEC-RAS Results**; The existing water surface profile plots should include the left and right top bank elevations which is an indication of the frequency of water entering the floodplain. Please update the report or provide an explanation of why this was not done.
24) **Appendix F: Hydraulic Model Analysis, F-2 Hydraulic Results – HEC-RAS Results**; Wilbarger Creek Tributary 165 Existing Water Surface Profiles: The significant increase in stage for the 0.2% ACE downstream of Ring RD & Skimmer Run crossing needs some discussion. The 1%, 2%, and 10% ACE show the increase of stage occurring at the crossing as one would expect. Also, Wilbarger Creek Tributary 167 Existing Water Surface Profiles: The reason for the increase in stage downstream of Hwy 290 crossing should be explained. Normally one would expect the increase in stage to occur at the bridge. In addition to the above locations, a review of all water surface profile plots should be conducted. Sites of abnormal changes like those mentioned above should have the reason notated.

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LIST OF ACRONYMS AND ABBREVIATIONS

AADT	Average Annual Daily Traffic
ACE	Annual Chance Event
BLE	Base Level Engineering
cfs	cubic feet per second
CMP	Corrugated Metal Pipe
CN	Curve Number
DEM	Digital Elevation Model
DCM	Drainage Criteria Manual
FEMA	Federal Emergency Management Agency
FIS	Flood Insurance Study
ft	feet/foot
GIS	Geographic Information System
HEC	Hydrologic Engineering Center (U.S. Army Corps of Engineers)
HMS	Hydrologic Modeling System
IC	Impervious Cover
ITE	Institute of Transportation Engineers
LiDAR	Light Detection and Ranging
NAD	North American Datum
NAVD	North American Vertical Datum
NRCS	Natural Resources Conservation Service
NLCD	National Land Cover Database
NWI	National Wetlands Inventory
RAS	River Analysis System
RCB	Reinforced Concrete Box
RCP	Reinforced Concrete Pipe
RS/XS	HEC-RAS River Station
SCS	Soil Conservation Service (now Natural Resources Conservation Service)
SIR	Scientific Investigations Report
SSURGO	Soil Survey Geographic
sq. mi.	square mile
TCEQ	Texas Commission of Environmental Quality
THC	Texas Historical Commission
TIN	triangulated irregular network
TNRIS	Texas Natural Resources Information System
TPWD	Texas Parks and Wildlife Department
TxDOT	Texas Department of Transportation
U.S.	United States
USCB	U.S. Census Bureau
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WSEL	Water Surface Elevation
WSS	Web Soil Survey

1.0 INTRODUCTION

Upon award of a Texas Water Development Board (TWDB) Flood Protection Planning grant in 2007, Bastrop County began a phased county-wide drainage study in partnership with TWDB and the U. S. Army Corps of Engineers (USACE). Between 2007 and 2018 Bastrop County obtained LiDAR and completed hydrologic, hydraulic, and mitigation analyses for selected streams within the Cedar Creek, Dry Creek, Walnut Creek, Willow Creek, Gazley Creek, Piney Creek, and Gills Branch watersheds.

In 2019, Bastrop County was approved for a TWDB Flood Protection Planning (FPP) Grant to conduct hydrologic, hydraulic, and mitigation analyses for Alum Creek and Wilbarger Creek watersheds. The following pages include discussions of the methods, procedures, and assumptions used in preparation of this study for the Wilbarger Creek Watershed Flood Protection Planning Study.

A hydrologic and hydraulic analysis of the Wilbarger Creek watershed in Bastrop and Travis County, Texas was performed by Halff Associates, Inc. This study is part of the larger Bastrop County FPP studies conducted in cooperation with Bastrop County and the TWDB. The goals of this study were to analyze the hydrologic characteristics of the watershed, develop Limited Detailed and Detailed floodplains, including 10 miles of floodway to identify flood mitigation alternatives to reduce flood risk within the Wilbarger Creek watershed.

Wilbarger Creek watershed headwaters begins in the City of Pflugerville in Travis County and discharges to the southeast at the confluence with Colorado River in Bastrop County as shown in **Appendix A1.** Wilbarger Creek is primarily rural except for the headwaters in the City of Pflugerville which is suburban development. **Table 1-1** below lists the watershed's 223.92 study stream miles contained within the 108.6 square mile drainage area. Wilbarger Creek, Cottonmouth Creek, Dry Creek West, Elm Creek, Elm Creek Tributary 1, Harris Branch South, Little Willow Creek, Lockwood Creek, Willow Creek, and Tributaries 1-9, were based on current effective FEMA naming conventions, while Tributaries 18 and higher are based on FEMA Base Level Engineering (BLE) naming conventions. The tables in the report will refer to Detailed study streams and Limited Detail study streams by their Stream ID, shown below in **Table 1-1**.

TABLE 1-1: STUDY STREAM PARAMETER SUMMARY

Study Streams	Stream ID	Stream Miles	Drainage Area Square Miles	Number of Structure Crossings
Detailed Study Streams				
Wilbarger Creek	WC	45.98	37.13	30
Elm Creek	EC	7.68	6.71	6
Elm Creek Tributary 1	EC_T001	1.12	0.99	0
Wilbarger Creek Tributary 165	WC_T165	0.69	0.13	1
Wilbarger Creek Tributary 167	WC_T167	2.33	1.86	8
Wilbarger Creek Tributary 178	WC_T178	0.49	0.35	0

Study Streams	Stream ID	Stream Miles	Drainage Area Square Miles	Number of Structure Crossings
Wilbarger Creek Tributary 183	WC_T183	0.35	0.51	0
Wilbarger Creek Tributary 185	WC_T185	0.47	0.72	1
Wilbarger Creek Tributary 186	WC_T186	1.28	0.6	2
Wilbarger Creek Tributary 187	WC_T187	0.50	0.41	0
Wilbarger Creek Tributary 196	WC_T196	3.33	2.84	3
Wilbarger Creek Tributary 200	WC_T200	5.49	3.81	18
Wilbarger Creek Tributary 206	WC_T206	0.78	0.66	3
Wilbarger Creek Tributary 207	WC_T207	0.36	0.22	1
Wilbarger Creek Tributary 209	WC_T209	0.29	0.19	2
Wilbarger Creek Tributary 210	WC_T210	8.85	4.29	13
Wilbarger Creek Tributary 216	WC_T216	1.33	1.22	2
Limited Detail Study Streams				
Cottonmouth Creek	CC	12.08	12.18	9
Dry Creek West	DCW	11.76	9.88	9
Harris Branch South	HBS	3.30	2.56	2
Little Willow Creek	LWC	7.68	5.72	4
Lockwood Creek	LC	7.83	7.79	3
Wilbarger Creek Tributary 1	WC_T001	2.96	1.88	0
Wilbarger Creek Tributary 3	WC_T003	1.11	1.57	1
Wilbarger Creek Tributary 4	WC_T004	3.10	3.94	1
Wilbarger Creek Tributary 6	WC_T006	3.17	1.96	2
Wilbarger Creek Tributary 9	WC_T009	7.88	5.48	3
Wilbarger Creek Tributary 018	WC_T018	0.96	0.82	0
Wilbarger Creek Tributary 019	WC_T019	0.31	0.08	2
Wilbarger Creek Tributary 020	WC_T020	0.43	0.12	1
Wilbarger Creek Tributary 021	WC_T021	0.26	0.15	1
Wilbarger Creek Tributary 024	WC_T024	2.65	1.15	2
Wilbarger Creek Tributary 025	WC_T025	0.59	0.36	0
Wilbarger Creek Tributary 026	WC_T026	0.54	0.1	0
Wilbarger Creek Tributary 027	WC_T027	0.67	0.39	0
Wilbarger Creek Tributary 030	WC_T030	1.79	1.35	1
Wilbarger Creek Tributary 047	WC_T047	5.71	3.19	5
Wilbarger Creek Tributary 049	WC_T049	0.38	0.39	1
Wilbarger Creek Tributary 056	WC_T056	11.04	9.67	7
Wilbarger Creek Tributary 062	WC_T062	2.59	1.66	2
Wilbarger Creek Tributary 070	WC_T070	0.59	0.54	0
Wilbarger Creek Tributary 080	WC_T080	7.72	4.89	8
Wilbarger Creek Tributary 082	WC_T082	2.01	1.45	3

Study Streams	Stream ID	Stream Miles	Drainage Area Square Miles	Number of Structure Crossings
Wilbarger Creek Tributary 085	WC_T085	0.40	0.38	0
Wilbarger Creek Tributary 086	WC_T086	0.65	0.59	1
Wilbarger Creek Tributary 113	WC_T113	8.28	5.25	7
Wilbarger Creek Tributary 138	WC_T138	0.98	4.74	0
Wilbarger Creek Tributary 169	WC_T169	0.26	0.74	1
Wilbarger Creek Tributary 171	WC_T171	1.70	1.36	1
Wilbarger Creek Tributary 208	WC_T208	0.52	0.5	1
Wilbarger Creek Tributary 220	WC_T220	5.26	3.68	3
Wilbarger Creek Tributary 227	WC_T227	2.73	1.45	1
Wilbarger Creek Tributary 229	WC_T229	0.29	0.44	0
Wilbarger Creek Tributary 260	WC_T260	0.59	0.97	1
Wilbarger Creek Tributary 286	WC_T286	1.55	0.5	1
Wilbarger Creek Tributary 298	WC_T298	0.93	0.93	0
Wilbarger Creek Tributary 304	WC_T304	1.50	0.49	0
Wilbarger Creek Tributary 305	WC_T305	1.95	1.09	0
Wilbarger Creek Tributary 307	WC_T307	1.16	1.6	1
Wilbarger Creek Tributary 326	WC_T326	1.33	0.49	1
Wilbarger Creek Tributary 328	WC_T328	1.18	0.34	0
Wilbarger Creek Tributary 346	WC_T346	1.54	0.93	0
Willow Creek	WLC	10.69	12.22	10
Total		223.92	180.60	186

2.0 DATA COLLECTION

2.1 Public Meetings

Three public meetings were held over the course of the study. These meetings with the community were important to ensure that community stakeholders understand the goals and scope of the project. Because the study area is so large it was decided that in-person public meetings should be held in two cities to allow more citizens to attend. The first public meetings were held in Pflugerville and Manor on October 16 and 17, 2019 respectively, to solicit public input on areas with flood risk concern within Wilbarger Creek Watershed. The second public meeting was held virtually during an evening and morning session to accommodate more residents' schedules. The morning session was on December 9, 2020 and the evening session was on December 10, 2020, to provide feedback on the identified floodplain and proposed flood mitigation projects. A third virtual public meeting was held on May 14 and 15, 2021 to provide Bastrop County, Travis County and the City of Pflugerville with a summary of the results of the study. Recordings of public meeting 2 and 3 were provided to the jurisdictions to publish on their respective websites.

Appendix B includes the announcement flyer, sign-in sheet, and presentation for each of the public meetings.

2.2 Obtain Base Mapping Info

2.2.1 Topographic Data

The primary source of terrain data used for this hydraulic study was developed from the Texas Natural Resources Information System (TNRIS) StratMap 2017 1.4-meter Central Texas LiDAR, surveyed by Fugro Geospatial, Inc. The data was provided in LiDAR Aerial Survey (LAS) format and converted to an ESRI multipoint feature class within a geodatabase. Multipoint files were projected and adjusted into Horizontal NAD83 State Plane and Vertical NAVD88 using a U.S. foot measurement. The resulting feature class was processed into an ESRI terrain and converted into a DEM with 3-foot cell sizes, illustrated in **Figure 2-1**. Both the hydrologic and hydraulic analysis for Wilbarger Creek were completed based upon this topographic data.

2.3 Survey

Survey was collected for the channel and roadway crossing structures along the Detailed study streams shown in **Exhibit A-1**. The Detailed study streams are primarily located within the City of Pflugerville and along a portion of Elm Creek east of City of Elgin. Surveyed channel sections improved the detail of the channel geometry below the water surface. The survey data of structures consists of the upstream and downstream channel cross section along with pertinent details and dimensions of the structure. The photos of the upstream channel, downstream channel, upstream face, and downstream face were taken for all the surveyed structures. Photos and field sketches of the surveyed channel sections are included in **Appendix C-1** and surveyed structures are included in **Appendix C-2**. The number of surveyed structures and surveyed channel sections for each jurisdiction is shown below in **Table 2-1**.

TABLE 2-1: SURVEYED STRUCTURES AND CHANNEL SECTIONS FOR JURISDICTIONS

Jurisdiction	Structures	Channel Sections
Bastrop County	3	6
Travis County	36	33
City of Pflugerville	38	34

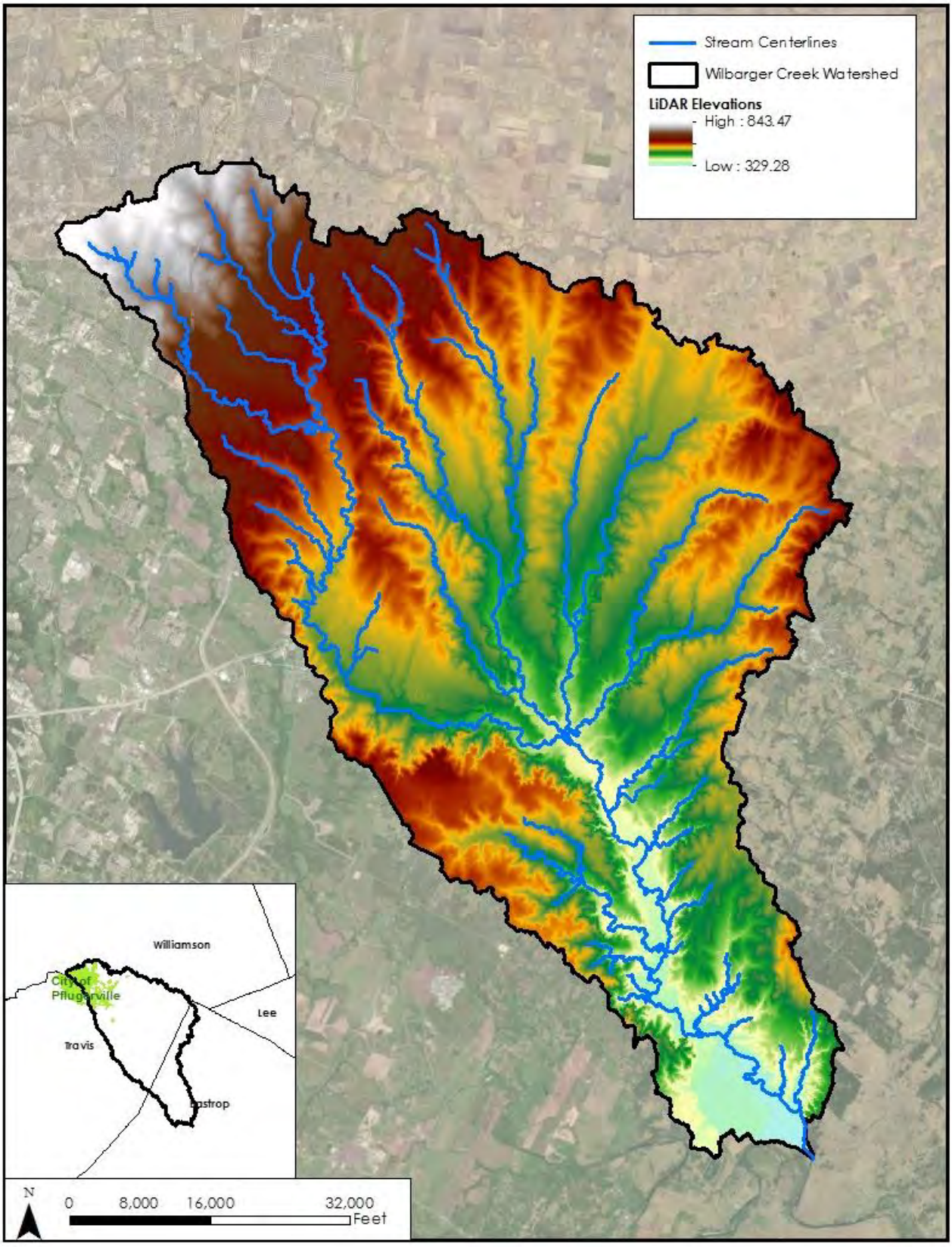


FIGURE 2-1: WILBARGER CREEK WATERSHED DEM

2.4 Field Reconnaissance

For Limited Detail study streams, primarily located in Travis and Bastrop County, field reconnaissance was performed in place of field survey. In 2019, field reconnaissance was performed on the Limited Detail study area's accessible bridge and culvert sites, providing field measured dimensions of road crossings. The photos of the upstream channel, downstream channel, upstream face, and downstream face were taken for all the structures. Detailed Field Observation Reports for these streams along with photos of the structures are included in **Appendix C-3**. The number of field reconnaissance structures for each jurisdiction is shown below in **Table 2-2**.

TABLE 2-2: FIELD RECONNAISSANCE STRUCTURES FOR JURISDICTIONS

Jurisdiction	Structures
Bastrop County	24
Travis County	84
City of Pflugerville	1

2.5 Environmental Constraints

An environmental desktop analysis was conducted to identify potential environmental constraints and permitting requirements for proposed projects within the Wilbarger Creek watershed. Numerous sources were reviewed to identify potential environmental constraints in the study area, including: socioeconomic data from the U.S. Census Bureau (USCB), Texas Parks and Wildlife Department (TPWD) threatened and endangered species by county and Element Occurrence locations, U.S. Fish and Wildlife Service (USFWS) critical habitats and National Wetlands Inventory (NWI) maps, Texas Commission on Environmental Quality (TCEQ) hazardous materials, GeoSearch Radius Report, and cultural resources data from the Texas Historical Commission (THC). Potential environmental impacts for the conceptual improvements discussed later in this report include Nationwide Permit for potential discharge of fill into waters of the U.S., notification of project commencement to THC, possible need for an archeological survey, and a Phase I Environmental Site Assessment for alternative projects near hazardous material sites if property acquisition is anticipated. A detailed Environmental Constraints Analysis report is included in **Appendix D**.

3.0 HYDROLOGIC MODELING

This study's hydrologic modeling was conducted using the U.S. Army Corps of Engineers (USACE) Hydrologic Engineering Center's (HEC) Hydrologic Modeling System (HEC-HMS). The hydrologic model for Wilbarger Creek was developed in HEC-HMS version 4.3 for existing watershed conditions as outlined on Halff's scope with the Bastrop County.

The HEC-HMS model simulates runoff based on subbasin parameters including drainage area, rainfall, soil infiltration losses, transformation of rainfall excess to runoff, and channel routing. Peak flows were determined for 50% (2-year), 20% (5-year), 10% (10-year), 4% (25-year), 2% (50-year), 1% (100-year), and 0.2% (500-year) annual chance rainfall events for existing conditions in the watershed based on current development. These methods are used to simulate peak discharges for each of the seven frequency events at different locations of the watershed to be applied in hydraulic modeling.

3.1 Storm Events

The hydrologic model for this study analyzed seven frequency storm events. Storm event categories discussed within this report are in terms of the percent Annual Chance Event (ACE) terminology. **Table 3-1** below relates this to the conventional annual recurrence interval nomenclature.

TABLE 3-1: STORM EVENT CATEGORY NOMENCLATURE

Classic Terminology	Percent Annual Chance Event
2-Year Storm	50% ACE
5-Year Storm	20% ACE
10-Year Storm	10% ACE
25-Year Storm	4% ACE
50-Year Storm	2% ACE
100-Year Storm	1% ACE
500-Year Storm	0.2% ACE

3.2 Drainage Basin Area Delineation

The hydrologic model was developed using ESRI ArcHydro tools and HEC-GeoHMS with the 3-foot LiDAR DEM. HEC-GeoHMS (USACE 2013) was used to delineate the contributing watershed boundary for the Wilbarger Creek watershed of 180.6 square miles. Subbasins were broken at road crossings, confluences, and other points of interest. The final delineation consists of 253 subbasins ranging from 0.015 square miles to 3.89 square miles, with the average subbasin size being 0.71 square miles. A detailed subbasin map is included in **Appendix A-2**.

3.3 Precipitation Data

Precipitation data was obtained from the City of Pflugerville Engineering Design Manual November 2014 Edition (revised in 2019) DG4.8 B for the subbasins located within the City of Pflugerville jurisdiction. The remainder of Wilbarger Creek used precipitation data from the City of Austin Drainage Criteria Manual (DCM) 2020, Zone 2 Atlas 14 rainfall data. A frequency-based hypothetical storm with a 24-hour duration and balanced distribution was used for the various frequency event simulations in HEC-HMS. Pflugerville storm depths are summarized in **Table 3-2**, City of Austin DCM storm depths are summarized in **Table3-3.**

TABLE 3-2: CITY OF PFLUGERVILLE FREQUENCY STORM DEPTHS

Frequency-Depth-Duration (Inches)							
Duration	50%	20%	10%	4%	2%	1%	0.20%
	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	500-Yr
5 min	0.52	0.66	0.77	0.94	1.08	1.23	1.59
15 min	1.05	1.31	1.54	1.88	2.15	2.44	3.16
1 hr	1.94	2.43	2.86	3.49	4.00	4.55	6.03
2 hr	2.38	3.04	3.65	4.55	5.32	6.16	8.52
3 hr	2.64	3.41	4.15	5.25	6.20	7.27	10.28
6 hr	3.09	4.05	4.98	6.40	7.63	9.04	13.07
12 hr	3.55	4.67	5.75	7.40	8.84	10.49	15.31
24 hr	4.03	5.31	6.53	8.38	9.98	11.82	17.22

TABLE 3-3: CITY OF AUSTIN FREQUENCY STORM DEPTHS

Frequency-Depth-Duration (Inches)							
Duration	50%	20%	10%	4%	2%	1%	0.20%
	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	500-Yr
5 min	0.52	0.66	0.79	0.96	1.11	1.26	1.66
15 min	1.05	1.32	1.57	1.92	2.21	2.51	3.29
1 hr	1.94	2.46	2.91	3.58	4.11	4.70	6.32
2 hr	2.39	3.08	3.72	4.68	5.49	6.40	8.97
3 hr	2.65	3.46	4.23	5.40	6.41	7.56	10.86
6 hr	3.11	4.10	5.08	6.57	7.89	9.41	13.80
12 hr	3.57	4.73	5.86	7.60	9.12	10.90	16.10
24 hr	4.06	5.38	6.65	8.59	10.28	12.23	18.05

3.4 Areal Reduction

The Wilbarger Creek watershed encompasses a total area of 180.6 square miles. This study applied the standard approach for watershed modeling, using point rainfall up to a total cumulative area of approximately 10 square miles. For contributing drainage areas larger than 10 square miles, areal

reduction curves published by the U.S. Weather Bureau were used to reduce the rainfall totals (U.S. Weather Bureau 1958).

The area-reduced flows for the Wilbarger Creek watershed were simulated using the HEC-HMS Depth-Area Analysis routine. Each hydrologic element with a drainage area greater than 10 square miles was selected to run as an analysis point.

3.5 Detention Ponds

The City of Pflugerville and surrounding Travis County ETJ have a large number of detention and retention ponds that have been built as the area has been developed. Lake Pflugerville and nine detention ponds were determined to be large enough to have a hydrologic impact. All modeled ponds are associated with subdivision developments except for one design for a commercial shopping center. The City of Pflugerville provided design plans for the nine ponds and Lake Pflugerville. If the Elevation-Area and Elevation-Discharge tables were not provided in the design sheets provided by the City, then the Elevation-Area curve was developed based on LiDAR terrain data. **Table 3-4** below shows the source of the data used to model the ponds in the HEC-HMS model.

TABLE 3-4: DETENTON POND MODELING DATA SOURCE

Detention Pond Name	Associated Subdivision	Source
Wilbarger Creek Tributary 185 Pond	Highland Park North Ph. A Sec. 1 & 2, Ph. B Sec. 1	Plans
Wilbarger Creek Tributary 186 Pond	Highland Park North Ph. A Sec. 3, Ph. B Sec 2 & 3, Ph. C Sec 1 & 2	Plans
Wilbarger Creek Tributary 187 Pond	Stone Hill Town Center	Plans
Wilbarger Creek Tributary 196 Pond	Falcon Pointe Sec. 14 Ph. 1, Sec. 6B, Sec. 15	LiDAR
Lake Pflugerville	Villages of Hidden Lakes Ph. 5A & B, Ph. 6A 1 & 2, Ph. 6 B2	Report
Wilbarger Creek Tributary 206 Pond	Falcon Point Sec. 3	LiDAR
Wilbarger Creek Tributary 207 Pond	Villages of Hidden Lakes Ph. 3A, 3B, 4B, 4C, 5B	LiDAR
Wilbarger Creek Tributary 208 Pond	Park at Blackhawk IV Ph. 6 A & B	Plans
Wilbarger Creek Tributary 210 Pond	Park at Blackhawk Sec. 1 & 4, Park at Blackhawk 2 Ph. 1	Plans
Wilbarger Creek Pond	Spring Trails Ph. A Sec. 1F, Ph.1B	Plans

3.6 Parameter Determination

3.6.1 Soil

Watershed-wide soil information was obtained from the Natural Resource Conservation Service (NRCS) Web Soil Survey (WSS) website. **Appendix A-3** shows the distribution of soil types within the Wilbarger Creek watershed. Type D is the dominant soil type with concentrations of type C along Elm Creek and Wilbarger Creek Tributary 9. Near the outfall of Wilbarger in Bastrop County there is a mix of primarily soil types B, C, and D. **Appendix E-1** contains a table of the hydrologic soil types and SSURGO soil classifications for Wilbarger Creek watershed.

3.6.2 Land Cover

Land cover information was provided from the USGS's 2011 National Land Cover Database (NLCD) as well as the City of Pflugerville. Land cover designations were validated against NearMap and ESRI's World Imagery basemap for accuracy of cover type. **Appendix A-4** shows the designated land cover from the NLCD and the City of Pflugerville land use layer. The City of Pflugerville landuse included portions of the Travis County ETJ near the city limit boundaries. The land cover classifications were reclassified with respect to the appropriate cover descriptions for Curve Numbers (CN) from the U.S. Department of Agriculture's Urban Hydrology for Small Watershed Technical Release 55 (TR-55) Documentation. The classifications were also assigned a "Hydrologic Condition" of Fair for CN calculation purposes.

3.6.3 Runoff Losses

The NRCS CN loss rate method was used for this study. The CN method utilizes a curve number, percent impervious cover, and initial abstraction. Land use was provided by the City of Pflugerville for use within the city limits while NLCD land use data was utilized for the remainder of the Wilbarger Creek watershed. The CN values were assigned based on the land use cover description in the table of **Appendix E-2.** The CN values are based on the land use description in Tables 2-2 of TR 55. For purposes of this study the default HEC-HMS calculations were used for the initial abstraction values. Percent impervious values for each subbasin were based on the assigned landuse and accounted for in the initial CN value. Percent impervious values for specific land uses were based on recent adjacent watershed studies and the NLCD's recommended percent impervious values. The impervious cover associated with each landuse is shown in **Appendix E-2.** HEC-GeoHMS and GIS tools were utilized to compute composite CN's based on land use and soil type. **Appendix E-2** presents the curve number and impervious cover for each subbasin.

3.6.4 Unit Hydrograph

NRCS TR-55 unit hydrograph was selected to define the unit hydrographs overall shape and timing. The time of concentration calculations were split into three sections including sheet, shallow concentrated, and channel flow. Sheet flow length was determined to be 50 feet for paved surfaces and 100 feet for unpaved surfaces. Sheet flow was calculated using Manning's kinematic solution (Overtop and Meadows 1976) as provided in TR-55. Manning's n-values in Table 3-1 of the TR-55 documentation were used for sheet flow for various surface conditions.

Standard time of concentration (t_c) values were computed for shallow concentrated flow using Equation 3-1 from TR-55. Velocities were based on watercourse slope and determined using Figure 3-1 of the TR-55 documentation. Channel flow t_c values were computed using Manning's equation, bankfull average velocity, and Equation 3-4 of the TR-55 documentation.

Lag time (t_{lag}) for each watershed was calculated by:

$$t_{lag} = 0.6\ t_c$$

Appendix E-3 lists assumptions and lag time calculations for all subbasins within the watershed.

3.7 Channel Routing

The Modified Puls method was selected to route hydrographs for the modeled study reaches within the Wilbarger Creek watershed where hydraulic models were developed. Storage discharge relationships were computed using the HEC-RAS program (Version 5.0.7) model developed for the study streams. The HEC-RAS model development is discussed in Section 4. **Appendix E-4** lists the computed modified puls discharge-storage relationships and the routing steps used in the HEC-HMS model.

The Muskingum-Cunge method was selected to route hydrographs for reaches with definable channels not included in the modeled study reaches. For each Muskingum-Cunge routing reach an 8-point cross section was developed. Cross-sections were extracted from the 3-foot LiDAR DEM at the most representative location for each routing reach. Tables in **Appendix E-5** display the computed cross-sections and parameters used for the Muskingum-Cunge routing in the HEC-HMS model.

The selected channel routing methods were used for the study to maintain continuity with the previous Wilbarger Creek watershed study and previous Flood Protection Planning Studies conducted within Bastrop County. Hydrology analysis conducted for the initial watershed studies were prepared by the US Army Corps of Engineers who selected the methods discussed above. Additionally, Travis County and City of Pflugerville reference City of Austin Drainage Criteria Manual listing both channel routing methodologies as acceptable for use.

3.8 Hydrologic Results

A summary of areal reduced computed peak flows for the 50%, 20%, 10%, 4%, 2%, 1%, and 0.2% ACE is available in **Appendix E-6**. A summary of subbasin peak discharges for each of the frequency events are displayed in **Appendix E-7**.

3.9 Comparison of Peak Flows

The Wilbarger Creek computed peak flows for the 1% ACE were compared to results from nearby watershed studies within Bastrop and Travis Counties. The studies used for the comparison include Alum Creek, Gills Branch, Piney Creek, and Walnut Creek from the 2020 Lower Colorado-Cummins Watershed Flood Risk Study that also utilized Atlas 14 rainfall. Wilbarger Creek was also compared to the 2008 Gilleland Creek study in Travis County that utilized pre-Atlas 14 rainfall values. The Base Level Engineering (BLE) values shown for Wilbarger Creek are from the 2018 Lower Colorado-Cummins BLE study where the peak flows are based on regression equations developed using the USGS Scientific Investigations Report (SIR) 2009-5087. This comparison is shown in **Appendix E-8.** The computed peak flows are slightly higher than the flow rate per square mile compared to the surrounding watershed studies but are considered reasonable with the following validations.

- Type D soils have a slow infiltration rate because they are clay type soils, causing more rainfall runoff. Soil type D is the dominant soil within the Wilbarger watershed.
- Wilbarger Creek results are slightly higher than Wilbarger BLE and Gilleland Creek as anticipated because both of these comparison studies are based on pre-Atlas 14 rainfall values.

Similar to the comparison of nearby watershed studies, a comparison of the Wilbarger Creek results along detailed study streams to the current effective Flood Insurance Study discharges was evaluated. The comparison is shown below in **Table 3-5**. The Flood Insurance Study (FIS) Number 48453CV002D included only a few published discharges in the Wilbarger Creek watershed despite the number of detailed study reaches on the current effective maps. The only reach published for comparison is located along unnamed tributary to Wilbarger Creek which is stream WC_T196 for this FPP study. The flow comparison at Becker Farm Road indicates the Wilbarger Creek FPP 1% ACE peak discharge is 18% lower compared to the peak discharge in FIS. This is likely from the incorporation of the detention pond upstream of the discharge comparison point in this FPP. The FIS shows a 1% ACE peak flow of 4,584 cfs at Lake Pflugerville. In comparison, the Wilbarger Creek FPP 1% ACE shows a peak discharge of 1,400 cfs. The stage-storage-discharge rating curve used for Lake Pflugerville dam was sourced from the 2003 Colorado River Water Supply Project Raw Water Storage Reservoir Flood Hydrology Study provided by the City of Pflugerville. The 1% ACE lake elevations for Lake Pflugerville for the Wilbarger FPP and the FIS are 637.2 feet and 637.6 feet, respectively which indicated the analysis of Lake Pflugerville is similar. It is unclear why the published discharge is higher, however given the similarities of the lake elevations and similar downstream floodplain extents, the FPP results are considered valid.

TABLE 3-5: FLOOD INSURANCE STUDY FLOW COMPARISON

Flood Insurance Study			Wilbarger Creek FPP			Percent Difference
Location	Drainage Area (square miles)	1% ACE Flow (cfs)	Location	Drainage Area (square miles)	1% ACE Flow (cfs)	
At Becker Farm Road	0.9	1,959	J_WCT196_20	0.82	1,600	-18%
At Pflugerville Raw Water Storage Reservoir	2	4,584	J_WCT196_15	2.03	1,400	-69%

4.0 HYDRAULIC MODEL ANALYSIS

The hydraulic models for the Wilbarger Creek main stem and all Wilbarger Creek Tributaries were developed in HEC-RAS version 5.0.7 to estimate the water surface profiles for the seven modeled flood events. Hydraulic work maps containing channel cross section layout, stream centerlines, floodplain extents, habitable structures in the floodplain, and modeled roadway crossings can be found in **Appendix G-1**. The following section discuss the methods and procedure in hydraulic model development.

4.1 Manning's Roughness Coefficients

Manning's "n" values were assigned by visual inspection and analysis of available aerial imagery. The channel n-values for Wilbarger Creek were determined to vary between 0.013-0.055. **Table 4.1** below summarizes the channel n-values used for this study. The overbank n-values varied between 0.06-.12. **Table 4.2** below summarizes the land use classifications and respective Manning's n-value classifications.

TABLE 4-1: MANNINGS N-VALUE ASSUMPTION FOR CHANNEL

Channel Conditions	Manning's N-Value
Concrete	0.013
Pond	0.025
Clean, winding, some pools and shoals	0.040-0.045
Same as above, but some weeds and stones	0.045
Same as above, lower stages, more ineffective slopes and sections	0.050
In between above and below	0.055

TABLE 4-2: EXISTING LANDUSE CLASSIFICATIONS MANNINGS N-VALUES

Classification	Manning's N-Value
Open Water	0.025
Developed, High Intensity	0.12
Developed, Medium Intensity	0.12
Deciduous Forest	0.1
Evergreen Forest	0.1
Mixed Forest	0.1
Woody Wetlands	0.1
Shrub/Scrub	0.08
Developed, Low Intensity	0.075
Developed, Open Space	0.07
Barren Land (Rock/Sand/Clay)	0.06
Cultivated Crops	0.06
Emergent Herbaceous Wetlands	0.06
Grassland/Herbaceous	0.06
Pasture/Hay	0.06

4.2 Cross Section Point Filtering Approach

Extracting cross sections using GeoRAS and the 3-foot LiDAR DEM resulted in many cross-sections containing more than the maximum 500 points allowed for HEC-RAS, version 5.0.7 modeling. The HEC-RAS Cross Section Point Filter tool was set to minimize cross sectional area change when reducing cross sections points to 500.

4.3 Boundary Conditions

The normal depth method was used for the downstream boundary condition for Wilbarger Creek and its tributaries. This type of boundary option requires the user to enter an energy slope for the downstream location by determining the average slope between the channel flowlines of the downstream cross sections within HEC-RAS.

4.4 Geometry Data

The stream centerline, channel cross sections, and lateral structures were generated based on the study's 3-foot LiDAR DEM. Hydraulic cross sections were placed approximately every 500 feet along stream centerlines to depict the studied channel.

Bridge and culvert structures were entered and modeled using survey data for detailed study streams and field reconnaissance data for limited detail study streams. Survey for specified cross sections was applied

to the detailed study streams. Pilot channels of the detailed study streams were developed to smooth the channel profile between inverts of the surveyed structures and channel cross sections to give a better representation of the channel slope. Ineffective areas were placed based on the methodology described in the HEC-RAS Hydraulic Reference Manual. The ineffective area expansion and contraction ratios for structures were specified as 1:1 on the upstream cross section and 2:1 for the downstream section.

Cross section expansion and contraction coefficients were left at the default values of 0.1 and 0.3, except at structures where they were changed to 0.3 and 0.5 for the two cross sections upstream of a structure and one downstream.

During the development of hydraulic models for the watershed it was determined that there are three areas within the watershed where overflow occurs. It was determined that flow leaves Wilbarger Creek, Wilbarger Creek Tributary 200 and Wilbarger Creek Tributary 056. A lateral structure was utilized to allow flow to leave the reach as it was determined that the overflow does not return to the respective channel. The lateral structures were placed along terrain ridge parallel to the stream to best quantify overflow that leaves the channel.

4.5 Floodway Analysis

Floodways are analyzed with Atlas 14 flows for Wilbarger Creek, Wilbarger Creek Tributary 185, Wilbarger Creek Tributary 196, Wilbarger Creek Tributary 207, Wilbarger Creek Tributary 210, and Wilbarger Creek Tributary 216. The stream reaches of the floodway extents for this study are similar to the current FEMA effective floodways. Floodway analyses were conducted using the HEC-RAS encroachment tool. Encroachment Method 4 with an initial target change of one (1) foot and the equal conveyance option was used to begin the process of defining the traditional floodway. The results were then transferred to Method 1 so localized adjustments could be made to the target to achieve a maximum of a one (1) foot change in water surface elevation. Negative surcharges occur on a few cross sections that do not have encroachments. Those negative surcharges are considered acceptable because the values round to a surcharge of 0.0 feet. Floodways for Zone AE reaches were delineated by importing encroachments from the associated hydraulic models and connecting them with smooth reasonable transitions between cross-sections. Between cross sections, the floodway boundaries were interpolated using engineering judgement. The results of the floodway computations are tabulated for selected cross sections in **Appendix F-3.**

4.6 Peak Flow Data

Peak flows from the Wilbarger Creek hydrology model were entered into the hydraulic model. Flow change locations were placed at hydrologic junctions at stream confluences and approximately one-third upstream of a subbasin divide in other locations. The peak flows and flow change locations are tabulated and summarized in **Appendix F-1**.

4.7 Hydraulic Results

Profiles of the detailed study streams were plotted from the HEC-RAS results for the 10%, 2%, 1%, and 0.2% ACE existing conditions. The limited detailed study streams were plotted from the HEC-RAS results for the 1% ACE existing conditions. The water surface profiles, in some cases, show abrupt increases due to head losses at road crossings. This is mentioned because the profiles do not show the road structures and only indicate the location of the road crossings by label. These profiles are included in **Appendix F-2**.

The Wilbarger Creek 1% and 0.2% ACE floodplains were generated using HEC-RAS model results and ArcGIS tools. Floodplains were developed for the 1% and 0.2% ACE for detailed study streams. For limited detail study streams, the 1% ACE floodplain was developed. Water surface elevations triangulated irregular networks (TIN) were created from the hydraulic model results then converted to water surface DEMs. These water surface DEMs were intersected with the hydraulic ground surface DEM to calculate and create polygon features of inundated areas. The 1% and 0.2% ACE floodplain extents, stream centerline, and cross sections are displayed in the hydraulic work maps, found in **Appendix G-1**. The work maps reference additional information in relation to the floodplain including all overtopping road crossings, structures located within the floodplain, floodways, and project study limits. There is a total of 61 road crossings that are overtopped during the 50% ACE within the watershed based on the hydraulic models. Most of these roads are in Bastrop County and the western portion of Travis County which are built at grade resulting in a lower level of service. In addition, these roads are designed using older design criteria and rainfall data.

A comparison of the proposed floodplains to the National Flood Hazard Layer (NFHL) is shown in **Appendix G-2**. Changes in the floodplain width are categorized as increase, decrease, or no change. Increases in floodplain width are shown in red, decreases are shown in green and where there has been no change the floodplain is blue. The floodplain extents have both increases and decreases in the headwaters within the City of Pflugerville and north eastern Travis County. In some areas, primarily along the Wilbarger Creek main stem and Elm Creek, the floodplain extents have increased due to Atlas 14 rainfall. In the eastern portion of the watershed, within Travis County, there are decreases seen in the limited detail streams Cottonmouth Creek, Little Willow Creek, Willow Creek, and Dry Creek. This is attributed to the updated LiDAR which more accurately represents the topography in this area. The lower portion of the watershed downstream of the confluence of Wilbarger Creek and Wilbarger Creek Tributary 4 shows an increase in floodplain which reflects Atlas 14 rainfall and newer terrain used for this study.

5.0 FLOOD MITIGATION EVALUATION

The flood mitigation concepts discussed within this report are conceptual evaluations of potential flood mitigation solutions. They are high-level feasibility concepts that may be refined through subsequent preliminary engineering analysis and coordination with project stakeholders.

The overall flood mitigation objective is to reduce bridge and culvert overtopping during the 1% ACE to the extent possible and to protect the safety of residents within the Wilbarger Creek. In many cases, the evaluated alternatives reduce existing flood risk but elimination of 1% ACE flood risk was not possible in all locations. In accordance with the Subdivision Regulations for Bastrop County, all culverts shall be designed to convey the 4% ACE, and the headwater surface elevation shall not exceed the minimum roadway surface elevation. The headwater depth for a 1% ACE shall not exceed 1 foot over the minimum roadway surface elevation (Bastrop County, 2017). Travis County follows the City of Austin Drainage Criteria Manual and requires the 1% ACE to pass without overtopping. City of Pflugerville Drainage Criteria requires the 1% ACE to be conveyed without overtopping. Reduction of flood risk can be accomplished using hydrologic alternatives (detention/retention ponds), hydraulic alternatives (diversions, floodwalls, channel improvements, etc.), or a combination of these alternatives. The sections below discuss the flood mitigation analysis including conceptual-level estimates of project cost.

Funding sources are available for communities through both state and federal programs. The following programs listed are available grants or loans for communities to advance projects.

- Hazard Mitigation Grant Program (HGMP)
- Flood Mitigation Assistance (FMA) Grant
- GLO CDBG Mitigation Program (GLO CDBG-MIT)
- TWDB Flood Infrastructure Fund (FIF)
- Clean Water State Revolving Fund (CWSRF) Loan
- Building Resilient Infrastructure and Communities (BRIC)

Additional project funding may come from each participating community's general fund or by purchasing certificates of obligation.

The purpose of this study is to identify flood risk and develop planning level flood mitigation or conceptual solutions. The conceptual solutions presented in this report will need further detailed analysis and evaluation as projects advance to preliminary and final design. Design items that should be evaluated further may include potential adjacent floodplain impacts due to new development, changes in channel velocities causing channel aggradation/degradation, bridge scour analysis, holistic understanding of potential geomorphic changes, easement needs, among other items. Development of the proposed

mitigation solutions ensured that downstream homes were not pulled into proposed floodplain extents as a result of the proposed projects.

Communities may choose to pursue the proposed improvement projects as funding becomes available. Project implementation should ideally begin downstream of the watershed, this would require watershed wide cooperation to coordinate.

5.1 Road Crossing Urgency Rating Evaluation

An urgency ranking of bridge, culvert, and low water crossing structures was developed for the Wilbarger Creek watershed to prioritize roadway crossings according to flood and public safety risk. Prioritizing road structures susceptible to flood overtopping and a threat to public safety, helps to focus available resources.

The proposed roadway improvements are high level analyses and further analysis of impacts will be needed in preliminary and final designs. These solutions are focused on reducing risk and further detailed evaluation ~~such as potential scour~~, will need to be done as projects advance into preliminary and final design. Improvements recommended below may require additional right-of-way and easement acquisition.

5.1.1 Traffic Count Determination

The traffic count for each crossing within the study basin was derived from traffic and saturation count data recorded by TxDOT in 2019 and the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition (2020). The Traffic Counts 2015 map on the City of Pflugerville GIS Open Data Page was utilized additionally to determine the traffic counts for the city roads that were not recorded in the TxDOT web maps. These maps were spatially referenced to political, geographical, and structural landmarks within the watershed. A spatial analysis was manually performed using aerial imagery and roadway networks in conjunction with the traffic count maps to determine a relative traffic pattern. Parcel data was utilized to best estimate the number of residences that utilize the road crossing. The number of entrances and exits for the residences along the road were located to estimate the number of potential routes that are available. An average daily trip per household of 9.44 was assigned to each residential dwelling from the ITE Trip Generation Manual. The daily trip per household was multiplied by the number of residences and modified by the number of available alternative routes.

5.1.2 Urgency Rating Evaluation

Halff Associates developed an urgency calculation for 20 roadways in Bastrop County, 83 roadways in Travis County, and 10 roadways in the City of Pflugerville totaling 114 of the 186 structures analyzed in this study. These 114 structures are public roads that the HEC-RAS models indicated some level of overtopping during a storm event. Private roads, driveways, golf cart paths, and railroads were not included in this analysis. **Appendix A-6** shows the locations of the overtopping public roadways within the Wilbarger Creek watershed. The urgency rating is calculated by taking the Average Annual Daily Traffic

Count divided by the Annual Chance of Flooding. The Annual Chance of Flooding was obtained from the minimum roadway elevations in the hydraulic models developed for this study. The higher a structure's urgency rating, the higher the flood risk for that structure. The column labeled Minimum Rainfall causing Overtopping indicates the 24-hour rainfall depth associated with the storm event that causes the road to overtop. The roadway urgency rating does not take into consideration repetitive loss damage. A summary of the top 10 urgency rating for each jurisdiction is presented in **Table 5-1 – Table 5-3** below. A complete urgency rating analysis for all overtopped major roads is provided in **Appendix H-1**.

The roadway improvement locations for each of the participating communities were selected based on community priorities. While the urgency rating provides a ranking, the community may choose a road to improve based on criteria that was not analyzed in the ranking analysis. A community may choose to pursue an improvement that has been funded through a bond or CIP funding. All communities were interested in increasing the level of service, to the extent possible, for traffic mobility allowing safe passage during large storm events. Typically, road crossing improvements do not remove homes from the floodplain, specifically in rural areas of the Counties, and placing an economic value on ease of mobility is difficult using the simplified BCA methodology used in this study. Further detailed BCA analysis may be needed based on grant funding requirements.

Roadways under the jurisdiction of TxDOT were not chosen to analyze. The participating communities do not have authority over those roads and TxDOT is not a participating member in the FPP Grant. It is recommended Bastrop County share the urgency rating developed for this study with TxDOT's District Engineer, District Roadway Planning Engineer, and Area Engineers to aid with planning and prioritizing roadway improvements.

TABLE 5-1: BASTROP COUNTY ROADWAY CROSSING URGENCY RATING

Stream Name	Road Name	Structure Type	Average Daily Traffic Count (vehicles/day)	Annual Chance of Flooding	Minimum Rainfall Causing Overtopping (in)	Urgency Rating	Risk Rank
Elm Creek	FM 1100	Culverts	4,731	20%	5.4	946.2	1
Elm Creek	TX 95	Culverts	8,409	10%	6.7	840.9	2
Elm Creek	US 290 Eastbound	Bridge	30,528	2%	10.3	610.6	3
Wilbarger Creek	FM 1704	Bridge	2,453	20%	5.4	490.6	4
Elm Creek	US 290 Westbound	Bridge	30,528	1%	12.2	305.3	5
Wilbarger Creek Tributary 9	Monkey Rd	Multi Opening	530	50%	4.1	265.0	6
Wilbarger Creek	Lower Elgin Rd	Bridge	377	50%	4.1	188.5	7
Wilbarger Creek	Upper Elgin Rd	Multi Opening	361	50%	4.1	180.5	8
Wilbarger Creek Tributary 6	Youngs Prairie Rd	Culverts	290	50%	4.1	145.0	9
Wilbarger Creek Tributary 030	Balch Rd	Culverts	250	50%	4.1	125.0	10

TABLE 5-2: TRAVIS COUNTY ROADWAY CROSSING URGENCY RATING

Stream Name	Road Name	Structure Type	Average Daily Traffic Count (vehicles/day)	Annual Chance of Flooding	Minimum Rainfall Causing Overtopping (in)	Urgency Rating	Risk Rank
Cottonmouth Creek	US 290	Bridge	30,630	20%	5.4	6,126.0	1
Wilbarger Creek Tributary 056	FM 973	Culverts	8,040	50%	4.1	4,020.0	2
Cottonmouth Creek	US 290	Bridge	30,630	10%	6.7	3,063.0	3
Wilbarger Creek Tributary 167	Old Highway 20	Bridge	4,991	50%	4.1	2,495.5	4
Wilbarger Creek Tributary 210	Cele Rd	Bridge	2,792	50%	4.1	1,396.0	5
Dry Creek West	US 290	Bridge	30,860	4%	8.6	1,234.4	6
Wilbarger Creek Tributary 220	Gregg Ln	Culverts	2,280	50%	4.1	1,140.0	7
Wilbarger Creek	Gregg Ln	Culverts	2,278	50%	4.1	1,139.0	8
Elm Creek	County Line Rd	Multi Opening	2,278	50%	4.1	1,138.8	9
Wilbarger Creek Tributary 167	US 290	Culverts	44,701	2%	10.3	894.0	10

TABLE 5-3: CITY OF PFLUGERVILLE ROADWAY CROSSING URGENCY RATING

Stream Name	Road Name	Structure Type	Average Daily Traffic Count (vehicles/day)	Annual Chance of Flooding	Minimum Rainfall Causing Overtopping (in)	Urgency Rating	Risk Rank
Wilbarger Creek	FM 685	Bridge	24,318	20%	5.3	4,863.6	1
Wilbarger Creek Tributary 200	Kelly Ln	Culverts	7,579	50%	4.1	3,789.5	2
Wilbarger Creek Tributary 200	Vilamoura St	Multi Opening	2,700	50%	4.1	1,350.0	3
Wilbarger Creek	E Pflugerville Pkwy	Bridge	10,357	4%	8.4	414.3	4
Wilbarger Creek Tributary 200	Kennemer Dr	Culverts	1,890	20%	5.3	378.0	5
Wilbarger Creek Tributary 200	Weiss Ln	Bridge	3,669	4%	8.4	146.7	6
Wilbarger Creek	Springbrook Dr	Culverts	4,040	2%	10.0	80.8	7
Wilbarger Creek Tributary 206	Murchison Ridge Tr	Culverts	1,910	4%	8.4	76.4	8
Wilbarger Creek Tributary 186	Town Center Dr	Culverts	1,860	1%	11.8	18.6	9
Wilbarger Creek Tributary 200	Dalshank St	Culverts	80	10%	6.5	8.0	10

5.2 Road Crossing Alternatives – Bastrop County

An alternative analysis of the following three crossings was conducted to identify potential improvements to reduce risk.

- Wilbarger Creek Tributary 9 Monkey Road crossing
- Wilbarger Creek Upper Elgin Road crossing
- Wilbarger Creek Tributary 6 Youngs Prairie Road crossing

Table 5-4 provides details of the existing conditions structure and level of service, in addition to the proposed improvement, level of service, and estimate of probable cost for each solution. These three selected roadway crossings for improvements are currently overtopped during the 50% ACE.

TABLE 5-4: BASTROP COUNTY ROADWAY IMPROVEMENT SUMMARY

Road Crossing	Structure ID [Lat., Long.]	Existing Conditions		Proposed Improvement			
		Existing Structure	Overtopping Event (ACE)	Structural Improvement	Roadway Improvement	Overtopping Event (ACE)	Probable Cost Estimate
Wilbarger Creek Trib 9 Monkey Rd.	WC_T9_STR_100_A [30.3261, -97.4173] & WC_T9_STR_100_B [30.3260, -97.4170]	A: 20' wide bridge B: 2 - 8' x 4' RCBs	50% (2-year)	A: 100' wide bridge B: 50'wide bridge B Plus: 5 – 4' x 2' overflow RCBs	330 LF of Raised Roadway	20% (5-year)	$2.3M
Wilbarger Creek Upper Elgin Rd.	WC_STR_400 [30.2831, -97.4402] & WC_STR_450 [30.2863, -97.4395]	400: 150'wide bridge 450: 5 - 3' CMPs	50% (2-year)	400: 150' wide bridge 450: 200' and 50' wide bridge Plus: 4 - 8' x 4' overflow RCBs	2,100 LF of New Raised Roadway	20% (5-year)	$5.8M
Wilbarger Creek Trib 6 Youngs Prairie Rd.	WC_T6_STR_200 [30.2992, -97.4168]	2 - 4' CMPs	50% (2-year)	4 - 5' x 5' RCBs	300 LF of Raised Roadway	20% (5-year)	$408,000

The crossing on Lower Elgin Road was originally selected as one of the three Bastrop County roads to conduct an alternative analysis. The crossing is located near the downstream end of the Wilbarger watershed [Lat. 30.2226, Long. -97.4095]. Hydraulic analysis shows existing conditions Wilbarger Creek overtopping Lower Elgin Road to a depth of 3.6 feet during the 50% ACE and 14.6 feet during the 1% ACE. Because the County does not prefer to demolish the recently built bridge and the historic 1888 truss pedestrian bridge, it was difficult to provide a 50% ACE improvement at this location. Halff attempted channel improvements under the existing bridge and 830 linear feet of a 100-foot-wide channel benching downstream of the bridge, but those improvements only provide minimal reduction in roadway overtopping. To fully convey the 50% ACE, the road profile will need to be raised for approximately 1,000 linear feet with an elevation increase of approximately 4 feet. In order to provide a 50% ACE improvement, the existing bridge would also need be replaced and upgraded to meet a raised roadway. Since alternatives were minimal in this location, the County alternatively selected the road crossing on Wilbarger Creek Tributary 6 at Youngs Prairie Road for roadway crossing improvements.

5.2.1 Bastrop Road Crossing 1 – Wilbarger Creek Tributary 9 Monkey Road Crossing

The crossing on Wilbarger Creek Tributary 9 on Monkey Road [Lat. 30.3261, Long. -97.4173] and the second structure approximately 120 feet east of the crossing [Lat. 30.3260, Long. -97.4170] are located approximately 1,600 feet east of Littig Road. Hydraulic analysis shows existing conditions Wilbarger Creek overtopping Monkey Road to a depth of 1.3 feet during the 50% ACE and 3.5 feet during the 1% ACE.

To help reduce roadway overtopping, a bridge with two 50-foot spans at the main creek crossing, a bridge with one 50 foot span at the second structure opening, five 4 foot x 2 foot reinforced concrete box culverts approximately 230 feet east of the crossing, and approximately 330 linear feet of roadway profile changes with an elevation increase of 1.1 feet are proposed. The two bridges will both have 24 inch slab beam bridge decks and share a 200-foot long, three (3) foot tall rail on each side of the road. A 24 inch slab beam has a thinner beam thickness allowing more conveyance under the bridges. The two (2) span bridge will have a three (3) foot diameter circular pier. Additionally, the channel within the roadway right-of-way will need to be widened at 3:1 side slope with a 30-foot-wide channel bottom width for the two (2) span bridge, and the channel at the single span bridge needs to be stabilized at 3:1 side slope keeping the existing channel bottom width. The five 4 foot x 2 foot reinforced concrete bridge-class box culverts are recommended to convey flood waters along the flat overbank. The channel will need to be widened to accommodate the culverts. The extents of the existing and proposed structures are shown in **Figure 5-1**. Larger bridges or road raise extents between the two structure openings could not be proposed because those changes would impact the private driveway access that is located between the two structure openings.

The proposed solutions do not meet the Subdivision Regulations for Bastrop County to pass the 4% ACE. However, the solution fully conveys the 50% ACE and improves safety for the traveling public. An estimate of probable project cost for the proposed roadway crossing improvements is shown in **Appendix H-3** which was determined to be approximately $2.3 million.

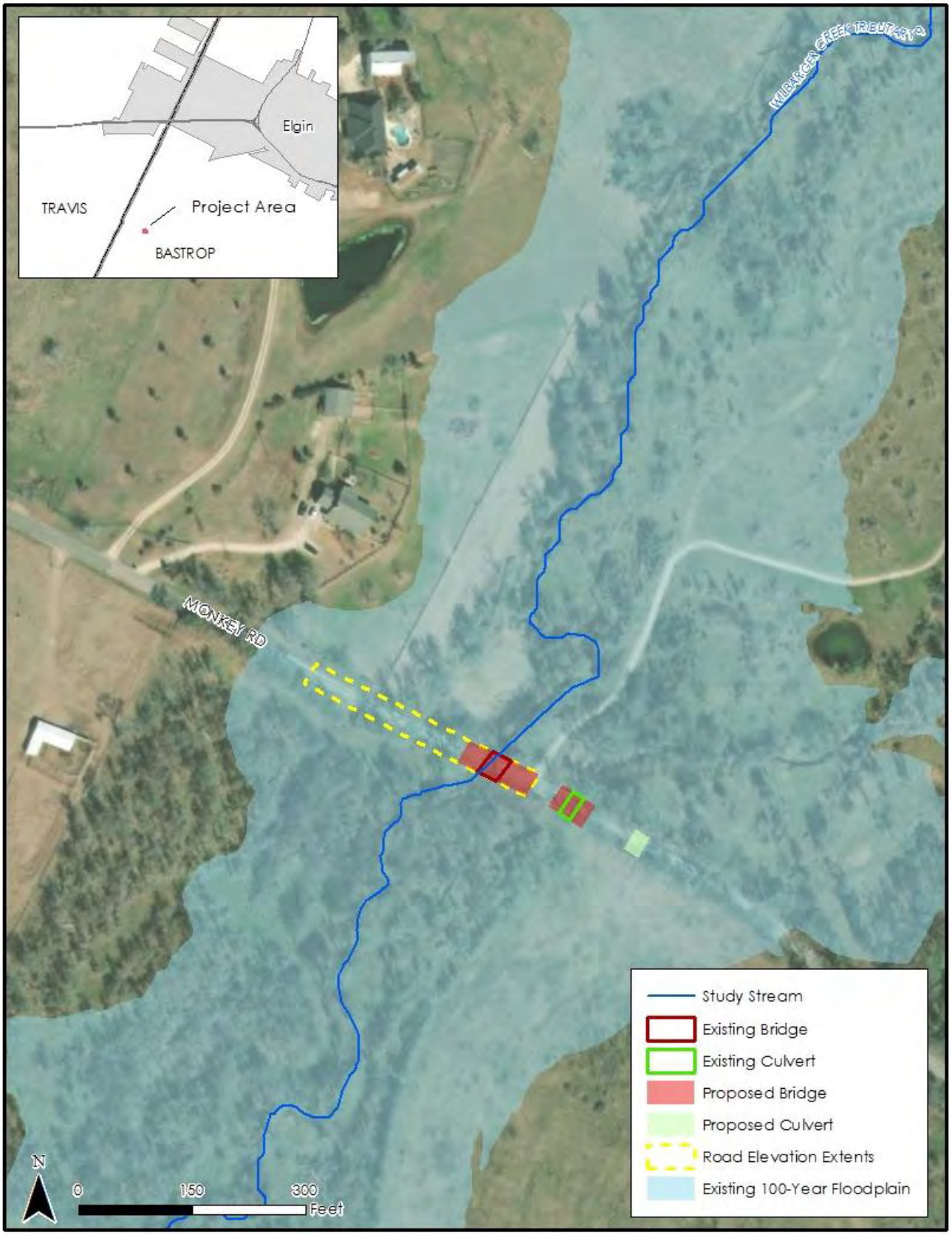


FIGURE 5-1: WILBARGER CREEK TRIBUTARY 9 MONKEY ROAD CROSSING IMPROVEMENTS

5.2.2 Bastrop Road Crossing 2 – Wilbarger Creek Upper Elgin Road Crossing

The crossing on Wilbarger Creek on Upper Elgin Road [Lat. 30.2831, Long. -97.4402] and the culvert structure approximately 1,300 feet north of the crossing [Lat. 30.2863, Long. -97.4395] are located approximately two (2) miles west of Farm-to-Market Road 1704 (FM 1704). Hydraulic analysis shows existing conditions Wilbarger Creek overtopping Upper Elgin Road to a depth of 5.8 feet during the 50% ACE and 13.7 feet during the 1% ACE.

To help reduce roadway inundation, it is recommended to replace the existing 150-foot-wide, three-span bridge with a 24-inch slab beam bridge and reconstruct the roadway on the north side of the crossing to flatten the S-curve that is currently constricting the flow coming into the secondary crossing. The proposed new road is approximately 2,100 linear feet with an elevation increase of 5.4 feet as shown in **Figure 5-2**, symbolized with the dashed, yellow polygon. The north end of the proposed new road curves slightly to tie back to the existing road so that the road profile at the adjacent properties' driveways is not changed. A bridge with four 50-foot spans, a bridge with one 50-foot span, and four 8 foot x 4 foot reinforced concrete bridge-class box culverts are proposed to be installed on the new road approximately 1,300 linear feet, 1,100 linear feet, and 740 linear feet north of the existing bridge, respectively, to help convey flood water along the flat overbank. The two bridges are both 24-inch slab beam bridges. The four-span bridge will have three (3) foot diameter circular piers. The guardrails for the new structures are all 3-feet high. Additionally, approximately 270 linear feet of channel benching is proposed on the downstream side of the existing 150-foot-wide bridge. The proposed channel has a 150-foot-wide bottom excavation placed two (2) feet above the existing channel flowline with 3:1 side slopes to minimize environmental permitting needs.

The proposed solution does not meet the Subdivision Regulations for Bastrop County to pass the 4% ACE. However, the proposed solution fully conveys the 50% ACE and improves safety for the traveling public**.** An estimate of probable project cost for the proposed roadway crossing improvements is shown in **Appendix H-3** which was determined to be approximately $5.8 million.

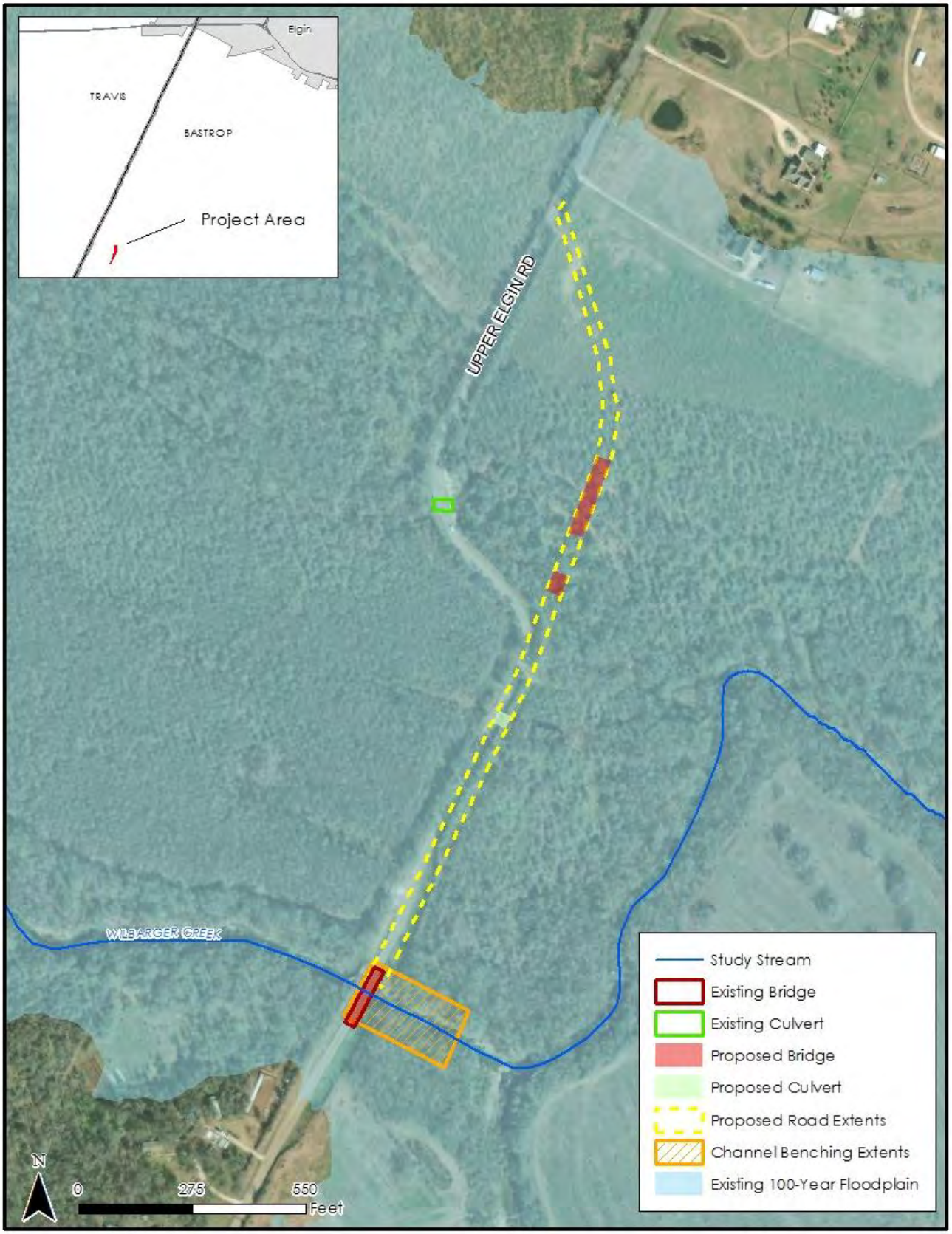


FIGURE 5-2: WILBARGER CREEK UPPER ELGIN ROAD CROSSING IMPROVEMENTS

5.2.3 Bastrop Road Crossing 3 – Wilbarger Creek Tributary 6 Youngs Prairie Road Crossing

The crossing on Wilbarger Creek Tributary 6 on Youngs Prairie Road [Lat. 30.2992, Long. -97.4168] is located approximately 1.4 miles west of FM 1704. Hydraulic analysis shows existing conditions Wilbarger Creek Tributary 6 overtopping Youngs Prairie Road to a depth of 1.2 feet during the 50% ACE and 2.4 feet during the 1% ACE.

To help reduce roadway inundation, four 5 foot x 5 foot reinforced concrete bridge-class box culverts and approximately 300 linear feet of roadway profile changes with an elevation increase of one (1) foot are proposed as shown in **Figure 5-3**. The extent of the raised road was limited to 300 linear feet to avoid raising the road near existing driveways. The channel within the right-of-way adjacent to the road will need to be widened to accommodate the new culverts.

The proposed culverts do not meet the Subdivision Regulations for Bastrop County to pass the 4% ACE. However, the solution fully conveys the 50% ACE and improves safety for the traveling public**.** An estimate of probable project cost for the proposed roadway crossing improvements is shown in **Appendix H-3** which was determined to be $408,000.

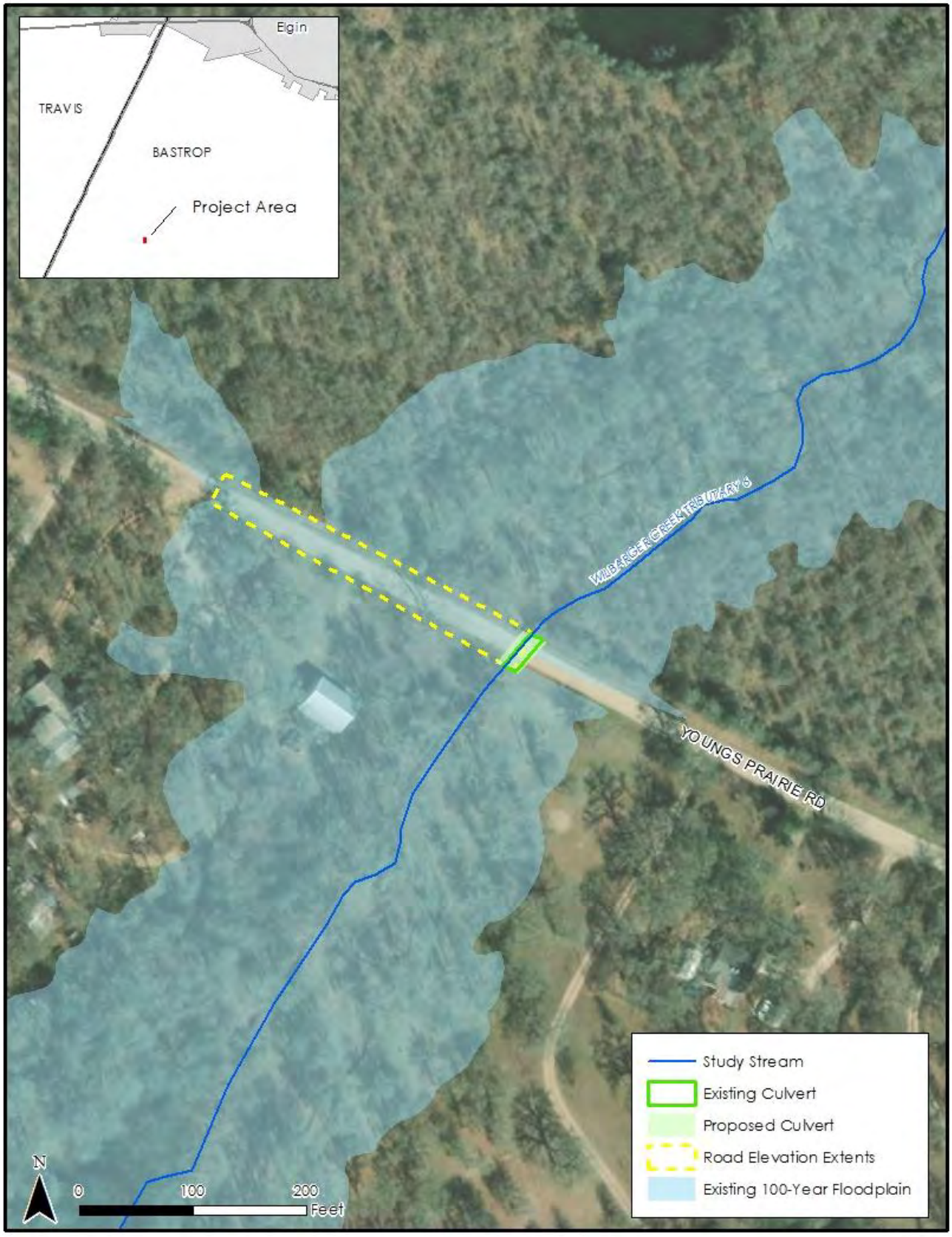


FIGURE 5-3: WILBARGER CREEK TRIBUTARY 6 YOUNGS PRAIRIE ROAD CROSSING IMPROVEMENTS

5.3 Road Crossing Alternatives – Travis County

The location of these roadway crossings can be referenced in **Appendix A-6.** An alternative analysis of the following three crossings was conducted to identify potential improvements to reduce risk.

- Wilbarger Creek Tributary 210 Cele Road crossing
- Wilbarger Creek Tributary 220 Gregg Lane crossing
- Wilbarger Creek Cameron Road crossing

Table 5-5 provides details of the existing condition structure and level of service, in addition to the proposed improvement, level of service, and estimate of probable cost for each solution. All three of these selected roadway crossings are currently overtopped during the 50% ACE and do not meet the City of Austin Drainage Criteria Manual, in passing the 1% ACE in existing conditions. Travis County drainage criteria follows City of Austin Drainage Criteria Manual per the County's Code of Ordinances.

TABLE 5-5: TRAVIS COUNTY ROADWAY IMPROVEMENT SUMMARY

Road Crossing	Structure ID [Lat., Long.]	Existing Conditions		Proposed Improvement			
		Existing Structure	Overtopping Event (ACE)	Structural Improvement	Roadway Improvement	Overtopping Event (ACE)	Probable Cost Estimate
Wilbarger Creek Trib 210 Cele Rd.	WC_T210_STR_2000 [30.4557, -97.5514]	85'wide bridge	50% (2-year)	200' wide bridge	1160 LF of Raised Roadway & Concrete Bridge Opening (2:1 side slope)	0.2% (500-year)	$4.3M
Wilbarger Creek Trib 220 Gregg Ln.	WC_T220_STR_100 [30.3854, -97.5491]	2 - 10'x 5' RCBs	50% (2-year)	200' wide bridge	870 LF of Raised Roadway	0.2% (500-year)	$5.5M
Wilbarger Creek Cameron Rd.	WC_STR_17000 [30.4044, -97.5434]	130' wide bridge	50% (2-year)	300' wide bridge	1520 LF of Raised Roadway	0.2% (500-year)	$3.1M

5.3.1 Travis Road Crossing 1 – Wilbarger Creek Tributary 210 Cele Road Crossing

The crossing on Cele Road is located north of the Reserve at Westcreek subdivision [Lat. 30.4557, Long. -97.5514]. Hydraulic analysis shows existing condition Wilbarger Creek Tributary 210 overtopping Cele Road to a depth of 0.9 feet during the 50% ACE and 3.1 feet during the 1% ACE.

To help reduce roadway overtopping, a 24-inch-thick slab beam bridge with four 50-foot spans and approximately 1,160 linear feet of roadway profile changes with an elevation increase of 1.5 feet are recommended. The bridge will have three (3) foot diameter circular piers and three (3) foot high guard rails. The extent of the raised road will not impact the driveways of adjacent properties. Additionally, the

channel underneath the bridge will need to be widened and stabilized with concrete at a 2:1 side slope. The extents of the existing and proposed structure openings and proposed road elevation extents are shown in **Figure 5-4**.

The proposed bridge meets the City of Austin Drainage Criteria Manual to pass the 1% ACE as seen in **Appendix H-2**. However, the Cele Road bridge solution is contingent on the channel benching for the Reserve at Westcreek subdivision improvements. The subdivision improvements are explained in Section 5.6.2 of the report. The bridge improvement and subdivision improvements work in tandem to provide a higher level of flood mitigation and reduction of roadway improvements costs rather than pursuing individual solutions at a higher cost. These projects can be phased as funding allows. An estimate of probable project cost for the proposed roadway crossing improvements is shown in **Appendix H-3** which was determined to be approximately $4.3 million.

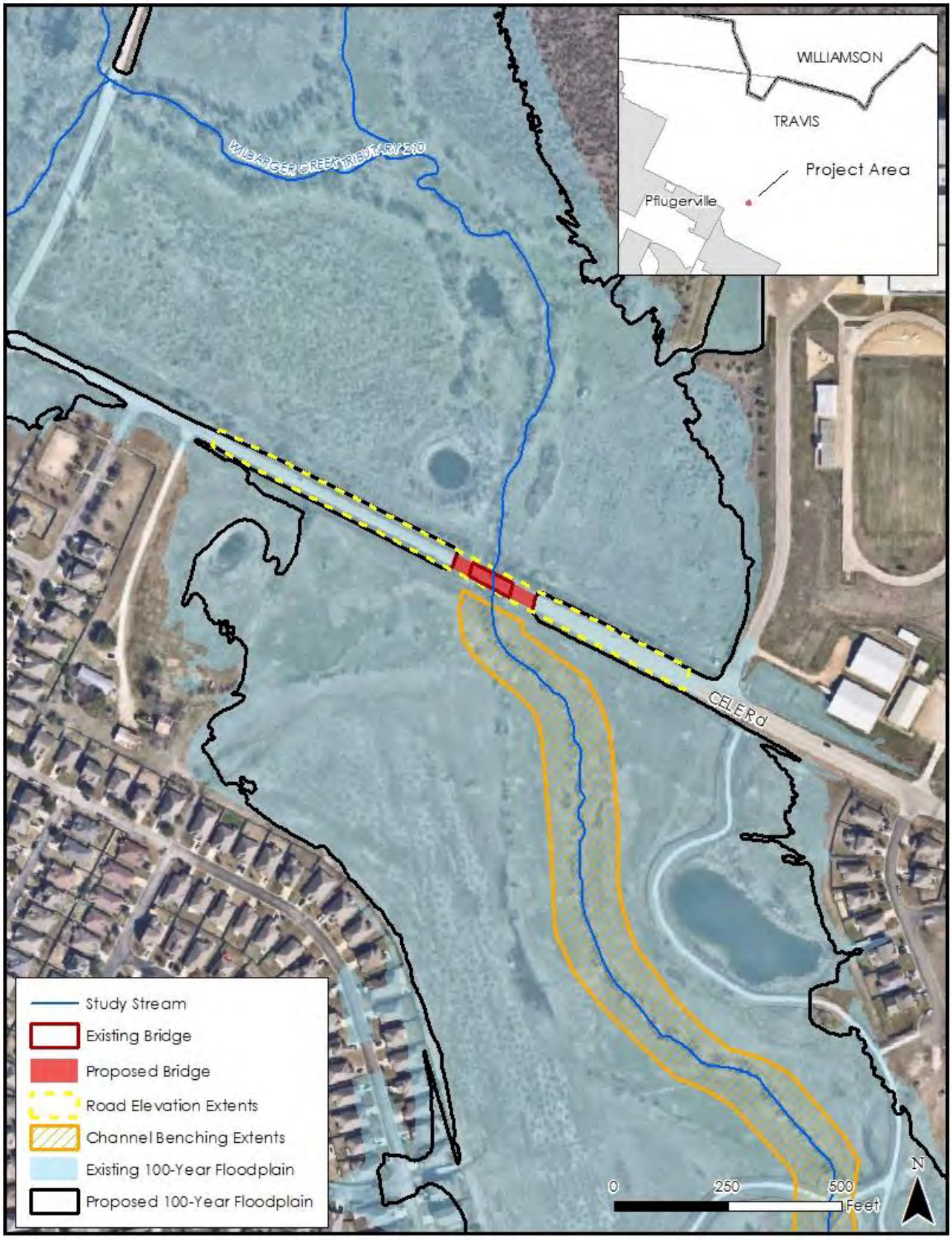


FIGURE 5-4: WILBARGER CREEK TRIBUTARY 210 CELE ROAD CROSSING IMPROVEMENTS

5.3.2 Travis Road Crossing 2 – Wilbarger Creek Tributary 220 Gregg Lane Crossing

The crossing on Gregg Lane is located approximately 2.2 miles east of SH 130 and approximately 1.4 miles west of FM 973 [Lat. 30.3854, Long. -97.5491]. Hydraulic analysis shows existing conditions Wilbarger Creek Tributary 220 overtopping Gregg Lane to a depth of 1.5 feet during the 50% ACE and 3.3 feet during the 1% ACE.

To help reduce roadway overtopping, a 24-inch-thick slab beam bridge with four 50-foot spans is proposed. The bridge will have three (3) foot diameter circular piers and three (3) foot high guard rails. Approximately 870 linear feet of roadway profile changes with an elevation increase of 3.6 feet are recommended. The property adjacent to Gregg Lane has a driveway that intersects the road approximately 300 feet of the creek crossing as shown in **Figure 5-5**. The driveway will need to be raised approximately 2.5 feet to match the proposed elevation of Gregg Lane.

The proposed bridge meets the City of Austin Drainage Criteria Manual to pass the 1% ACE as shown in **Appendix H-2**. An estimate of probable project cost for the proposed roadway crossing improvements is shown in **Appendix H-3** which was determined to be approximately $5.5 million.

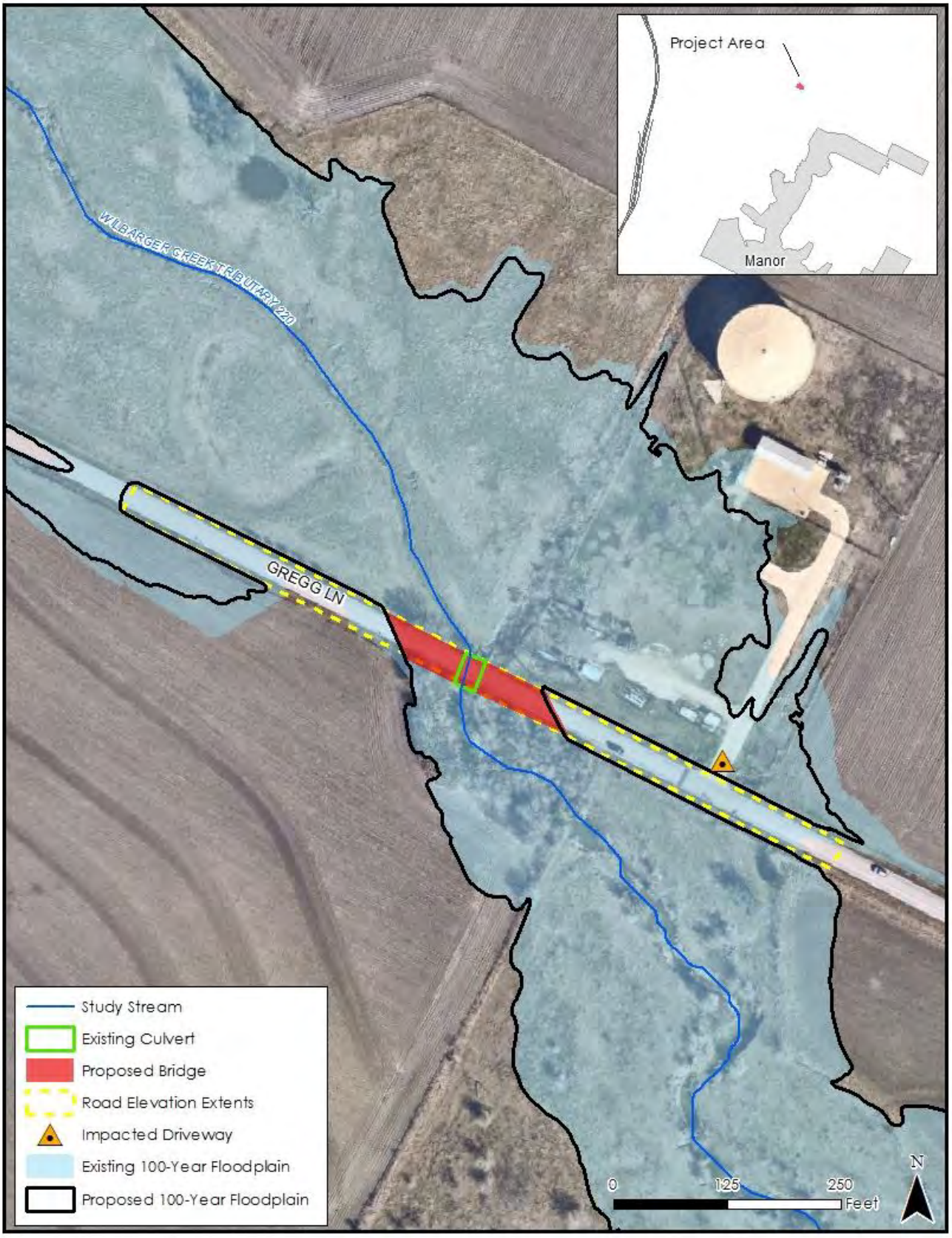


FIGURE 5-5: WILBARGER CREEK TRIBUTARY 220 GREGG LANE CROSSING IMPROVEMENTS

5.3.3 Travis Road Crossing 3 – Wilbarger Creek Cameron Road Crossing

The crossing on Wilbarger Creek on Cameron Road [Lat. 30.4044, Long. -97.5434] is located approximately 2.5 miles east of SH 130. Hydraulic analysis shows existing conditions Wilbarger Creek overtopping Cameron Road to a depth of 2.8 feet during the 50% ACE and 10.2 feet during the 1% ACE.

To help reduce roadway overtopping, a bridge with six 50 foot spans is proposed. The bridge will have three (3) foot diameter circular piers, a 42-inch-thick deck, and three (3) foot tall rails. Approximately 1,520 linear feet of roadway profile changes with an elevation increase of nine (9) feet are required for the proposed bridge to meet the City of Austin Drainage Criteria Manual to pass the 1% ACE. The property adjacent to Cameron road has a driveway that intersects the road approximately 390 feet south of the creek crossing. The driveway will need to be raised 2.9 feet to match the proposed elevation of Cameron Road as shown in **Figure 5-6**. The significant change of the roadway profile will impact the floodplain on the upstream side of the structure by raising the water surface elevation higher than the existing water surface elevation. To prevent this, the channel underneath the bridge will need to be widened at 3:1 side slope with a 280-foot-wide channel bottom width. The channel grading helps prevent the proposed 1% ACE floodplain extents from exceeding the existing floodplain extents. An estimate of probable project cost for the proposed roadway crossing improvements is shown in **Appendix H-3** which was determined to be approximately $3.1 million.

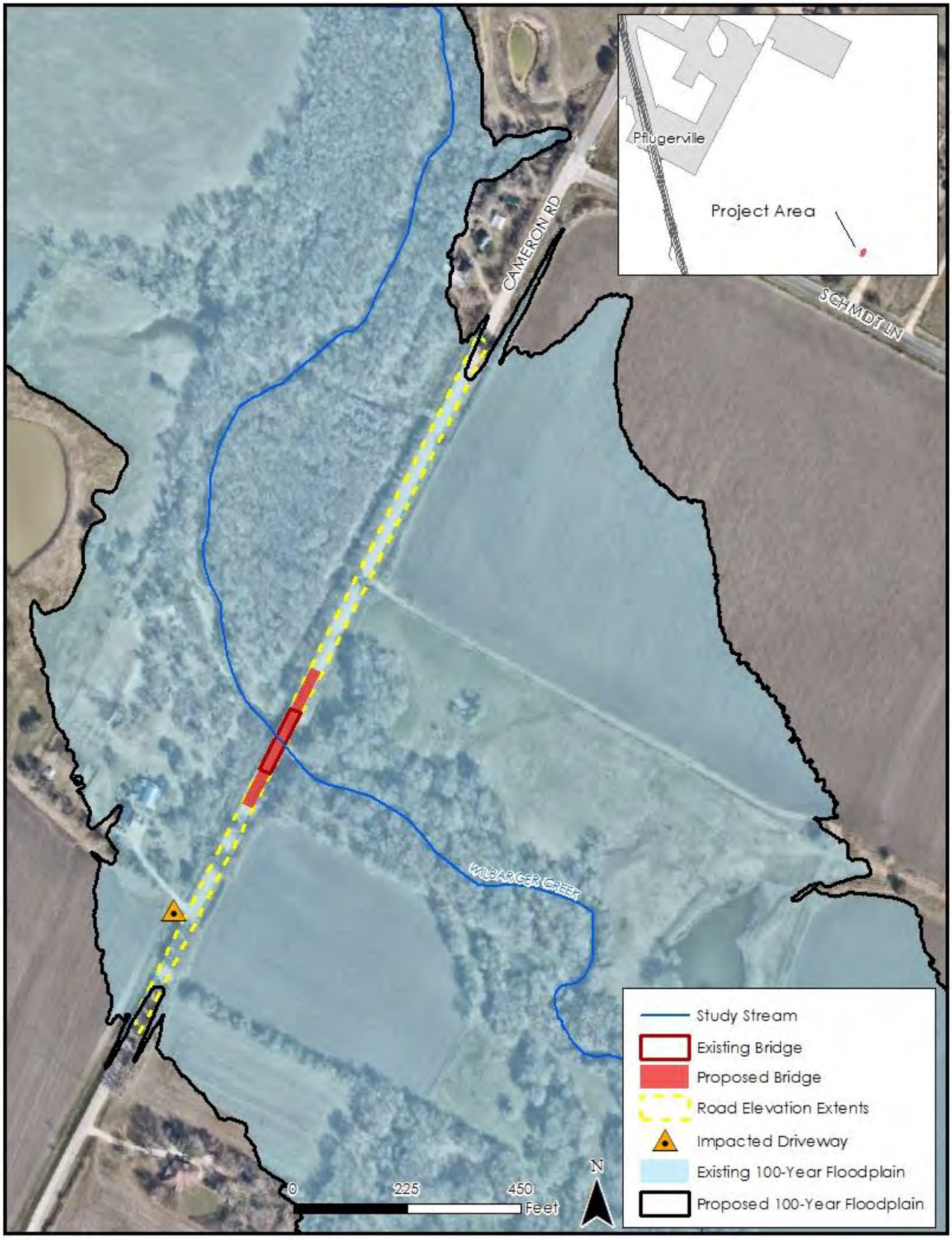


FIGURE 5-6: WILBARGER CREEK CAMERON ROAD CROSSING IMPROVEMENTS

5.4 Road Crossing Alternatives – City of Pflugerville

An alternative analysis of the following three crossings was conducted to identify potential improvements to reduce risk.

- Wilbarger Creek FM 685 crossing
- Wilbarger Creek East Pflugerville Parkway crossing
- Wilbarger Creek Tributary 200 Kennemer Drive crossing

Table 5-6 provides a summary of details for existing and proposed conditions at each of the three structures and indicates the level of service and estimate of probable cost for each structure. All three structures currently do not meet the City of Pflugerville Engineering Design Manual in passing the 1% ACE in existing conditions.

TABLE 5-6: CITY OF PFLUGERVILLE ROADWAY IMPROVEMENT SUMMARY

Road Crossing	Structure ID [Lat., Long.]	Existing Conditions		Proposed Improvement			
		Existing Structure	Overtopping Event (ACE)	Structural Improvement	Roadway Improvement	Overtopping Event (ACE)	Probable Cost Estimate
Wilbarger Creek FM 685	WC_STR_24000 [30.4572, -97.6013]	100'wide bridge	20% (5-year)	200' wide bridge	810 LF of Raised Roadway	0.2% (500-year)	$8.3M
Wilbarger Creek E. Pflugerville Pkwy	WC_STR_23000 [30.4554, -97.6010]	150' wide bridge	4% (25-year)	200' wide bridge	1700 LF Channel Improvement	0.2% (500-year)	$3.1M
Wilbarger Creek Trib 200 Kennemer Dr.	WC_T200_STR_13000 [30.4726, -97.5820]	12 - 8' x 6' RCBs	20% (5-year)	150'wide bridge	230 LF of Raised Roadway & Concrete Bridge Opening (2:1 side slope)	4% (25-year)	$3.4M

5.4.1 Pflugerville Road Crossings 1 & 2 – Wilbarger Creek FM 685 and East Pflugerville Parkway Crossings

Crossing 1 on Wilbarger Creek at FM 685 [Lat. 30.4572, Long. -97.6013] is located west of SH 130, and crossing 2 on Wilbarger Creek at East Pflugerville Parkway [Lat. 30.4554, Long. -97.6010] is approximately 730 feet downstream of the FM 685 crossing (see **Figure 5-7**). Both FM 685 and East Pflugerville Parkway are located in close proximity to each other, therefore, Halff developed an integrated solution for the two

road crossings. Existing conditions hydraulic analysis indicates Wilbarger Creek will overtop FM 685 to a depth of 1.6 feet during the 20% ACE and four (4) feet during the 1% ACE and East Pflugerville Parkway will overtop to a depth of 0.9 feet during the 4% ACE and 2.2 feet during the 1% ACE.

To help reduce roadway inundation and increase vehicular safety two bridges are proposed at FM 685 and East Pflugerville Parkway along with channel benching to increase channel capacity. The proposed improvements at FM 685 will be a bridge with four 50-foot spans and approximately 810 linear feet of roadway profile changes with an elevation increase of two (2) feet. The East Pflugerville Parkway improvements include a bridge with four 50-foot spans and with no change in roadway profile. Each bridge will have three (3) foot diameter circular piers, a 42-inch-thick deck, and 3-foot-tall rails. The length of the rails on FM 685 will be kept as 800 feet for protection from the ditch located on the right overbank on the upstream side of the road. East Pflugerville Parkway also includes the removal of the concrete drop structure that is located on the upstream face the structure. Proposed channel improvements consist of approximately 1,700 linear feet of channel benching only on the eastern side of the creek. The proposed channel benching has a 100-foot-wide bottom excavation placed two (2) feet above the existing channel flowline with a 3:1 side slope and extend approximately 230 feet upstream of FM 685, approximately 730 feet from FM 685 to East Pflugerville Parkway, and approximately 720 feet downstream of East Pflugerville Parkway. The extents of the existing and proposed structure openings and channel benching are shown in **Figure 5-7**.

Advanced design will be required to determine if the existing East Pflugerville Parkway bridge is able to be salvaged. If the road is not being raised, then there is a possibility that the bridge can be salvaged, and the additional span length can be added to the existing structure. At this conceptual stage, FM 685 is proposed to be raised by two (2) feet which likely requires a new structure. East Pflugerville Parkway is not proposed to be raised and may be able to be salvaged. For construction cost estimating purposes, Halff assumed an additional new span will be added to the existing East Pflugerville Parkway bridge structure.

The proposed bridge improvements for both roads meet the City of Pflugerville Engineering Design Manual to pass the 1% ACE. An estimate of probable project cost for the proposed roadway crossing improvements is shown in **Appendix H-3** which was determined to be approximately $8.3 million for FM 685 and $3.1 million for E. Pflugerville Parkway.

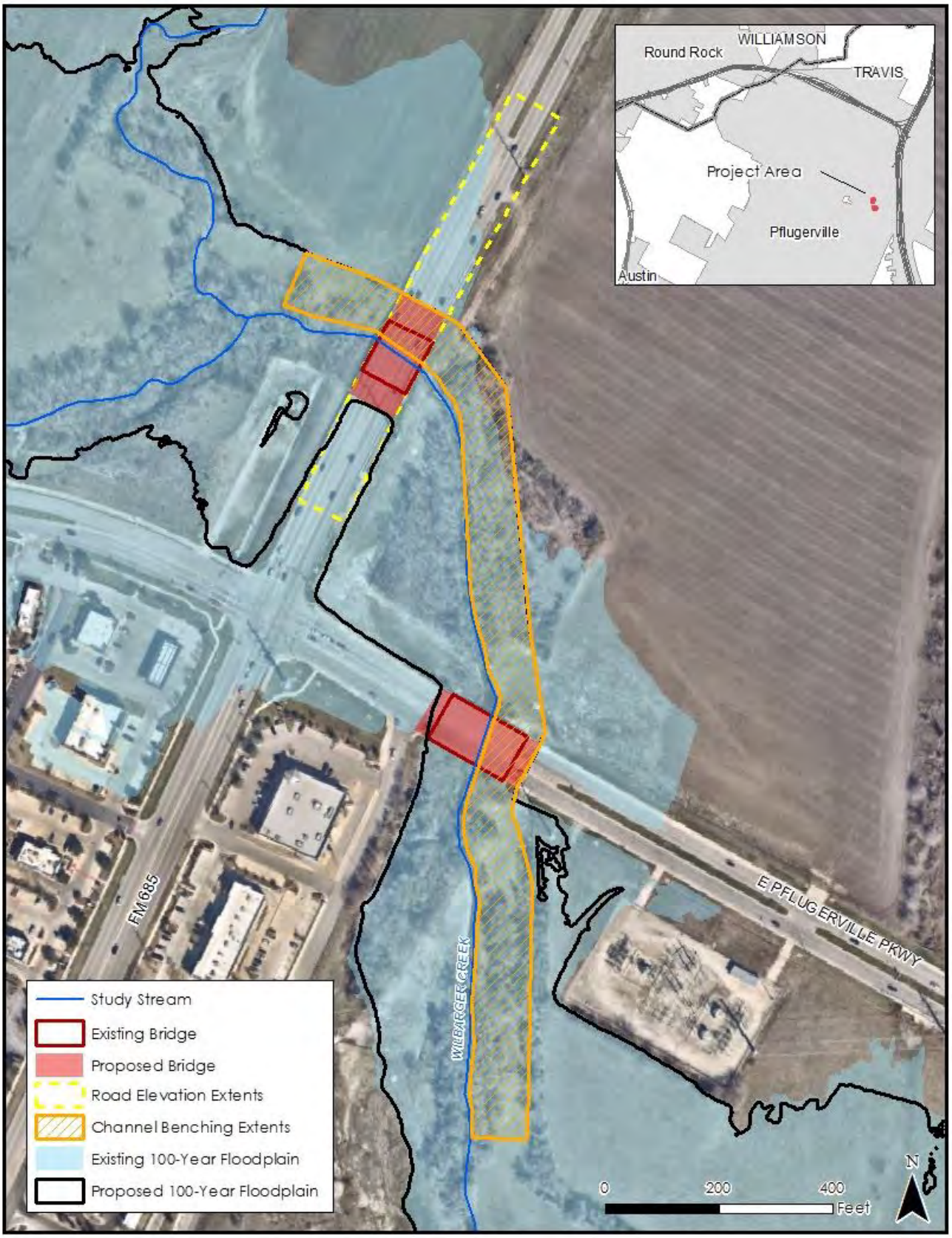


FIGURE 5-7: WILBARGER CREEK FM 685 AND EAST PFLUGERVILLE PARKWAY CROSSINGS IMPROVEMENTS

5.4.2 Pflugerville Road Crossing 3 – Wilbarger Creek Tributary 200 Kennemer Drive Crossing

The crossing on Kennemer Drive is in the Falcon Pointe and Fairways of Blackhawk subdivisions that are located east of SH 130 [Lat. 30.4726, Long. -97.5820]. Hydraulic analysis shows existing conditions Wilbarger Creek Tributary 200 overtopping Kennemer Drive to a depth of 0.2 feet during the 20% ACE and 2.7 feet during the 1% ACE.

To help reduce roadway inundation, a 24-inch-thick slab beam bridge with three 50-foot spans and approximately 230 linear feet of roadway profile changes with an elevation increase of 0.8 feet are recommended. The bridge will have three (3) foot diameter circular piers and three (3) foot high guard rails. A bigger bridge was not proposed due to the two residential driveways bounding the downstream channel. The extent of the raised road was limited to 230 linear feet to avoid raising the road at the driveways. Additionally, the channel underneath the bridge will need to be widened and stabilized with concrete at a 2:1 side slope. The extents of the existing and proposed structure openings and proposed road elevation extents are shown in **Figure 5-8**.

The proposed bridge does not currently meet the City of Pflugerville Engineering Design Manual to pass the 1% ACE and is still overtopped by the 4% ACE. However, with the proposed solution, the road crossing passes the 20% and 10% ACEs and improves vehicular safety**.** The top width of the proposed 1% ACE floodplain is reduced by 50 feet through the bridge, and the 1% ACE roadway overtopping is reduced from 2.7 feet to 1.2 feet resulting in an overtopping reduction of 1.5 feet. An estimate of probable project cost for the proposed roadway crossing improvements is shown in **Appendix H-3** which was determined to be approximately $3.4 million.

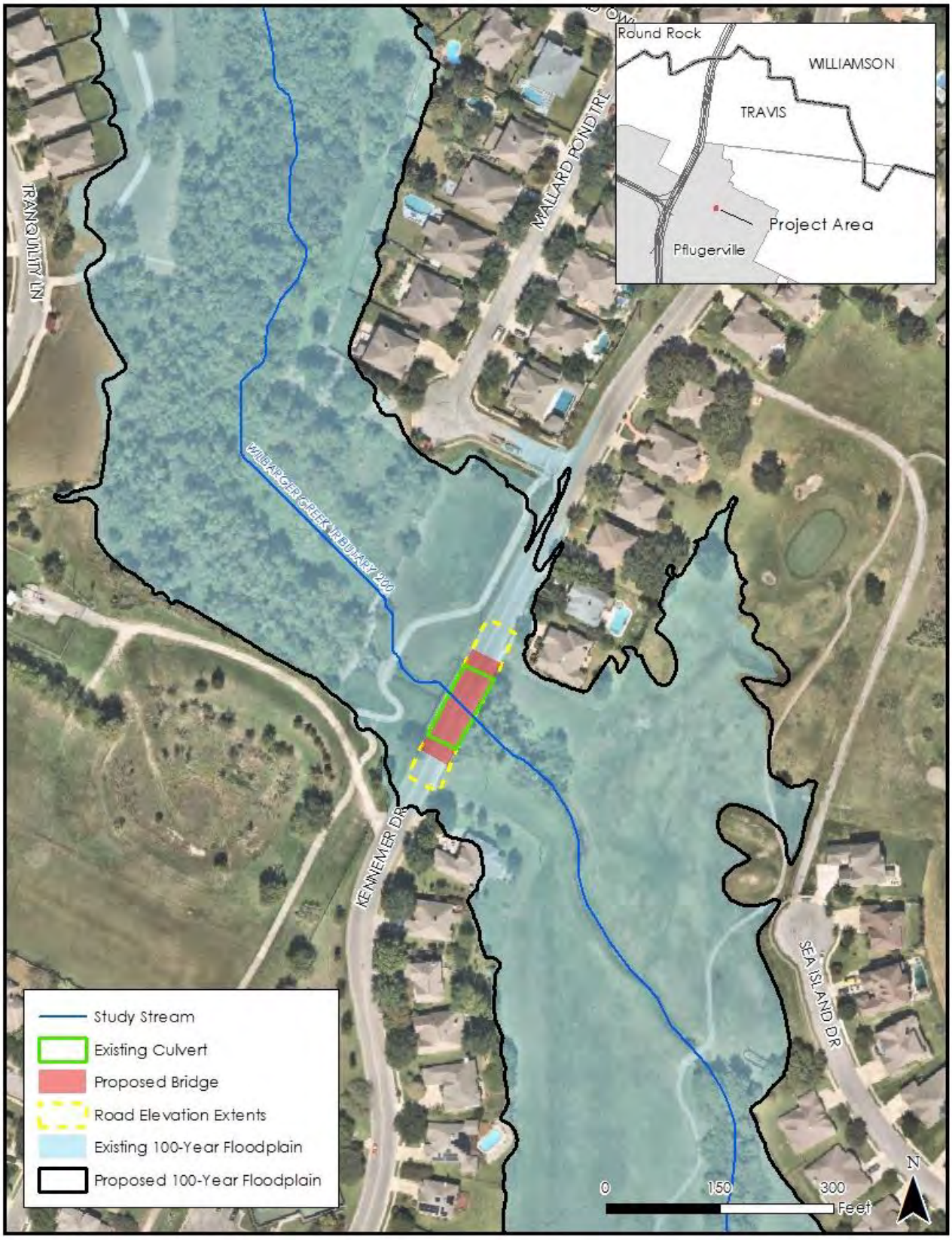


FIGURE 5-8: WILBARGER CREEK TRIBUTARY 200 KENNEMER DRIVE CROSSING IMPROVEMENTS

5.5 Subdivision Alternatives – Travis County

5.5.1 Shadowglen Phase 1 Sections 9, 11, 12, and 13 Subdivision

The Shadowglen subdivision is located north of U.S. 290 and west of FM 973 in Travis County. Wilbarger Creek runs just west of the subdivision and crosses Lexington Street approximately 3,700 feet downstream of the confluence with Wilbarger Creek Tributary 229 [Lat. 30.3547, Long. -97.5554] and U.S. 290 [Lat. 30.3492, Long. -97.5497] approximately 3,600 feet downstream of Lexington Street. The floodplains developed from the hydrologic and hydraulic analysis show that approximately133 residential homes in Phase 1 Sections 9, 11, 12, and 13 are at risk of flooding during the 1% ACE. Lexington Street is overtopped by 50% ACE by 4.3 feet, but a flood mitigation solution is not proposed because it is not a County roadway.

Regional detention was evaluated upstream of the Shadowglen area, but the natural terrain is not suited for placement of a viable dam embankment. While a dam could be constructed in this area, it would not be cost-effective and the required length and height of a proposed dam embankment would be classified as a high hazard dam per TCEQ Dam Safety regulations. Following conversations with Travis County, it was decided to seek other mitigation strategies for this area.

The proposed improvements include upgrading the U.S. 290 westbound and eastbound bridges, approximately 5,430-linear-foot channel benching, and removing fills and ponds from the ShadowGlen Golf Club golf course. The U.S. 290 bridges will be expanded from 420' wide bridges to 1,350' wide bridges with 26 spans. Each bridge will have three (3) foot diameter circular piers, a 42-inch-thick deck, and three (3) foot tall rails. The proposed channel benching has a 200-foot-wide bottom excavation placed two (2) feet above the existing channel flowline with 3:1 side slopes and extends approximately 2,590 feet upstream and approximately 2,260 feet downstream of Lexington Street. An existing golf course is located within the Wilbarger Creek floodplain and contains a significant number of small hills that have subsequently reduced floodplain storage. The flood mitigation solution considers removal of the golf course hills within the floodplain to increase floodplain storage. The golf course is located within the City of Manor jurisdiction which will require Travis County to coordinate closely with the City regarding the adjustment of golf course hills within the Wilbarger Creek floodplain should this component advance during design. The proposed improvements reduced the 1% ACE floodplain extents as shown in **Figure 5-9.** While this recommended alternative removes 81 homes from the floodplain, 52 homes remain inside the reduced 1% ACE floodplain. An estimate of probable project costs for the proposed roadway crossing improvements, channel improvement, and improved floodplain storage with reductions of the golf course hills is shown in **Appendix H-3** which was determined to be $50 million.

To analyze the benefits of this alternative, existing flood elevations and finished floor elevations were determined for each building within the 0.2% ACE floodplain. Finished floor elevations were based on subdivisions plans provided by Travis County for some of the subdivision phases. Where no site plans were available, finished floor elevations where estimated based on LiDAR terrain data and subdivision grading plans. Approximately 213 homes are identified within the 0.2% ACE floodplain extents where the home

is inundated above their finished floor elevation. Based on the existing 213 structures inundated, only 52 homes were removed from inundation during the 0.2% ACE with the recommended alternative. The benefit cost ratio resulted to a 0.35, suggesting that the mitigation costs outweigh the benefits. However, this analysis only considers structural damages to the homes and does not consider a value of lot and roadway flooding. Further detailed BCA analysis is recommended should the County decide to advance the proposed flood mitigation solutions. The benefit-cost analysis is shown in **Appendix H-4** that summarizes the total number of at risk structures and their estimated damages for each storm event. To reduce risk for all impacted homes in the Shadowglen subdivision, the County may consider property acquisition (buyouts) for the remaining at-risk homes.

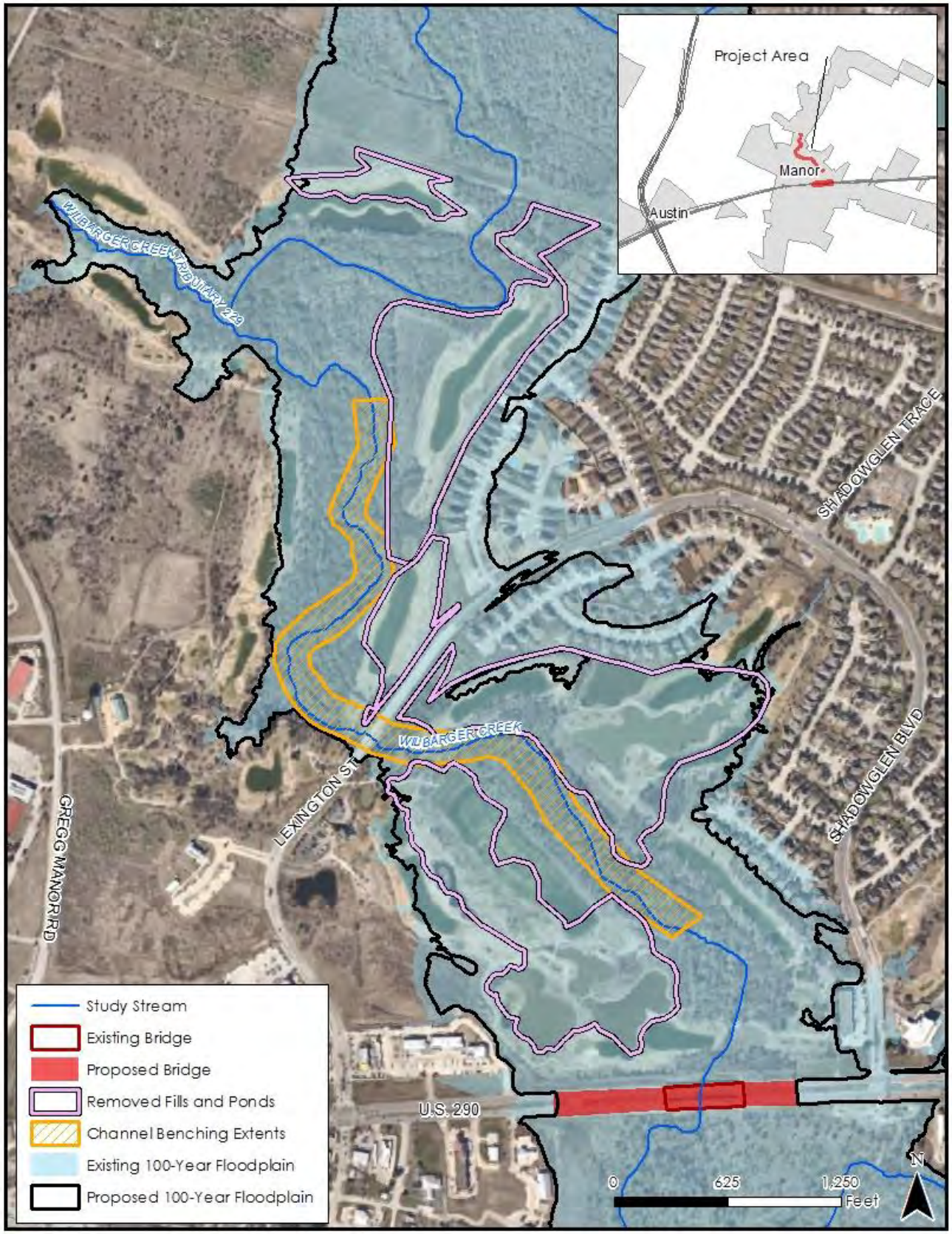


FIGURE 5-9: SHADOWGLEN SUBDIVISION IMPROVEMENTS

5.5.2 Reserve at Westcreek Subdivision

The Reserve at Westcreek subdivision is located east of the intersection of Kelly Lane and Weiss Lane in Travis County and just south of the crossing on Wilbarger Creek Tributary 210 on Cele Road [Lat. 30.4557, Long. -97.5514]. The floodplains developed from the hydrologic and hydraulic analysis are showing that there are currently 63 properties at risk of flooding during the 1% ACE and 88 properties during the 0.2% ACE. The subdivision plans provided by Travis County contained the finished floor elevation (FFE) for each home on these properties. These FFEs were used to determine the flood risk of each home. All home FFE's are above the 1% ACE floodplain elevation, however seven home FFEs are below the existing condition 0.2% ACE floodplain elevation. While the FFEs are generally above the floodplain elevations, many properties experience lot and local roadway flooding. As noted in Section 5.4.1, the Reserve at Westcreek subdivision improvements are combined with the Cele Road roadway improvements and should be considered as an integrated solution.

Channel benching on Wilbarger Creek Tributary 210 would decrease the existing condition floodplain elevations by increasing channel capacity. The proposed channel benching extends approximately 4,000 linear feet downstream of Cele Road and has a 150-foot-wide bottom excavation placed two (2) feet above the existing channel flowline with 3:1 side slopes. When the channel is excavated, it is important to avoid damaging the existing gas pipeline shown in **Figure 5-10**. With the excavated channel, the number of homes experiencing lot flooding would decrease to 29 properties for 1% ACE and 70 properties for 0.2% ACE. Additionally, the water surface elevations of the proposed 0.2% ACE are also lower than all seven home FFEs that are at risk of flooding during the existing 0.2% ACE. An estimate of probable project cost for the proposed channel improvements is shown in **Appendix H-3** which was determined to be approximately $2.5 million.

To analyze the benefits of this alternative, existing flood elevations and finished floor elevations were determined for each building within the 0.2% ACE floodplain. Finished floor elevations were based on subdivisions plans provided by Travis County. Approximately 88 homes are identified within the 0.2% ACE floodplain extents with only six (6) determined to be inundated above their finished floor elevation. Based on the existing six (6) structures inundated during the existing 0.2% ACE floodplain, all homes were removed from inundation during the 0.2% ACE with the recommended alternative. The benefit cost ratio resulted to 0.02, suggesting that the mitigation costs outweigh the benefits. However, this analysis only considers structural damages to the homes and does not consider a value of lot and roadway flooding. Further detailed BCA analysis is recommended should the County decide to advance the proposed flood mitigation solutions. The benefit-cost analysis is shown in **Appendix H-4** that summarizes the total number of at risk structures and their estimated damages for each storm event.

FIGURE 5-10: RESERVE AT WESTCREEK SUBDIVISION IMPROVEMENTS

5.6 Subdivision Alternatives – City of Pflugerville

5.6.1 Highland Park Subdivision

The Highland Park Phase C subdivision is located south of SH 45 and west of SH 130 in City of Pflugerville. Wilbarger Creek Tributary 185 is located east of the subdivision and crosses Craters of the Moon Boulevard at [Lat. 30.4705, Long. -97.4158]. There are two (2) homes within the 1% ACE existing conditions floodplain. Culvert improvements are proposed under Craters of the Moon Boulevard to remove the homes from the 1% ACE floodplain. Currently, there are multiple box culverts underneath the roadway which includes one 10 foot x 4 foot reinforced concrete box culvert at the main creek centerline and five 8 foot x 4 foot reinforced concrete box culverts at the secondary channel opening approximately 120 feet east of the crossing [Lat. 30.4704, Long. -97.6155]. Several options were evaluated including upstream excavation and berming along the roadway, but the results did not show significant benefits to meet City criteria. Installation of two additional 8 foot x 4 foot reinforced concrete box culverts on the west side of the existing box culvert structure on the secondary channel is proposed. Grading on the upstream overbank will be necessary to allow flow though the culverts. Additionally, Crater of the Moon Boulevard is currently overtopped by the existing 1% ACE on the right overbank due to a sag in the roadway profile. A 150-foot-long, 1.5-foot-tall berm is recommended to be installed on the upstream side of the road to prevent water flowing on the road for events up to 1% ACE.

With the proposed solution, Craters of the Moon Boulevard that is currently overtopped 1.7 feet during the 2% ACE, can pass the 1% ACE and meet the City of Pflugerville Engineering Design Manual. The roadway improvements also remove the two (2) homes from the 1% ACE floodplain as shown in **Figure 5-11**. An estimate of probable project cost for the proposed roadway crossing improvements is shown in **Appendix H-3** which was determined to be approximately $578,100.

To analyze the benefits of this alternative, existing flood elevations and finished floor elevations were determined for each building within the 0.2% ACE floodplain. Finished floor elevations were based on subdivisions plans provided by Travis County. Approximately six (6) homes were identified within the 0.2% ACE floodplain extents. None of the six (6) homes were determined to be inundated above their finished floor elevation. Based on this evaluation, there are no estimated damages during existing 0.2% ACE floodplain and the benefit cost ratio would be 0.00, suggesting that the mitigation costs outweigh the benefits. However, this analysis only considers structural damages to the homes and does not consider a value of property and roadway flooding. Because the benefit cost ratio is 0.00, the analysis is not included in the appendices.

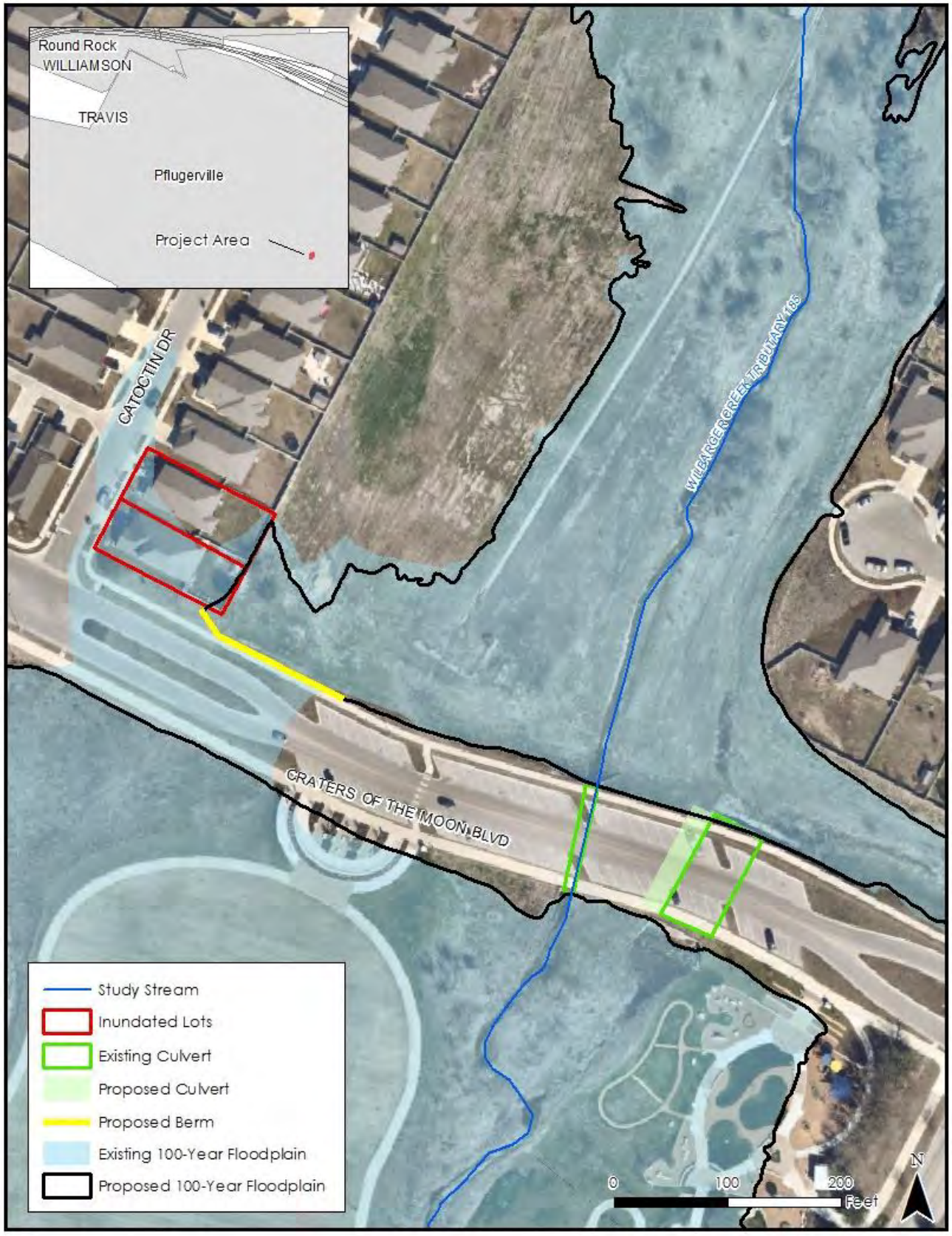


FIGURE 5-11: HIGHLAND PARK SUBDIVISION IMPROVEMENTS

6.0 FLOOD MONITORING EVALUATION

Flood resilience includes a variety of strategies. A common strategy particularly common in Flash Flood Alley is flood monitoring. Flood monitoring via the use of gaging stations provides real-time information to the public and emergency personnel during storm events. These types of monitoring systems provide a significant benefit by providing flood level elevations within the watershed to assist emergency personnel and the public with vital information in making decisions to reduce flood risk. Opportunities identified for Wilbarger Creek include identifying roadway overtopping risk, locations for stream gage placement, and flood monitoring systems. Implementation of a flood monitoring system could reduce the use of County and City resources during storm events and improve safety of residents.

6.1 Roadway Overtopping Risk Determination

As part of this study, an urgency rating was developed for 20 roadways in Bastrop County, 83 roadways in Travis County, and 10 roadways in the City of Pflugerville in the Wilbarger Creek watershed that overtop during storm events. **Appendix H-1** shows the Atlas 14, 24-hour rainfall depth for the storm events that would overtop these roadway crossings. The Counties and the City may utilize this information to monitor rainfall gages within the watershed and deploy road crews to close road crossings with greater confidence.

6.2 Stream Gage Placement Opportunities

Stream gage placement is ideal along critical roadways and low water crossings that serve as the only point of ingress or egress for residents. As such, gage placement along roads with a high Annual Average Daily Traffic are proposed for each jurisdiction. **Figure 6-1** below displays these potential stream gage placements for the three jurisdictions. Within the Wilbarger Creek watershed the Lower Colorado River Authority (LCRA) Hydromet system has an existing stream gage located on FM 1704 at Wilbarger Creek. Within only one stream gage within the entire Wilbarger Creek watershed, there are many opportunities for additional stream gages in the mid to upper portions of the watershed.

Proposed stream gages within the watershed within the City of Pflugerville are at crossings on Wilbarger Creek at Weiss Lane and SH 130, both have a high AADT within the watershed and therefore are important locations to gage the rise in the Creek during a storm event. US 290 crosses multiple streams within Travis County, the two largest are Wilbarger Creek on the western side near Manor, and Cottonmouth Creek near the eastern portion of the watershed. The confluence of Willow Creek and Little Willow Creek is upstream of US 290, placing a gage at that location would gage the rise in water surface at two large creeks in the middle of the watershed. US 290 has the highest AADT and serves as an important access road to City of Austin. Travis County could also benefit from stream gages place along FM 973 along a larger tributary at Wilbarger Creek Tributary 056. Albert Voelker Road is just downstream of the confluence of Dry Creek West and Elm Creek and is positioned to allow both Travis and Bastrop County to get a

measurement of the flood wave moving through the watershed. Placing a gage at Bitting School Road on Wilbarger Creek just north of the county boundary with Bastrop County would give the county an idea of the rise in water before it enters their jurisdiction. Bastrop County's roads with the highest AADT are located near or within the City of Elgin. A road within Bastrop County's jurisdiction that has a high AADT is Lower Elgin Road on Wilbarger Creek near the county line. Placing a gage at this crossing would give the county an idea of the speed of the flood wave as moves through the County.

Two common gaging devices include real-time precipitation gages and stream stage gages. Following implementation of gaging stations, development of rating curves and observation of gage data at specific locations can be established with alerting triggers during storm events. These triggers can activate on-site safety measures such as automated flood gate closure or flood warning lights. These gaging networks and devices monitor developing flood threats and either activate on-site safety measures or send alerts to emergency personnel and the public. Annual estimated maintenance costs average about $15,000 per year per stream gage.

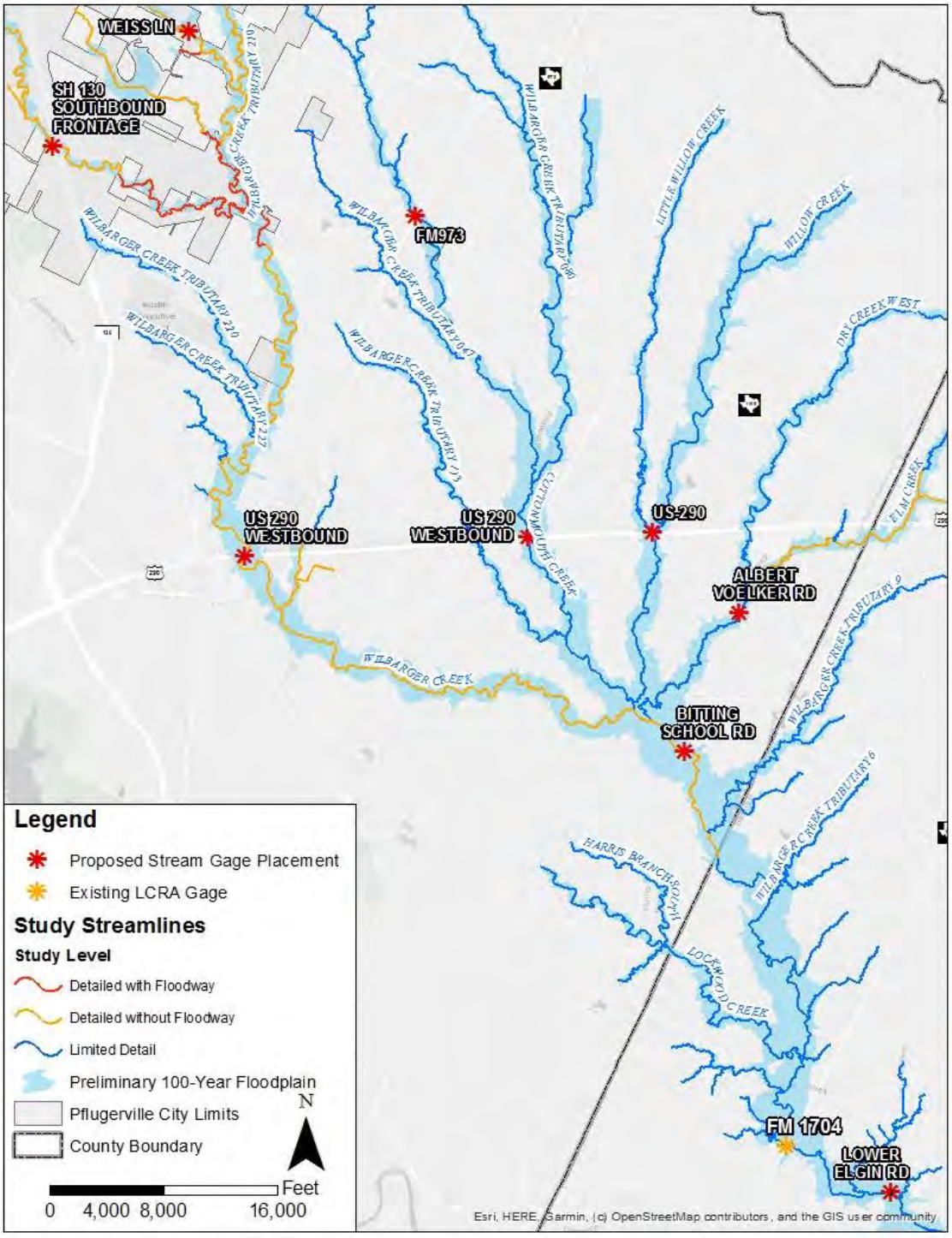


FIGURE 6-1: PROPOSED STREAM GAGE LOCATIONS

6.3 Flood Hazard Web Map

Many entities such as the Upper Brushy Creek Water Control and Improvement District and Hays County and are using Flood Monitoring Systems with the development of interactive web maps. A public and/or secured web map can be developed for the public and emergency personnel to monitor flood risk within the County. Of particular interest in this study, would be road closures and flood threat within the

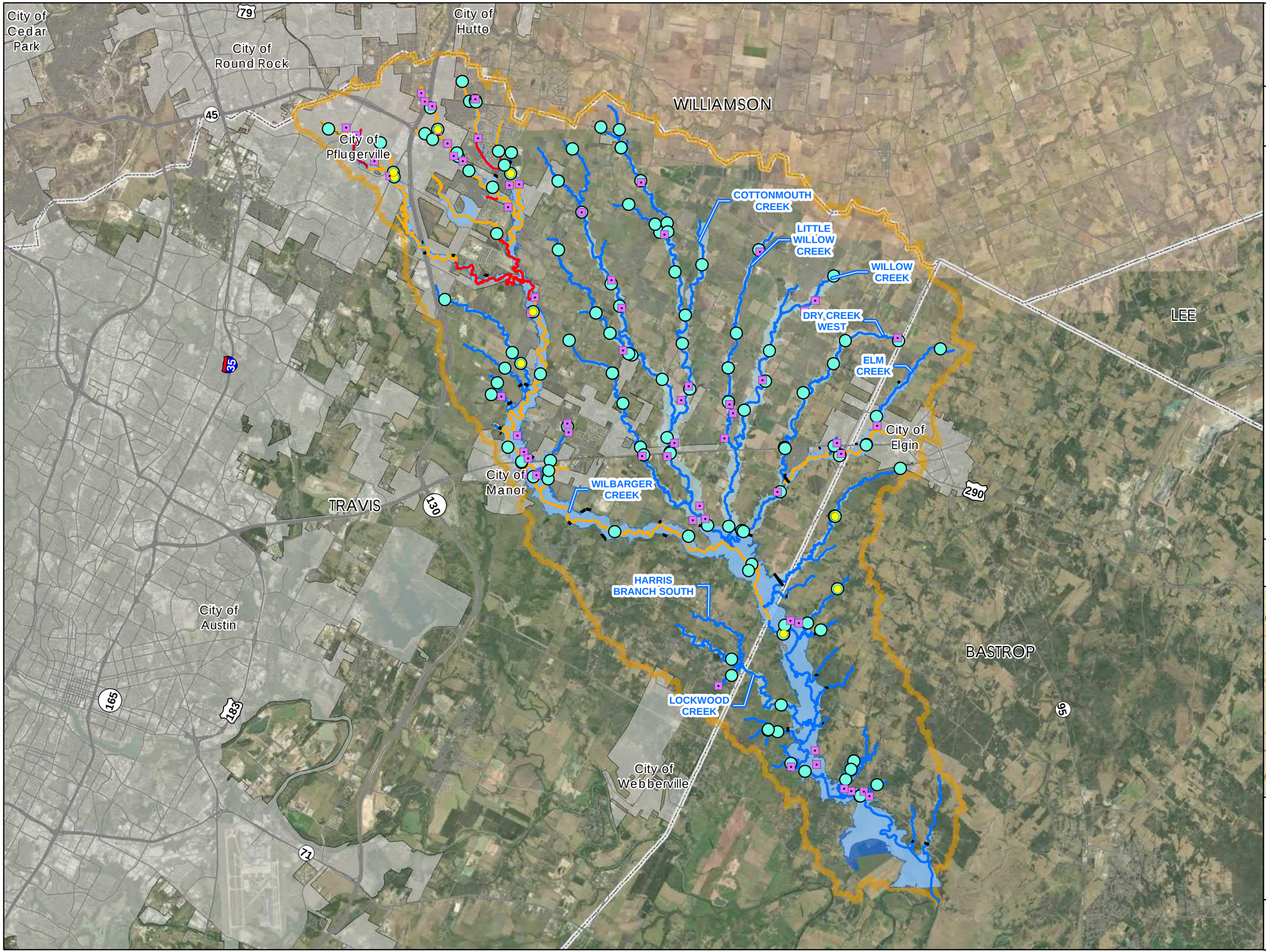
Wilbarger Creek watershed. Common components of these web maps include stream gage readings, colored symbology to visualize flood threat, and display of inundation mapping. Frequency floodplains for storm events can be accessed in a secured Flood Monitoring System that displays real-time inundation levels associated with flood gage readings, radar rainfall, and NWS rainfall. These web maps can be developed to leverage existing information such as the City of Austin ATX Floods website, the LCRA Hydromet, and the U.S. Geologic Survey gaging and inundation data. The City of Austin ATX Floods website allows Bastrop County. Travis County, and City of Pflugerville to manually log into the City of Austin ATX Floods website and identify low water crossings that are closed due to high water based on feedback from field crews. Once stream gages are installed, these closure notifications could be automated. A Flood Monitoring System and associated web map would enhance the Counties' and City's ability to makes real time decisions regarding flood risk thus improving public safety.

6.3.1 Automated Creek Crossing Alerts

Stream gages on creek crossings can activate triggers to alert residents of high water at road crossings. Once an alert is triggered by a particular gage reading, signal lights can be activated, text alerts can be activated, and/or flood gates can be automatically closed at the crossing. The roadway closure and/or flashing light warnings would notify drivers that the road is unsafe to cross.

Appendix A: Exhibits

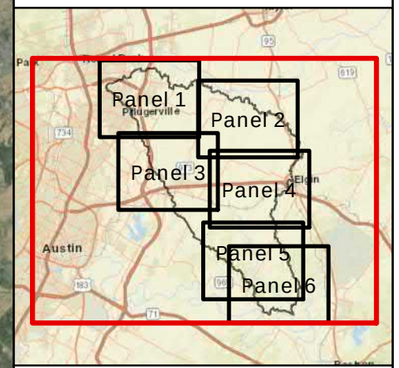
A-1 Watershed Overview



Wilbarger Creek Watershed Study

- Roadway Improvements
- Structures in 100-Yr Floodplain
- Overtopped Public Road Crossings
- 500-Year Limit of Study
- Limited Detail Study
- Detailed Study with Floodway
- Detailed Study without Floodway
- 100-Year Floodplain
- 500-Year Floodplain
- Watershed Boundary
- County Boundary
- City Boundary

Exhibit A1
Watershed Overview



N

0 12,000 24,000 Feet

HALFF

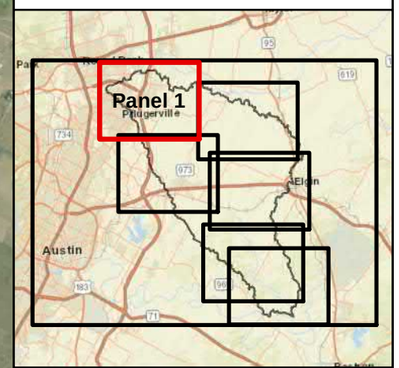
Wilbarger Creek Watershed Study

City of Round Rock
City of Hutto
WILLIAMSON
TRAVIS
City of Pflugerville
45
130

WILBARGER CREEK TRIBUTARY 185
WILBARGER CREEK TRIBUTARY 206
WILBARGER CREEK TRIBUTARY 186
WILBARGER CREEK TRIBUTARY 187
WILBARGER CREEK TRIBUTARY 200
WILBARGER CREEK TRIBUTARY 209
WILBARGER CREEK TRIBUTARY 056
WILBARGER CREEK TRIBUTARY 216
WILBARGER CREEK TRIBUTARY 062
WILBARGER CREEK TRIBUTARY 207
WILBARGER CREEK TRIBUTARY 210
WILBARGER CREEK
WILBARGER CREEK TRIBUTARY 178
WILBARGER CREEK TRIBUTARY 196
WILBARGER CREEK TRIBUTARY 047

- Roadway Improvements
- Structures in 100-Yr Floodplain
- Overtopped Public Road Crossings
- 500-Year Limit of Study
- Limited Detail Study
- Detailed Study with Floodway
- Detailed Study without Floodway
- 100-Year Floodplain
- 500-Year Floodplain
- Watershed Boundary
- County Boundary
- City Boundary

Exhibit A1.1
Watershed Overview



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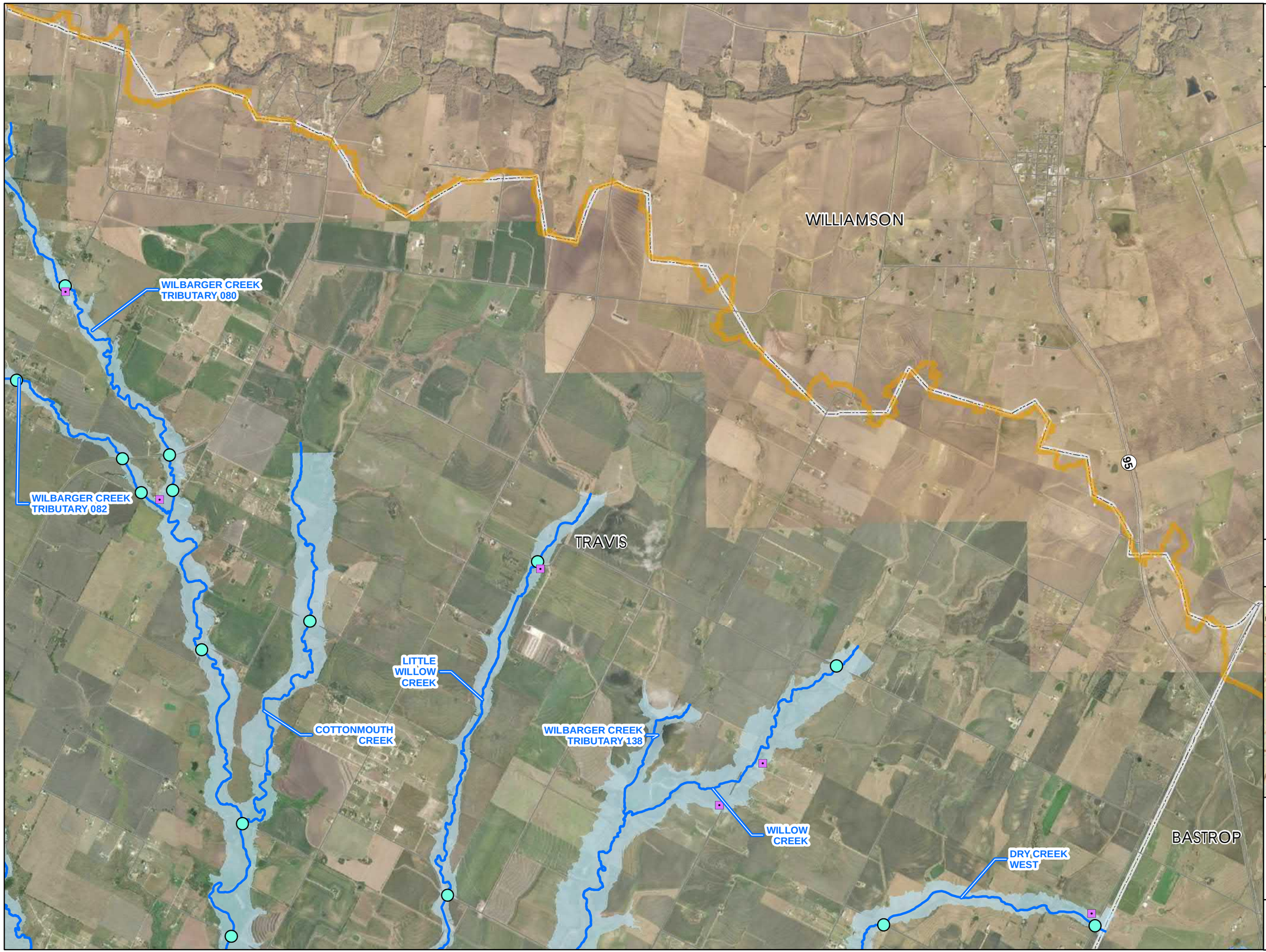
0 3,000 6,000 Feet

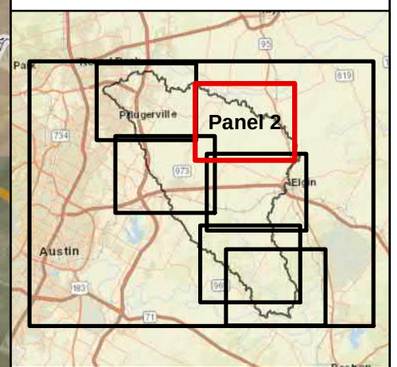
HALFF



Wilbarger Creek Watershed Study

- Roadway Improvements
- Structures in 100-Yr Floodplain
- Overtopped Public Road Crossings
- 500-Year Limit of Study
- Limited Detail Study
- Detailed Study with Floodway
- Detailed Study without Floodway
- 100-Year Floodplain
- 500-Year Floodplain
- Watershed Boundary
- County Boundary
- City Boundary

Exhibit A1.2
Watershed Overview



N

0 3,000 6,000 Feet

HALFF

Wilbarger Creek Watershed Study

City of Pflugerville

City of Austin

City of Manor

TRAVIS

WILBARGER CREEK TRIBUTARY 220

WILBARGER CREEK TRIBUTARY 227

WILBARGER CREEK TRIBUTARY 171

WILBARGER CREEK

WILBARGER CREEK TRIBUTARY 047

WILBARGER CREEK TRIBUTARY 113

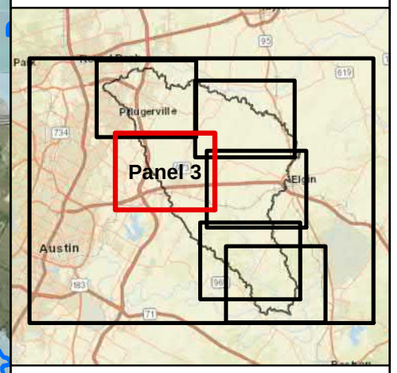
WILBARGER CREEK TRIBUTARY 167

130

290

- Roadway Improvements
- Structures in 100-Yr Floodplain
- Overtopped Public Road Crossings
- 500-Year Limit of Study
- Limited Detail Study
- Detailed Study with Floodway
- Detailed Study without Floodway
- 100-Year Floodplain
- 500-Year Floodplain
- Watershed Boundary
- County Boundary
- City Boundary

Exhibit A1.3
Watershed Overview



N

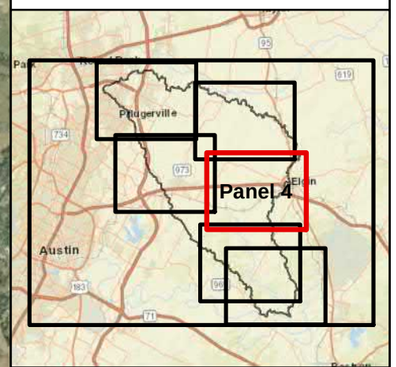
0 3,000 6,000 Feet

HALFF

Wilbarger Creek Watershed Study

- Roadway Improvements
- Structures in 100-Yr Floodplain
- Overtopped Public Road Crossings
- 500-Year Limit of Study
- Limited Detail Study
- Detailed Study with Floodway
- Detailed Study without Floodway
- 100-Year Floodplain
- 500-Year Floodplain
- Watershed Boundary
- County Boundary
- City Boundary

Exhibit A1.4
Watershed Overview



N

0 3,000 6,000 Feet

HALFF

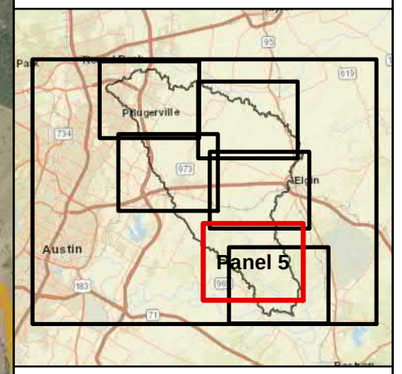
LITTLE WILLOW CREEK
City of Manor
WILLOW CREEK
WILBARGER CREEK TRIBUTARY 260
ELM CREEK TRIBUTARY 1
290
95
City of Elgin
DRY CREEK WEST
TRAVIS
ELM CREEK
COTTONMOUTH CREEK
BASTROP
WILBARGER CREEK TRIBUTARY 9
WILBARGER CREEK
WILBARGER CREEK TRIBUTARY 298
WILBARGER CREEK TRIBUTARY 286
WILBARGER CREEK TRIBUTARY 6

Wilbarger Creek Watershed Study

WILBARGER CREEK TRIBUTARY 6
HARRIS BRANCH SOUTH
WILBARGER CREEK TRIBUTARY 030
WILBARGER CREEK TRIBUTARY 304
LOCKWOOD CREEK
TRAVIS
WILBARGER CREEK TRIBUTARY 305
WILBARGER CREEK TRIBUTARY 307
WILBARGER CREEK TRIBUTARY 027
WILBARGER CREEK TRIBUTARY 024
WILBARGER CREEK TRIBUTARY 025
WILBARGER CREEK TRIBUTARY 4
BASTROP
City of Webberville
WILBARGER CREEK
WILBARGER CREEK TRIBUTARY 328
WILBARGER CREEK TRIBUTARY 018
WILBARGER CREEK TRIBUTARY 326
WILBARGER CREEK TRIBUTARY 3
WILBARGER CREEK TRIBUTARY 1
WILBARGER CREEK TRIBUTARY 346

- Roadway Improvements
- Structures in 100-Yr Floodplain
- Overtopped Public Road Crossings
- 500-Year Limit of Study
- Limited Detail Study
- Detailed Study with Floodway
- Detailed Study without Floodway
- 100-Year Floodplain
- 500-Year Floodplain
- Watershed Boundary
- County Boundary
- City Boundary

Exhibit A1.5
Watershed Overview



N

0 3,000 6,000 Feet

HALFF

TRAVIS

WILBARGER CREEK TRIBUTARY 305

WILBARGER CREEK TRIBUTARY 027

WILBARGER CREEK TRIBUTARY 024

WILBARGER CREEK TRIBUTARY 025

WILBARGER CREEK TRIBUTARY 4

WILBARGER CREEK

WILBARGER CREEK TRIBUTARY 328

WILBARGER CREEK TRIBUTARY 018

WILBARGER CREEK TRIBUTARY 326

WILBARGER CREEK TRIBUTARY 3

WILBARGER CREEK TRIBUTARY 1

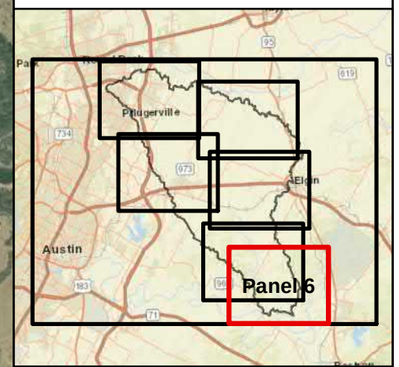
BASTROP

WILBARGER CREEK TRIBUTARY 346

Wilbarger Creek Watershed Study

- Roadway Improvements
- Structures in 100-Yr Floodplain
- Overtopped Public Road Crossings
- 500-Year Limit of Study
- Limited Detail Study
- Detailed Study with Floodway
- Detailed Study without Floodway
- 100-Year Floodplain
- 500-Year Floodplain
- Watershed Boundary
- County Boundary
- City Boundary

Exhibit A1.6
Watershed Overview



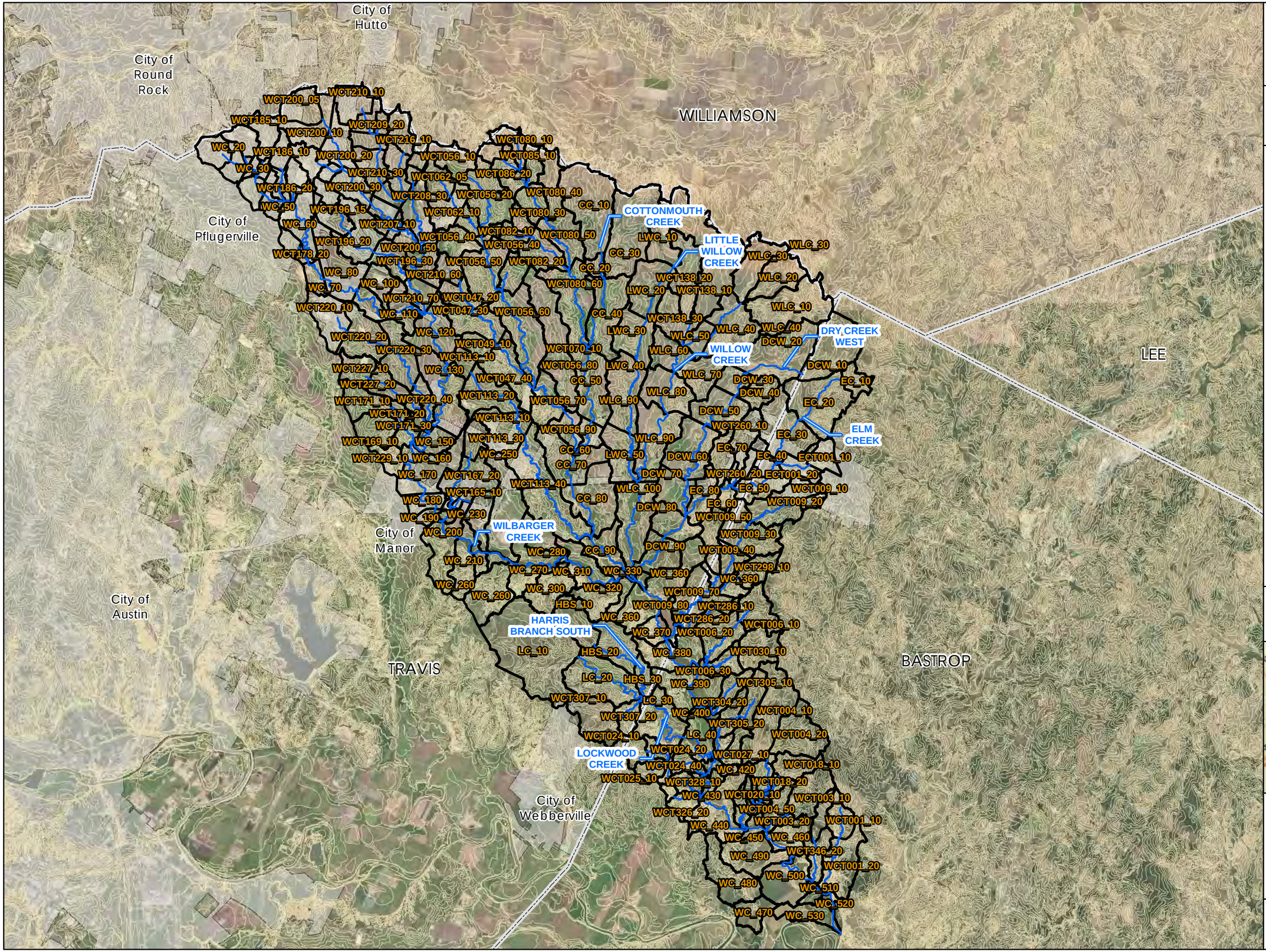
N

0 3,000 6,000 Feet

HALFF

Appendix A: Exhibits

A-2 Subbasin Map



Wilbarger Creek Watershed Study

Stream Centerlines

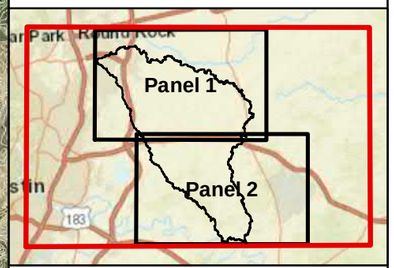
Contours - 10-ft

Wilbarger Subbasins

City Boundary

County Boundary

Exhibit A2
Subbasin Map



N

0 12,000 24,000 Feet

HALFF

Wilbarger Creek Watershed Study

Stream Centerlines

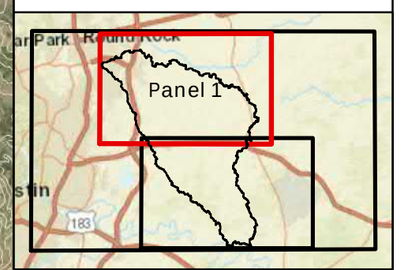
Contours - 10-ft

Wilbarger Subbasins

City Boundary

County Boundary

Exhibit A2.1
Subbasin Map



N

0 7,000 14,000 Feet

HALFF

City of Taylor
City of Hutto
City of Round Rock
City of Pflugerville
City of Austin
City of Manor
City of Elgin
WILLIAMSON
TRAVIS
BASTROP
LEE
WILBARGER CREEK
COTTONMOUTH CREEK
LITTLE WILLOW CREEK
WILLOW CREEK
DRY CREEK WEST
ELM CREEK
WCT200_05
WCT210_10
WCT209_10
WCT209_20
WCT185_10
WCT200_10
WCT210_20
WCT216_10
WCT183_10
WCT200_20
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WCT196_20
WCT200_50
WCT056_40
WCT178_20
WCT196_30
WCT056_40
WCT082_20
WC_80
WCT210_60
WCT056_50
WC_70
WCT047_10
WCT070_10
WC_100
WCT210_70
WCT080_60
WCT047_20
WC_90
WC_110
WCT056_60
WCT220_10
WCT047_30
WC_120
WCT220_20
WCT049_10
WCT070_10
WCT220_30
WCT227_10
WCT113_10
WCT047_40
WC_130
WCT227_20
WCT220_40
WCT113_20
WCT171_10
WCT227_30
WCT171_20
WCT171_30
WCT113_10
WCT169_10
WC_140
WCT113_30
WCT056_90
WCT167_10
WC_150
WCT229_10
WC_160
WCT113_40
WC_170
WCT167_20
WC_230
WC_180
WCT167_30
WCT167_40
WC_190
WC_200
WC_250
WCT113_50
WC_280
CC_10
CC_30
CC_20
CC_40
CC_50
CC_60
CC_70
CC_80
CC_90
WCT080_05
WCT080_10
WCT086_20
WCT086_10
WCT085_10
WCT080_20
WCT080_40
WCT056_70
LWC_10
WCT138_20
LWC_20
WCT138_30
LWC_30
LWC_40
LWC_50
WCT056_80
WCT056_90
LWC_90
WCT260_10
WCT260_20
LWC_100
WCT009_20
WCT009_10
WCT009_30
WCT009_50
WCT138_10
WLC_30
WLC_20
WLC_10
WLC_40
WLC_50
WLC_60
WLC_70
WLC_80
WLC_90
DCW_20
DCW_10
DCW_30
DCW_40
DCW_50
DCW_60
DCW_70
DCW_80
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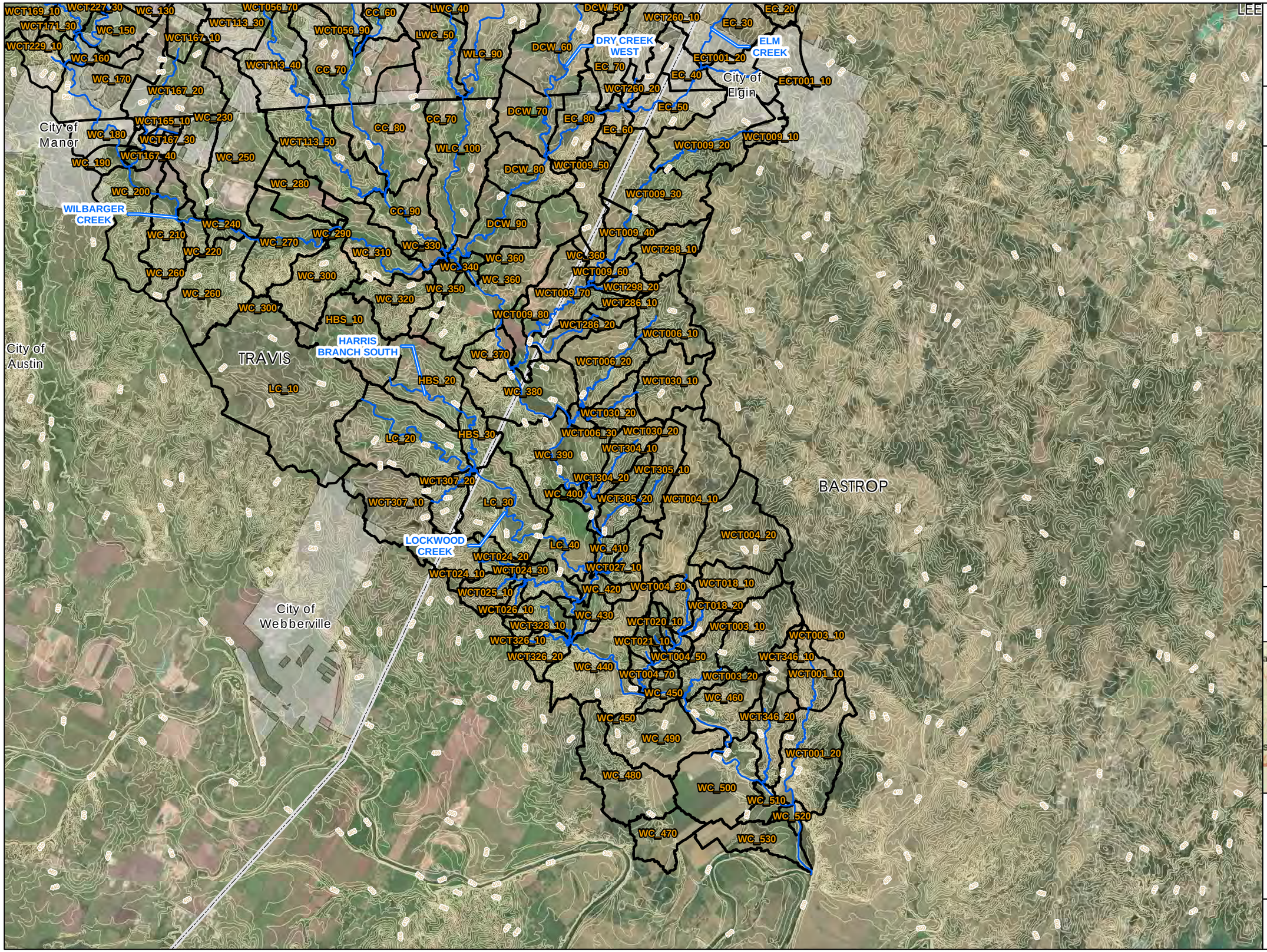
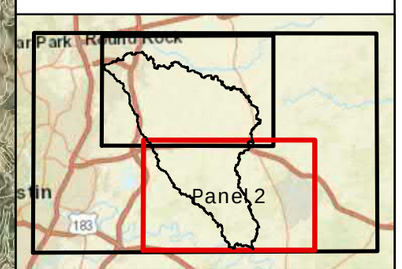
EC_20
EC_30
EC_70
EC_40
EC_50
EC_80
EC_60
ECT001_20
ECT001_10



Wilbarger Creek Watershed Study

- Stream Centerlines
- Contours - 10-ft
- Wilbarger Subbasins
- City Boundary
- County Boundary

Exhibit A2.2
Subbasin Map



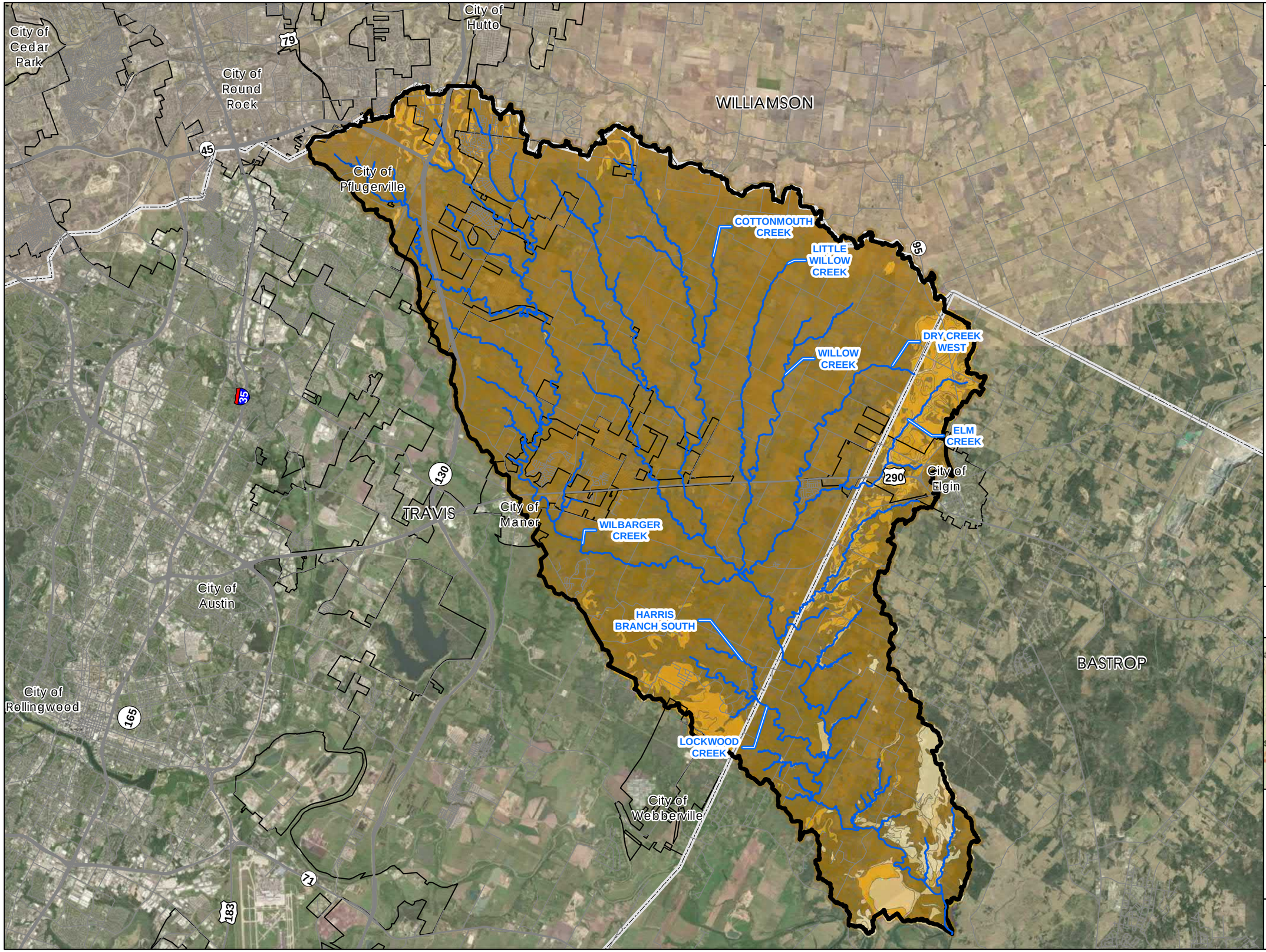
N

0 7,000 14,000 Feet

HALFF

Appendix A: Exhibits

A-3 Soil Map



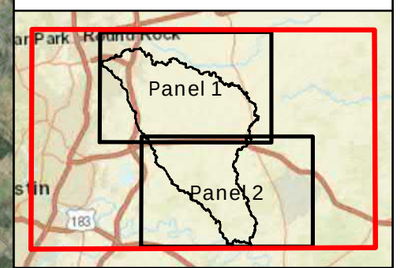
Wilbarger Creek Watershed Study

- Stream Centerlines
- Watershed Boundary
- City Boundary
- County Boundary

Hydrologic Soils Group

- Group A
- Group B
- Group C
- Group D

Exhibit A3
Soil Map

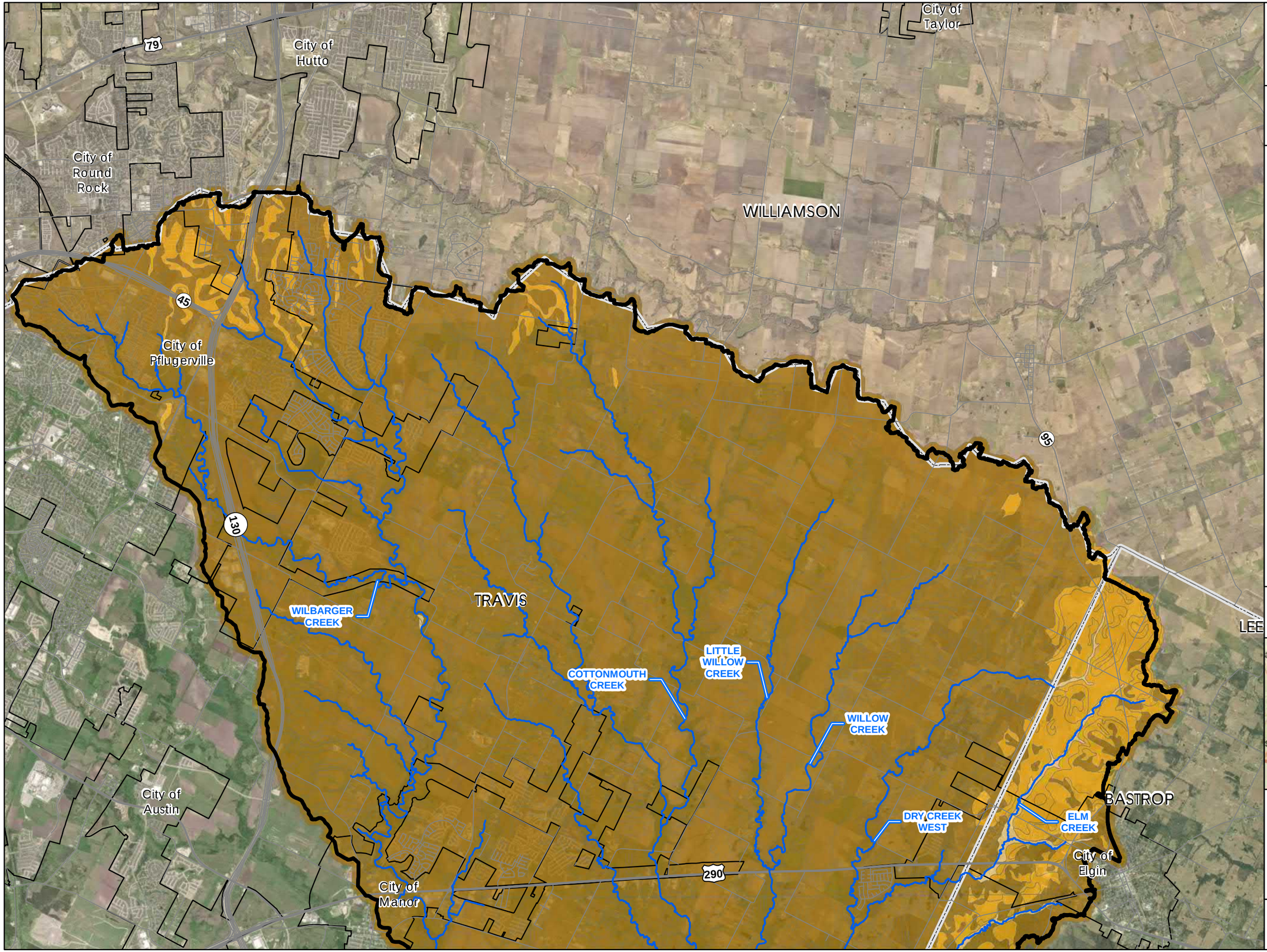


N

0 12,000 24,000 Feet

HALFF

Wilbarger Creek Watershed Study

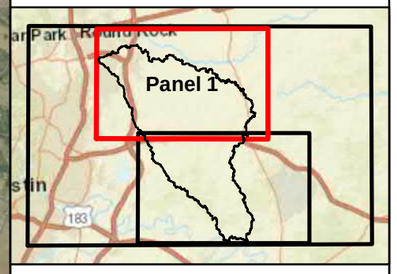


- Stream Centerlines
- Watershed Boundary
- City Boundary
- County Boundary

Hydrologic Soils Group

- Group A
- Group B
- Group C
- Group D

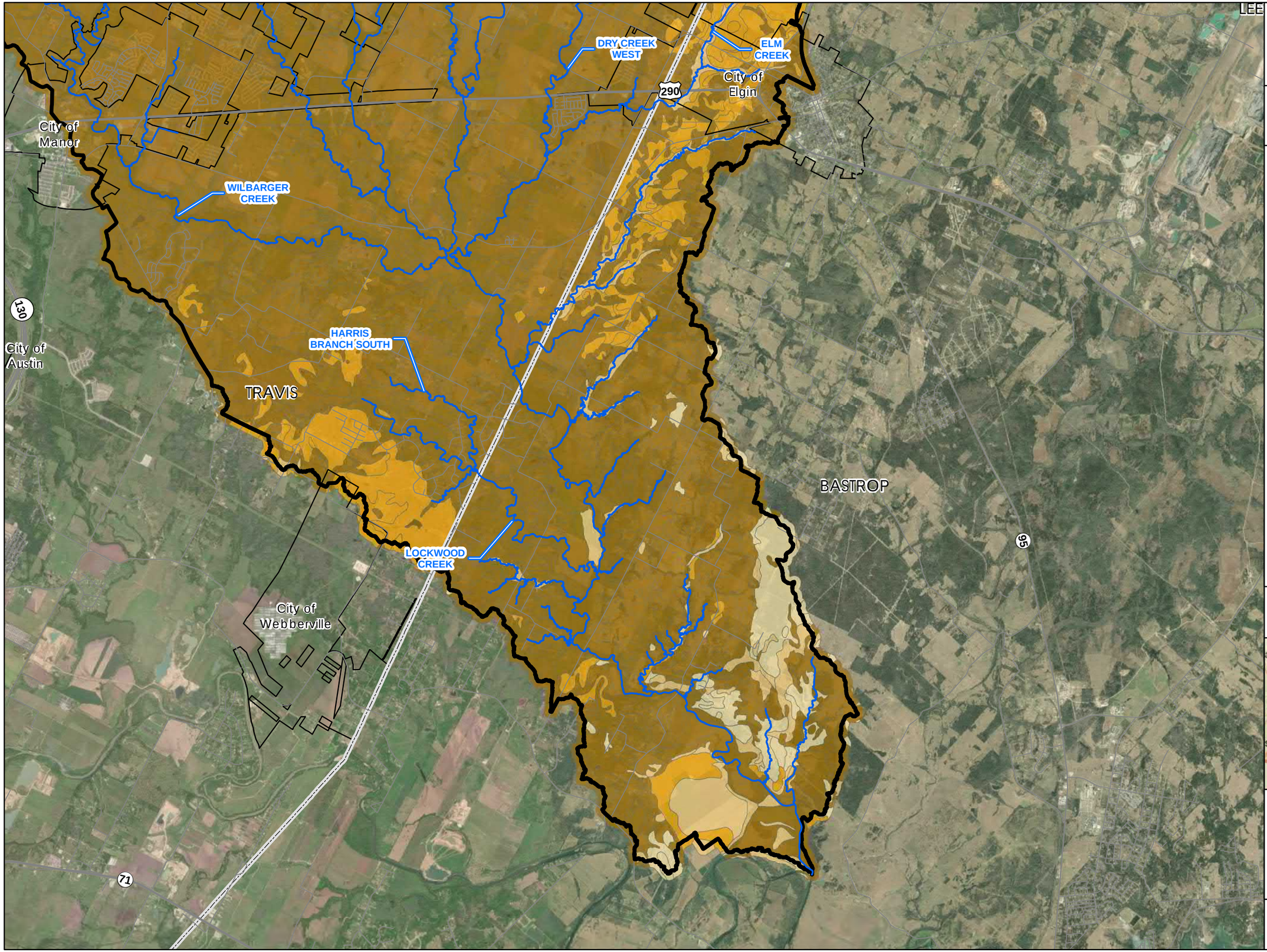
Exhibit A3.1
Soil Map



N

0 7,000 14,000 Feet

HALFF



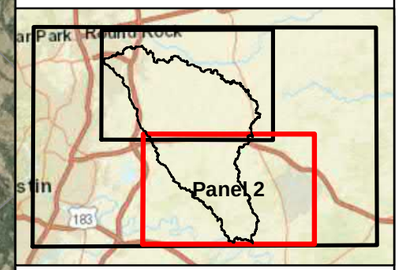
Wilbarger Creek Watershed Study

- Stream Centerlines
- Watershed Boundary
- City Boundary
- County Boundary

Hydrologic Soils Group

- Group A
- Group B
- Group C
- Group D

Exhibit A3.2
Soil Map



N

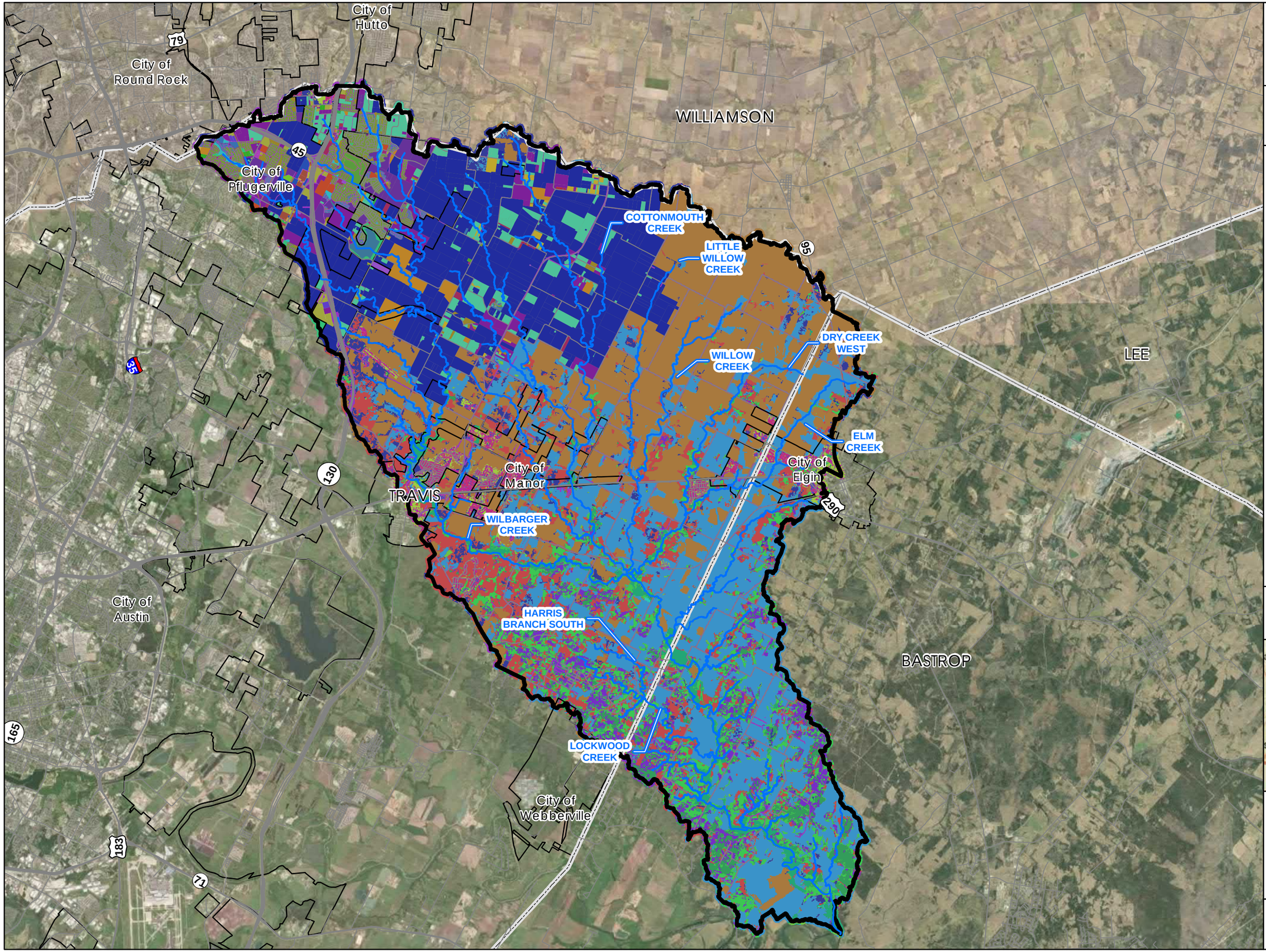
0 7,000 14,000 Feet

HALFF

Appendix A: Exhibits

A-4 Landuse Map

Wilbarger Creek Watershed Study



Stream Centerlines

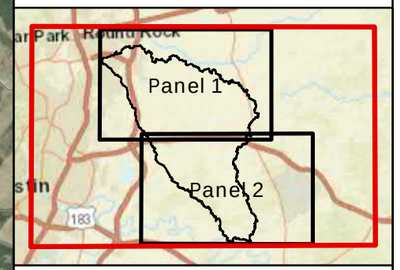
Watershed Boundary

City Boundary

County Boundary

See Page A4.3 for Landuse Classifications

Exhibit A4
Landuse Map



N

0 12,000 24,000 Feet

HALFF

Wilbarger Creek Watershed Study

Stream Centerlines

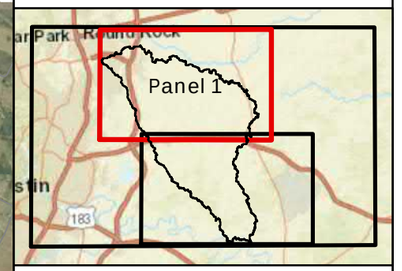
Watershed Boundary

City Boundary

County Boundary

See Page A4.3 for Landuse Classifications

Exhibit A4.1
Landuse Map



N

0 7,000 14,000 Feet

HALFF

WILLIAMSON

TRAVIS

LEE

BASTROP

City of Taylor

City of Hutto

City of Round Rock

City of Pflugerville

City of Austin

City of Manor

City of Elgin

79

45

130

290

95

COTTONMOUTH CREEK

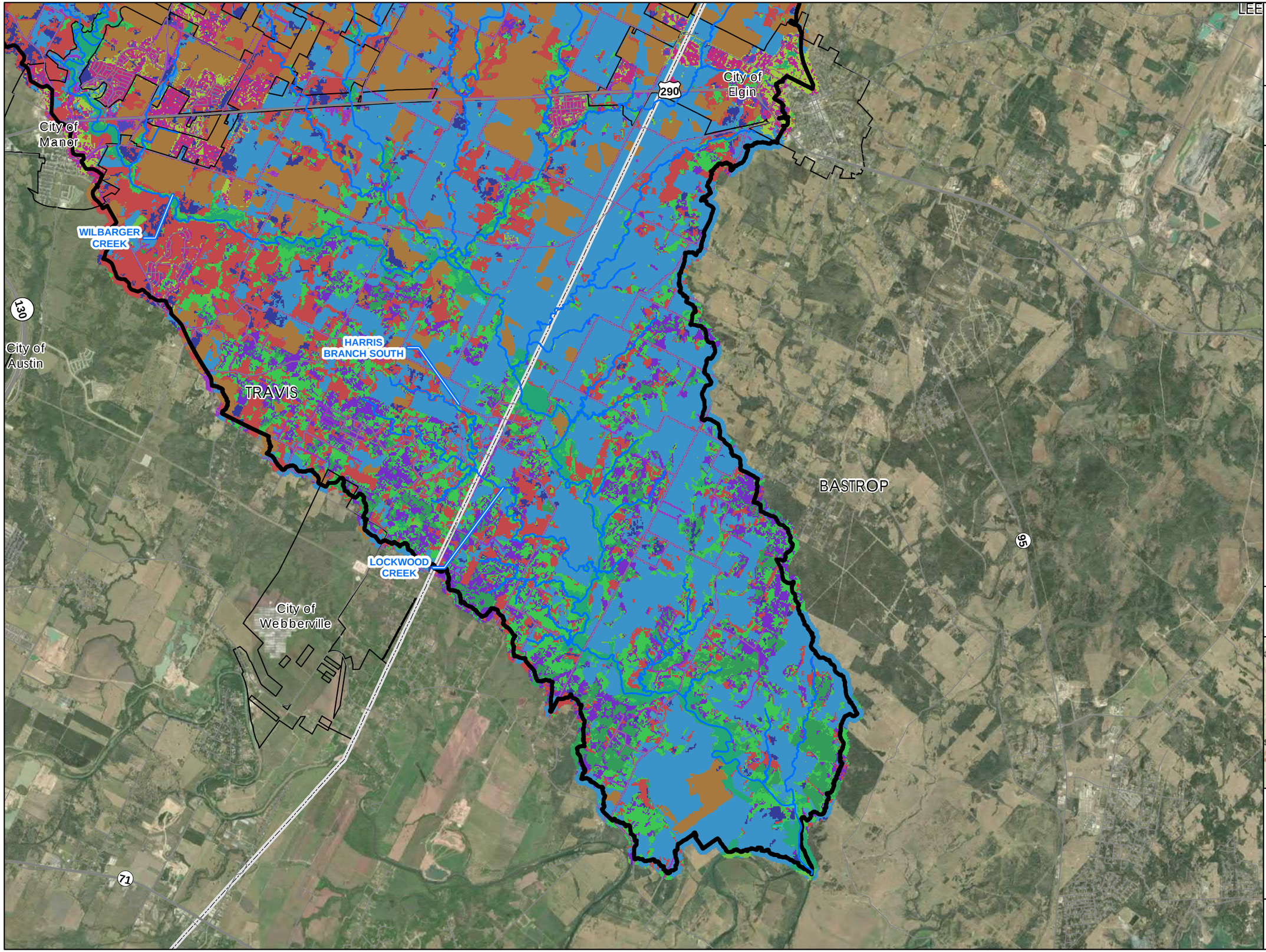
LITTLE WILLOW CREEK

WILLOW CREEK

DRY CREEK WEST

ELM CREEK

Wilbarger Creek Watershed Study



Stream Centerlines

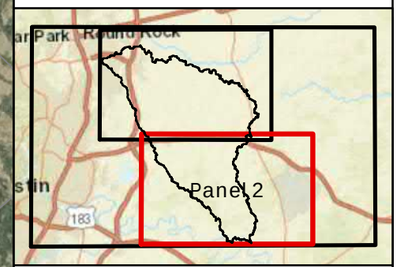
Watershed Boundary

City Boundary

County Boundary

See Page A4.3 for Landuse Classifications

Exhibit A4.2
Landuse Map



N

0 7,000 14,000 Feet

HALFF

Figure A4.3 Landuse Classification Legend

Appendix A: Exhibits

A-5 Percent Impervious Map

Wilbarger Creek Watershed Study

WILLIAMSON

TRAVIS

LEE

BASTROP

COTTONMOUTH CREEK

LITTLE WILLOW CREEK

WILLOW CREEK

DRY CREEK WEST

ELM CREEK

WILBARGER CREEK

HARRIS BRANCH SOUTH

LOCKWOOD CREEK

79 45 35 130 95 290 183 165 71

Stream Centerlines

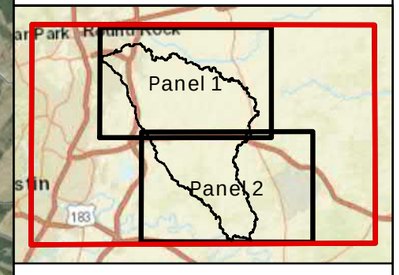
Watershed Boundary

County Boundary

Impervious Cover

- 0 - 5%
- 5 - 20%
- 20 - 45%
- 45 - 65%
- 65 - 85%
- 85 - 100%

Exhibit A5
Impervious Cover



N

0 12,000 24,000 Feet

HALFF

Wilbarger Creek Watershed Study

WILLIAMSON

TRAVIS

LEE

BASTROP

79

45

130

290

95

COTTONMOUTH CREEK

LITTLE WILLOW CREEK

WILLOW CREEK

DRY CREEK WEST

ELM CREEK

Stream Centerlines

Watershed Boundary

County Boundary

Impervious Cover

0 - 5%

5 - 20%

20 - 45%

45 - 65%

65 - 85%

85 - 100%

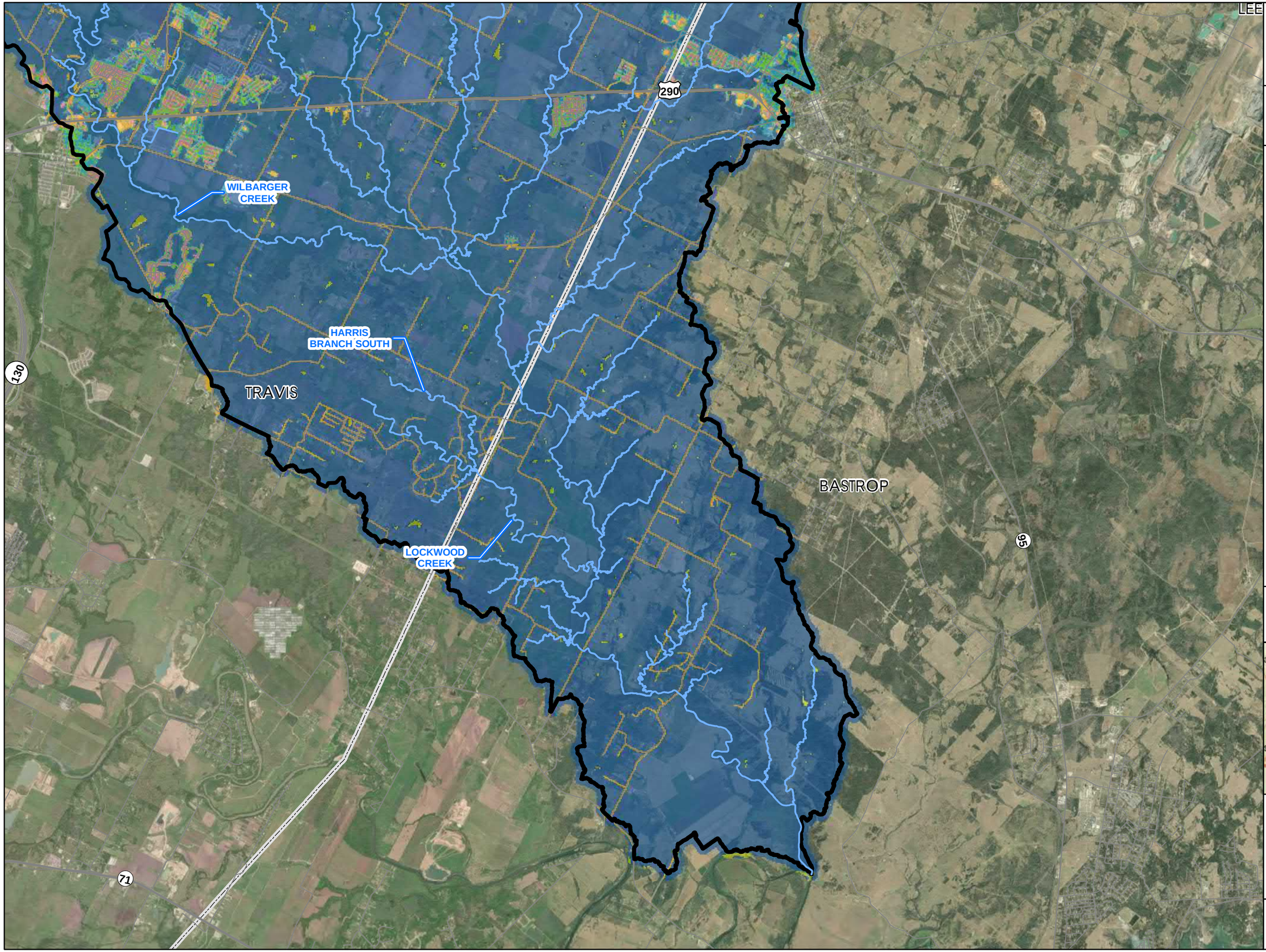
Exhibit A5.1
Impervious Cover

Panel 1

N

0 7,000 14,000 Feet

HALFF



Wilbarger Creek Watershed Study

Stream Centerlines

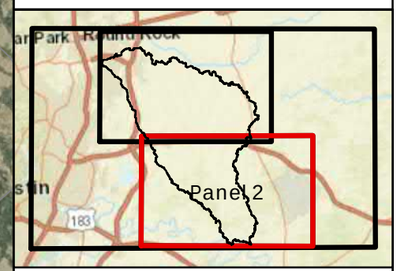
Watershed Boundary

County Boundary

Impervious Cover

- 0 - 5%
- 5 - 20%
- 20 - 45%
- 45 - 65%
- 65 - 85%
- 85 - 100%

Exhibit A5.2
Impervious Cover



N

0 7,000 14,000 Feet

HALFF

Appendix A: Exhibits

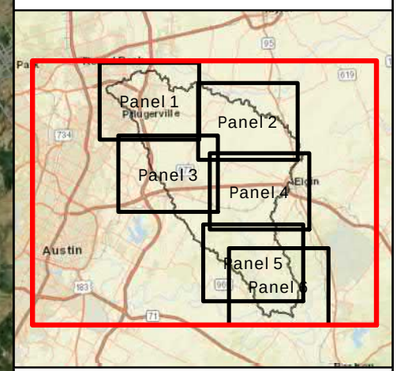
A-6 Overtopping Road Crossing Map

Wilbarger Creek Watershed Study

Proposed Road Improvement
- Bastrop County
- City of Pflugerville
- Travis County

Public Road Crossing Overtop
- Yes, Bastrop County
- No, Bastrop County
- Yes, City of Pflugerville
- No, City of Pflugerville
- Yes, Travis County
- No, Travis County
- Limited Detail Study
- Detailed Study with Floodway
- Detailed Study without Floodway
- Watershed Boundary
- City Boundary
- County Boundary

Exhibit A6
Road Crossings Map

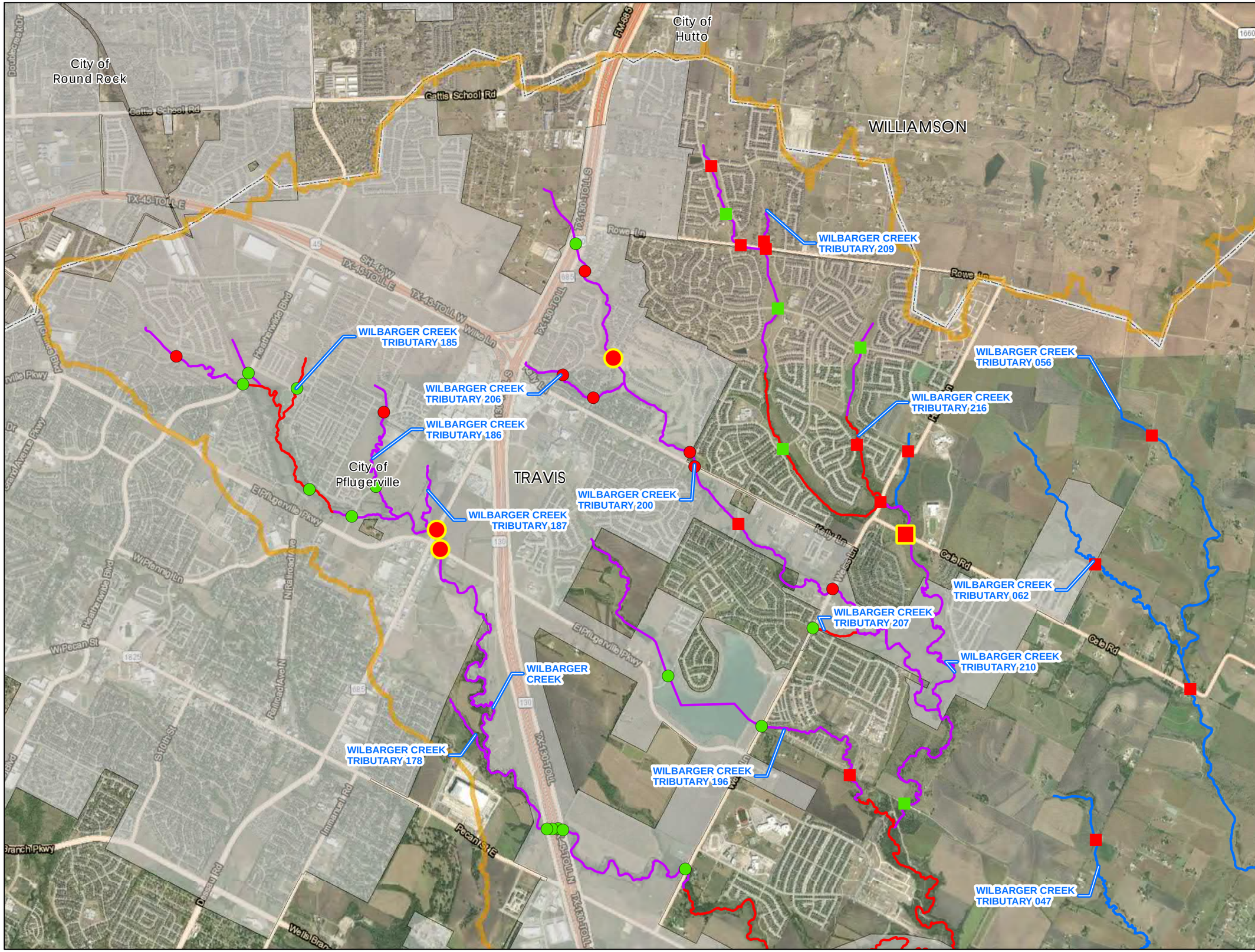


N

0 12,000 24,000 Feet

HALFF

City of Cedar Park
City of Round Rock
City of Hutto
City of Pflugerville
WILLIAMSON
COTTONMOUTH CREEK
LITTLE WILLOW CREEK
WILLOW CREEK
DRY CREEK WEST
ELM CREEK
LEE
City of Elgin
City of Manor
WILBARGER CREEK
TRAVIS
HARRIS BRANCH SOUTH
City of Austin
LOCKWOOD CREEK
City of Webberville
BASTROP
79
45
35
130
290
95
165
183
71

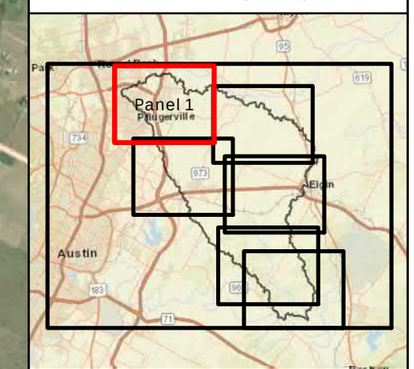


Wilbarger Creek Watershed Study

Proposed Road Improvement
- Bastrop County
- City of Pflugerville
- Travis County

Public Road Crossing Overtop
- Yes, Bastrop County
- No, Bastrop County
- Yes, City of Pflugerville
- No, City of Pflugerville
- Yes, Travis County
- No, Travis County
- Watershed Boundary
- City Boundary
- County Boundary

Exhibit A6.1
Road Crossings Map



N

0 3,000 6,000 Feet

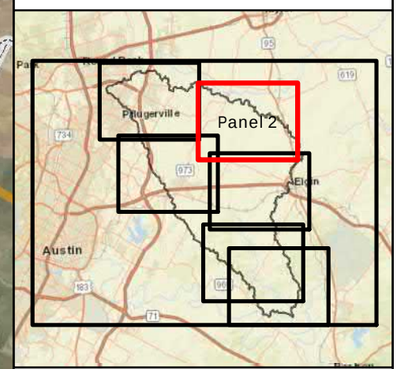
HALFF

Wilbarger Creek Watershed Study

Proposed Road Improvement
- Bastrop County
- City of Pflugerville
- Travis County

Public Road Crossing Overtop
- Yes, Bastrop County
- No, Bastrop County
- Yes, City of Pflugerville
- No, City of Pflugerville
- Yes, Travis County
- No, Travis County
- Watershed Boundary
- City Boundary
- County Boundary

Exhibit A6.2
Road Crossings Map



N

0 3,000 6,000 Feet

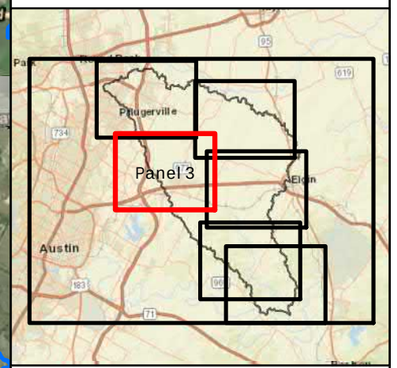
HALFF

Wilbarger Creek Watershed Study

Proposed Road Improvement
- Bastrop County
- City of Pflugerville
- Travis County

Public Road Crossing Overtop
- Yes, Bastrop County
- No, Bastrop County
- Yes, City of Pflugerville
- No, City of Pflugerville
- Yes, Travis County
- No, Travis County
- Watershed Boundary
- City Boundary
- County Boundary

Exhibit A6.3
Road Crossings Map



N

0 3,000 6,000 Feet

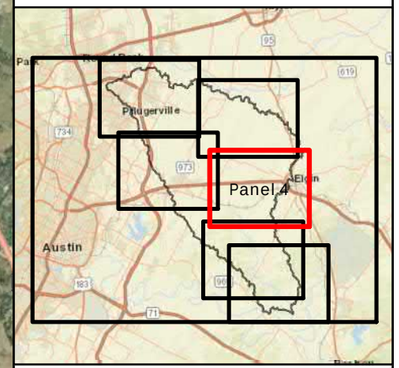
HALFF

Wilbarger Creek Watershed Study

Proposed Road Improvement
- Bastrop County
- City of Pflugerville
- Travis County

Public Road Crossing Overtop
- Yes, Bastrop County
- No, Bastrop County
- Yes, City of Pflugerville
- No, City of Pflugerville
- Yes, Travis County
- No, Travis County
- Watershed Boundary
- City Boundary
- County Boundary

Exhibit A6.4
Road Crossings Map



N

0 3,000 6,000 Feet

HALFF

LITTLE WILLOW CREEK
WILLOW CREEK
DRY CREEK WEST
COTTONMOUTH CREEK
WILBARGER CREEK
WILBARGER CREEK TRIBUTARY 260
ELM CREEK
ELM CREEK TRIBUTARY 1
WILBARGER CREEK TRIBUTARY 9
WILBARGER CREEK TRIBUTARY 298
City of Manor
TRAVIS
City of Elgin
BASTROP
FM 1100
US Highway 290 E
US-290 W
N Avenue C
S Main St
E 2nd St
FM 1704

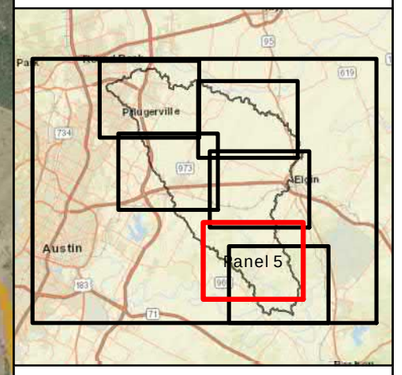
Wilbarger Creek Watershed Study

Proposed Road Improvement
- Bastrop County
- City of Pflugerville
- Travis County

Public Road Crossing Overtop
- Yes, Bastrop County
- No, Bastrop County
- Yes, City of Pflugerville
- No, City of Pflugerville
- Yes, Travis County
- No, Travis County
- Watershed Boundary
- City Boundary
- County Boundary

WILBARGER CREEK TRIBUTARY 6
WILBARGER CREEK TRIBUTARY 030
HARRIS BRANCH SOUTH
WILBARGER CREEK TRIBUTARY 304
LOCKWOOD CREEK
TRAVIS
WILBARGER CREEK TRIBUTARY 307
WILBARGER CREEK TRIBUTARY 305
WILBARGER CREEK TRIBUTARY 027
WILBARGER CREEK TRIBUTARY 024
WILBARGER CREEK TRIBUTARY 025
BASTROP
WILBARGER CREEK TRIBUTARY 4
City of Webberville
WILBARGER CREEK
WILBARGER CREEK TRIBUTARY 328
WILBARGER CREEK TRIBUTARY 018
WILBARGER CREEK TRIBUTARY 326
WILBARGER CREEK TRIBUTARY 3
WILBARGER CREEK TRIBUTARY 1
WILBARGER CREEK TRIBUTARY 346
1704
969
FM 969
FM 1704

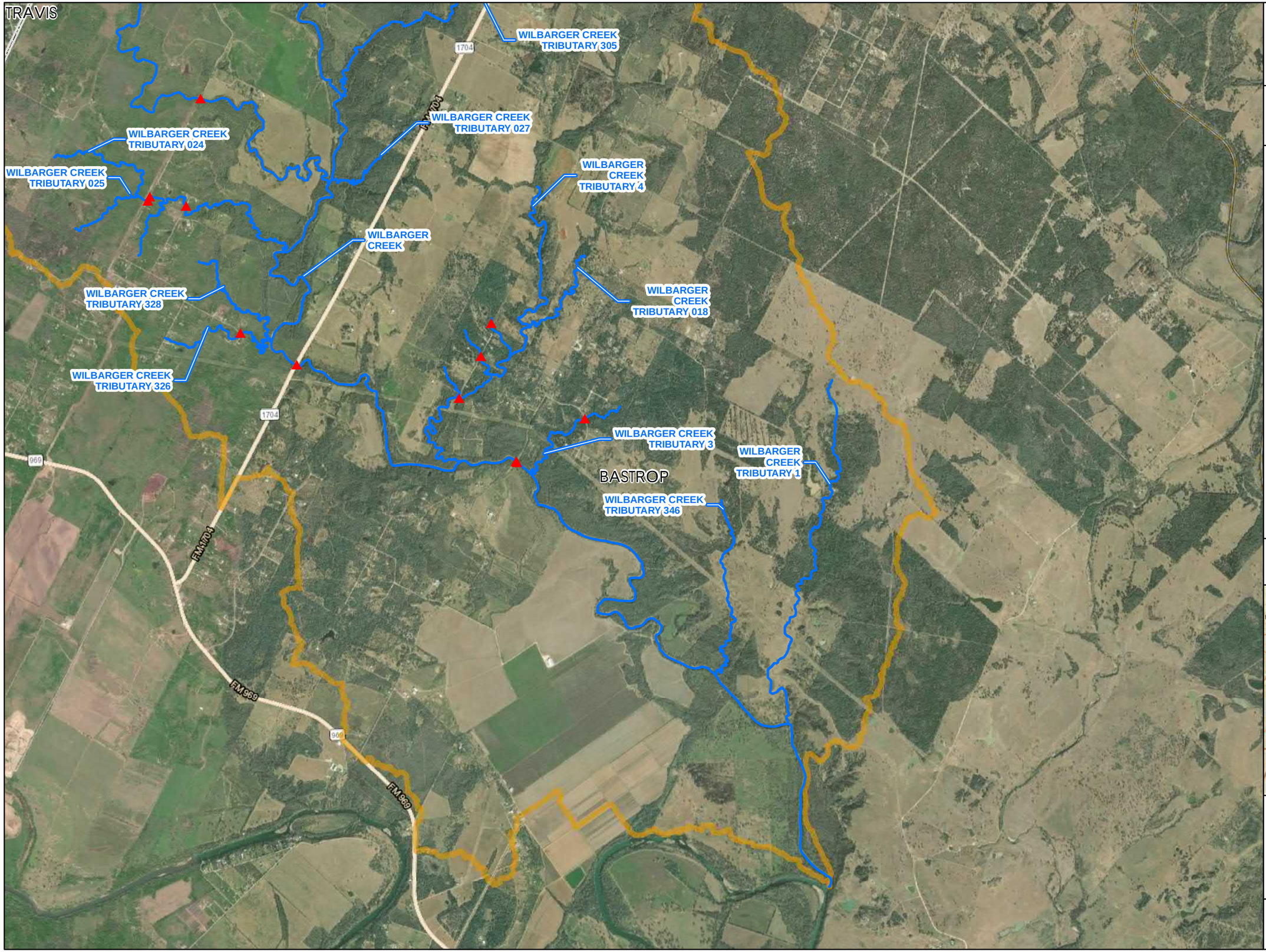
Exhibit A6.5
Road Crossings Map



N

0 3,000 6,000 Feet

HALFF

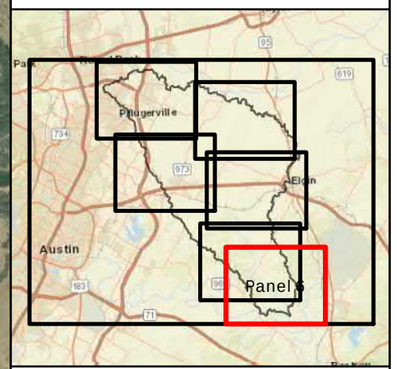


Wilbarger Creek Watershed Study

Proposed Road Improvement
- Bastrop County
- City of Pflugerville
- Travis County

Public Road Crossing Overtop
- Yes, Bastrop County
- No, Bastrop County
- Yes, City of Pflugerville
- No, City of Pflugerville
- Yes, Travis County
- No, Travis County
- Watershed Boundary
- City Boundary
- County Boundary

Exhibit A6.6
Road Crossings Map



N

0 3,000 6,000 Feet

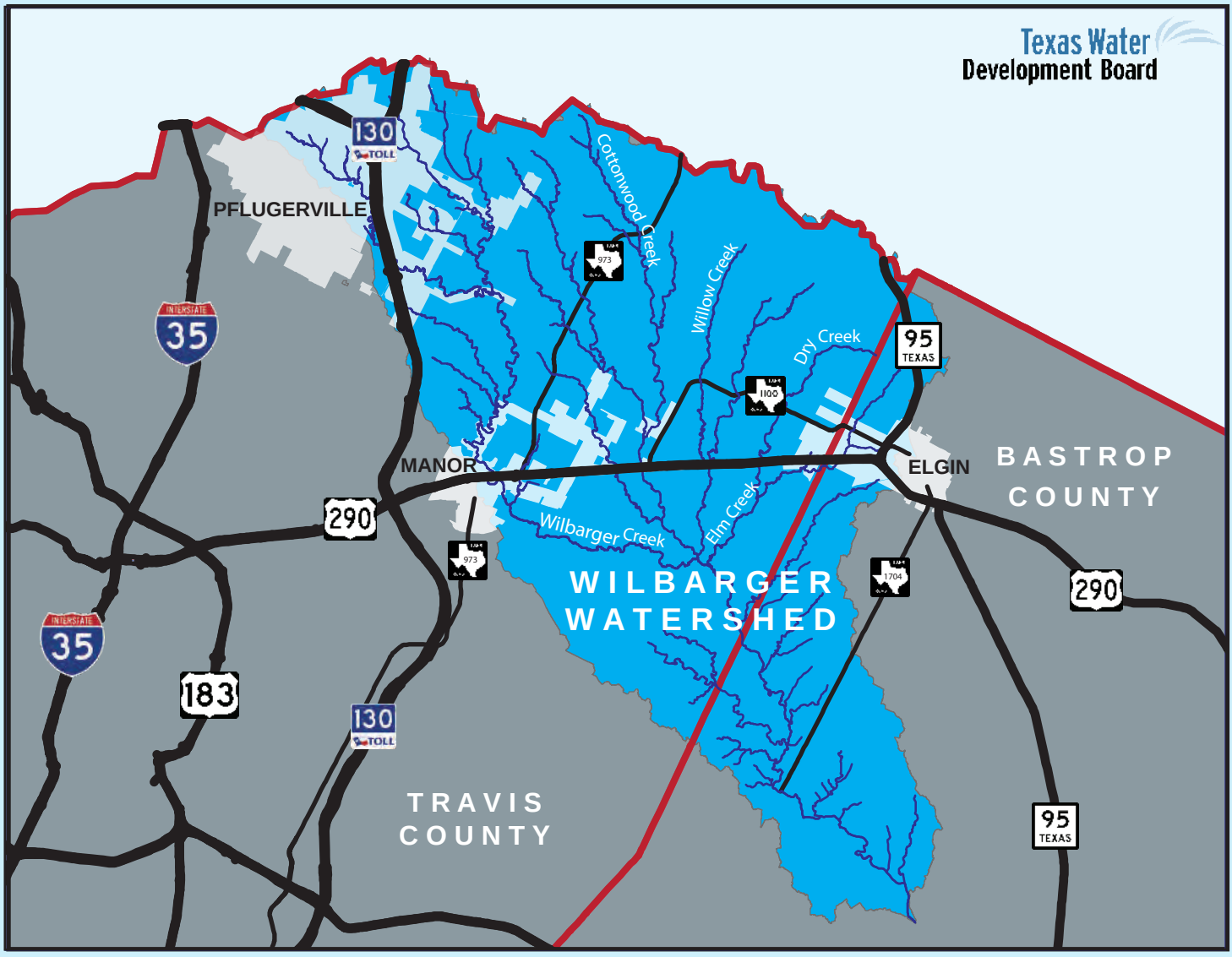
HALFF

Appendix B: Public Meetings

Public Meeting

Wednesday, October 16th, 2019
7 PM - 8:30 PM
Pflugerville Public Library
1008 W. Pfluger St.
Pflugerville, TX 78660

Bastrop County, with participation from Travis County and the City of Pflugerville, has been awarded a Texas Water Development Board Flood Protection Planning Grant to conduct a floodplain study of the Wilbarger Creek Watershed shown below.



The study will determine floodplain extents and investigate structural and nonstructural flood damage reduction projects which will be used to develop a comprehensive Flood Protection Plan for Wilbarger Creek. Public input is being solicited to help identify and quantify areas of concern and discuss possible solutions. Use the following web link or QR code to access an online questionnaire to provide flooding input for the Wilbarger Creek Study.

https://www.surveymonkey.com/r/3SCHVW3

Questions about the study can be directed to Carolyn Dill, P.E., Bastrop County Engineer, at (512) 581-7180 or by email at carolyn.dill@co.bastrop.tx.us

Texas Water Development Board

HALFF

WILBARGER CREEK WATERSHED STUDY SIGN-IN SHEET

Project: _____ **Date:** _____

Location: _____ **City, State:** _____

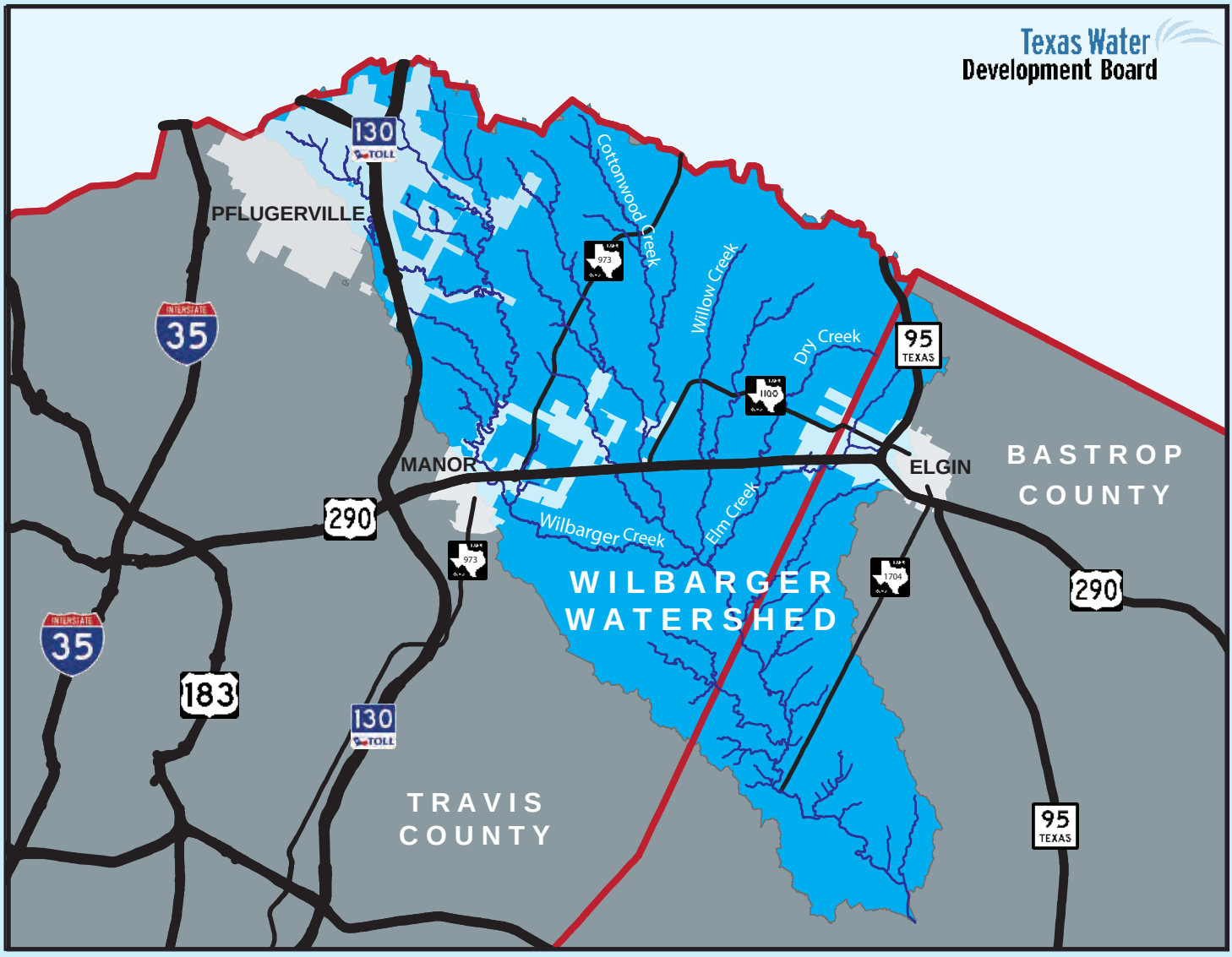
PUBLIC MEETING 1

	Name	Address	Phone	Email
1.	JACK ATTERSTROM	13709 PFLUGER BERRYMAN COUPLAND, TX 78615		JACKAT@HOTMAIL.COM
2.	Clifton Gonzenbach	15309 Fuchs Grove Rd		
3.	Lexine Spillman	900 FM 1327 Buda		
4.	Vernagene Mott	16814 Cameron Rd		vrmott@aol.com
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				

Public Meeting

Thursday, October 17th, 2019
7 PM - 8:30 PM
City of Manor Council Chambers
105 E. Eggleston St.
Manor, Tx 78653

Bastrop County, with participation from Travis County and the City of Pflugerville, has been awarded a Texas Water Development Board Flood Protection Planning Grant to conduct a floodplain study of the Wilbarger Creek Watershed shown below.



The study will determine floodplain extents and investigate structural and nonstructural flood damage reduction projects which will be used to develop a comprehensive Flood Protection Plan for Wilbarger Creek. Public input is being solicited to help identify and quantify areas of concern and discuss possible solutions. Use the following web link or QR code to access an online questionnaire to provide flooding input for the Wilbarger Creek Study.

https://www.surveymonkey.com/r/3SCHVW3

Questions about the study can be directed to Carolyn Dill, P.E., Bastrop County Engineer, at (512) 581-7180 or by email at carolyn.dill@co.bastrop.tx.us

Texas Water Development Board

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WILBARGER CREEK WATERSHED STUDY SIGN-IN SHEET

Project: Wilbarger Creek Flood Protection Plan **Date:** 10/17/2019

Location: City of Manor Council Chambers **City, State:** Manor, Tx

PUBLIC MEETING 1

	Name	Address	Phone	Email
1.	VALERIE TAMBURRI	2808 LYONS RD, B	512-506-1128	VALERIE@TREEFOLKS.ORG
2.	andreina alpates	10803 platt ln.	713-252-7528	ina@treefolks.org
3.	Sara Hustead	TWDB	512-936-0129	sara.hustead@TWDB.Texas.gov
4.	Alex Carrillo	14812 FM 973 N. Manor	512-653-3091	alex@bolaman.com
5.	Jim LUTZ	14812 FM 973N Manor	5126808464	Jim@bolaman.com
6.	Jon Beall	17312 Liffig Rd Elgin	512 632-1760	jonbeall1@gmail.com
7.	Roy Dill	319 PATTON LN BASTROP	512-549-3716	RoyMDill3@gmail.com
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				

WILBARGER CREEK WATERSHED
TWDB FLOOD PROTECTION PLANNING STUDY

OCTOBER 16, 2019

PFLUGERVILLE LIBRARY

OCTOBER 17, 2019

MANOR COUNCIL CHAMBERS

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1

WILBARGER CREEK WATERSHED
TWDB FLOOD PROTECTION PLANNING STUDY

OUTLINE

- FPP STUDIES
- STUDY PARTNERSHIP
- WATERSHED OVERVIEW
- STUDY EFFORT
- PUBLIC QUESTIONNAIRE
- STUDY SCHEDULE

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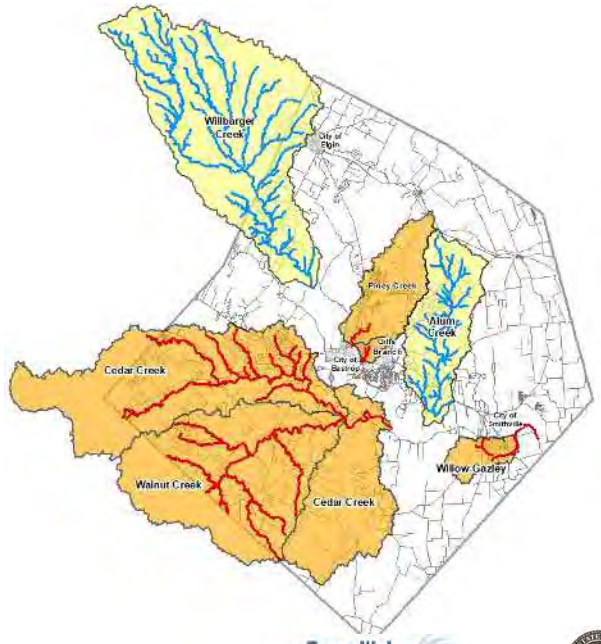
2



STUDIED WATERSHEDS

- 2008-2018 Bastrop Co. FPP
  - Cedar Creek
  - Walnut Creek
  - Sandy Creek
  - Willow Creek (Smithville)
  - Gazley Creek (Smithville)
  - Gills Branch (Bastrop)
  - Piney Creek (Bastrop)
- 2019-2020 Bastrop Co. FPP
  - Alum Creek
  - Wilbarger Creek (Pflugerville, Travis Co.)

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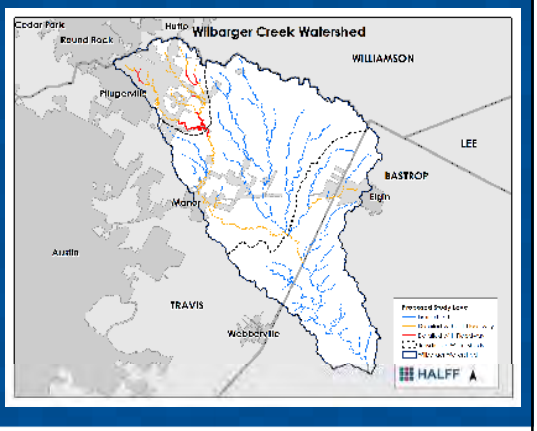
3

WILBARGER CREEK WATERSHED
TWDB FLOOD PROTECTION PLANNING STUDY

2019 LEVERAGED FUNDING FOR WILBARGER CREEK

Texas Water Development Board	50%
Bastrop County	12%
Travis County	21.5%
City of Pflugerville	16.5%
Total	100%



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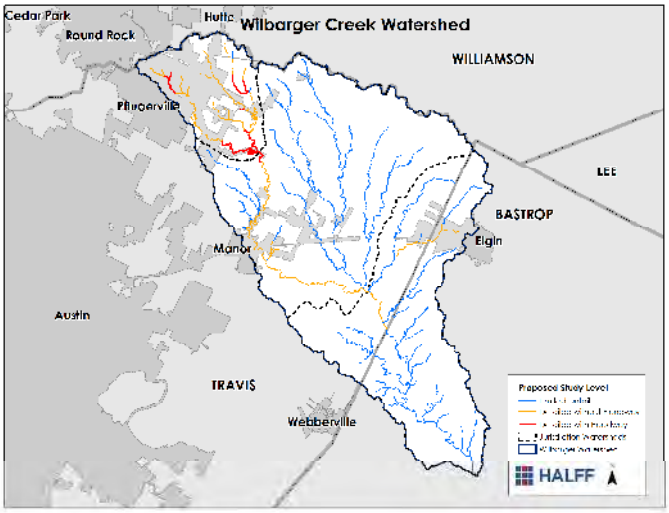

WILBARGER CREEK WATERSHED OVERVIEW

- Drainage Area
  - 181 sq. miles
  - 252 sub-basins
- 223 stream miles by level of study:
  - 11 mi. – Detailed with Floodway
  - 54 mi. – Detailed no Floodway
  - 158 mi. – Limited Detail
- 81 surveyed road crossings
- 103 survey channel cross sections
- 116 field recon of road crossings

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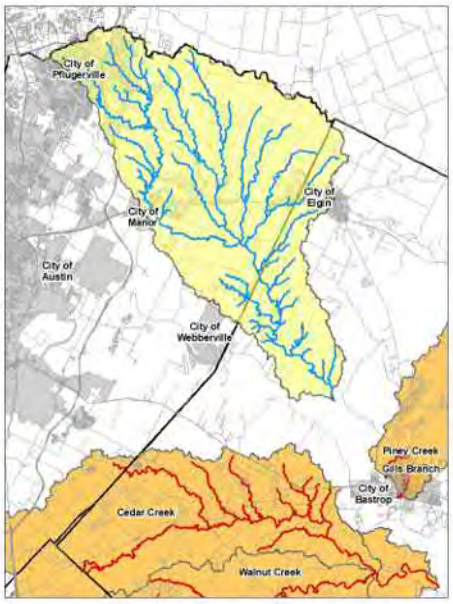
5



TASK 1 – DATA COLLECTION

- 2017 LiDAR terrain
- Ground Survey
  - Structures
  - Stream Crossings
- Field Reconnaissance
  - Field measurements
  - Sketches/Photos
- Soil Data
- Existing Land Use/Development
- Record/As-Builts Plans
  - Large Detention Ponds
  - Road Crossings
- Public Flooding Observations

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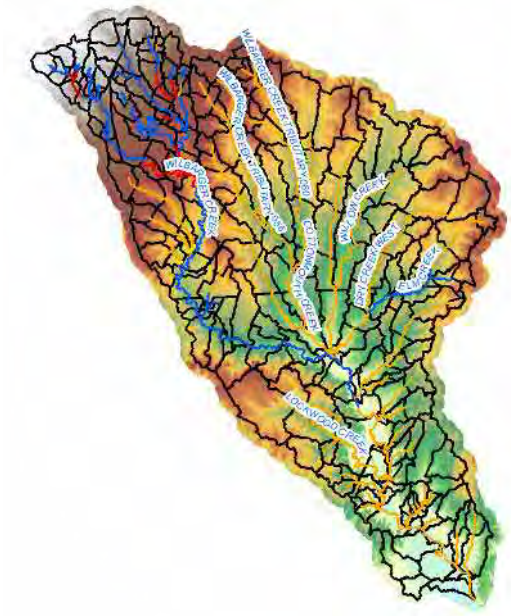

TASK 2 – MODELING & MAPPING

- Hydrology (Rainfall Runoff)
  - Hydrologic Watershed Model
  - Verified outer basin boundary
  - NOAA Atlas 14 rainfall data
  - 2-, 5-, 10-, 25-, 50-, 100-, and 500-yr storm events
- Hydraulics (Creek Flooding)
  - Creek Flood Model
  - Channel cross section every 500 ft
  - Detailed Analysis
    - Incorporate channel and road crossing survey
  - Limited Detailed
    - Incorporate field recon
  - Mapping 100- and 500-yr floodplain

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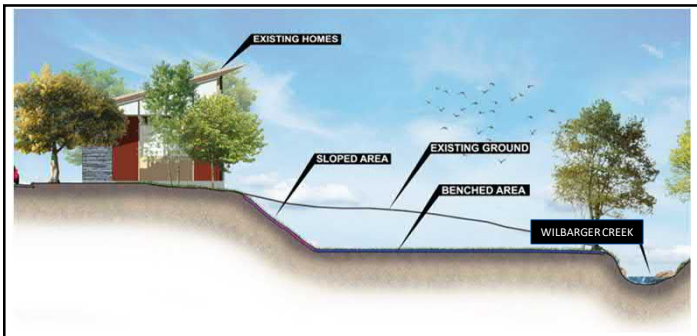
7



TASK 3 - FLOOD MITIGATION SOLUTIONS

- Flood Protection Measures:
  - Bridge/culvert improvements
  - Channel improvements
  - Detention/retention ponds
  - Floodwalls and dams
  - Buyouts
- Probable Cost Estimate
- Benefit/Cost Analysis
  - Preferred mitigation solutions

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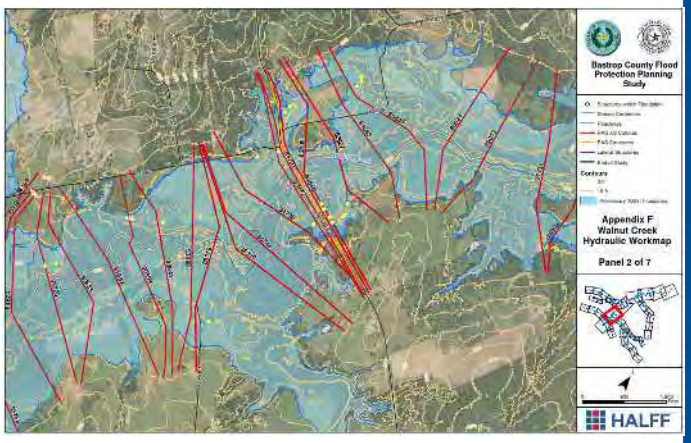

TASK 4 – FLOOD MONITORING

- Prioritized roadway overtopping risk
- Identify opportunities for new stream gages
- Web maps showing flood inundation

TASK 5 – PROJECT MANAGEMENT & REPORTING

- Three public meetings
- Study report documentation

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WILBARGER CREEK WATERSHED STUDY
FLOODING QUESTIONNAIRE

- Public input is being solicited to help identify flooding areas
- Obtain flooding photos and videos to help with modeling
- Define flooding area hot spots to develop mitigation solutions
- Questionnaire open till end of December 2019

https://www.surveymonkey.com/r/3SCHVW3

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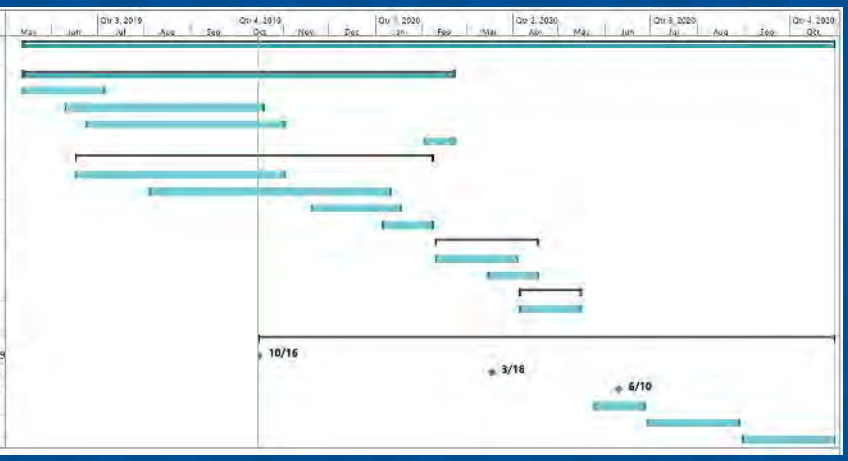
WILBARGER CREEK WATERSHED STUDY
PROJECT SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**WILBARGER CREEK WATERSHED**	**385 days**	**Mon 5/13/19**	**Fri 10/30/20**
2	**Task 1: Data Collection**	**205 days**	**Mon 5/13/19**	**Fri 2/21/20**
3	Obtain Base Mapping Info	30 days	Mon 5/13/19	Fri 7/5/19
4	Field Survey	95 days	Mon 6/10/19	Fri 10/18/19
5	Field Recon	95 days	Mon 6/24/19	Fri 11/1/19
6	Environmental Constraints	15 days	Mon 2/3/20	Fri 2/21/20
7	**Task 2: Modeling and Mapping**	**170 days**	**Mon 6/17/19**	**Fri 2/7/20**
8	Hydrologic Model Analysis	100 days	Mon 6/17/19	Fri 11/1/19
9	Hydraulic Model Analysis	115 days	Mon 8/5/19	Fri 1/10/20
10	Floodplain Mapping	43 days	Wed 11/20/19	Fri 1/17/20
11	Flood Risk Determination	25 days	Mon 1/6/20	Fri 2/7/20
12	**Task 3: Alternative Evaluation**	**50 days**	**Mon 2/10/20**	**Fri 4/17/20**
13	Flood Mitigation Evaluation	40 days	Mon 2/10/20	Fri 4/3/20
14	Benefit/Cost Analysis	25 days	Mon 3/16/20	Fri 4/17/20
15	**Task 4: Flood Monitoring**	**30 days**	**Mon 4/6/20**	**Fri 5/15/20**
16	Flood Monitoring Development	30 days	Mon 4/6/20	Fri 5/15/20
17	**Task 5: PM and Reporting**	**273 days**	**Wed 10/16/19**	**Fri 10/30/20**
18	Public Meeting 1	0 days	Wed 10/16/19	Wed 10/16/19
19	Public Meeting 2	0 days	Wed 3/18/20	Wed 3/18/20
20	Public Meeting 3	0 days	Wed 6/10/20	Wed 6/10/20
21	Prepare Report	25 days	Mon 5/25/20	Fri 6/26/20
22	TWDB Review	45 days	Mon 6/29/20	Fri 8/28/20
23	Final Report	45 days	Mon 8/31/20	Fri 10/30/20



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Texas Water Development Board

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Texas Water Development Board

WILBARGER CREEK STUDY CONTACT INFORMATION

BASTROP COUNTY
Carolyn Dill, PE
Bastrop Co. Engineer
512-581-7180
carolyn.dill@co.bastrop.tx.us

TRAVIS COUNTY
Shawn Snyder, CFM
Floodplain Project Manager
512-854-7563
shawn.snyder@traviscountytx.gov

CITY OF PFLUGERVILLE
Cynthia Pierce, PE
Assistant City Engineer - CIP
512-990-6341
cindyp@pflugervilletx.gov

HALFF ASSOCIATES
Paul Morales, PE
512-777-4547
pMorales@halff.com

Katherine Smith, EIT
512-777-4623
kSmith@halff.com

HALFF

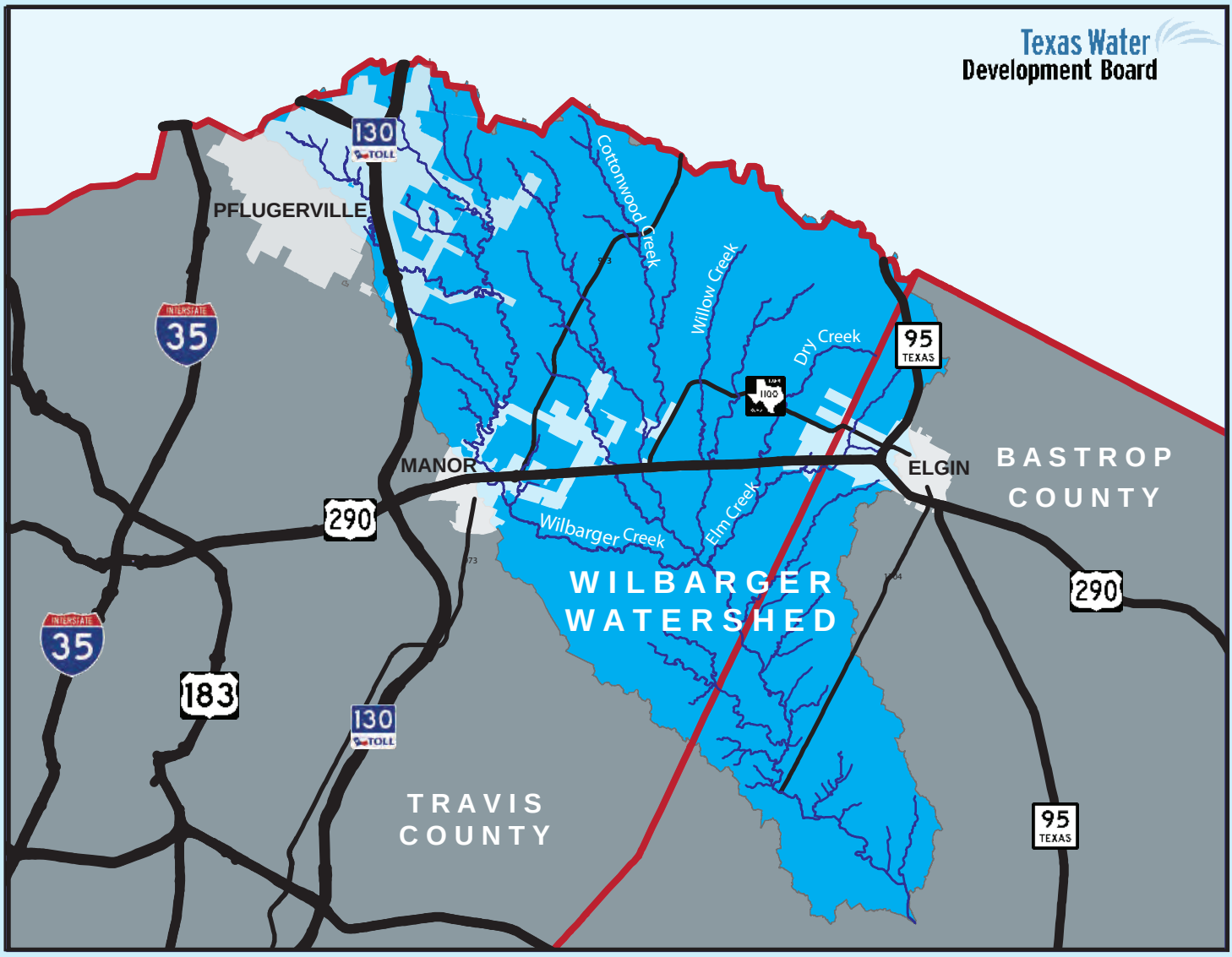
12

Wilbarger Creek Watershed Study
Public Meeting #2

Wednesday, December 9th
10 am – 11 am
Virtual
https://bit.ly/2HeBPgV

Thursday, December 10th
6:30 pm – 7:30 pm
Virtual
https://bit.ly/2IPkThJ

Bastrop County, with participation from Travis County and the City of Pflugerville, has been awarded a Texas Water Development Board Flood Protection Planning Grant to conduct a floodplain study of the Wilbarger Creek Watershed shown below.



The study has identified floodplains, as well as areas at high risk of flooding during storm events. Public feedback is requested on the proposed flood mitigation projects, with the goal to reduce flood risk and improve the safety for residents during storm events. Opportunities to implement a flood monitoring system to assist the public during storm events will also be discussed.

Questions about the study can be directed to Carolyn Dill, P.E., Bastrop County Engineer, at (512) 581-7180 or by email at carolyn.dill@co.bastrop.tx.us

9500 Amberglen Blvd., Building F, Suite 125
Austin, Texas 78729
(512) 777-4600
Fax (512) 252-8141

MEETING MINUTES

December 9, 2020
Bastrop Co. FPP - Wilbarger Creek

Public Meeting #2
Online Virtual Meeting

Type of Meeting:	Public Meeting #2
Meeting Start Time:	10:00 am
Meeting Stop Time:	11:00 am

Agenda

Attendees:

Bastrop County: Commissioner Donna Snowden, Carolyn Dill, Abram Barker

Travis County: Shawn Snyder

City of Pflugerville: Trey Fletcher, Jenna Goolsby, Amy Giannini, Patricia Davis

Texas Water Development Board (TWDB): Ivan Ortiz, Michael Vielleux

Halff Associates: Paul Morales, Katherine Smith

Citizen Attendees: Genine Layne, Duncan Charlon, Debra Ferguson, Terri Toledo, Shirley Adams, Keith Collins, Kaitlyn Karmount, Shanna Heine, Tim Daley, Kristen Dodge, Ken Heroy, Pape Dawson, Katie (no last name provided) , Ron (no last name provided), 3 no-name call in numbers

1. PowerPoint Presentation – see attached slides
2. Questions after Presentation
    a. Ken Heroy
        i. Mr. Heroy is the engineer at Jones-Heroy Associates serves as the MUD engineer for the Avalon and Sorento developments in the Travis County ETJ. He asked Halff Associates if there is any funding already set aside to address the flooding areas that have identified.
        ii. Ivan Ortiz of TWDB answered and said that there is not any money earmarked for the specific areas that were identified. However, there are grants available through the TWDB that communities can apply for. For example, the Flood Infrastructure Fund is currently awarding grants to communities at this time.
    b. Duncan Charlton
        i. Mr. Charlton lives in Bastrop County off Lower Elgin Road. He asked Halff Associates to clarify the impacts to the downstream portions of a stream when channel improvements are done to a stream. Mr. Charlton asked Halff Associates if there would be significant scour on the downstream side of the stream if channel improvements were conducted in a portion of the stream.
        ii. Halff Associates said that when channel improvements are recommended the analysis conducted checks that there are no impacts to structures

downstream. Solutions will be developed to minimize any channel impacts downstream .

c. Abram Barker

i. Mr. Barker is the floodplain administrator for Bastrop County. Mr. Barker asked for clarification on how the three proposed roads were selected for each jurisdiction.

ii. Halff Associates said that the top roads are identified by the amount of traffic on the roadway and the frequency that the roadway overtops during storm events. The top three roads identified are roads that are within the jurisdiction of the community. TxDOT roads are not included in the top three to evaluate, but the results of the study can be shared with the regional TxDOT office.

iii. Mr. Barker also asked for clarification on how the soil properties were analyzed for the study and if karst features were identified.

iv. Halff Associates answered that soil properties were taken from the USGS Soil Survey site and that no major karst features are known in the watershed.

Action Items

1. **Halff Associates**: To provide Bastrop County, Travis County and City of Pflugerville with following data:

   i. A PDF of the Public Meeting 2 presentation slides.

   ii. A recording of the presentation

9500 Amberglen Blvd., Building F, Suite 125
Austin, Texas 78729
(512) 777-4600
Fax (512) 252-8141

MEETING MINUTES

December 10, 2020
Bastrop Co. FPP - Wilbarger Creek

Public Meeting #2
Online Virtual Meeting

Type of Meeting:	Public Meeting #2
Meeting Start Time:	6:30 pm
Meeting Stop Time:	7:30 pm

Agenda

Attendees:

Bastrop County: Carolyn Dill

Travis County: Shawn Snyder

City of Pflugerville: Trey Fletcher, Jenna Goolsby, Patricia Davis

Texas Water Development Board (TWDB): Ivan Ortiz

Halff Associates: Paul Morales, Katherine Smith

Citizen Attendees: Justin and Zack Smith, Mallory Harrod, Steve Chapman, Holly Kernier-Henderson, 1 call in number

1. A poll was conducted at the beginning of the presentation asking the attendee to indicate where the live within the Wilbarger Creek watershed
    a. There was a total of 11 responses to the poll. Three attendees indicated they live in Bastrop County, two attendees said they live in Travis County, one attendee said they live in City of Pflugerville, and one attendee said they live in another location.
    b. There were “no answers” on the poll.
2. PowerPoint Presentation – see attached slides
3. Questions after Presentation
    a. Steve Chapman
        i. Steve Chapman asked if there will be more channel improvement areas recommended by the study.
        ii. Halff Associates answered that there are more flooding areas within the watershed, but the areas that are identified are bigger problem areas that have the most impacts on residents.
        iii. Mr. Chapman also asked what agency provides the funding for the flood mitigation projects.
        iv. Halff Associates answered that 50% of this study is funded by the state through the TWDB. The other half of the study is funded by the three jurisdictions. Bastrop County is funding 12%, Travis County is Funding 21.5%, and City of Pflugerville is funding 16.5%.

b. Justin Smith
    i. Mr. Smith is a resident of the Villages of Hidden Lake in the City of Pflugerville. He has noticed a lot of flooding around the neighborhood, although he would not say it is large scale flooding.
    ii. Mr. Smith also asked if there is a timeline for adding more stream gages within the Wilbarger Creek watershed.
    iii. Halff Associates answered no, there is no timeline for adding stream gages. The FPP only identifies areas where flood gages would have the most benefit for communities. The study does not install stream gages. There are separate grants and programs that do install stream gages available.

c. Holly Henderson
    i. Ms. Henderson is the Programs Manager of the Wilbarger Creek Conservation Alliance. She asked where the Alliance can obtain the flood maps produced from the study to share with the members and property owners that are part of the alliance.
    ii. Halff Associates answered that at the conclusion of the study Halff Associates will provide the floodplain maps to Bastrop County, Travis County, and City of Pflugerville. The communities will be responsible in utilizing the floodplain maps developed as part of this study.

d. Jon Beall
    i. Mr. Beall asked for clarification on the significance of the dashed lines on the slide describing the funding breakdown for the study.
    ii. The dashed lines on the map show the boundary for each jurisdiction. These boundaries were used to establish contribution percentages.
    iii. Mr. Beall asked for clarification on how each jurisdictions' contribution is applied to the study.
    iv. Halff Associates answered that 50% of this study is funded by the state through the TWDB. The other half of the study is funded by the three jurisdictions. Bastrop County is funding 12%, Travis County is Funding 21.5%, and City of Pflugerville is funding 16.5%.

Action Items

1. **Halff Associates**: To provide Bastrop County, Travis County and City of Pflugerville with following data:
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    ii. A recording of the presentation

WILBARGER CREEK WATERSHED
TWDB FLOOD PROTECTION PLANNING STUDY

DECEMBER 9, 2020
DECEMBER 10, 2020

VIRTUAL WEBEX MEETING

HALFF

1

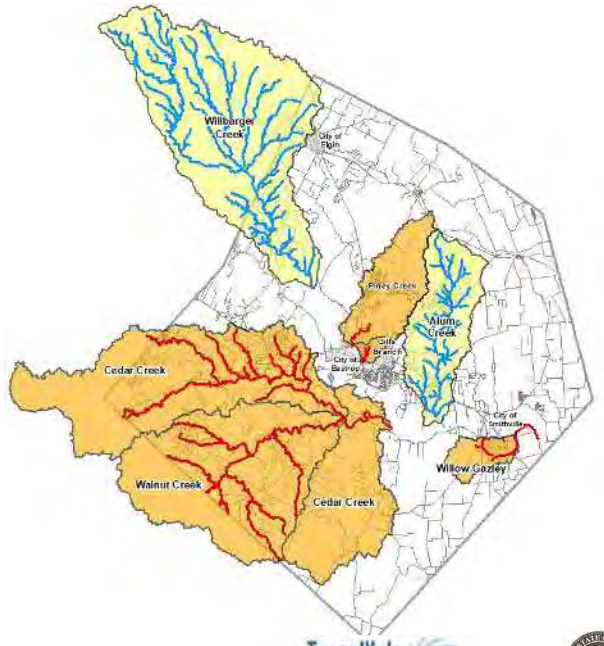
WILBARGER CREEK WATERSHED
TWDB FLOOD PROTECTION PLANNING STUDY

OUTLINE

- FLOOD PROTECTION PLANNING (FPP) STUDIES
- STUDY PARTNERSHIP
- WATERSHED OVERVIEW
- FLOODPLAIN MAPPING
- FLOOD MITIGATION SOLUTIONS
- FLOOD MONITORING OPPORTUNITIES
- STUDY SCHEDULE

HALFF

2



STUDIED WATERSHEDS

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  - Alum Creek
  - Wilbarger Creek (Pflugerville, Travis Co.)

HALFF Texas Water Development Board

3

WILBARGER CREEK WATERSHED
TWDB FLOOD PROTECTION PLANNING STUDY

2019 LEVERAGED FUNDING FOR WILBARGER CREEK

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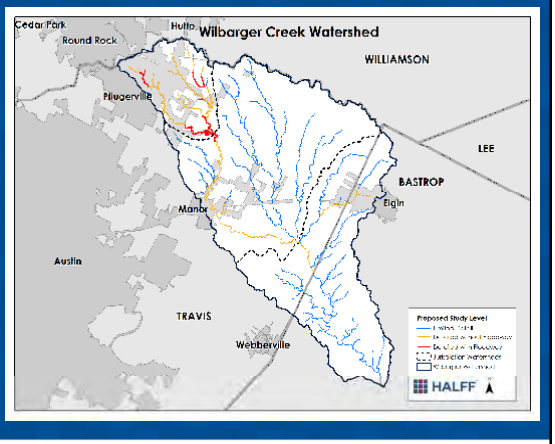

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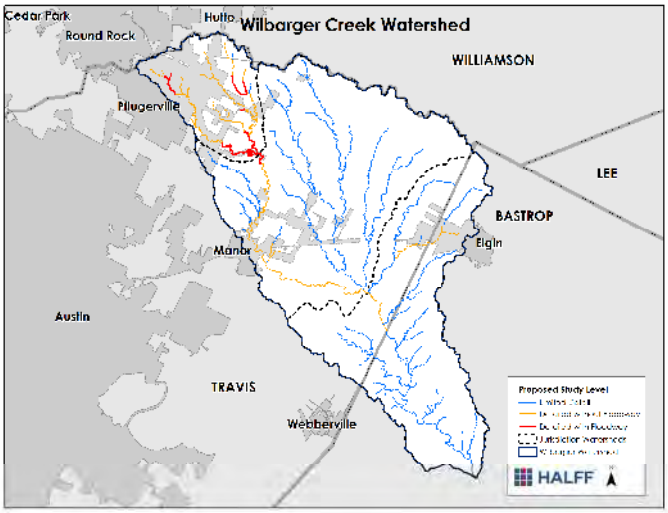

WILBARGER CREEK WATERSHED OVERVIEW

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- 223 stream miles by level of study:
  - 11 mi. – Detailed with Floodway
  - 54 mi. – Detailed no Floodway
  - 158 mi. – Limited Detail
- 81 surveyed public road crossings
- 103 survey channel cross sections
- 96 field recon public road crossings

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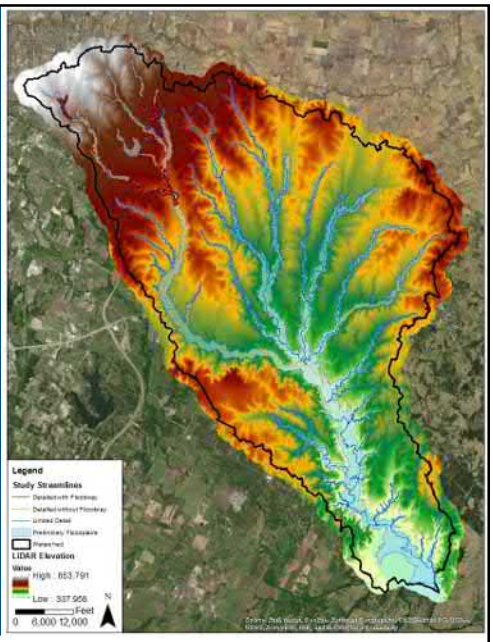
5

HYDROLOGY AND HYDRAULICS

1. Rainfall
   - Source: NOAA Atlas 14
   - Distribution of Pflugerville rainfall and City of Austin rainfall
2. Detention Ponds
   - Lake Pflugerville
   - 9 large detention ponds, 3 in Travis County ETJ
3. Landuse
   - Existing Conditions
   - City of Pflugerville Landuse
   - NLCD Landuse
4. Hydraulic Modeling
   - Survey Data Incorporation
   - Structure Input – culvert, bridges, dams, railroads
5. Floodplain Mapping
   - 100-year Floodplain for Limited Detail streams
   - 100-year and 500-year for Detailed streams
   - 100-year, 500-year, and Floodway for Detailed streams with Floodway



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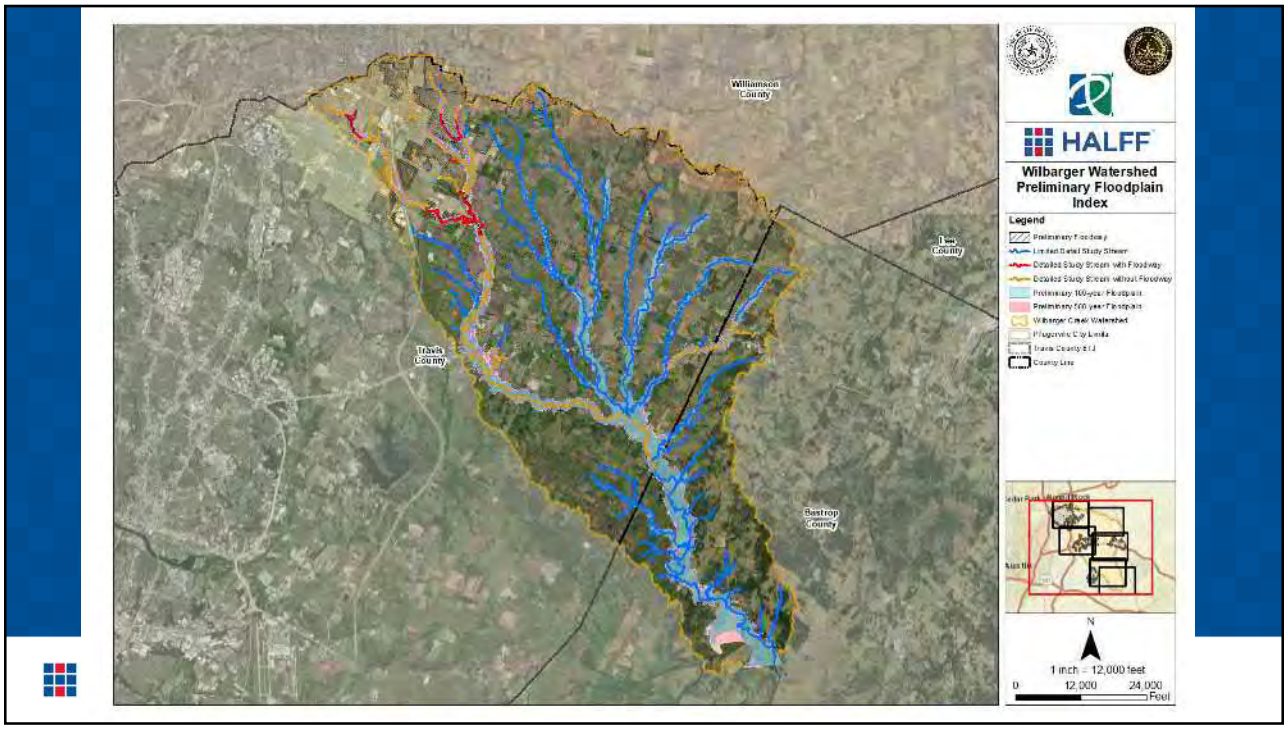
Williamson County
Travis County
Bastrop County
HALFF
Wilbarger Watershed Preliminary Floodplain Index
Legend
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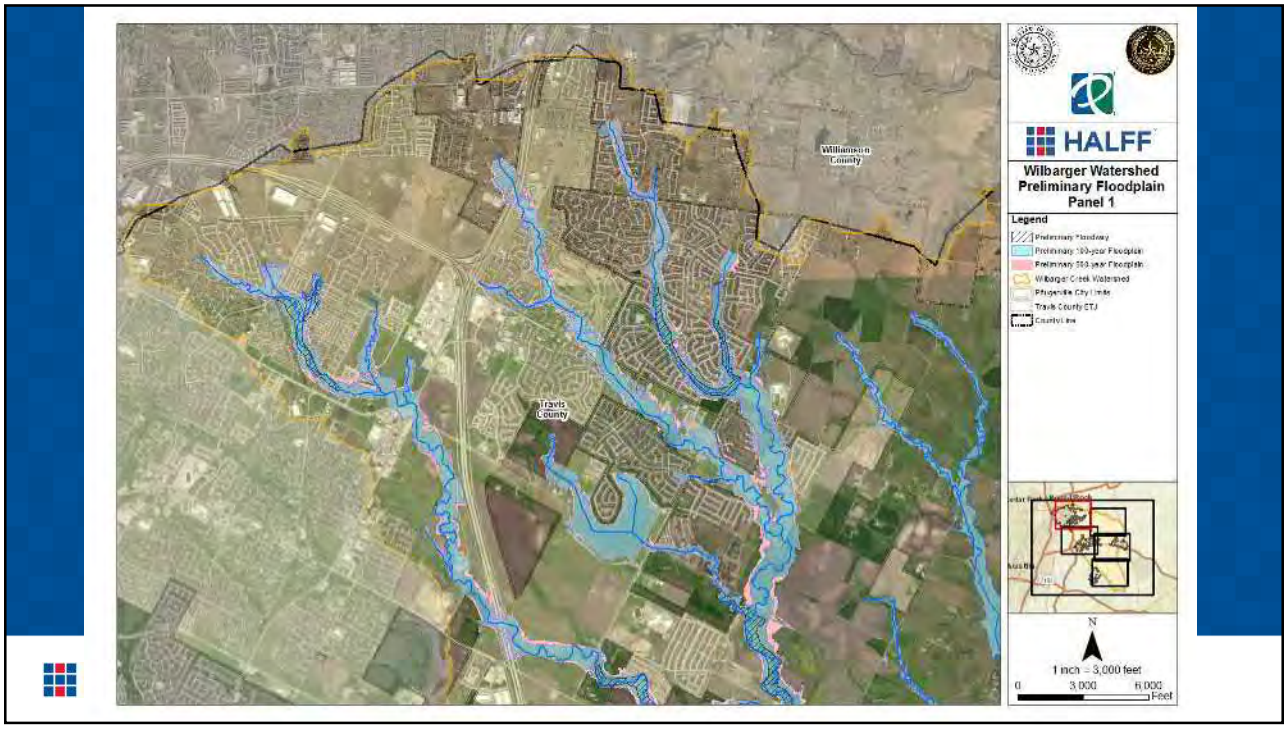
1 inch = 12,000 feet
0
12,000
24,000
Feet

7


Williamson County
Travis County
HALFF
Wilbarger Watershed Preliminary Floodplain Panel 1
Legend
N
1 inch = 3,000 feet
0
3,000
6,000
Feet

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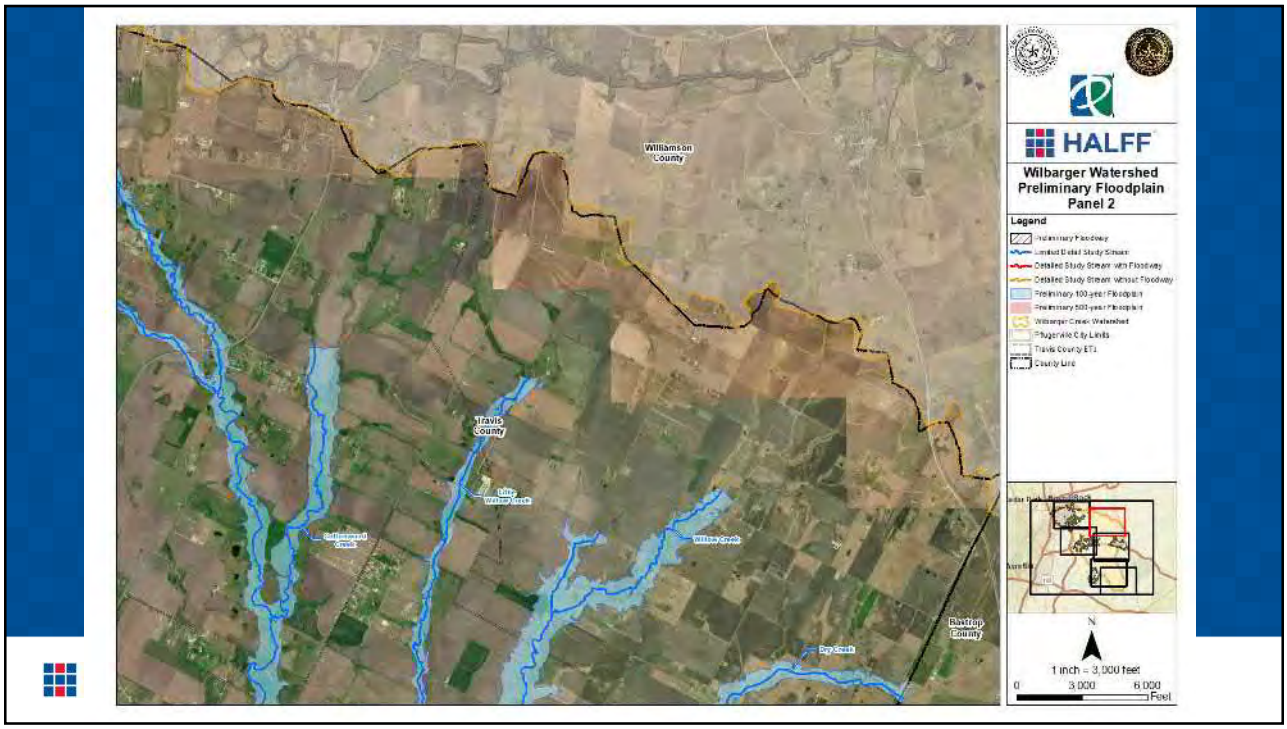
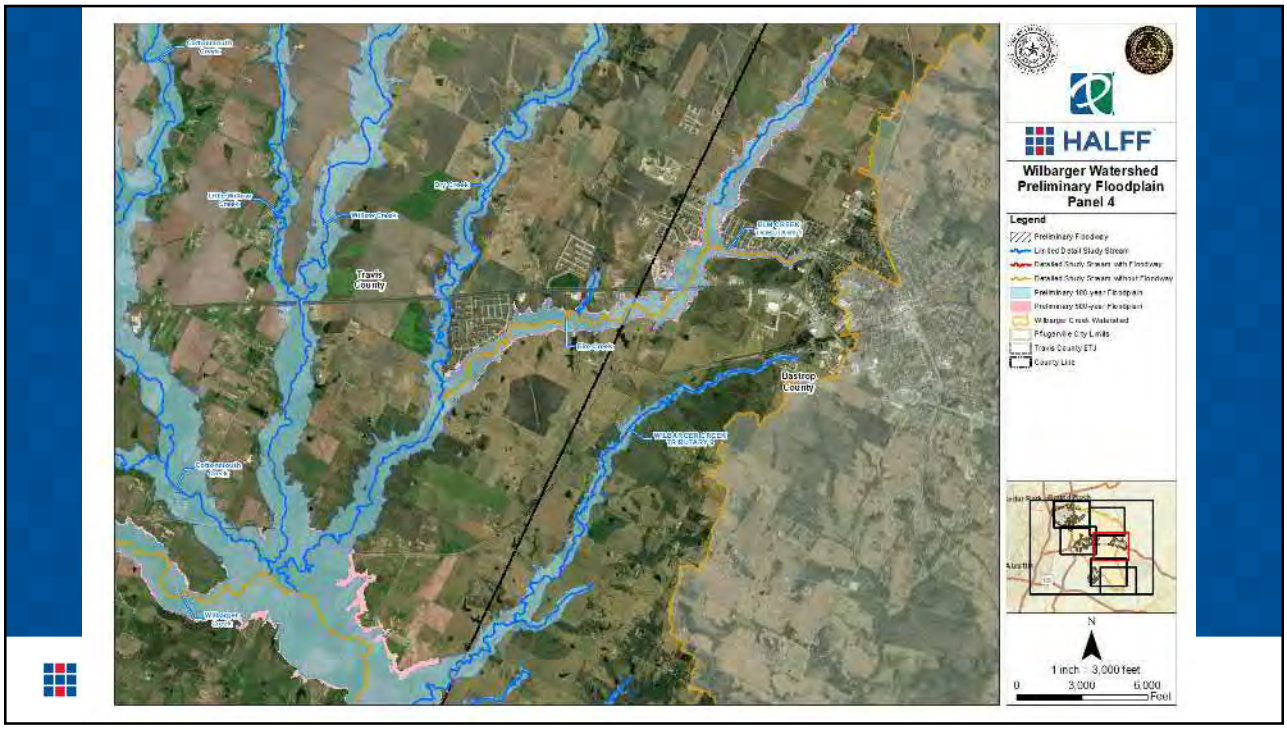

Williamson County
Travis County
Bastrop County
HALFF
Wilbarger Watershed
Preliminary Floodplain
Panel 2
Legend
1 inch = 3,000 feet
0
3,000
6,000
Feet

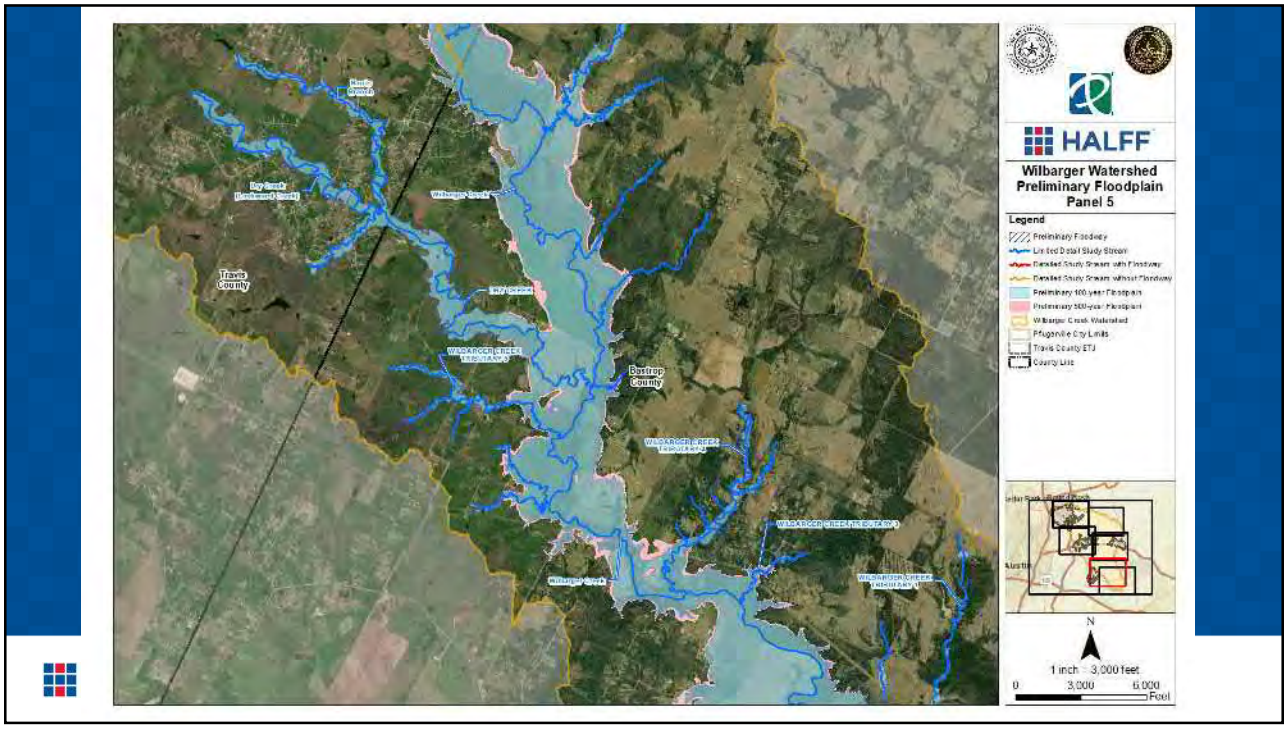
9

Travis County
HALFF
Wilbarger Watershed
Preliminary Floodplain
Panel 3
Legend
1 inch = 3,000 feet
0
3,000
6,000
Feet

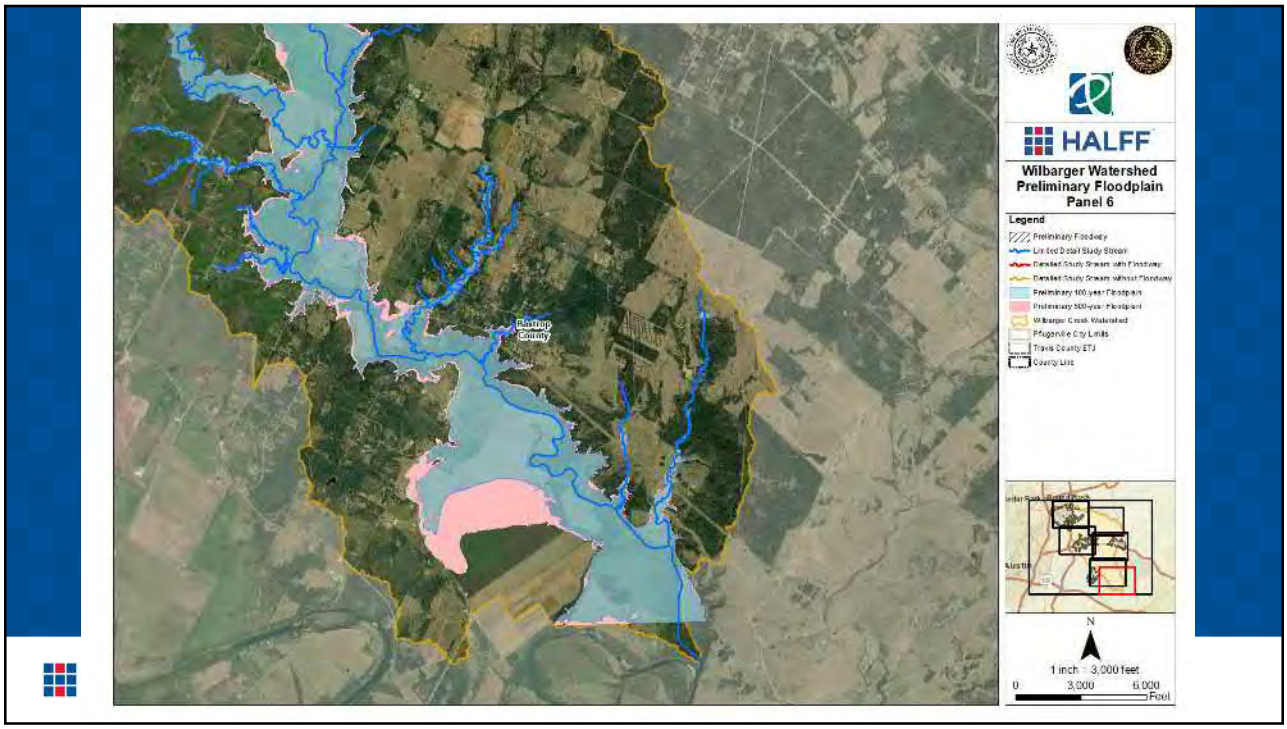
10


HALFF
Wilbarger Watershed
Preliminary Floodplain
Panel 4
Legend
Travis County
Bastrop County
N
1 inch = 3,000 feet
0
3,000
6,000
Feet

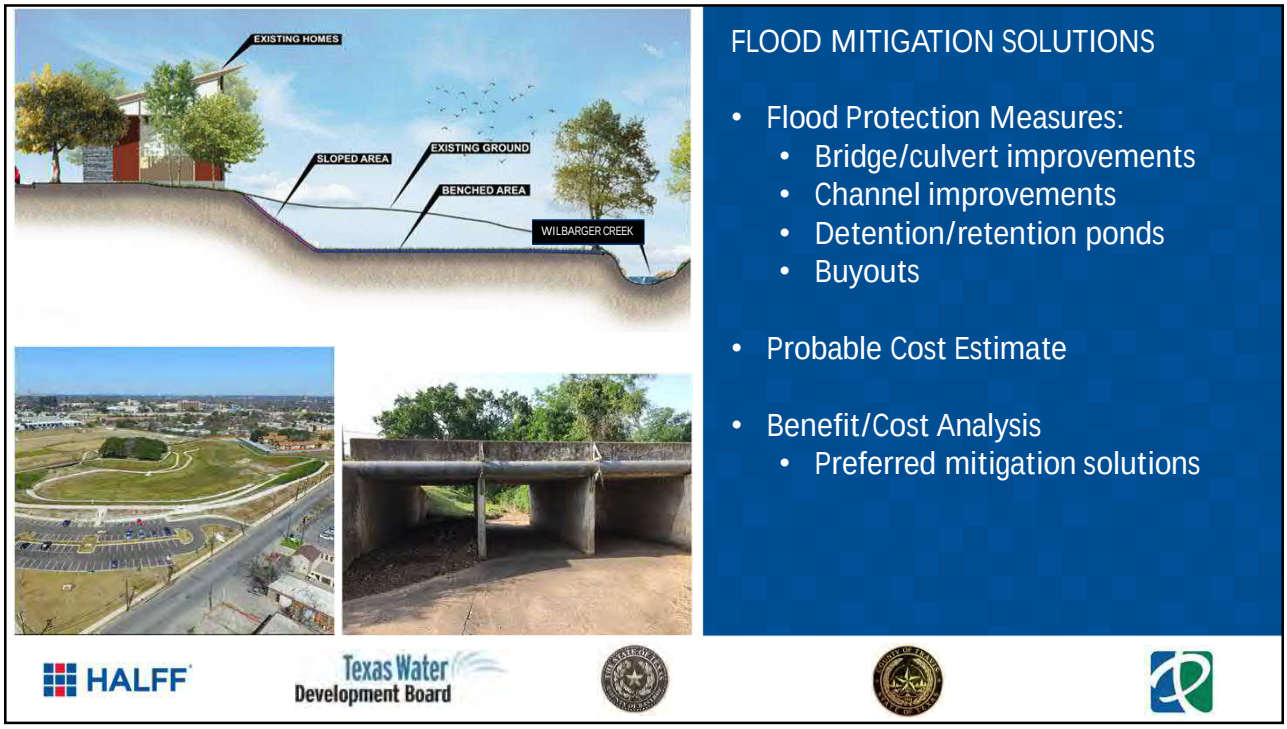
11


HALFF
Wilbarger Watershed
Preliminary Floodplain
Panel 5
Legend
Travis County
Bastrop County
N
1 inch = 3,000 feet
0
3,000
6,000
Feet

12


HALFF
Wilbarger Watershed
Preliminary Floodplain
Panel 6
Legend
Bastrop County
N
1 inch = 3,000 feet
0
3,000
6,000
Feet

13


EXISTING HOMES
SLOPED AREA
EXISTING GROUND
BENCHED AREA
WILBARGER CREEK
FLOOD MITIGATION SOLUTIONS
• Flood Protection Measures:
• Bridge/culvert improvements
• Channel improvements
• Detention/retention ponds
• Buyouts
• Probable Cost Estimate
• Benefit/Cost Analysis
• Preferred mitigation solutions
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ROAD CROSSING IMPROVEMENTS

BOWIE DRIVE IN SMITHVILLE

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Stream	Structure ID	Road Name	Structure Type	AADT Traffic (veh/day)	Annual Chance of Flooding Percent Chance	Urgency Rating (veh/day/yr)
Wilbarger Creek Structure Urgency Ratings - Bastrop County						
WC_T009	WC_T9_STR_100_A & WC_T9_STR_100_B	MONKEY RD	Multiple Opening	530	50%	265
WC	WC_STR_200	LOWER ELGIN RD	Bridge	377	50%	189
WC	WC_STR_400	UPPER ELGIN RD	Bridge	361	50%	181
Wilbarger Creek Structure Urgency Ratings - Travis County						
WC	WC_STR_13000	LEXINGTON ST	Culverts	3270	50%	1635
WC_T210	WC_T210_STR_2000	CELE RD	Bridge	2792	50%	1396
WC_T220	WC_T220_STR_100	GREGG LN	Culverts	2280	50%	1140
Wilbarger Creek Structure Urgency Ratings - City of Pflugerville						
WC	WC_STR_24000	FM 685	Bridge	24318	20%	4864
WC	WC_STR_23000	E PFLUGERVILLE PKWY	Bridge	10357	4%	414
WC_T200	WC_T200_STR_13000	KENNEMER DR	Culverts	1890	20%	378

ROADWAY IMPROVEMENT RANKING

- Developed urgency risk ranking
- Determined Average Daily Traffic Counts
  - TxDOT Traffic Counts
  - Trip Generation Manual
- Determined annual chance of road overtopping

- Higher priority if the road is overtopped more frequently
- A higher urgency rating means the higher the flood risk for the structure

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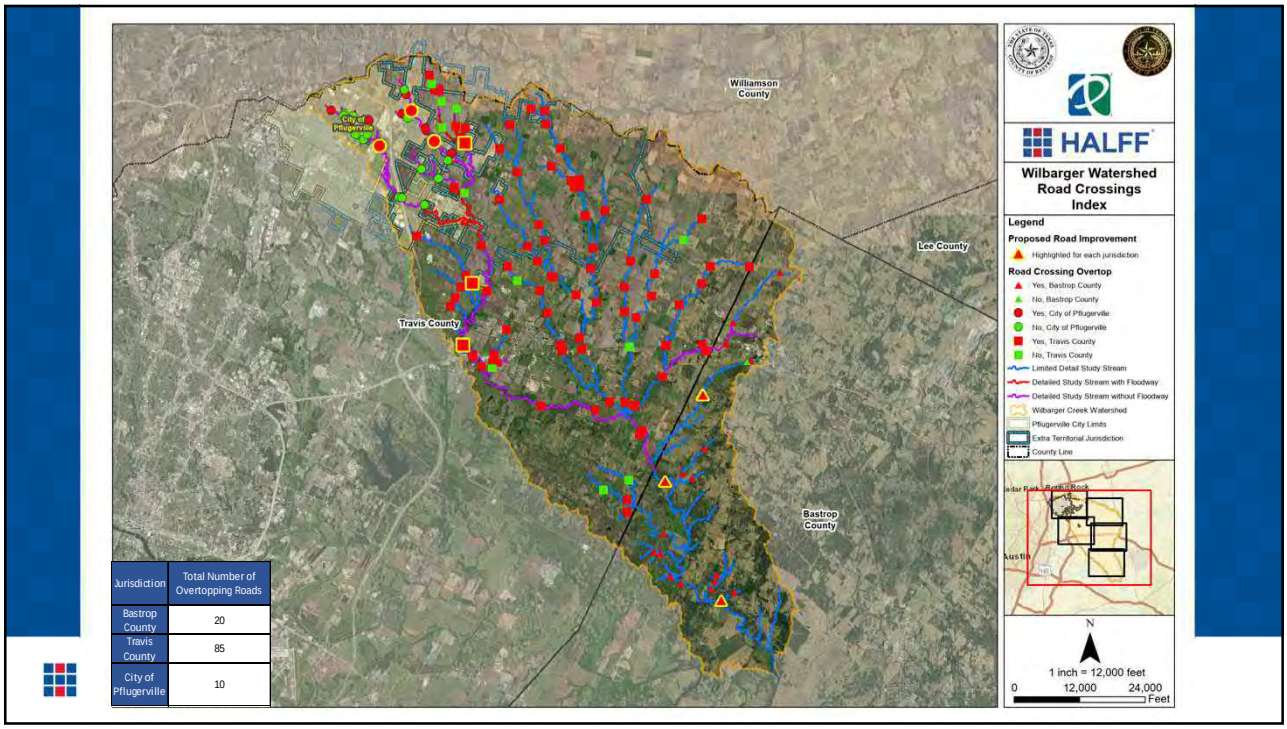
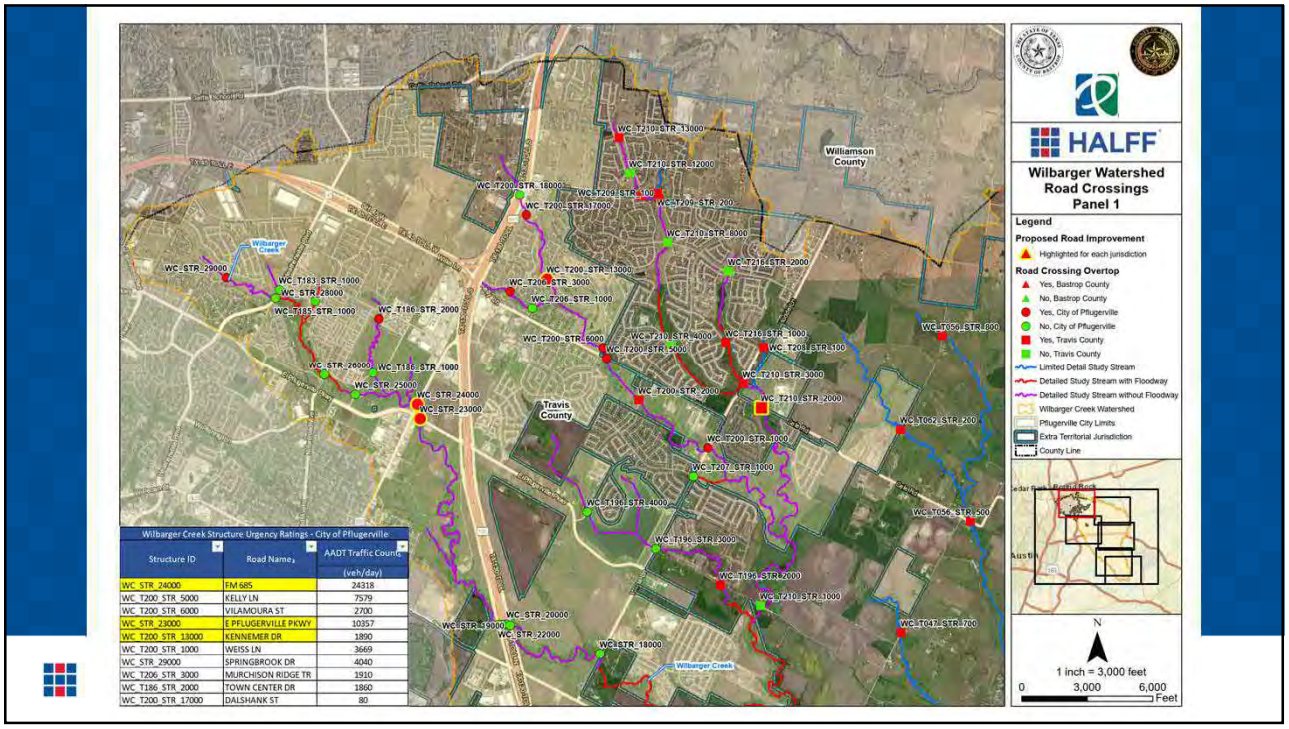


Jurisdiction	Total Number of Overtopping Roads
Bastrop County	20
Travis County	85
City of Pflugerville	10

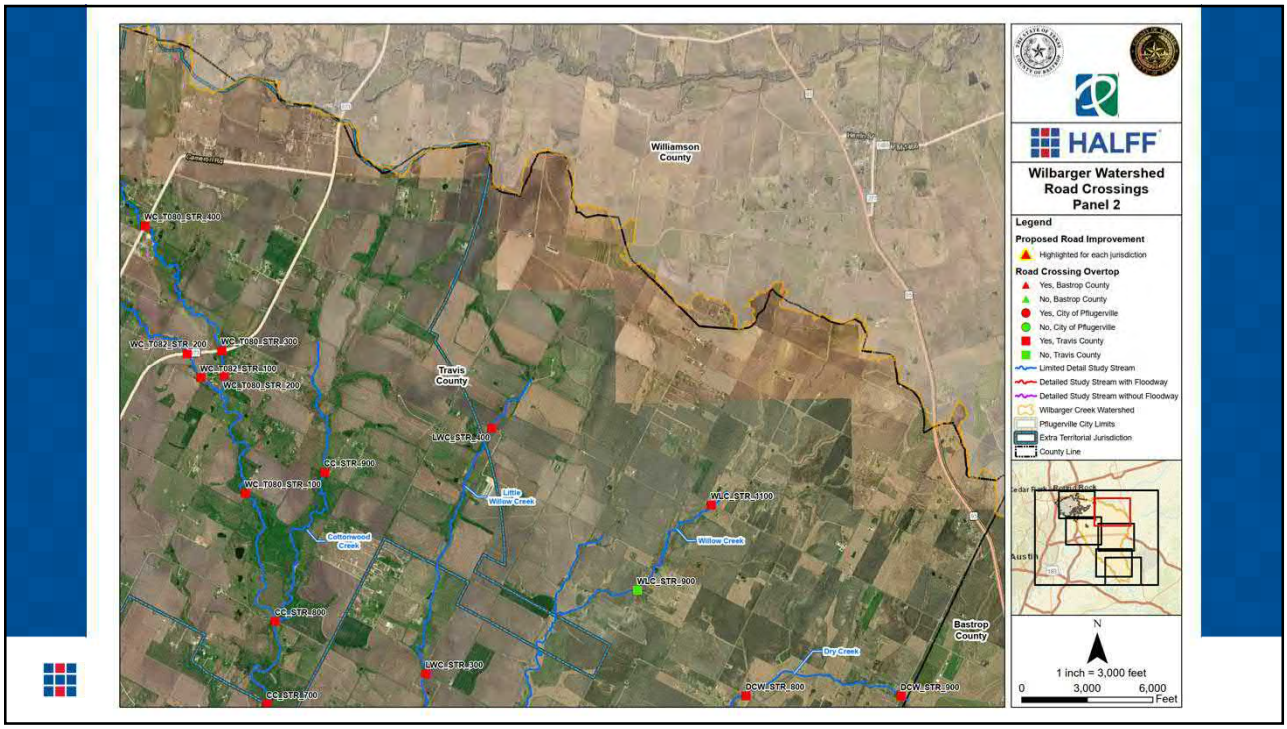
17



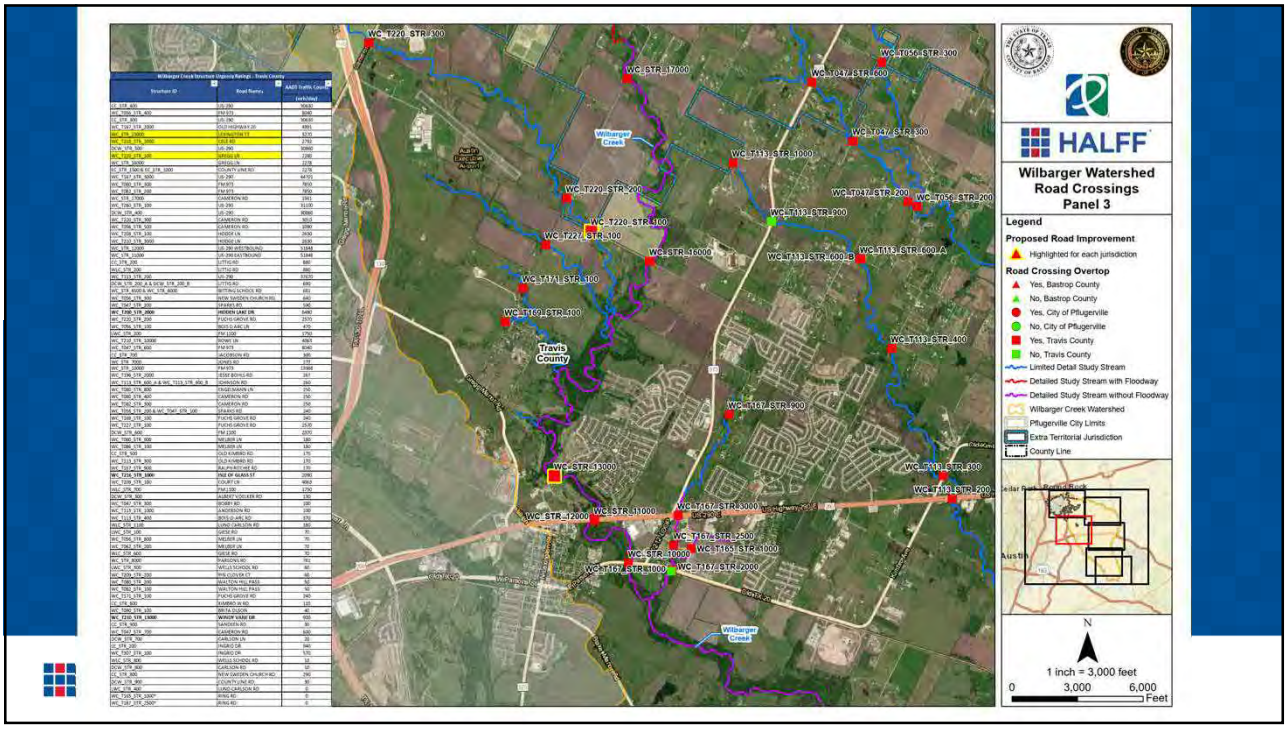
Wilbarger Creek Structure Urgency Ratings - City of Pflugerville

Structure ID	Road Name	AADT Traffic Count (veh/day)
WC_STR_24000	FM 685	24318
WC_T200_STR_5000	KELLY LN	7579
WC_T200_STR_6000	VILAMOURA ST	2700
WC_STR_23000	E PFLUGERVILLE PKWY	10357
WC_T200_STR_13000	KENNEMER DR	1890
WC_T200_STR_1000	WEISS LN	3669
WC_STR_29000	SPRINGBROOK DR	4040
WC_T206_STR_3000	MURCHISON RIDGE TR	1910
WC_T186_STR_2000	TOWN CENTER DR	1860
WC_T200_STR_17000	DALSHANK ST	80

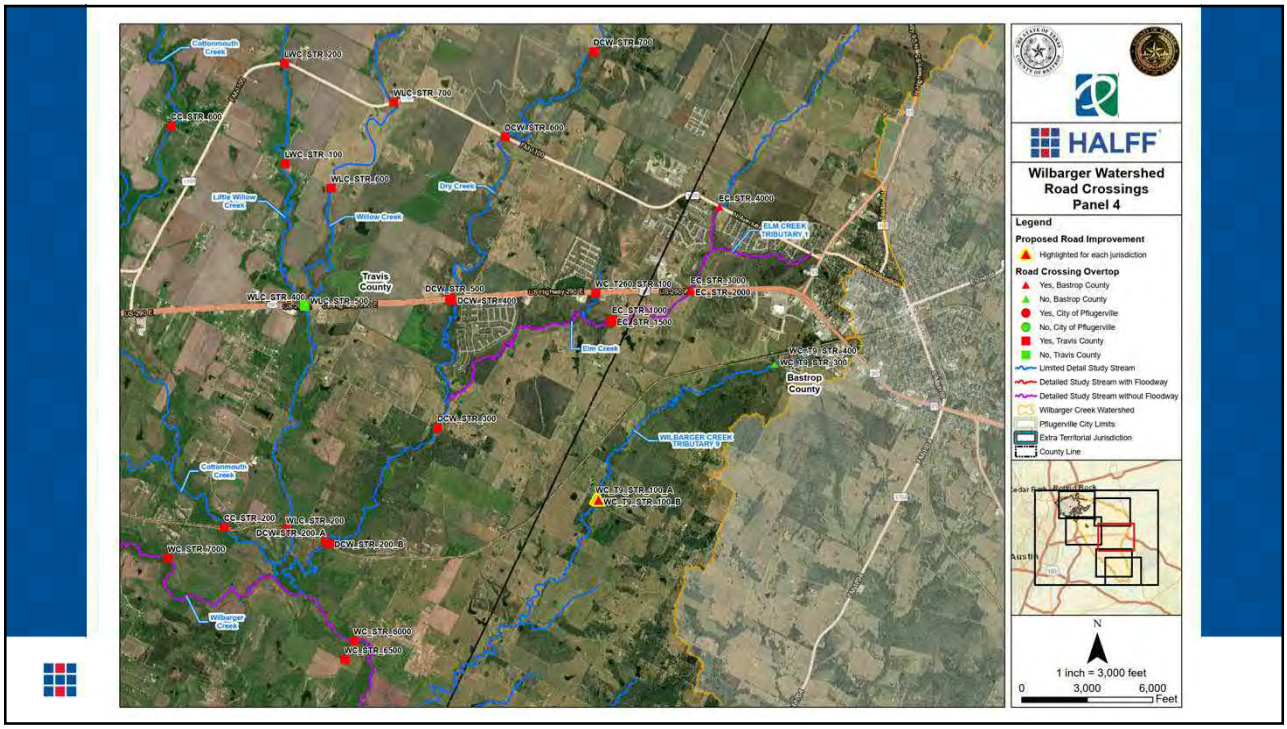
18


Williamson County
Travis County
Bastrop County
Little Willow Creek
Willow Creek
Cottonwood Creek
Dry Creek
WC_T080_STR_400
WC_T080_STR_300
WC_T080_STR_100
WC_T080_STR_200
LWC_STR_100
CC_STR_900
WC_T080_STR_100
WLC_STR_1100
WLC_STR_900
CC_STR_800
LWC_STR_300
CC_STR_700
DCW_STR_800
DCW_STR_900
HALFF
Wilbarger Watershed Road Crossings Panel 2
Legend
Proposed Road Improvement
Highlighted for each jurisdiction
Road Crossing Overtop
Yes, Bastrop County
No, Bastrop County
Yes, City of Pflugerville
No, City of Pflugerville
Yes, Travis County
No, Travis County
Limited Detail Study Stream
Detailed Study Stream with Floodway
Detailed Study Stream without Floodway
Wilbarger Creek Watershed
Pflugerville City Limits
Extra Territorial Jurisdiction
County Line
N
1 inch = 3,000 feet
0 3,000 6,000
Feet

19


WC_T220_STR_100
WC_STR_17000
WC_T047_STR_600
WC_T056_STR_300
WC_T047_STR_300
WC_T111_STR_1000
WC_T220_STR_200
WC_T042_STR_200
WC_T056_STR_200
WC_T220_STR_400
WC_T111_STR_1000
WC_T220_STR_100
WC_STR_16000
WC_T113_STR_600_B
WC_T119_STR_600_A
WC_T171_STR_100
WC_T169_STR_400
WC_T113_STR_400
Travis County
WC_T167_STR_1000
WC_STR_13000
WC_T113_STR_300
WC_T113_STR_200
WC_STR_12000
WC_STR_11000
WC_T167_STR_3000
WC_T167_STR_2500
WC_T165_STR_1000
WC_STR_10000
WC_T167_STR_1000
WC_T167_STR_2000
Wilbarger Creek
HALFF
Wilbarger Watershed Road Crossings Panel 3
Legend
Proposed Road Improvement
Highlighted for each jurisdiction
Road Crossing Overtop
Yes, Bastrop County
No, Bastrop County
Yes, City of Pflugerville
No, City of Pflugerville
Yes, Travis County
No, Travis County
Limited Detail Study Stream
Detailed Study Stream with Floodway
Detailed Study Stream without Floodway
Wilbarger Creek Watershed
Pflugerville City Limits
Extra Territorial Jurisdiction
County Line
N
1 inch = 3,000 feet
0 3,000 6,000
Feet

20



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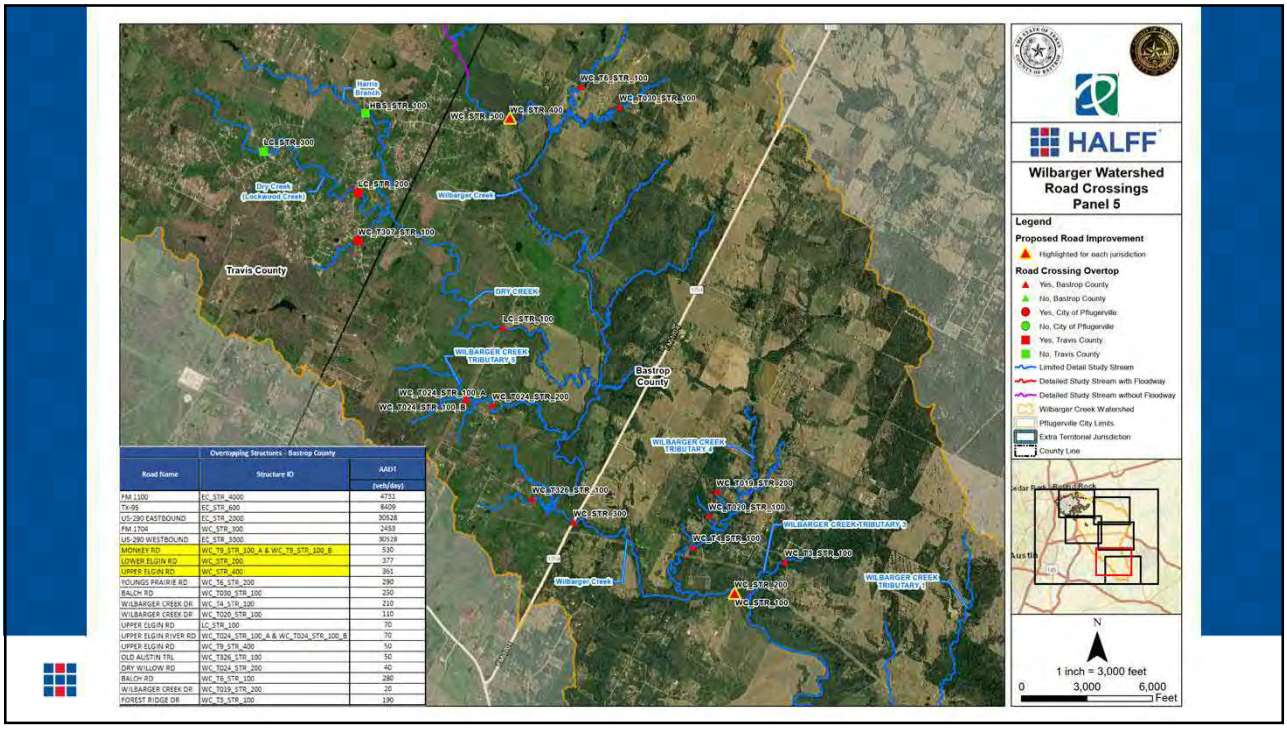

Overtopping Structures - Bastrop County

Road Name	Structure ID	AADT (veh/day)
FM 1100	EC_STR_4000	4731
TX-95	EC_STR_600	8409
US-290 EASTBOUND	EC_STR_2000	30528
FM 1704	WC_STR_300	2453
US-290 WESTBOUND	EC_STR_3000	30528
MONKEY RD	WC_T9_STR_100_A & WC_T9_STR_100_B	530
LOWER ELGIN RD	WC_STR_200	377
UPPER ELGIN RD	WC_STR_400	391
YOUNGS PRAIRIE RD	WC_T6_STR_200	230
BALCH RD	WC_T030_STR_100	250
WILBARGER CREEK DR	WC_T4_STR_100	210
WILBARGER CREEK DR	WC_T020_STR_100	110
UPPER ELGIN RD	LC_STR_100	70
UPPER ELGIN RIVER RD	WC_T024_STR_100_A & WC_T024_STR_100_B	70
UPPER ELGIN RD	WC_T9_STR_400	50
OLD AUSTIN TRL	WC_T926_STR_100	50
DRY WILLOW RD	WC_T024_STR_200	40
BALCH RD	WC_T6_STR_100	280
WILBARGER CREEK DR	WC_T029_STR_200	20
FOREST RIDGE DR	WC_T3_STR_100	190

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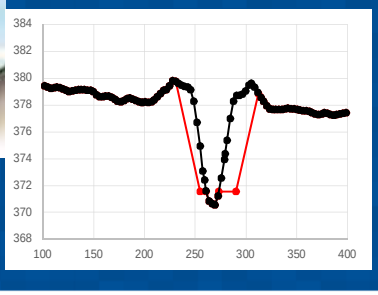
CHANNEL IMPROVEMENTS



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CHANNEL IMPROVEMENTS

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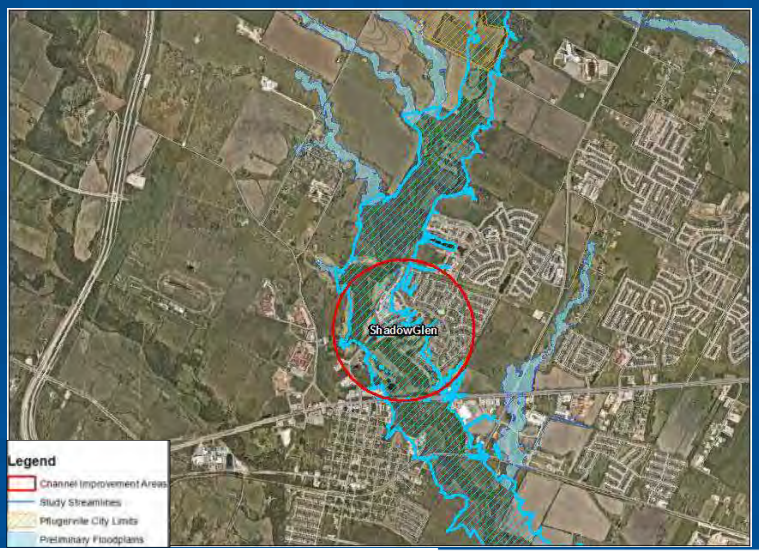
CHANNEL IMPROVEMENTS



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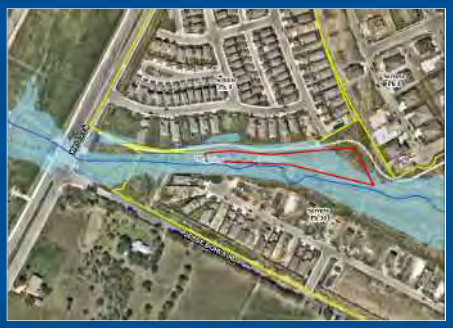
CHANNEL IMPROVEMENTS



Sorento Neighborhood Sections 9 and 10
Travis County

Reserve at West Creek
Travis County

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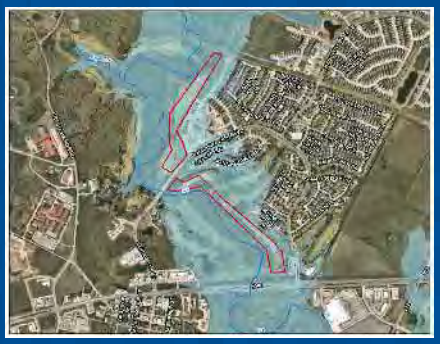
CHANNEL IMPROVEMENTS

Avalon Phase 14 and 17A
Travis County



ShadowGlen Development
Travis County

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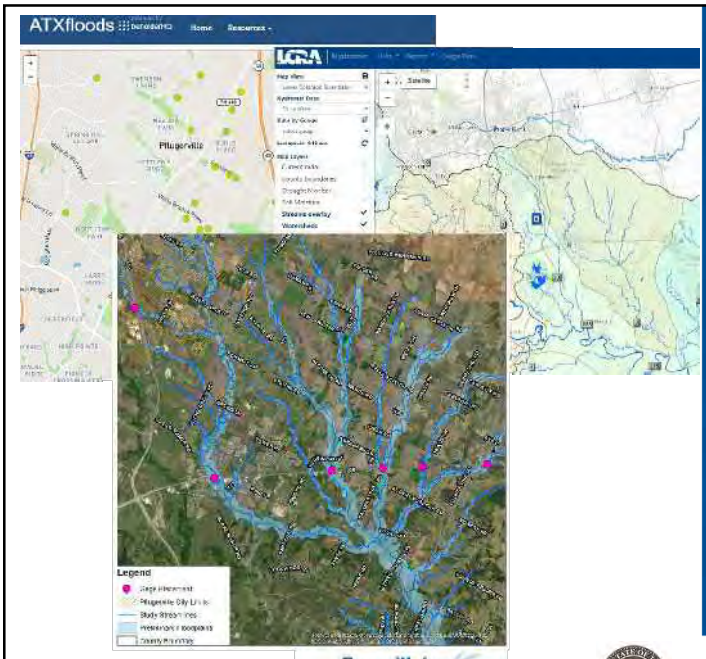

FLOOD MONITORING OPPURTUNITIES

- Stream/rainfall gage placement
  - Critical watershed locations
  - Major roadways
  - Select low water crossings
- Automated Creek Crossings
  - Alerts
  - Flood gate closures
- Existing Systems
  - USGS Stream gage dashboard
  - LCRA Hydromet network in Travis County
  - City of Austin ATX Floods Web Map

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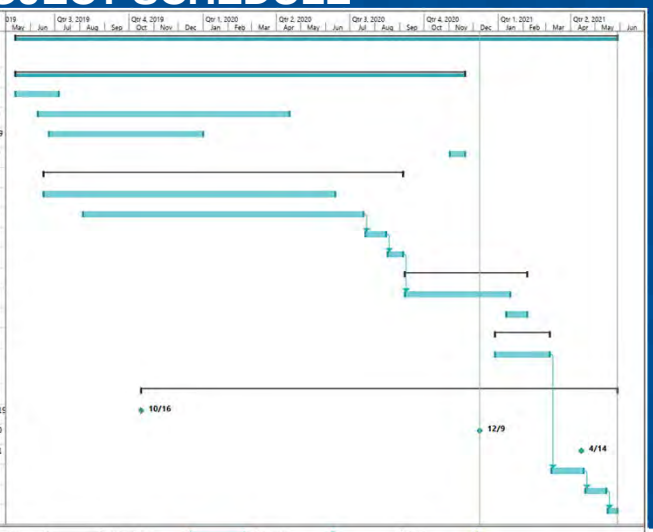
WILBARGER CREEK WATERSHED STUDY
PROJECT SCHEDULE

ID	Task Name	Duration	Start	Finish
1	**WILBARGER CREEK WATERSHED**	**535 days**	**Mon 5/13/19**	Fri 5/28/21
2	**Task 1: Data Collection**	**400 days**	**Mon 5/13/19**	Fri 11/20/20
3	Obtain Base Mapping Info	40 days	Mon 5/13/19	Fri 7/5/19
4	Field Survey	224 days	Mon 6/10/19	Thu 4/16/20
5	Field Recon	137 days	Mon 6/24/19	Tue 12/31/19
6	Environmental Constraints	15 days	Mon 11/2/20	Fri 11/20/20
7	**Task 2: Modeling and Mapping**	**320 days**	**Mon 6/17/19**	**Fri 9/4/20**
8	Hydrologic Model Analysis	260 days	Mon 6/17/19	Fri 6/12/20
9	Hydraulic Model Analysis	250 days	Mon 8/5/19	Fri 7/17/20
10	Floodplain Mapping	20 days	Mon 7/20/20	Fri 8/14/20
11	Flood Risk Determination	15 days	Mon 8/17/20	Fri 9/4/20
12	**Task 3: Alternative Evaluation**	**110 days**	**Mon 9/7/20**	**Fri 2/5/21**
13	Flood Mitigation Evaluation	95 days	Mon 9/7/20	Fri 1/15/21
14	Benefit/Cost Analysis	20 days	Mon 1/11/21	Fri 2/5/21
15	**Task 4: Flood Monitoring**	**50 days**	**Mon 12/28/20**	**Fri 3/5/21**
16	Flood Monitoring Development	50 days	Mon 12/28/20	Fri 3/5/21
17	**Task 5: PM and Reporting**	**423 days**	**Wed 10/16/19**	**Fri 5/28/21**
18	Public Meeting 1	0 days	Wed 10/16/19	Wed 10/16/19
19	Public Meeting 2	0 days	Wed 12/9/20	Wed 12/9/20
20	Public Meeting 3	0 days	Wed 4/14/21	Wed 4/14/21
21	Prepare Report	30 days	Mon 3/8/21	Fri 4/16/21
22	TWDB Review	20 days	Mon 4/19/21	Fri 5/14/21
23	Final Report	10 days	Mon 5/17/21	Fri 5/28/21



Project: Bastrop Co FPP_Alum-W
Date: Wed 12/9/20

Task, Split, Milestone, Summary, Project Summary, Inactive Task, Inactive Milestone, Inactive Summary, Manual Task, Duration-only, Manual Summary Rollup, Manual Summary, Start-only, Finish-only, External Tasks, External Milestone, Deadline, Progress, Manual Progress

Page 1

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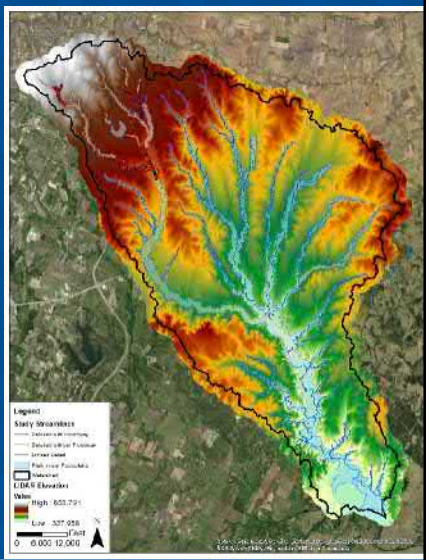
WILBARGER CREEK WATERSHED STUDY
NEXT STEPS

- Finalize Floodplain Extents
- Finalize Flood Mitigation Solutions
- Determine Flood Monitoring Opportunities
- Prepare Wilbarger Watershed Study Report
- April 14, 2021 - Public Meeting #3
- April 16, 2021 - Submit Wilbarger Creek Watershed Study Report



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WILBARGER CREEK STUDY CONTACT INFORMATION

BASTROP COUNTY
Carolyn Dill, PE
Bastrop Co. Engineer
512-581-7180
carolyn.dill@co.bastrop.tx.us

TRAVIS COUNTY
Shawn Snyder, CFM
Interim Permit Manager/
County Floodplain Administrator
512-854-7563
shawn.snyder@traviscountytx.gov

CITY OF PFLUGERVILLE
Jenna Goolsby, PE, CFM
Development Engineer
512-990-6312
jennag@pflugervilletx.gov

HALFF ASSOCIATES
Paul Morales, PE
512-777-4547
pMorales@halff.com

Katherine Smith, EIT
512-777-4623
kSmith@halff.com

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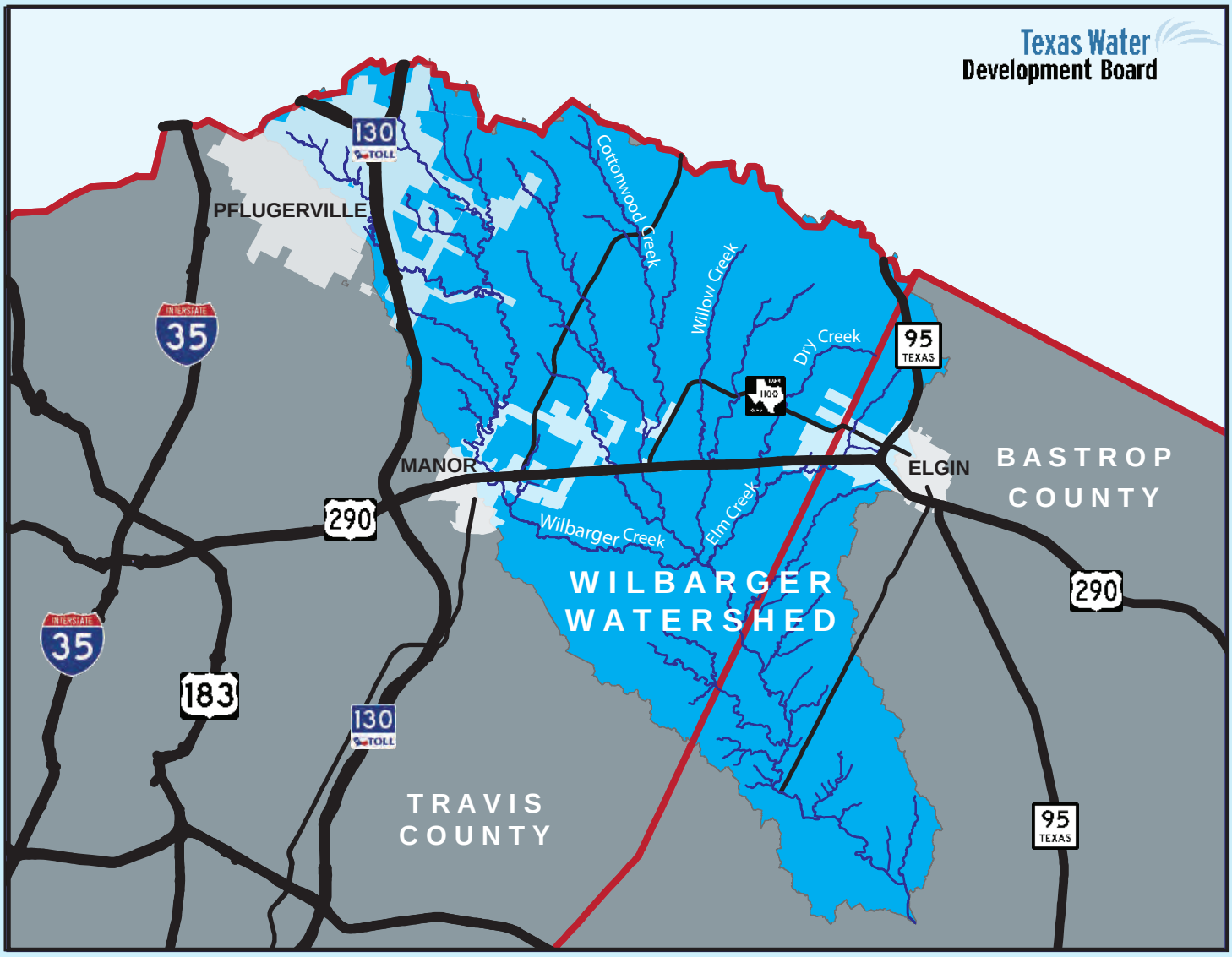
Wilbarger Creek Watershed Study
Public Meeting #3

Wednesday, May 12th
10 am – 11 am
Virtual
https://bit.ly/3t09lEf

Thursday, May 13th
6:30 pm – 7:30 pm
Virtual
https://bit.ly/3xxAoQ8

Bastrop County, with participation from Travis County and the City of Pflugerville, has been awarded a Texas Water Development Board Flood Protection Planning Grant to conduct a floodplain study of the Wilbarger Creek watershed shown below.



The Wilbarger Creek watershed study has developed 100- and 500-year floodplains, as well as floodway boundaries on select creeks. Areas at high risk of flooding during the 100-year storm events have been identified. An overview of the project study analysis and the proposed flood mitigation solutions to increase safety for residents will be presented to the public. A summary of flood monitoring opportunities within the watershed will also be discussed.

Questions about the study can be directed to Carolyn Dill, P.E., Bastrop County Engineer, at (512) 581-7180 or by email at carolyn.dill@co.bastrop.tx.us

WILBARGER CREEK WATERSHED
TWDB FLOOD PROTECTION PLANNING STUDY

MAY 12, 2021 @ 10:00AM
MAY 13, 2021 @ 6:30PM

VIRTUAL WEBEX MEETING

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1

WILBARGER CREEK WATERSHED
TWDB FLOOD PROTECTION PLANNING STUDY

OUTLINE

- FLOOD PROTECTION PLANNING (FPP) STUDIES
- STUDY PARTNERSHIP
- WATERSHED OVERVIEW
- H&H METHODOLOGY
- FLOOD MITIGATION SOLUTIONS
- FLOOD MONITORING OPPORTUNITIES
- NEXT STEPS

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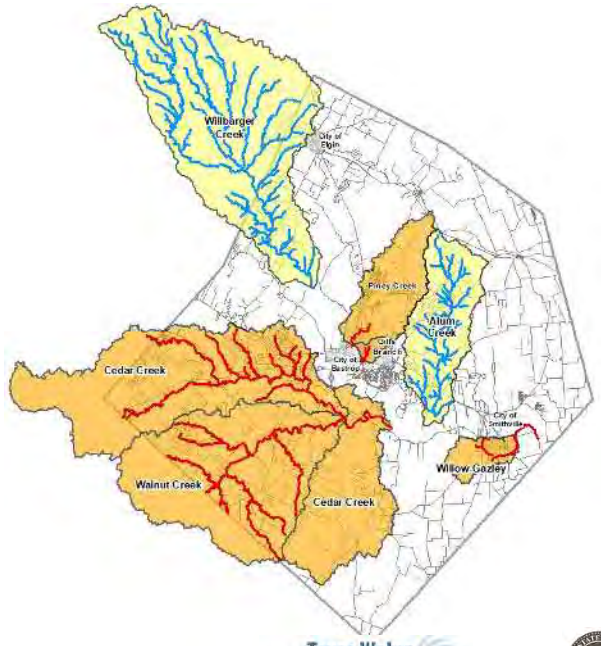
2



STUDIED WATERSHEDS

- 2008-2018 Bastrop Co. FPP
  - Cedar Creek
  - Walnut Creek
  - Sandy Creek
  - Willow Creek (Smithville)
  - Gazley Creek (Smithville)
  - Gills Branch (Bastrop)
  - Piney Creek (Bastrop)
- 2019 Bastrop Co. FPP
  - Alum Creek
  - Wilbarger Creek (Travis Co. & Pflugerville)

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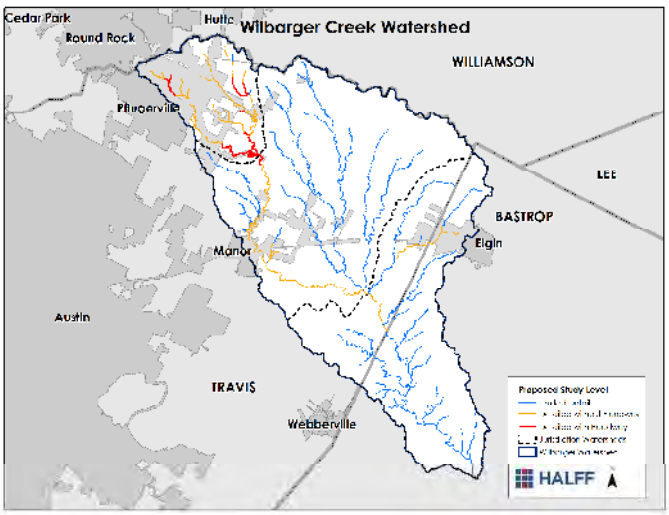

WILBARGER CREEK WATERSHED OVERVIEW

- Drainage Area
  - 181 sq. miles
  - 253 sub-basins
- 223 stream miles by level of study:
  - 11 mi. – Detailed with Floodway
  - 54 mi. – Detailed no Floodway
  - 158 mi. – Limited Detail
- 90 surveyed public road crossings
- 96 field recon public road crossings
- 103 survey channel cross sections

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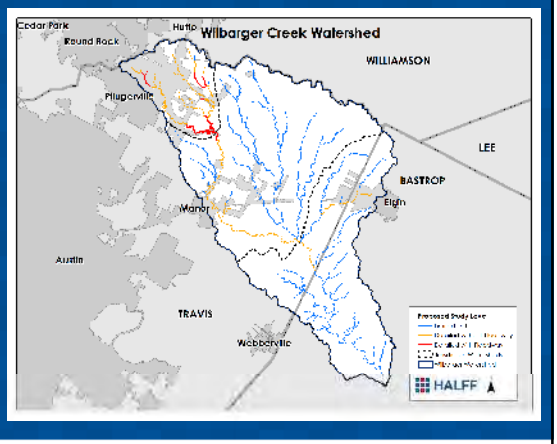
WILBARGER CREEK WATERSHED
TWDB FLOOD PROTECTION PLANNING STUDY

2019 LEVERAGED FUNDING FOR WILBARGER CREEK

Texas Water Development Board	50%
Bastrop County	12%
Travis County	21.5%
City of Pflugerville	16.5%
Total	100%



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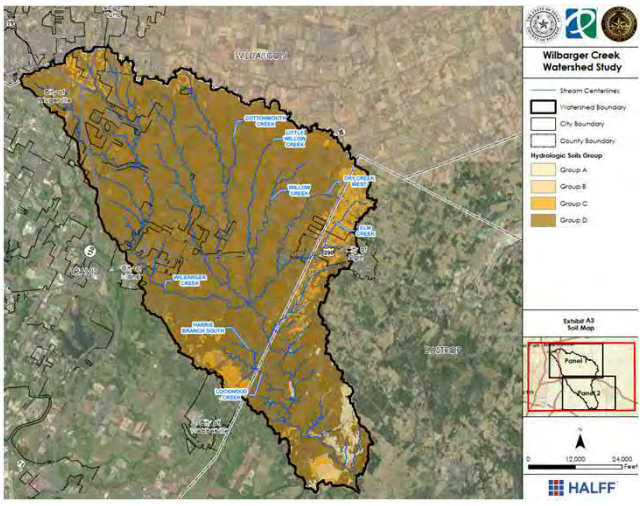

DATA COLLECTION

- Public Flood Problem Questionnaire
- 2017 LiDAR terrain
  - Hydrology: 10'x10' DEM
  - Hydraulics: 3'x3' DEM
- SSURGO Soil Survey
- Land Use
- Survey & Field Reconnaissance
  - Field measurements
  - Field Sketches
  - Photos

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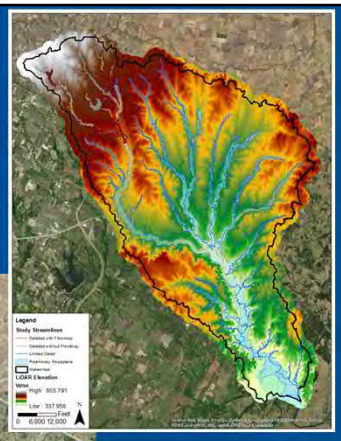
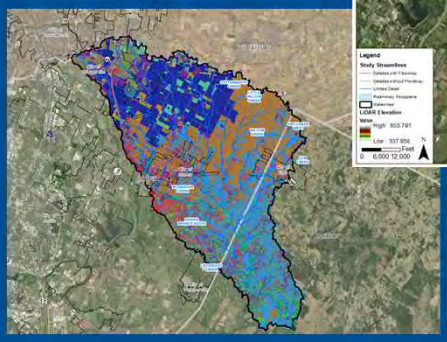
HYDROLOGY (RAINFALL RUNOFF)

1. RAINFALL
   - Source: NOAA Atlas 14
   - Distribution of Pflugerville rainfall and City of Austin rainfall
2. TOPOGRAPHY (GROUND SURFACE)
   - LiDAR
   - Watershed Boundaries
   - Watershed Slopes
3. SOILS
   - Hydrologic Soil Types
   - Antecedent Moisture Condition
4. LAND USE
   - Existing Conditions
   - City of Pflugerville Landuse
   - NLCD Landuse
5. DETENTION PONDS
   - 9 large detention ponds, 3 in Travis County ETJ
   - Lake Pflugerville





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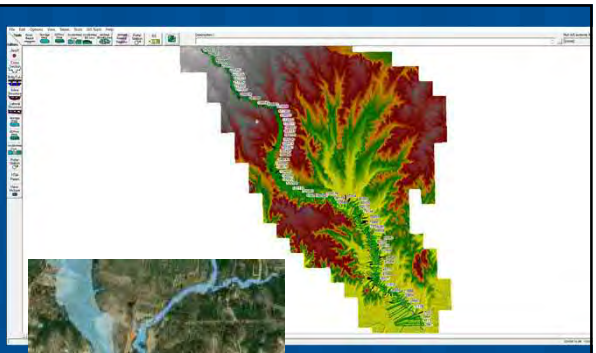
HYDRAULICS (CREEK FLOODING)

1. HYDROLOGY
   - Peak Discharge – 2, 5, 10, 25, 50, 100, and 500-year
2. TOPOGRAPHY (GROUND SURFACE)
   - LiDAR
   - Stream Slope/Definition
3. CROSS-SECTION
   - Incorporate Survey information
   - Roughness Coefficients (N-values)
   - Expansion/Contraction Coefficients
   - Ineffective/Blocked Areas
4. CROSSINGS/CONSTRICTIONS
   - Incorporate Survey information
   - Bridges, Culverts, Dams, Small Stock Ponds, Railroads



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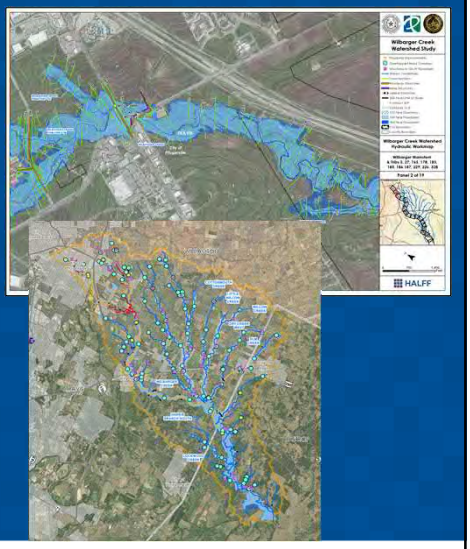
8

FLOODPLAIN MAPPING (FLOOD EXTENTS)

1. TOPOGRAPHY (GROUND SURFACE)
   - Drainage patterns
2. FLOODPLAIN EXTENTS
   - 100-year Floodplain for Limited Detail streams
   - 100-year and 500-year for Detailed streams
   - 100-year, 500-year, and Floodway for Detailed streams with Floodway
   - Width of Floodplain
3. CROSSINGS/CONSTRICTIONS
   - Overtopping Road Crossings



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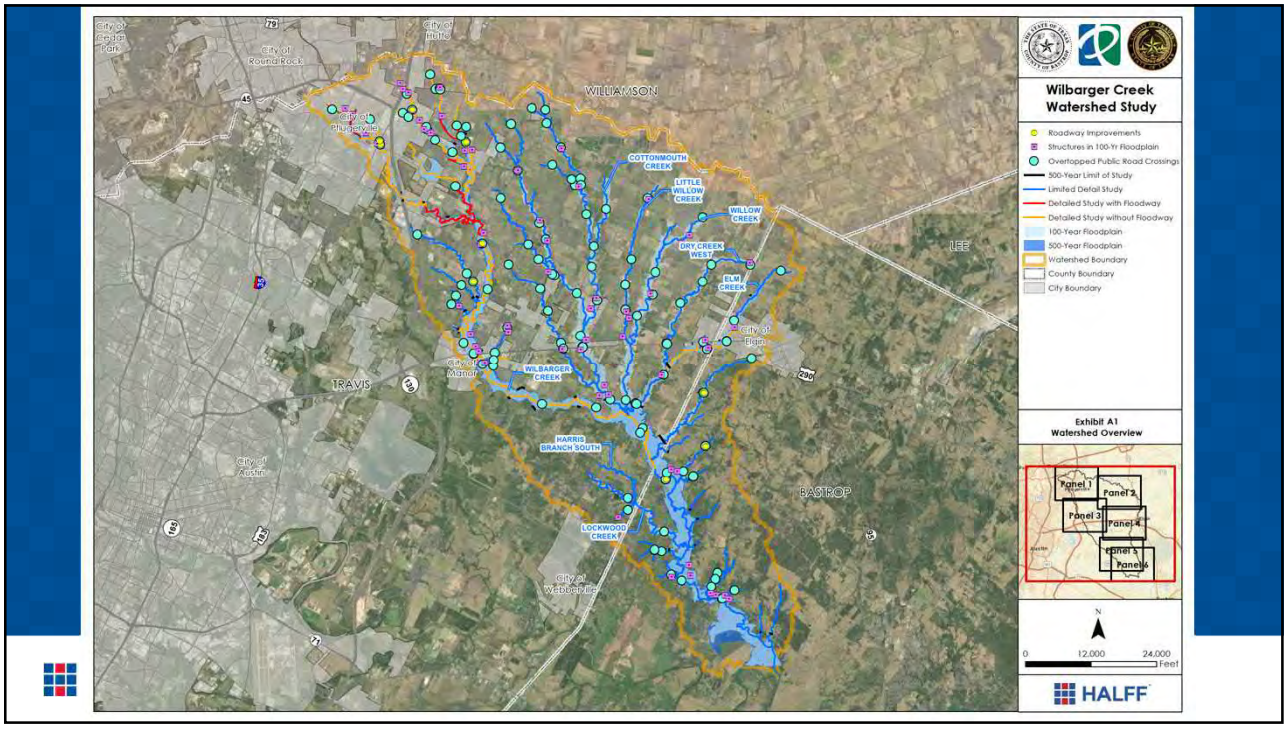
9



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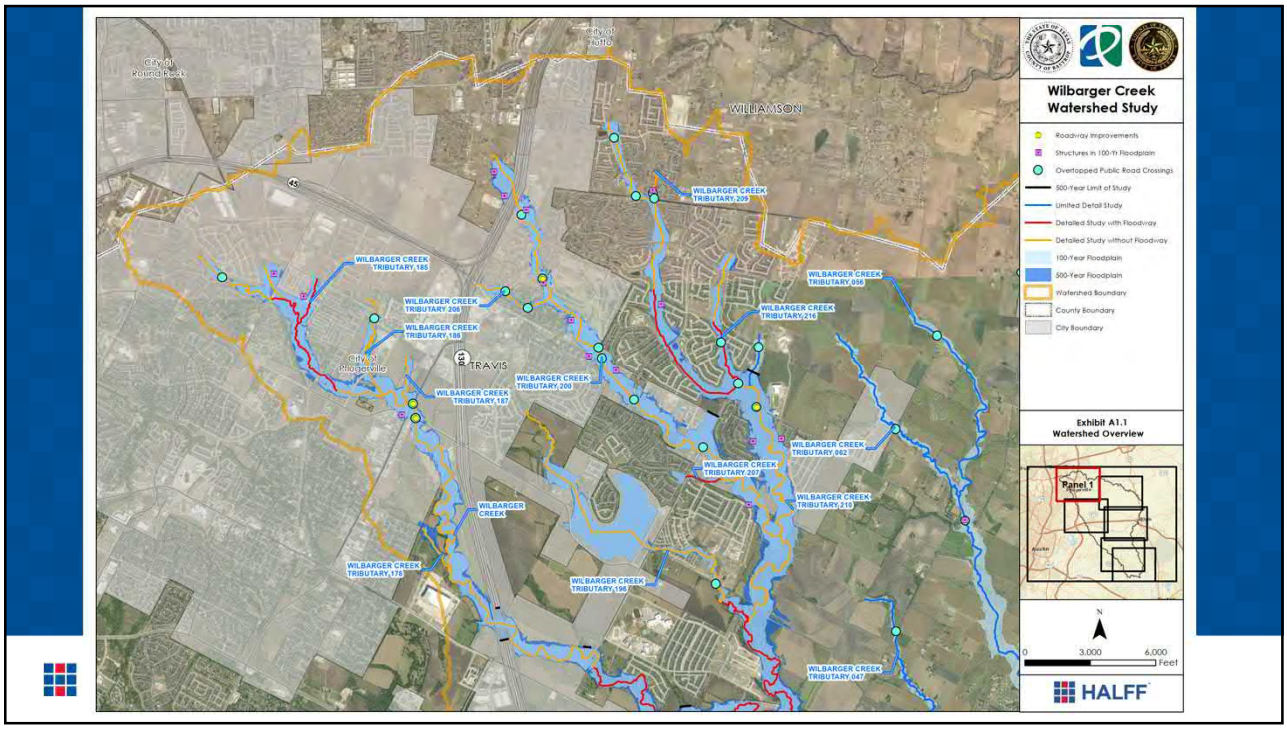
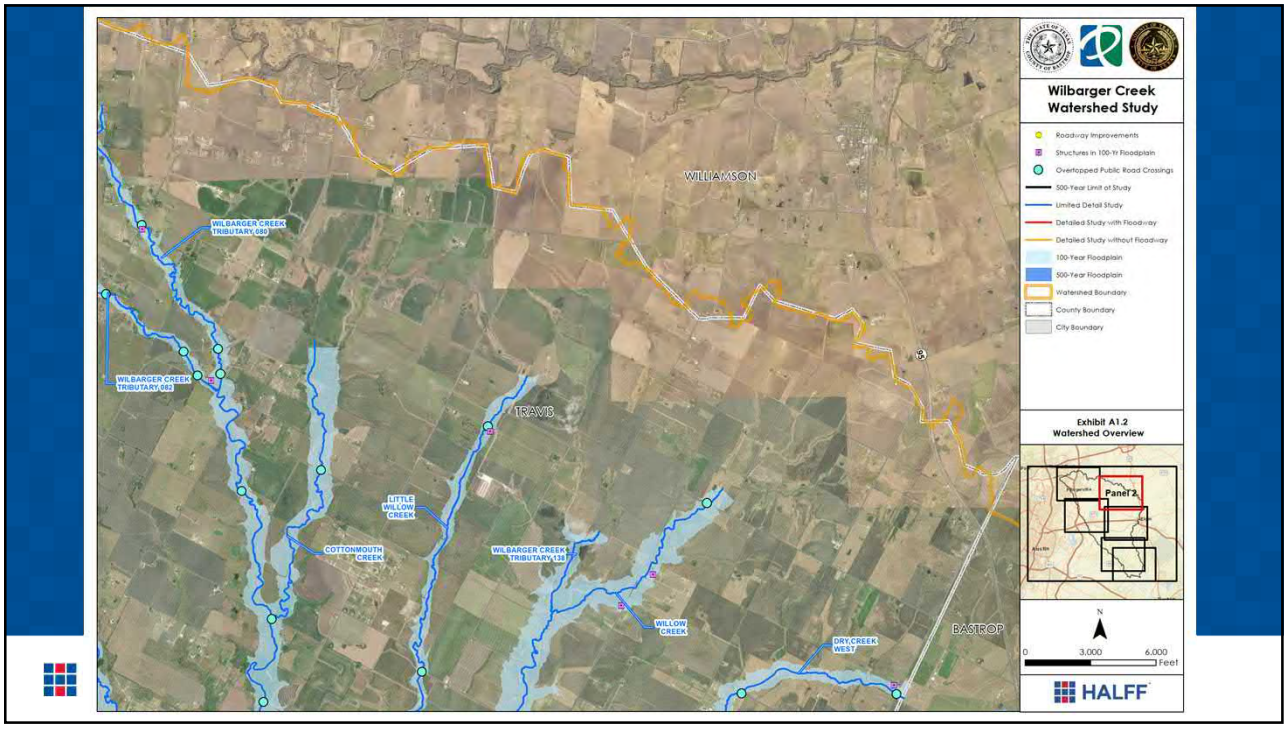

Wilbarger Creek Watershed Study
Roadway Improvements
Structures in 100-Yr Floodplain
Overtopped Public Road Crossings
500-Year Limit of Study
Limited Detail Study
Detailed Study with Floodway
Detailed Study without Floodway
100-Year Floodplain
500-Year Floodplain
Watershed Boundary
County Boundary
City Boundary
Exhibit A1.1
Watershed Overview
Panel 1
WILLIAMSON
TRAVIS
WILBARGER CREEK TRIBUTARY 209
WILBARGER CREEK TRIBUTARY 185
WILBARGER CREEK TRIBUTARY 200
WILBARGER CREEK TRIBUTARY 188
WILBARGER CREEK TRIBUTARY 187
WILBARGER CREEK TRIBUTARY 200
WILBARGER CREEK TRIBUTARY 056
WILBARGER CREEK TRIBUTARY 216
WILBARGER CREEK TRIBUTARY 062
WILBARGER CREEK TRIBUTARY 207
WILBARGER CREEK TRIBUTARY 210
WILBARGER CREEK
WILBARGER CREEK TRIBUTARY 178
WILBARGER CREEK TRIBUTARY 196
WILBARGER CREEK TRIBUTARY 047
0 3,000 6,000 Feet
HALFF

11


Wilbarger Creek Watershed Study
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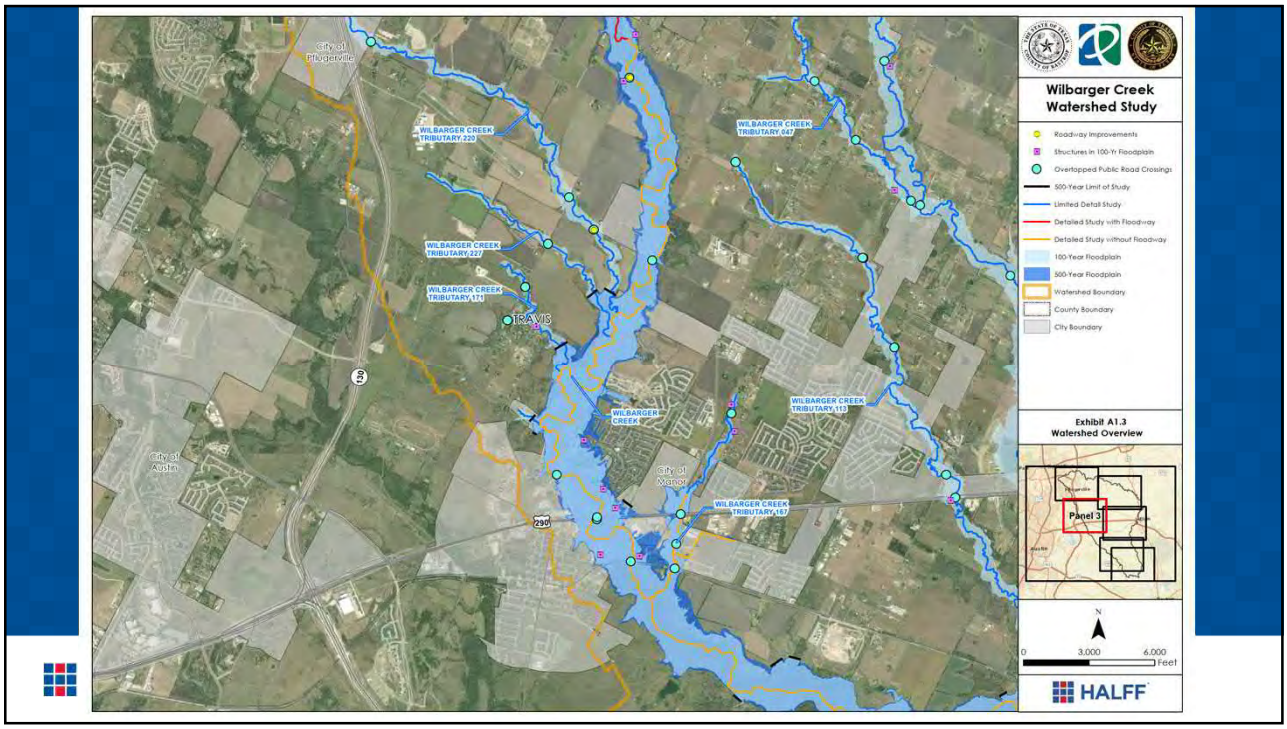
Overtopped Public Road Crossings
500-Year Limit of Study
Limited Detail Study
Detailed Study with Floodway
Detailed Study without Floodway
100-Year Floodplain
500-Year Floodplain
Watershed Boundary
County Boundary
City Boundary
Exhibit A1.2
Watershed Overview
Panel 2
WILLIAMSON
TRAVIS
BASTROP
WILBARGER CREEK TRIBUTARY 080
WILBARGER CREEK TRIBUTARY 082
LITTLE WILLOW CREEK
COTTONMOUTH CREEK
WILBARGER CREEK TRIBUTARY 138
WILLOW CREEK
DRY CREEK WEST
0 3,000 6,000 Feet
HALFF

12


Wilbarger Creek Watershed Study
Roadway Improvements
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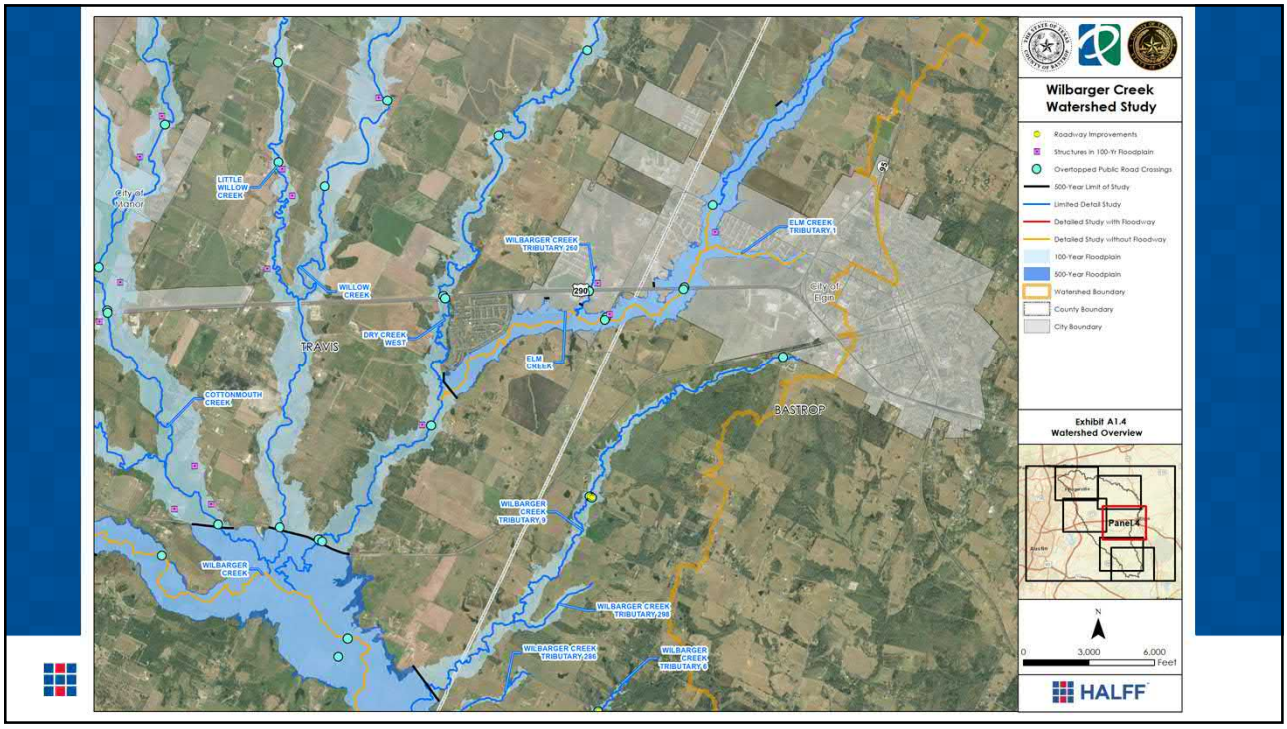
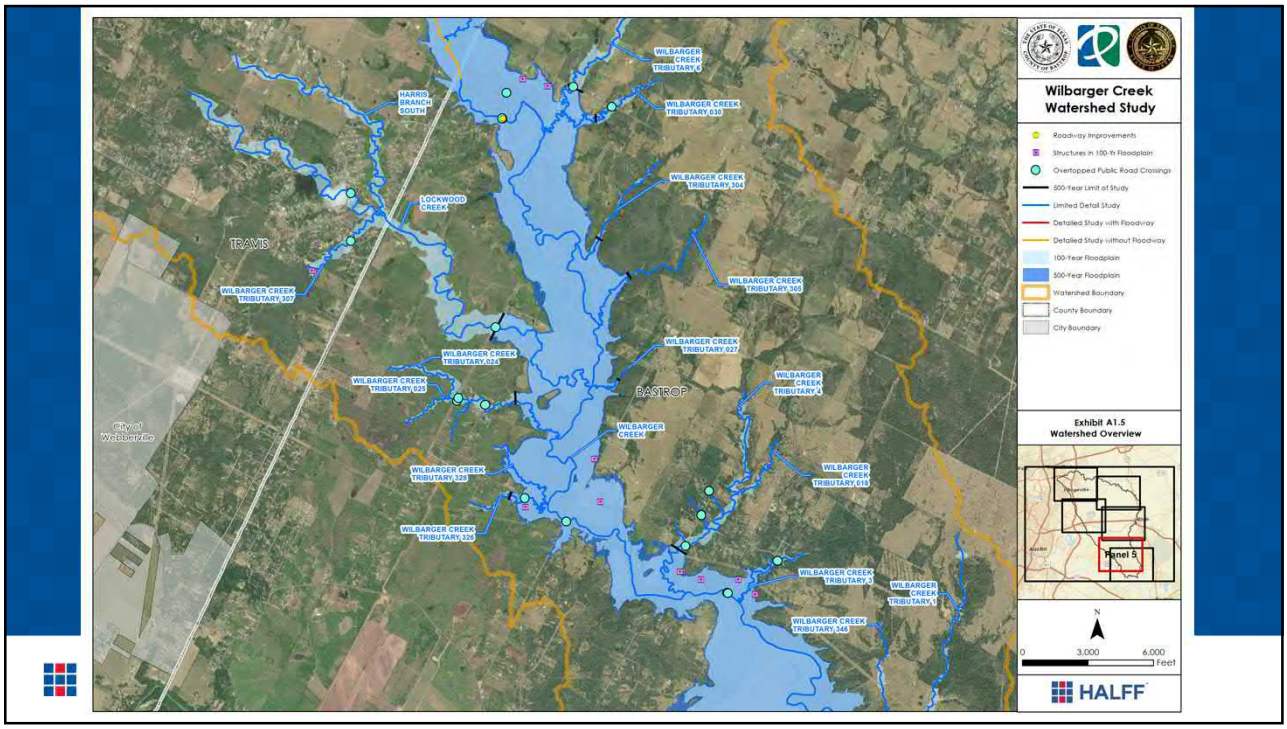
Overtopped Public Road Crossings
500-Year Limit of Study
Limited Detail Study
Detailed Study with Floodway
Detailed Study without Floodway
100-Year Floodplain
500-Year Floodplain
Watershed Boundary
County Boundary
City Boundary
Exhibit A1.3
Watershed Overview
Panel 3
N
0
3,000
6,000
Feet
HALFF
City of Pflugerville
WILBARGER CREEK TRIBUTARY 220
WILBARGER CREEK TRIBUTARY 047
WILBARGER CREEK TRIBUTARY 227
WILBARGER CREEK TRIBUTARY 171
TRAVIS
WILBARGER CREEK
WILBARGER CREEK TRIBUTARY 113
City of Austin
City of Manor
WILBARGER CREEK TRIBUTARY 187
290
95

13


Wilbarger Creek Watershed Study
Roadway Improvements
Structures in 100-Yr Floodplain
Overtopped Public Road Crossings
500-Year Limit of Study
Limited Detail Study
Detailed Study with Floodway
Detailed Study without Floodway
100-Year Floodplain
500-Year Floodplain
Watershed Boundary
County Boundary
City Boundary
Exhibit A1.4
Watershed Overview
Panel 4
N
0
3,000
6,000
Feet
HALFF
LITTLE WILLOW CREEK
City of Manor
WILBARGER CREEK TRIBUTARY 260
ELM CREEK TRIBUTARY 1
WILLOW CREEK
290
City of Elgin
DRY CREEK WEST
TRAVIS
ELM CREEK
COTTONMOUTH CREEK
BASTROP
WILBARGER CREEK TRIBUTARY 9
WILBARGER CREEK
WILBARGER CREEK TRIBUTARY 288
WILBARGER CREEK TRIBUTARY 286
WILBARGER CREEK TRIBUTARY 6

14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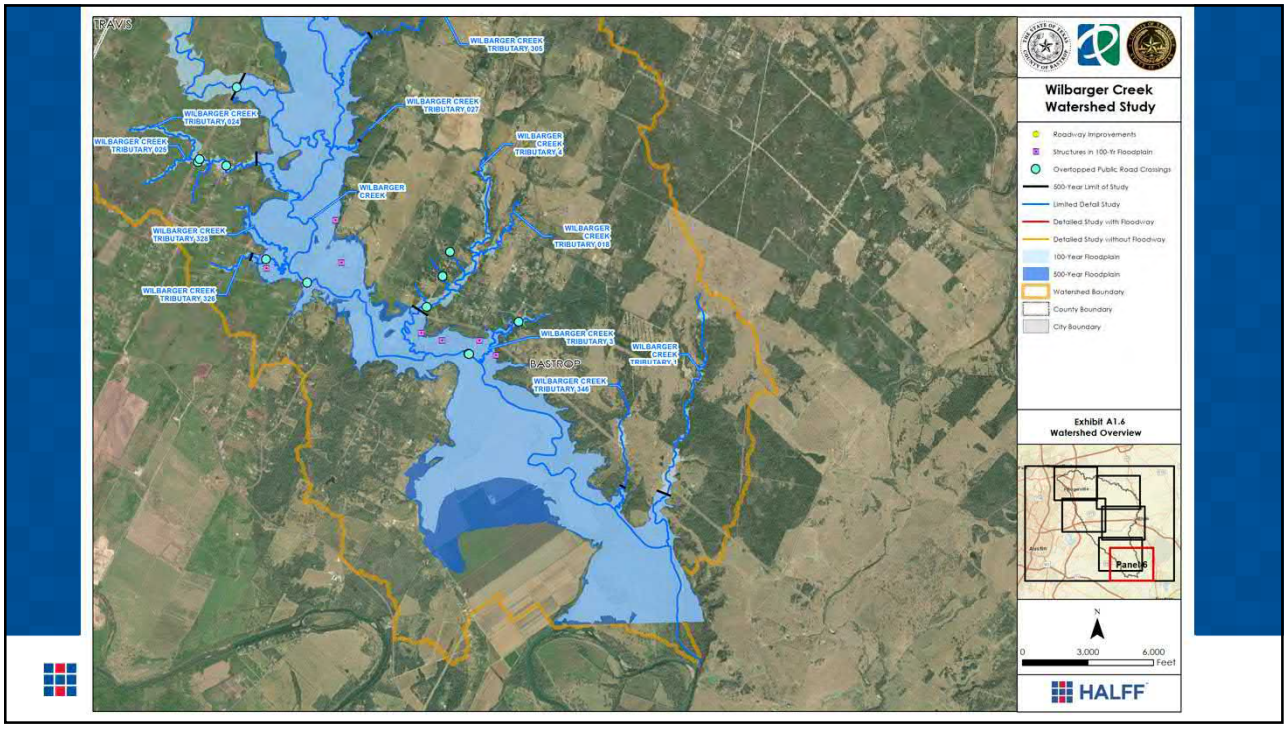
HARRIS BRANCH SOUTH
WILBARGER CREEK TRIBUTARY 030
WILBARGER CREEK TRIBUTARY 304
LOCKWOOD CREEK
TRAVIS
WILBARGER CREEK TRIBUTARY 307
WILBARGER CREEK TRIBUTARY 305
WILBARGER CREEK TRIBUTARY 027
WILBARGER CREEK TRIBUTARY 024
WILBARGER CREEK TRIBUTARY 025
BASTROP
WILBARGER CREEK TRIBUTARY 4
City of Webberville
WILBARGER CREEK
WILBARGER CREEK TRIBUTARY 023
WILBARGER CREEK TRIBUTARY 015
WILBARGER CREEK TRIBUTARY 026
WILBARGER CREEK TRIBUTARY 3
WILBARGER CREEK TRIBUTARY 1
WILBARGER CREEK TRIBUTARY 346
Wilbarger Creek Watershed Study
Roadway Improvements
Structures in 100-Yr Floodplain
Overtopped Public Road Crossings
500-Year Limit of Study
Limited Detail Study
Detailed Study with Floodway
Detailed Study without Floodway
100-Year Floodplain
500-Year Floodplain
Watershed Boundary
County Boundary
City Boundary
Exhibit A1.5
Watershed Overview
Panel 5
N
0
3,000
6,000
Feet
HALFF

15


TRAVIS
WILBARGER CREEK TRIBUTARY 305
WILBARGER CREEK TRIBUTARY 027
WILBARGER CREEK TRIBUTARY 024
WILBARGER CREEK TRIBUTARY 026
WILBARGER CREEK TRIBUTARY 4
WILBARGER CREEK
WILBARGER CREEK TRIBUTARY 023
WILBARGER CREEK TRIBUTARY 015
WILBARGER CREEK TRIBUTARY 325
WILBARGER CREEK TRIBUTARY 3
WILBARGER CREEK TRIBUTARY 1
BASTROP
WILBARGER CREEK TRIBUTARY 346
Wilbarger Creek Watershed Study
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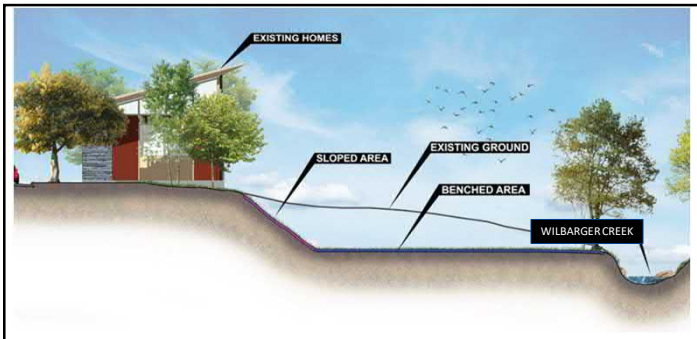
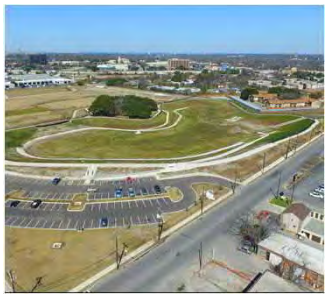
Limited Detail Study
Detailed Study with Floodway
Detailed Study without Floodway
100-Year Floodplain
500-Year Floodplain
Watershed Boundary
County Boundary
City Boundary
Exhibit A1.6
Watershed Overview
Panel 6
N
0
3,000
6,000
Feet
HALFF

16





FLOOD MITIGATION SOLUTIONS

- Flood Protection Measures:
  - Bridge/culvert improvements
  - Channel improvements
  - Detention/retention ponds
  - Buyouts
- Probable Cost Estimate

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ROAD CROSSING IMPROVEMENTS

BOWIE DRIVE IN SMITHVILLE

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Stream	Structure ID	Road Name	Structure Type	AADT Traffic (veh/day)	Annual Chance of Flooding Percent Chance	Urgency Rating (veh/day/yr)
Wilbarger Creek Structure Urgency Ratings - Bastrop County						
WC_T009	WC_T9_STR_100_A & WC_T9_STR_100_B	MONKEY RD	Multiple Opening	530	50%	265
WC	WC_STR_400	UPPER ELGIN RD	Bridge	361	50%	181
WC	WC_T6_STR_200	YOUNGS PRAIRIE RD	Culverts	290	50%	145
Wilbarger Creek Structure Urgency Ratings - Travis County						
WC_T210	WC_T210_STR_2000	CELE RD	Bridge	2792	50%	1396
WC_T220	WC_T220_STR_100	GREGG LN	Culverts	2280	50%	1140
WC	WC_STR_17000	CAMERON RD	Bridge	1561	50%	781
Wilbarger Creek Structure Urgency Ratings - City of Pflugerville						
WC	WC_STR_24000	FM 685	Bridge	24318	20%	4864
WC	WC_STR_23000	E PFLUGERVILLE PKWY	Bridge	10357	4%	414
WC_T200	WC_T200_STR_13000	KENNEMER DR	Culverts	1890	20%	378

ROADWAY IMPROVEMENT RANKING

- Developed urgency risk ranking
- 113 overtopping roadways
- Determined Average Daily Traffic Counts
  - TxDOT Traffic Counts
  - Trip Generation Manual
  - Pflugerville Open Data Portal
- Determined annual chance of road overtopping

- Higher priority if the road is overtopped more frequently
- A higher urgency rating means the higher the flood risk for the structure

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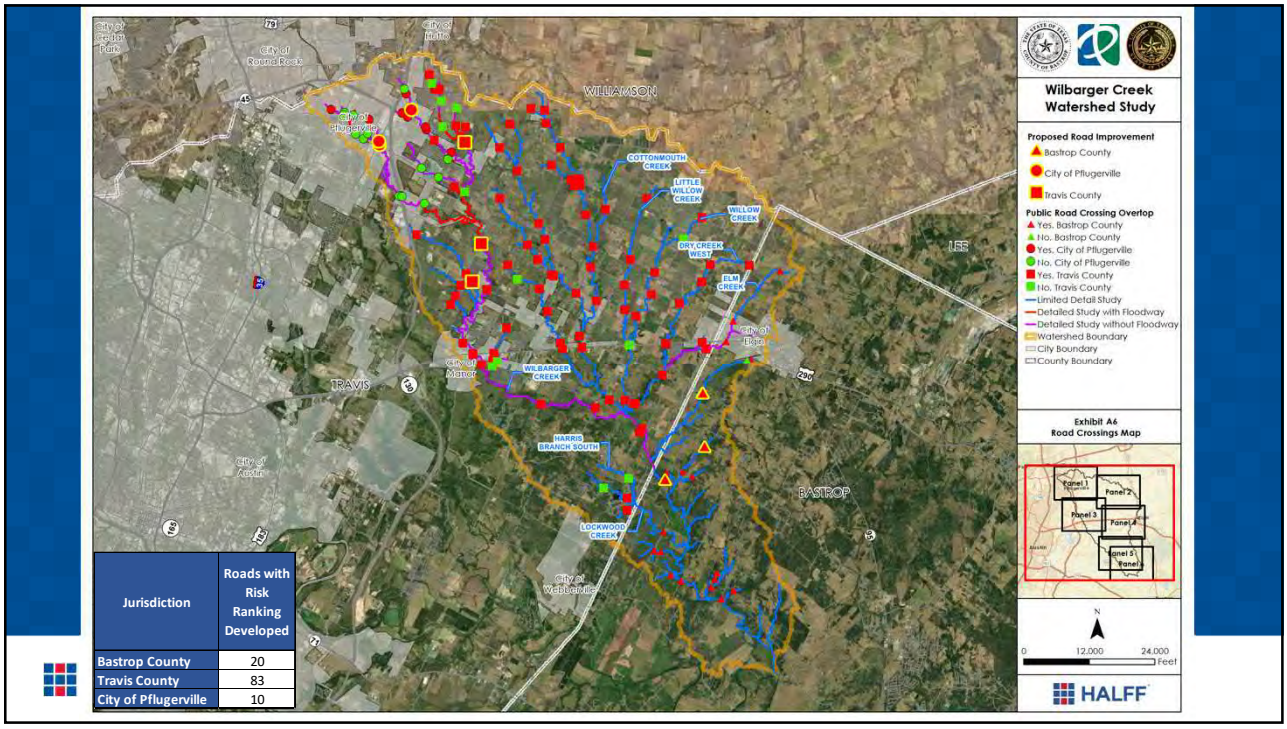

Jurisdiction	Roads with Risk Ranking Developed
Bastrop County	20
Travis County	83
City of Pflugerville	10

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BASTROP COUNTY ROADWAY IMPROVEMENTS

Road Crossing	Structure ID [Lat., Long.]	Existing Conditions		Proposed Improvement			
		Existing Structure	Overtopping Event (ACE)	Structural Improvement	Roadway Improvement	Overtopping Event (ACE)	Probable Cost Estimate
Wilbarger Creek Trib 9 Monkey Rd.	WC_T9_STR_100_A [30.3261, -97.4173] & WC_T9_STR_100_B [30.3260, -97.4170]	A: 20' wide bridge B: 2 - 8' x 4' RCBs	50% (2-year)	A: 100' wide bridge B: 50'wide bridge B Plus: 5 – 4' x 2' overflow RCBs	330 LF of Raised Roadway	20% (5-year)	$2.3M
Wilbarger Creek Upper Elgin Rd.	WC_STR_400 [30.2831, -97.4402] & WC_STR_450 [30.2863, -97.4395]	400: 150'wide bridge 450: 5 - 3' CMPs	50% (2-year)	400: 150' wide bridge 450: 200' and 50' wide bridge Plus: 4 - 8' x 4' overflow RCBs	2,100 LF of New Raised Roadway	20% (5-year)	$5.8M
Wilbarger Creek Trib 6 Youngs Prairie Rd.	WC_T6_STR_200 [30.2992, -97.4168]	2 - 4' CMPs	50% (2-year)	4 - 5' x 5' RCBs	300 LF of Raised Roadway	20% (5-year)	$408,000

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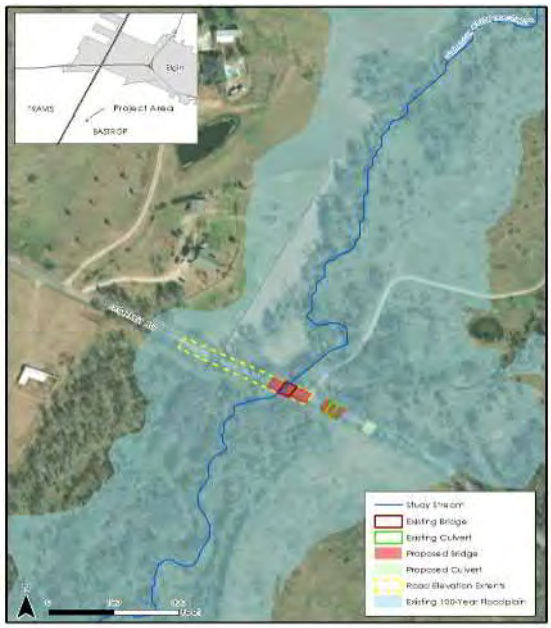

MONKEY ROAD IMPROVEMENTS

- Existing Conditions
  - 20 ft bridge span
  - 2 – 8 ft x 4 ft culverts
  - Overtopped by all storm events
- Proposed Improvements
  - 100 ft bridge span
  - 50 ft bridge span
  - 5 – 4 ft x 2 ft culverts
  - 330 ft of raised roadway
  - Passes the 2-yr storm
- Probable cost estimate - $2.3M

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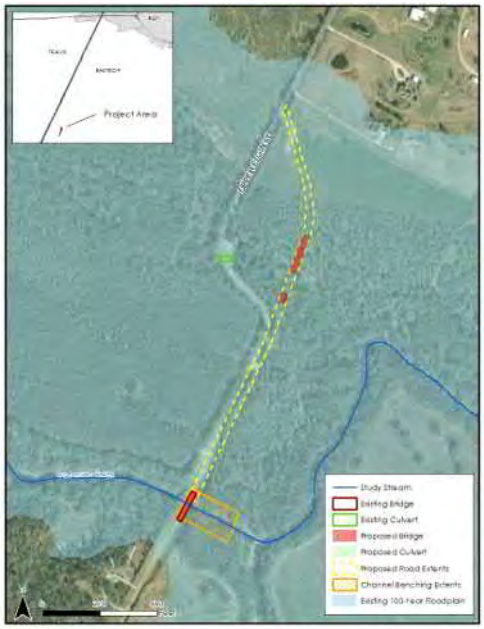

UPPER ELGIN ROAD IMPROVEMENTS

- Existing Conditions
  - 150 ft bridge span
  - 5 – 3 ft culverts
  - Overtopped by all storm events
- Proposed Improvements
  - 150 ft bridge span
  - 100 ft bridge span
  - 4 – 8 ft x 4 ft culverts
  - Removal of roadway S-curve
  - 2,100 ft of raised roadway
  - Passes the 2-yr storm
- Probable cost estimate - $5.8M

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YOUNGS PRAIRIE ROAD IMPROVEMENTS

- Existing Conditions
  - 2 – 4 ft culverts
  - Overtopped by all storm events
- Proposed Improvements
  - 4 – 5 ft x 5ft culverts
  - 300 ft of raised roadway
  - Passes the 2-yr storm
- Probable cost estimate - $408,000

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TRAVIS COUNTY ROADWAY IMPROVEMENTS

Road Crossing	Structure ID [Lat., Long.]	Existing Conditions		Proposed Improvement			
		Existing Structure	Overtopping Event (ACE)	Structural Improvement	Roadway Improvement	Overtopping Event (ACE)	Probable Cost Estimate
Wilbarger Creek Trib 210 Cele Rd.	WC_T210_STR_2000 [30.4557, -97.5514]	85'wide bridge	50% (2-year)	200' wide bridge	1160 LF of Raised Roadway & Concrete Bridge Opening (2:1 side slope)	0.2% (500-year)	$4.3M
Wilbarger Creek Trib 220 Gregg Ln.	WC_T220_STR_100 [30.3854, -97.5491]	2 - 10'x 5' RCBs	50% (2-year)	200' wide bridge	870 LF of Raised Roadway	0.2% (500-year)	$5.5M
Wilbarger Creek Cameron Rd.	WC_STR_13000 [30.4044, -97.5434]	130' wide bridge	50% (2-year)	300' wide bridge	1520 LF of Raised Roadway	0.2% (500-year)	$3.1M

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CELE ROAD IMPROVEMENTS

- Existing Conditions
  - 85 ft bridge span
  - Overtopped during all storm events
- Proposed Improvements
  - 200 ft bridge span
  - 1,160 ft of raised roadway
  - Passes the 100-yr storm
- Probable cost estimate - $4.3M

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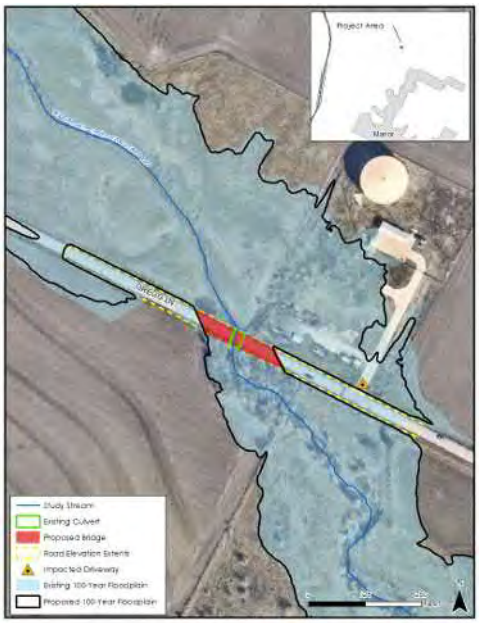

GREGG LANE IMPROVEMENTS

- Existing Conditions
  - 2- 10 ft x 5 ft culverts
  - Overtopped during all storm events
- Proposed Improvements
  - 200 ft bridge span
  - 870 ft of raised roadway
  - Passes the 100-yr storm
- Probable cost estimate - $5.5M

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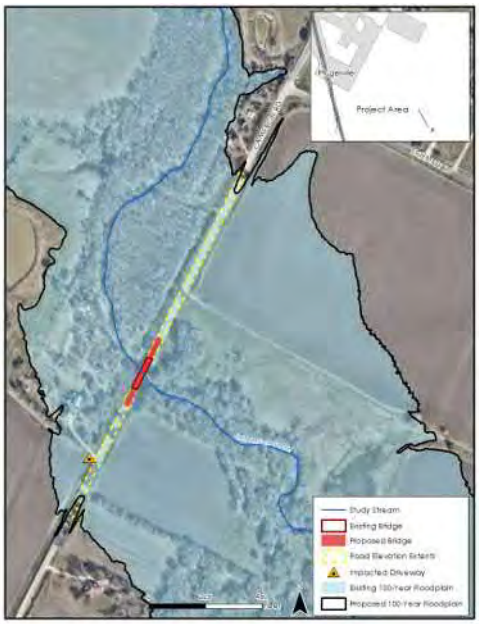

CAMERON ROAD IMPROVEMENTS

- Existing Conditions
  - 130 ft bridge span
  - Overtopped by all storm events
- Proposed Improvements
  - 300 ft bridge span
  - 1,520 ft of raised roadway
  - Passes the 100-yr storm
- Probable cost estimate - $3.1M

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CITY OF PFLUGERVILLE ROADWAY IMPROVEMENTS

Road Crossing	Structure ID [Lat., Long.]	Existing Conditions		Proposed Improvement			
		Existing Structure	Overtopping Event (ACE)	Structural Improvement	Roadway Improvement	Overtopping Event (ACE)	Probable Cost Estimate
Wilbarger Creek FM 685	WC_STR_24000 [30.4572, -97.6013]	100'wide bridge	20% (5-year)	200' wide bridge	810 LF of Raised Roadway	0.2% (500-year)	$8.3M
Wilbarger Creek E. Pflugerville Pkwy	WC_STR_23000 [30.4554, -97.6010]	150' wide bridge	4% (25-year)	200' wide bridge	1700 LF Channel Improvement	0.2% (500-year)	$3.1M
Wilbarger Creek Trib 200 Kennemer Dr.	WC_T200_STR_13000 [30.4726, -97.5820]	12 - 8' x 6' RCBs	20% (5-year)	150'wide bridge	230 LF of Raised Roadway & Concrete Bridge Opening (2:1 side slope)	4% (25-year)	$3.4M

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FM 685 and E. PFLUGERVILLE PARKWAY IMPROVEMENTS

- Existing Conditions
  - 100 ft bridge span on FM 685
  - Passes the 2-year storm
  - 150 ft bridge span on E. Pflugerville Pkwy
  - Passes the 10-yr storm
- Proposed Improvements
  - 200 ft bridge span (FM 685)
  - 810 ft of raised roadway (FM 685)
  - 200 ft bridge span (E. Pflugerville Pkwy.)
  - 1,700 ft channel benching
  - Passes the 100-yr storm
- Probable cost estimate - $11.4M

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KENNEMER DRIVE IMPROVEMENTS

- Existing Conditions
  - 12 – 8 ft x 6 ft culverts
  - Private driveway constraints
  - Passes the 2-year storm
- Proposed Improvements
  - 150 ft bridge span
  - 230 ft of raised roadway
  - Passes the 10-yr storm
- Probable cost estimate - $3.4M

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SUBDIVISION IMPROVEMENTS

Shadowglen

Reserve at Westcreek

Highland Park

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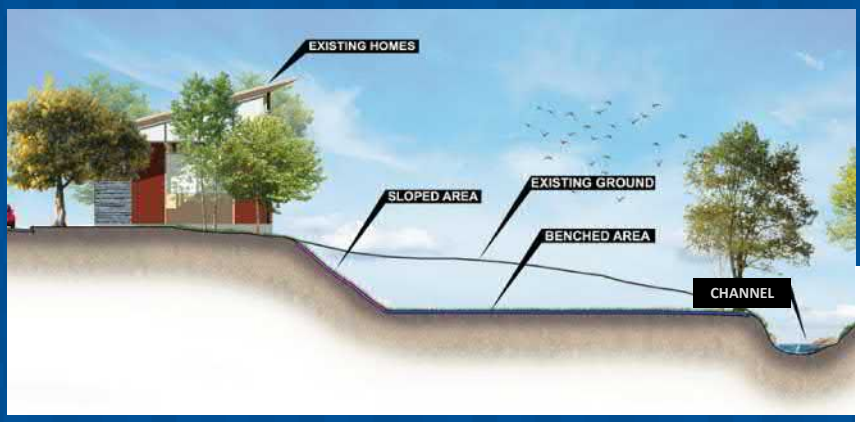
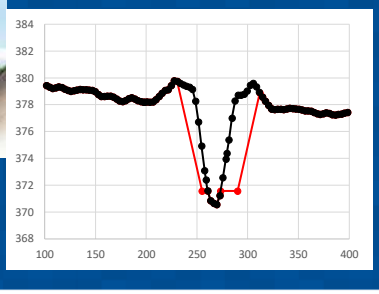
CHANNEL IMPROVEMENTS





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SHADOWGLEN SUBDIVISION IMPROVEMENTS

- Existing Conditions
  - 133 homes in 100-yr floodplain
- Proposed Improvements
  - Widen US 290 bridge span from 420 ft to 1,350 ft
  - 5,430 ft of channel benching
  - Increase floodplain storage by removing fill
  - Removes 81 homes from 100- yr floodplain
  - Additional detailed analysis recommended
- Probable cost estimate - $50M

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RESERVE AT WESTCREEK IMPROVEMENTS

- Existing Conditions
  - 63 homes in 100-yr floodplain
- Proposed Improvements
  - 4,000 ft of channel benching
  - Removes 34 homes from 100- yr floodplain
  - Remaining 29 homes FFE are higher than 100-yr flood elevation
- Probable cost estimate - $2.5M

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HIGHLAND PARK IMPROVEMENTS

- Existing Conditions
  - 2 homes in 100- yr floodplain
  - 1- 10 ft x 4 ft culvert on main channel
  - 5- 8 ft x 4 ft culverts on secondary channel
- Proposed Improvements
  - 2 additional 8 ft x 4 ft culverts on secondary channel
  - 2 ft berm on upstream side to prevent water on the road
  - Removes 2 homes from 100-yr floodplain
- Probable cost estimate - $578,000

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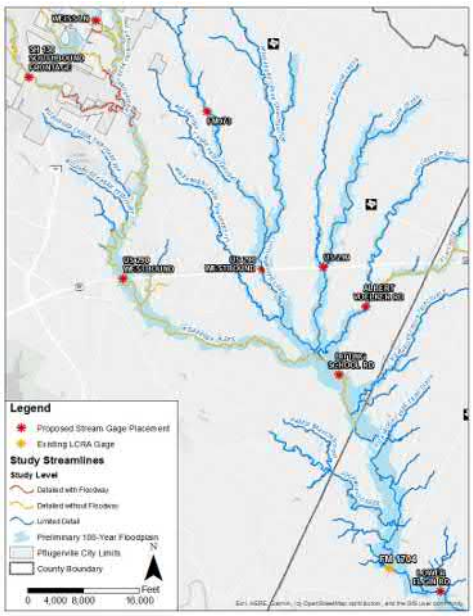

FLOOD MONITORING OPPURTUNITIES

- Stream/rainfall gage placement
  - Critical watershed locations
  - Major roadways
  - Select low water crossings
- Existing Systems
  - USGS Stream gage dashboard
  - LCRA Hydromet network in Travis County
  - City of Austin ATX Floods Web Map
- Automated Creek Crossings
  - Alerts
  - Flood gate closures

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WILBARGER CREEK WATERSHED STUDY NEXT STEPS

- Hydrology & Hydraulic analysis considered best available data
- Update FEMA Floodplain Maps
- Improvement Funding
  - Pre-Disaster Mitigation (PDM) Grant
  - Hazard Mitigation Grant Program (HGMP)
  - Flood Mitigation Assistance (FMA) Grant
  - GLO CDBG Mitigation Program (GLO CDBG-MIT)
  - TWDB Flood Infrastructure Fund (FIF)
  - Clean Water State Revolving Fund (CWSRF) Loan
  - Building Resilient Infrastructure and Communities (BRIC)

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Texas Water Development Board

WILBARGER CREEK STUDY CONTACT INFORMATION

BASTROP COUNTY
Carolyn Dill, PE
Bastrop Co. Engineer
512-581-7180
carolyn.dill@co.bastrop.tx.us

TRAVIS COUNTY
Shawn Snyder, CFM
Floodplain Project Manager
512-854-7563
shawn.snyder@traviscountytx.gov

CITY OF PFLUGERVILLE
Jenna Goolsby, PE, CFM
City Floodplain Administrator
512-990-6312
jennag@pflugervilletx.gov

HALFF ASSOCIATES

Paul Morales, PE, CFM
512-777-4547
pMorales@halff.com

Katherine Smith, EIT, CFM
512-777-4623
kSmith@halff.com

HALFF

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Appendix C: Field Reconnaissance

Appendix C-1: Surveyed Channel Cross Sections

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: EC_T001_XS_100

STREAM NAME: WILBARGER CREEK DATE: 9/4/19

LOCATION: WILDERNESS TRAIL CREW: JJ/CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 502.905 ERM ID: EC001S101 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

ERM Description: 1/2" IR W/ HALF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE _____ OTXS: _____ USFACE _____ USCH: 1

Additional Info: _____

File Name: 190904JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)

PLAN VIEW:

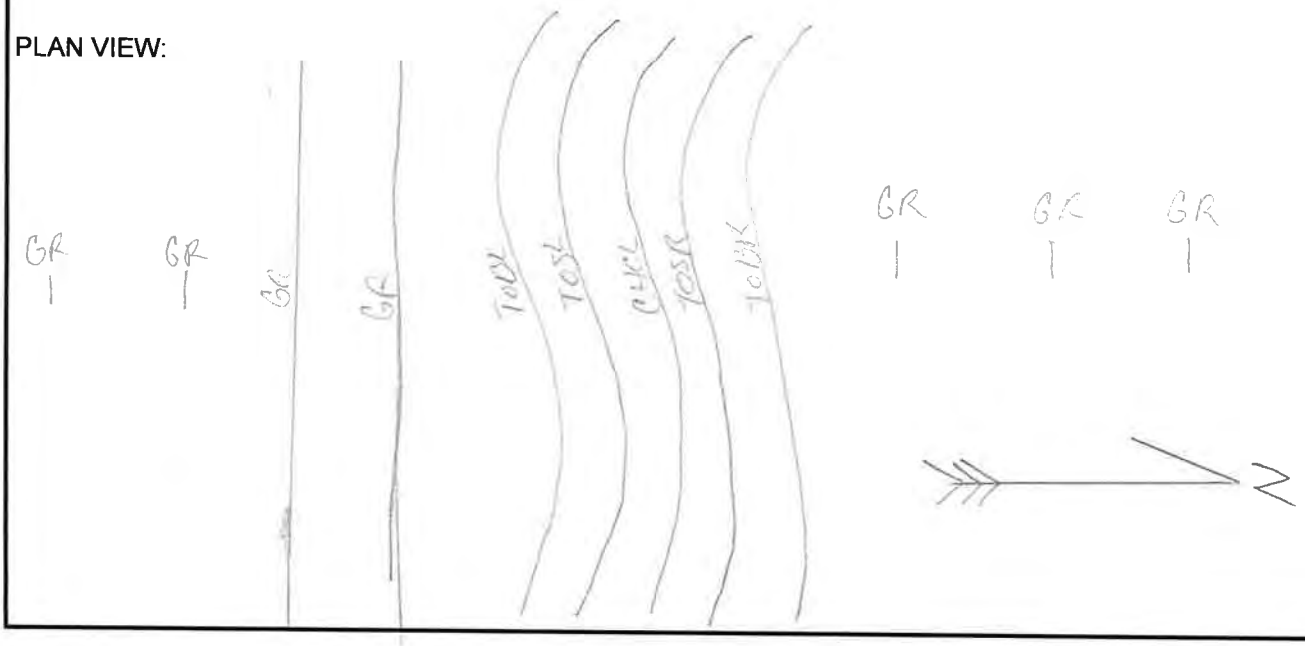


	Photo ID: Coordinates: Description:	EC_T001_XS_100_USCH 30.35653, -97.395901 Upstream channel
	Photo ID: Coordinates: Description:	EC_T001_XS_100_DSCH 30.35653, -97.395901 Downstream channel

	Photo ID: Coordinates: Description:	EC_T001_XS_200_USC 30.355138, -97.386932 Upstream channel
	Photo ID: Coordinates: Description:	EC_T001_XS_200_DSC 30.355138, -97.386932 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: EC_XS_100

STREAM NAME: WILBARGER CREEK DATE: 4/7/20

LOCATION: COUNTY LN RD CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 468.946 ERM ID: ECXS101 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope _____ Side Slope _____ US: _____ DS: _____ Outlet: _____

ERM Description: 1/2" IRON ROD W/ HALFF CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE _____ OTXS: _____ USFACE _____ USCH: 1

Additional Info: _____

File Name: 200407JJ-_____

PROFILE VIEW:
(Left to Right looking Downstream)

PLAN VIEW:

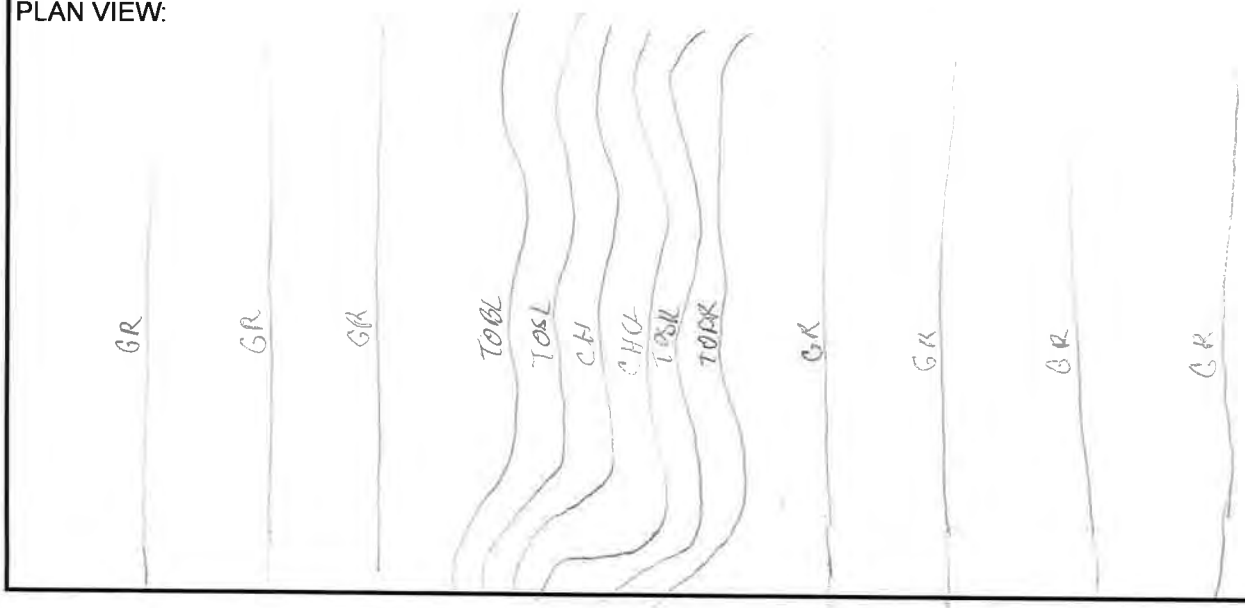


	Photo ID: Coordinates: Description:	EC_XS_100_USCH 30.340188, -97.436137 Upstream channel
	Photo ID: Coordinates: Description:	EC_XS_100_DSCH 30.340188, -97.436137 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: EC_XS_200

STREAM NAME: WILBARGER CREEK DATE: 9/6/19

LOCATION: BASKET FLOWER BEND CREW: JJ/CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 460.042 ERM ID: ~~ECAS~~ 201 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

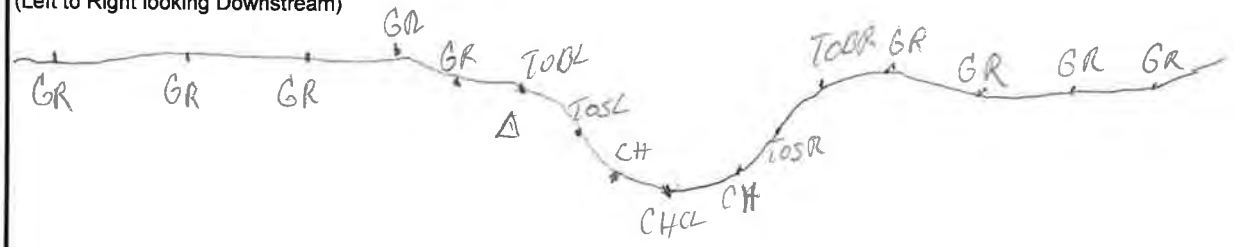
ERM Description: 1/2" IR W/ HALFF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE _____ OTXS: _____ USFACE _____ USCH: 1

Additional Info: _____

File Name: 190906JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

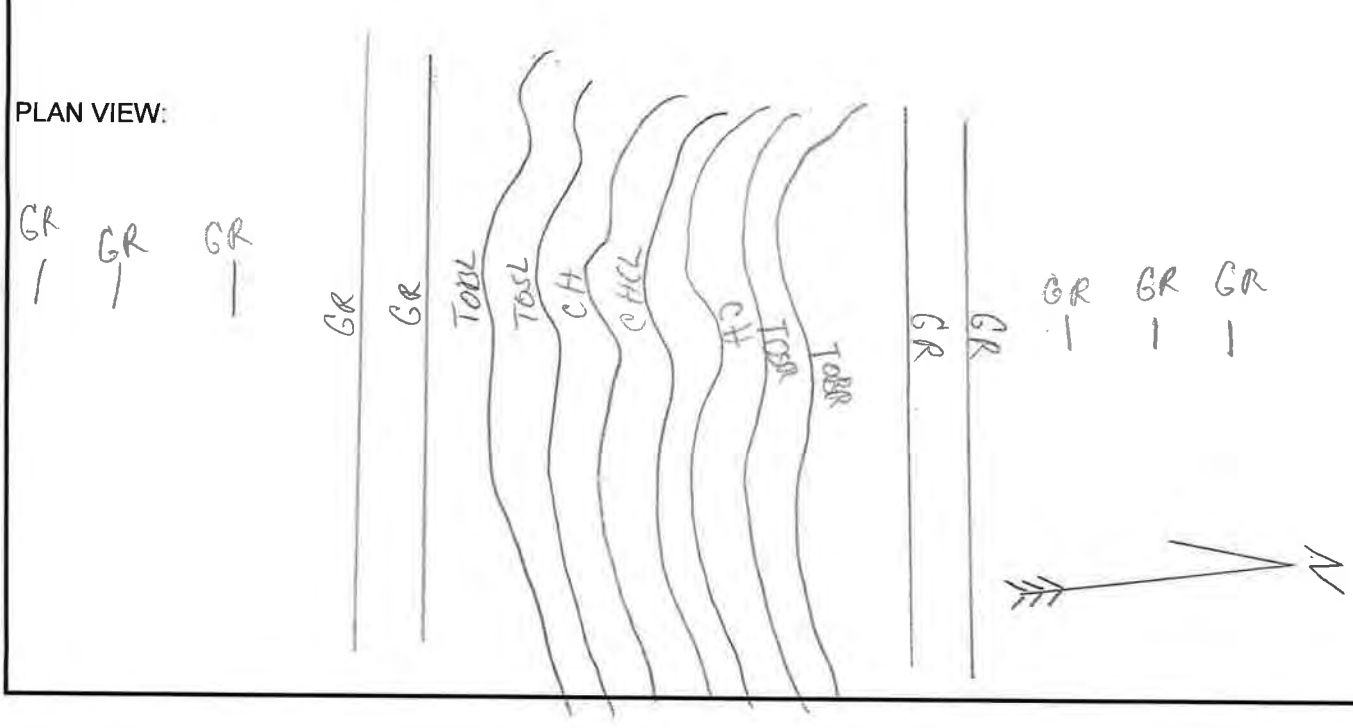


	Photo ID: Coordinates: Description:	EC_XS_200_USCH 30.344008, -97.43364 Upstream channel
	Photo ID: Coordinates: Description:	EC_XS_200_DSCH 30.344008, -97.43364 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: EC_XS_300

STREAM NAME: WILBARGER CREEK DATE: 9/5/19

LOCATION: BASKET FLOWER BEND CREW: JJ/CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 466.238 ERM ID: ECXS301 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

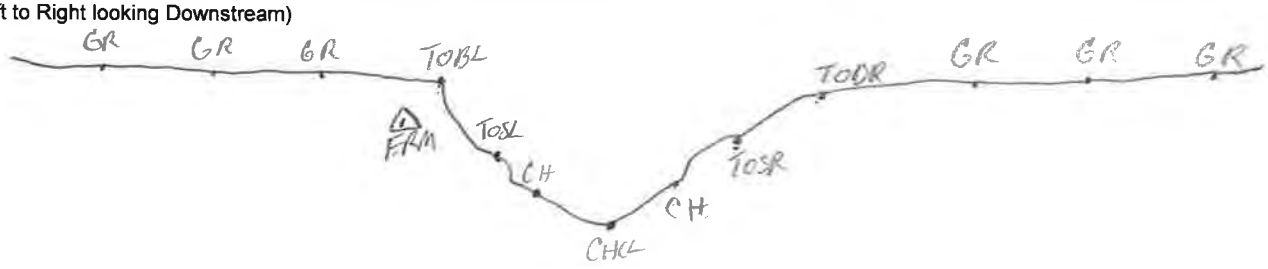
ERM Description: ½IR w/ HALFF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE _____ OTXS: _____ USFACE _____ USCH: 1

Additional Info: _____

File Name: 190905JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

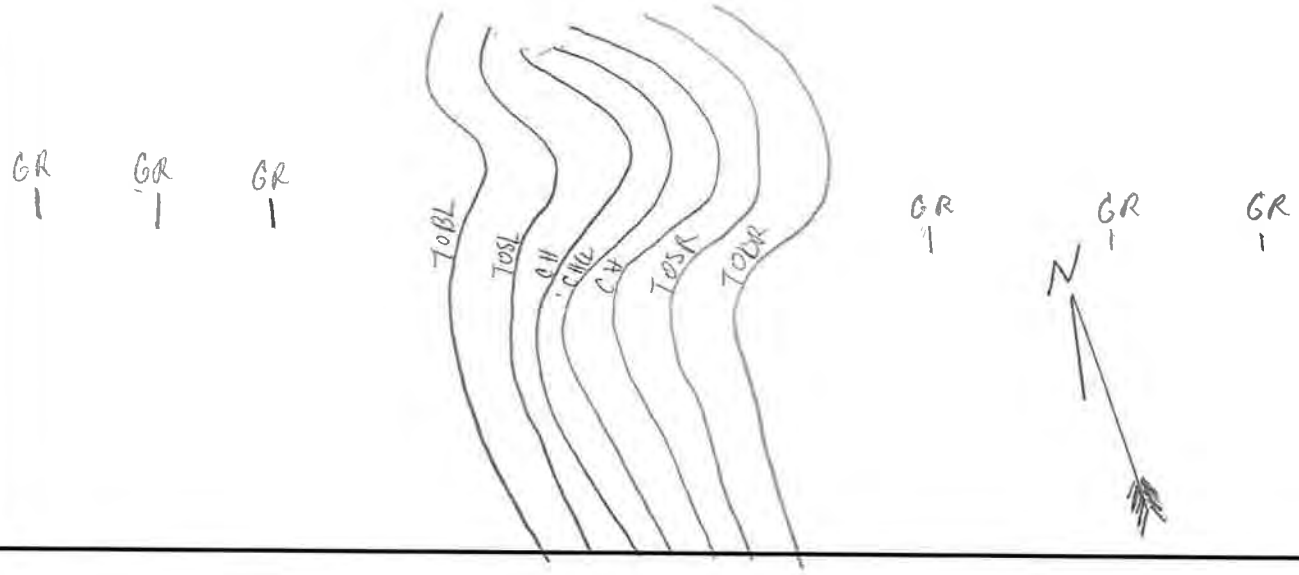


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	Photo ID: Coordinates: Description:	EC_XS_300_DSCH 30.346492, -97.428713 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: EC_XS-400

STREAM NAME: WILBARGER CREEK DATE: 4/6/20

LOCATION: HWY 290 CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 454.249 ERM ID: ECXS401 GEOID: 12B

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):		@		Pier Shape:
CULVERT:	Number:		Shape:		Length:		Height:		Width:		Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle				
DAM:	Top Width:		Side Slope		Side Slope		US:		DS:		Outlet:

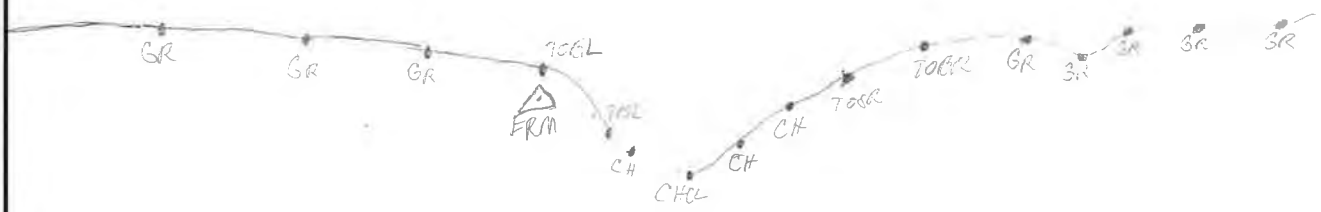
ERM Description: 1/2" IRON ROD W/ HALFF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE OTXS: USFACE USCH: 1

Additional Info:

File Name: 20040611_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

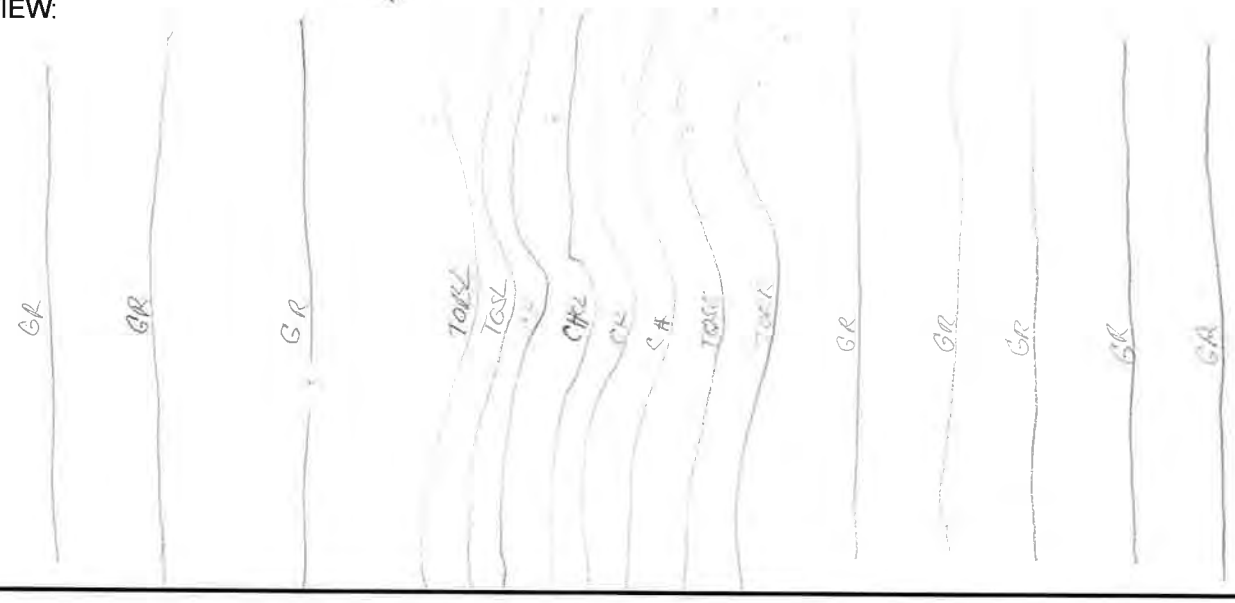


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	Photo ID: Coordinates: Description:	EC_XS_400_DSCH 30.347904, -97.424133 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: EC_XS_500

STREAM NAME: WILBARGER CREEK DATE: 9/5/19

LOCATION: HWY 290 CREW: JJ/CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 474.991 ERM ID: ECXS01 GEOID: 128

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

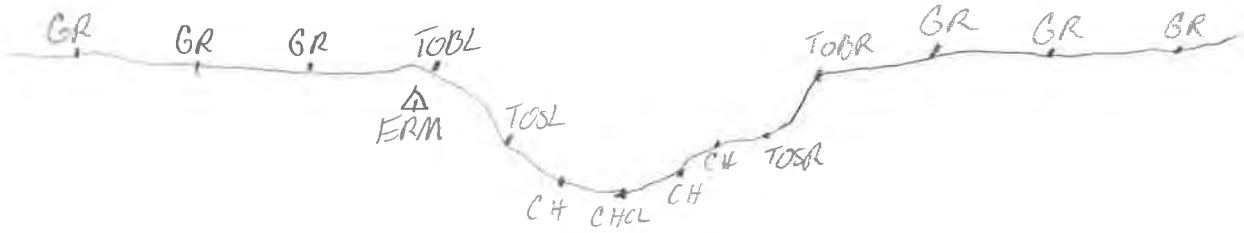
ERM Description: 1/2" IR W/ HALFF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE _____ OTXS: _____ USFACE _____ USCH: 1

Additional Info: _____

File Name: 190905JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

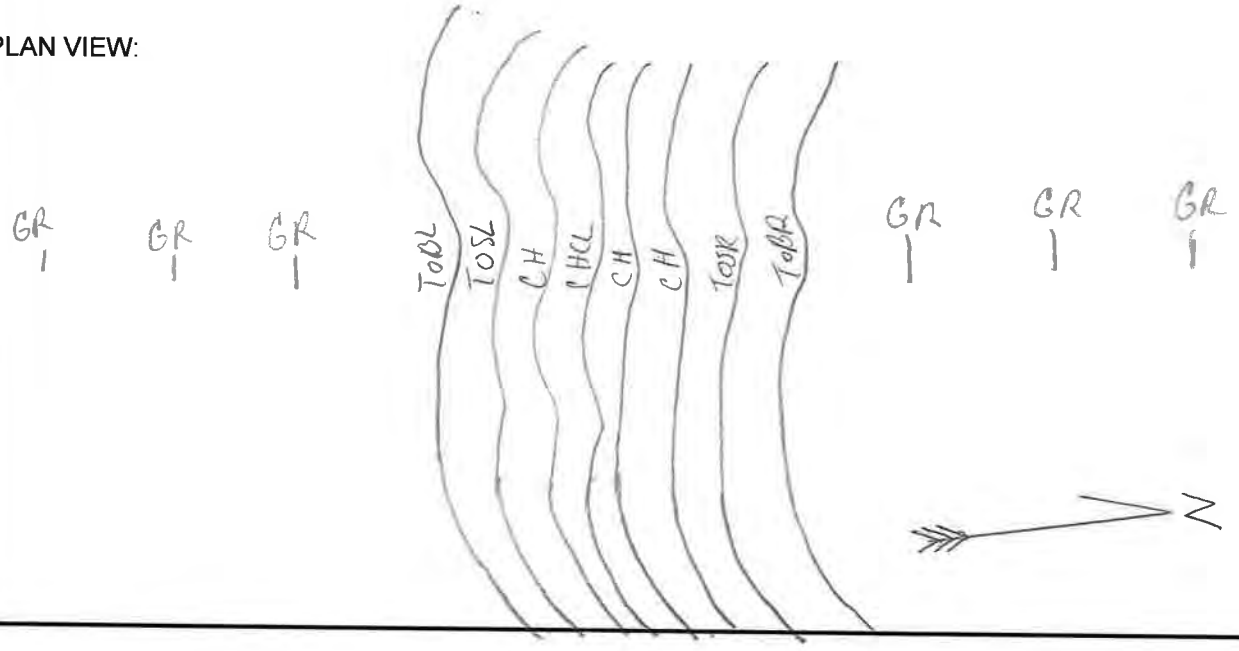


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	Photo ID: Coordinates: Description:	EC_XS_500_DSCH 30.349586, -97.419206 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: EC_XS_600

STREAM NAME: WILBARGER CREEK DATE: 9/4/19

LOCATION: Hwy 290 CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 486,608 ERM ID: ECXS601 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

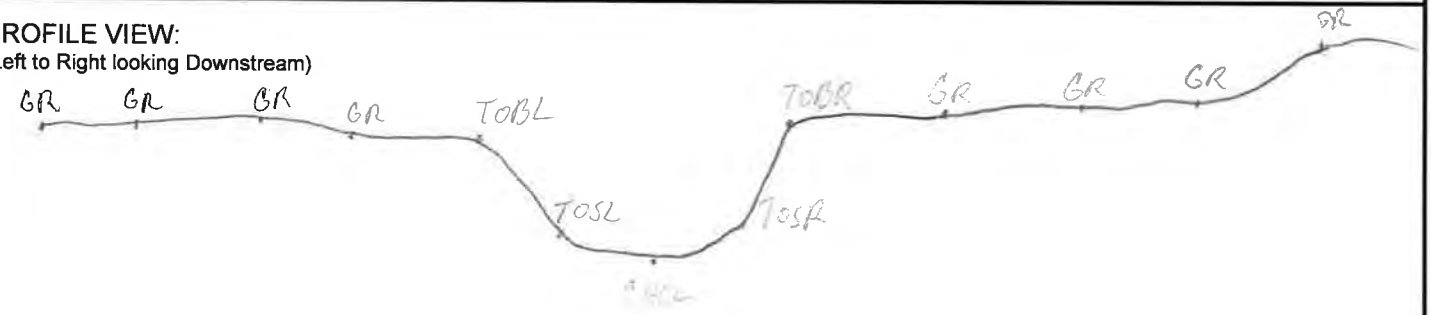
ERM Description: 1/2" IR w/ TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE _____ OTXS: _____ USFACE _____ USCH: 1

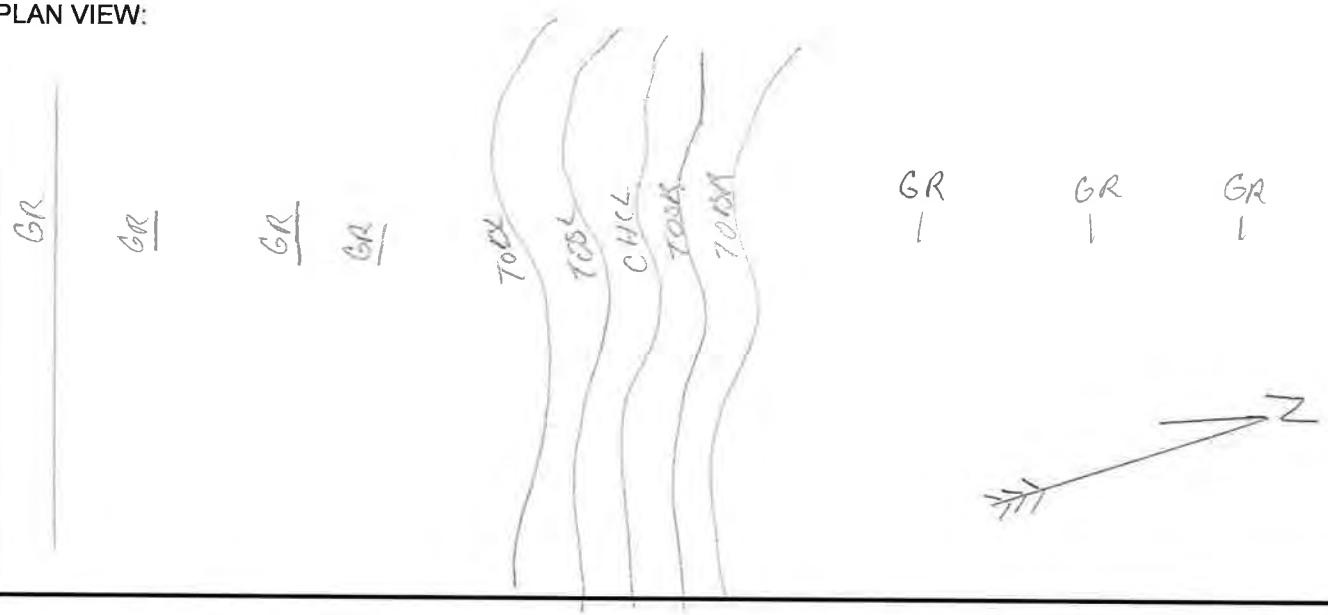
Additional Info: _____

File Name: 190904JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:



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Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: EC_XS_700

STREAM NAME: WILBARGER CREEK DATE: 9/4/19

LOCATION: HWY 290 CREW: JJ/CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 494.965 ERM ID: ECXS701 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope _____ Side Slope _____ US: _____ DS: _____ Outlet: _____

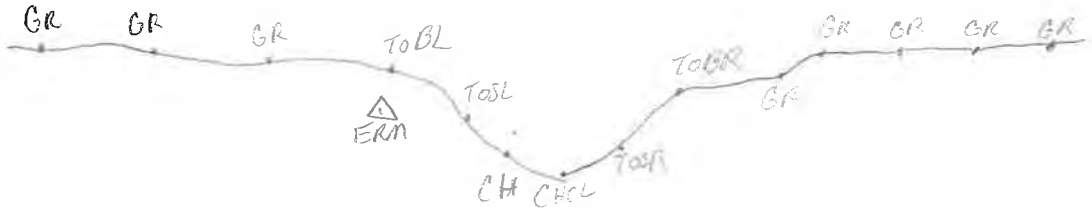
ERM Description: 1/2 IR W/ HALFF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE _____ OTXS: _____ USFACE _____ USCH: 1

Additional Info: _____

File Name: 190904JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

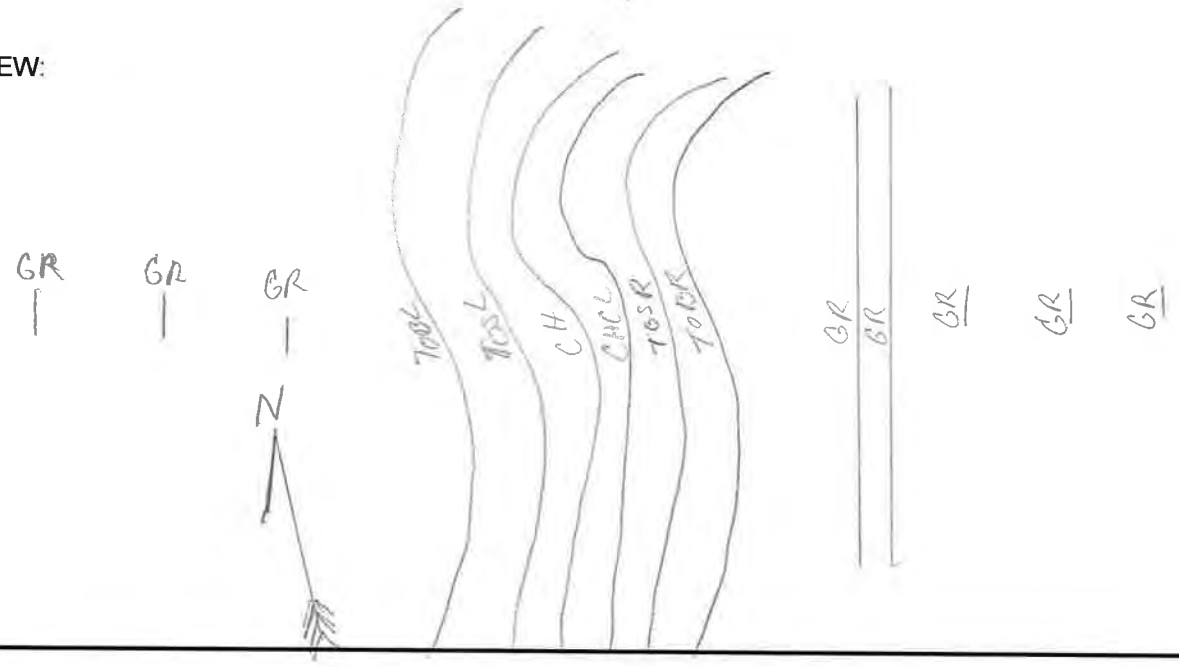


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	Photo ID: Coordinates: Description:	EC_XS_700_DSCH 30.354043, -97.401531 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: EL_XS_800

STREAM NAME: WILBARGER CREEK DATE: 9-3-2019

LOCATION: _____ CREW: JJ CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 498.01 ERM ID: ELXS801 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

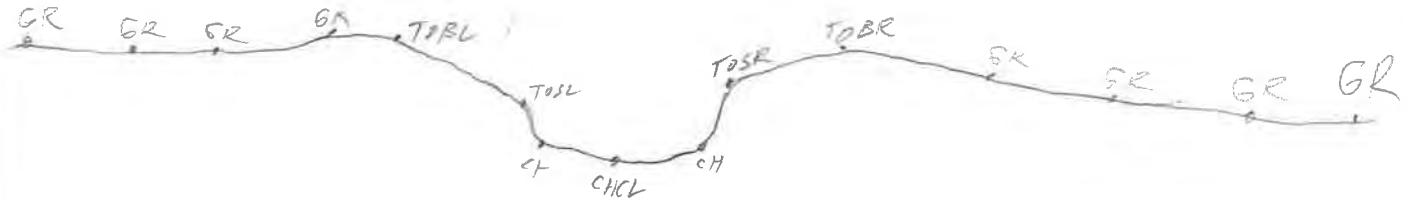
ERM Description: 1/2 IN IR W/HALF TRAV Coordinate System: Tx C

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: 190903JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

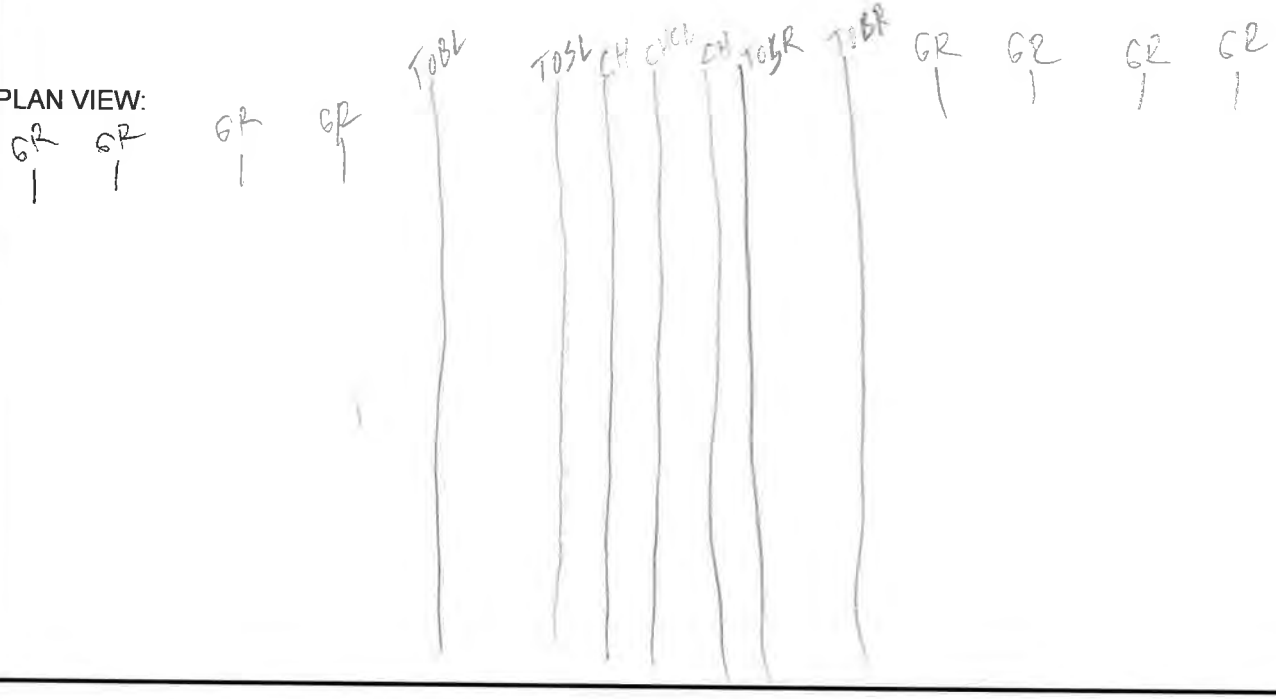


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	Photo ID: Coordinates: Description:	EC_XS_800_DSCH 30.356601, -97.400191 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: EC_XS_900

STREAM NAME: WILBARGER CREEK DATE: 9/3/19

LOCATION: N AVENUE C CREW: TJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 499.178 ERM ID: ECXS901 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

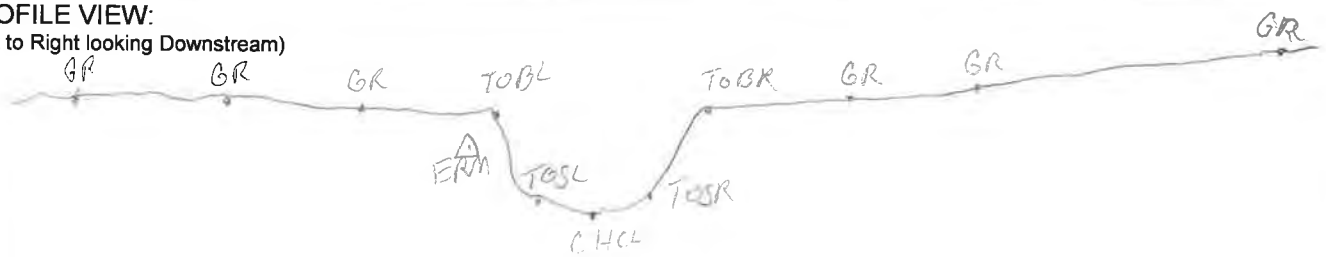
ERM Description: 1/2" IR W/ HALF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE _____ OTXS: _____ USFACE _____ USCH: 1

Additional Info: _____

File Name: 190903.TJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

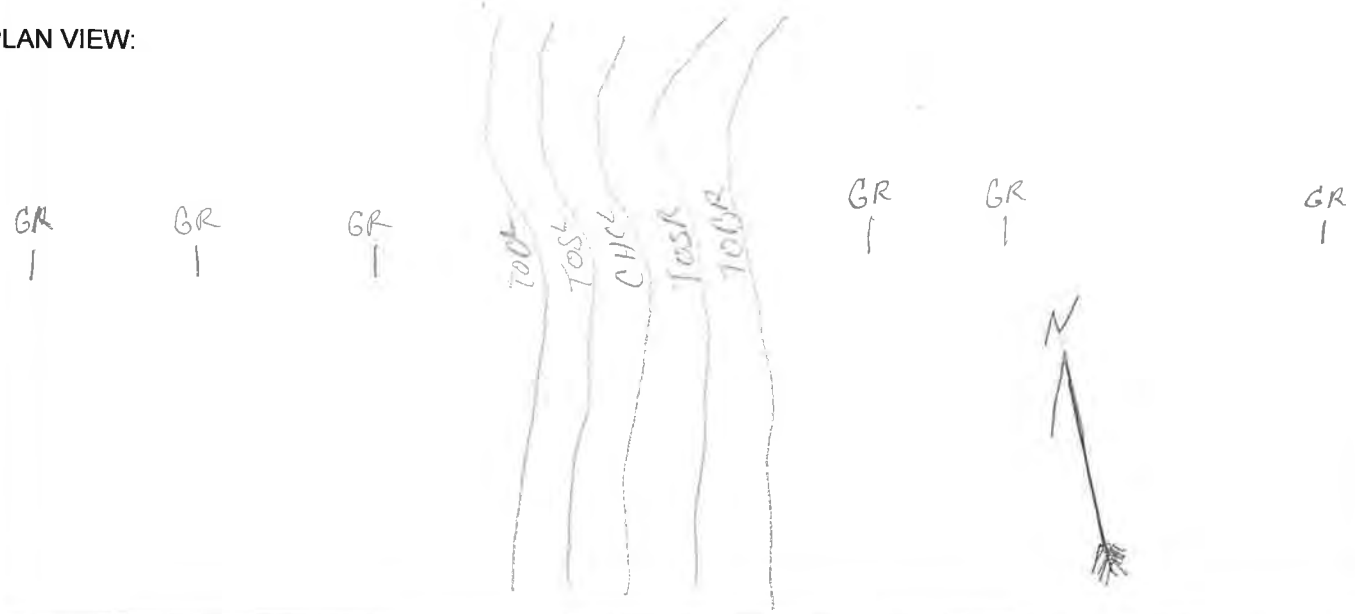


	Photo ID: Coordinates: Description:	EC_XS_900_USCH 30.3595, -97.399292 Upstream channel
	Photo ID: Coordinates: Description:	EC_XS_900_DSCH 30.3595, -97.399292 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_T165_XS_100

STREAM NAME: WILBARGER CREEK DATE: 9/10/19

LOCATION: OLD Hwy 20 CREW: JJ/CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 508.387 ERM ID: WC165XS101 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

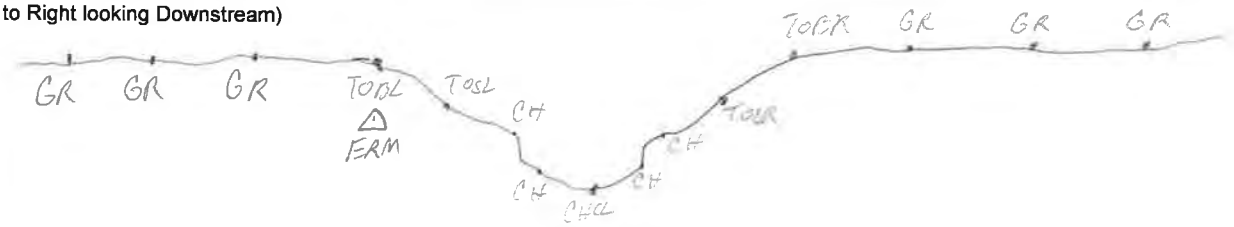
ERM Description: ½" IR W/ HALIFF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE _____ OTXS: _____ USFACE _____ USCH: 1

Additional Info: _____

File Name: 190910JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

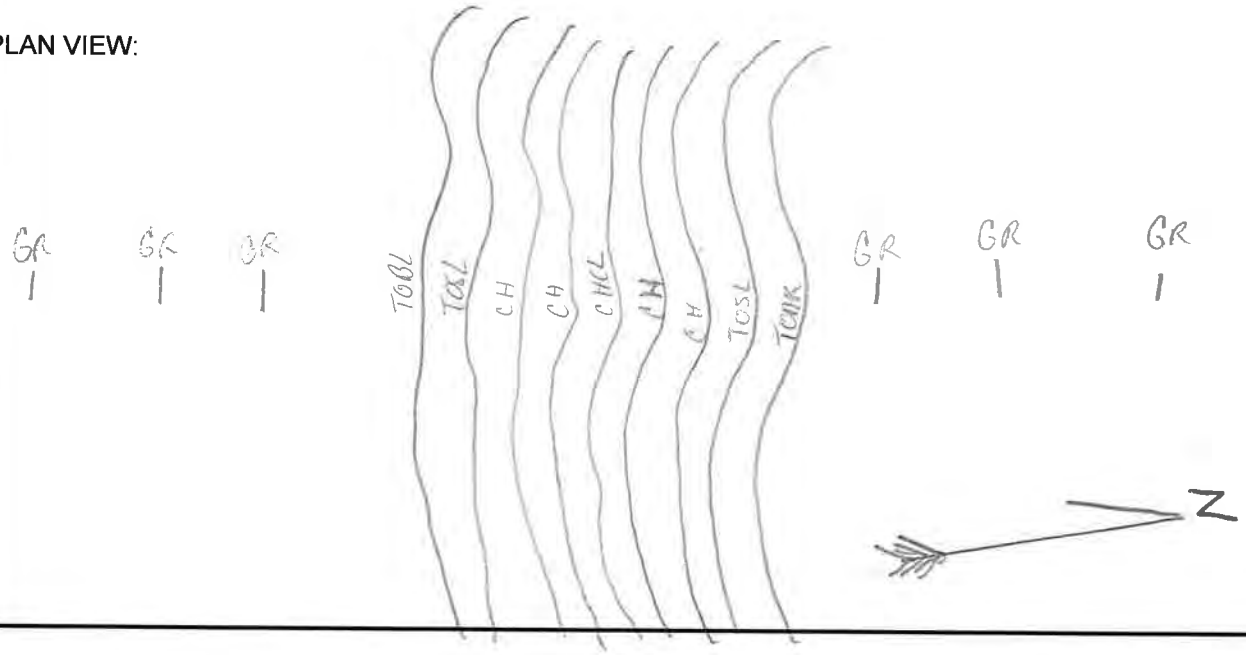


	Photo ID: Coordinates: Description:	WC_T165_XS_100_USCH 30.344145, -97.537475 Upstream channel
	Photo ID: Coordinates: Description:	WC_T165_XS_100_DSCH 30.344145, -97.537475 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_T165_XS_200

STREAM NAME: WILBARGER CREEK DATE: 9/9/19

LOCATION: HWY 290 CREW: JJ/CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 578.327 ERM ID: WC165XS201 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

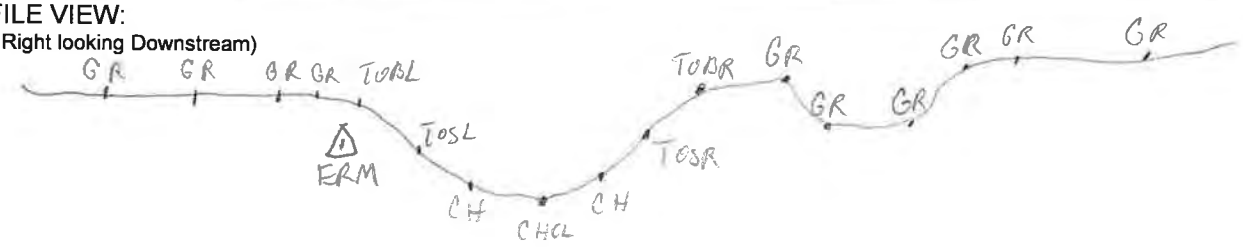
ERM Description: V2IR W HALFF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE _____ OTXS: _____ USFACE _____ USCH: 1

Additional Info: _____

File Name: 19090JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

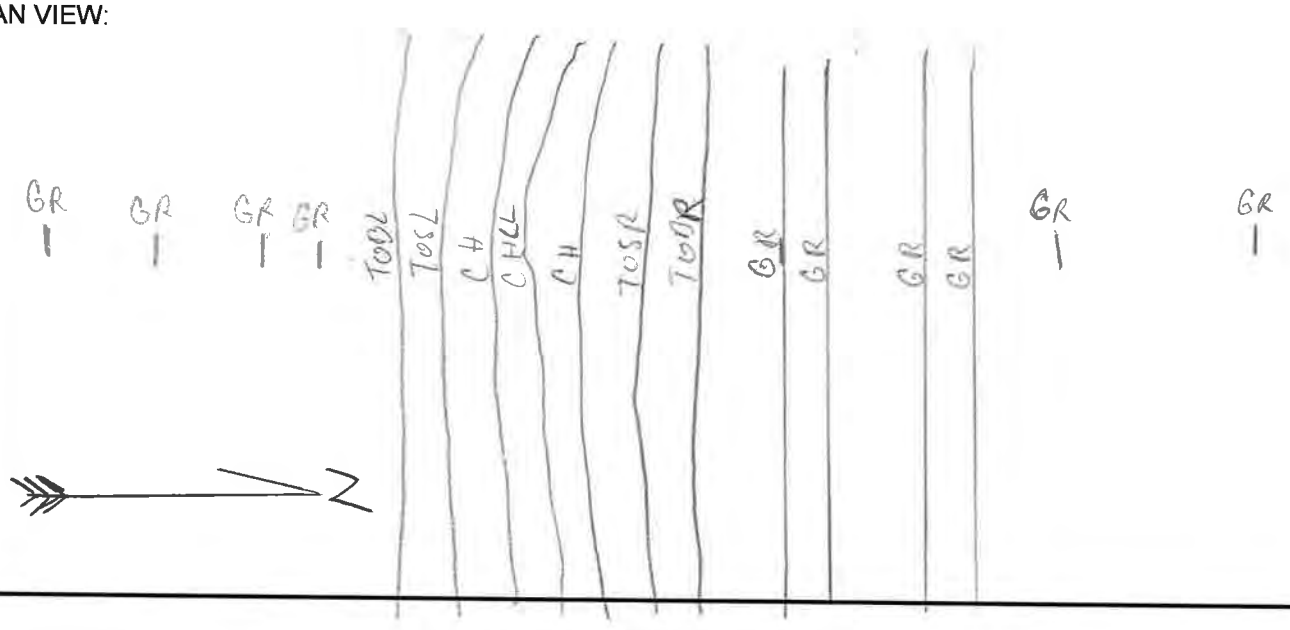


	Photo ID: Coordinates: Description:	WC_T165_XS_200_USCH 30.346684, -97.533379 Upstream channel
	Photo ID: Coordinates: Description:	WC_T165_XS_200_DSCH 30.346684, -97.533379 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_T167_XS_100

STREAM NAME: WILDARGER CREEK DATE: 12/5/19

LOCATION: OLD HWY 20 CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 490.640 ERM ID: WC167 101 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope _____ Side Slope _____ US: _____ DS: _____ Outlet: _____

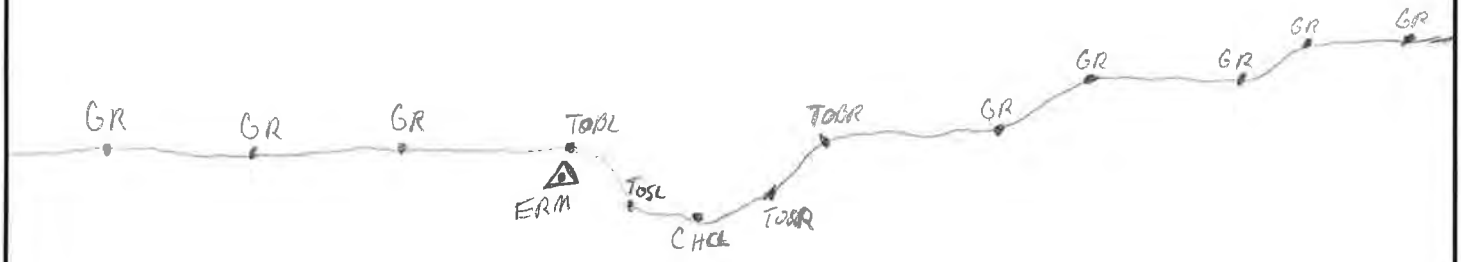
ERM Description: 1/2" IR W/ HALFF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: 191205JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

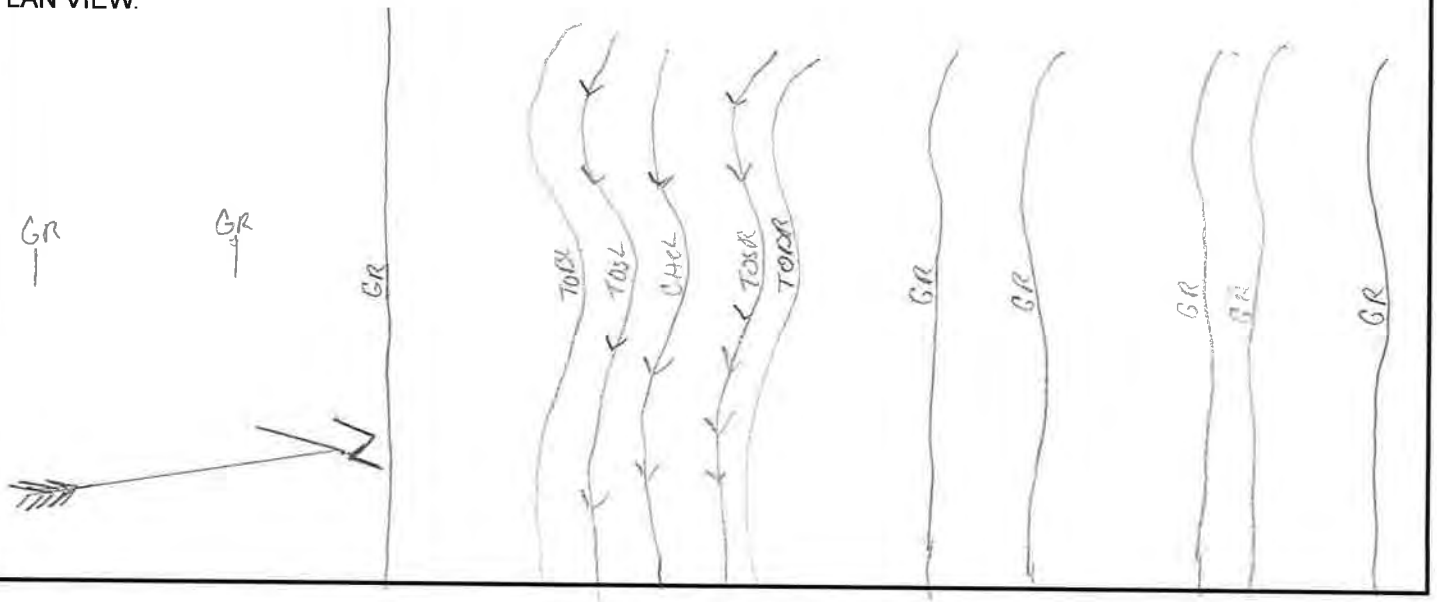


	Photo ID: Coordinates: Description:	WC_T167_XS_100_USCH 30.340256, -97.540039 Upstream channel
	Photo ID: Coordinates: Description:	WC_T167_XS_100_DSCH 30.340256, -97.540039 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_T167_XS_200

STREAM NAME: WILBARGER CREEK DATE: 9/10/19

LOCATION: OLD HWY 20 CREW: JJ/CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 499.095 ERM ID: WC167XS201 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

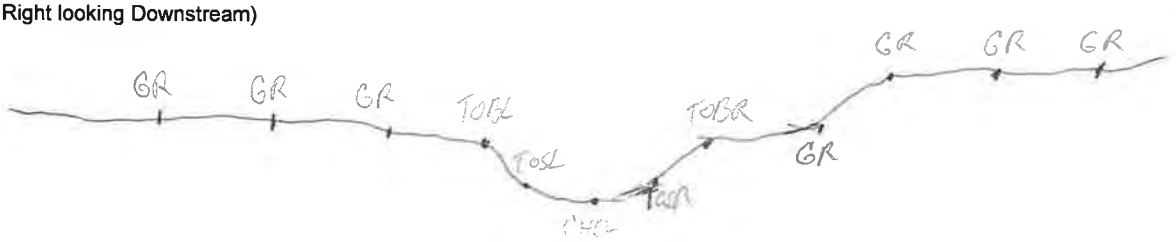
ERM Description: 1/2" IR W/ HALFF TRAV CAP Coordinate System: TXC

Photo Numbers: DSCH: 2 DSFACE _____ OTXS: _____ USFACE _____ USCH: 1

Additional Info: _____

File Name: 190910JJ-35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

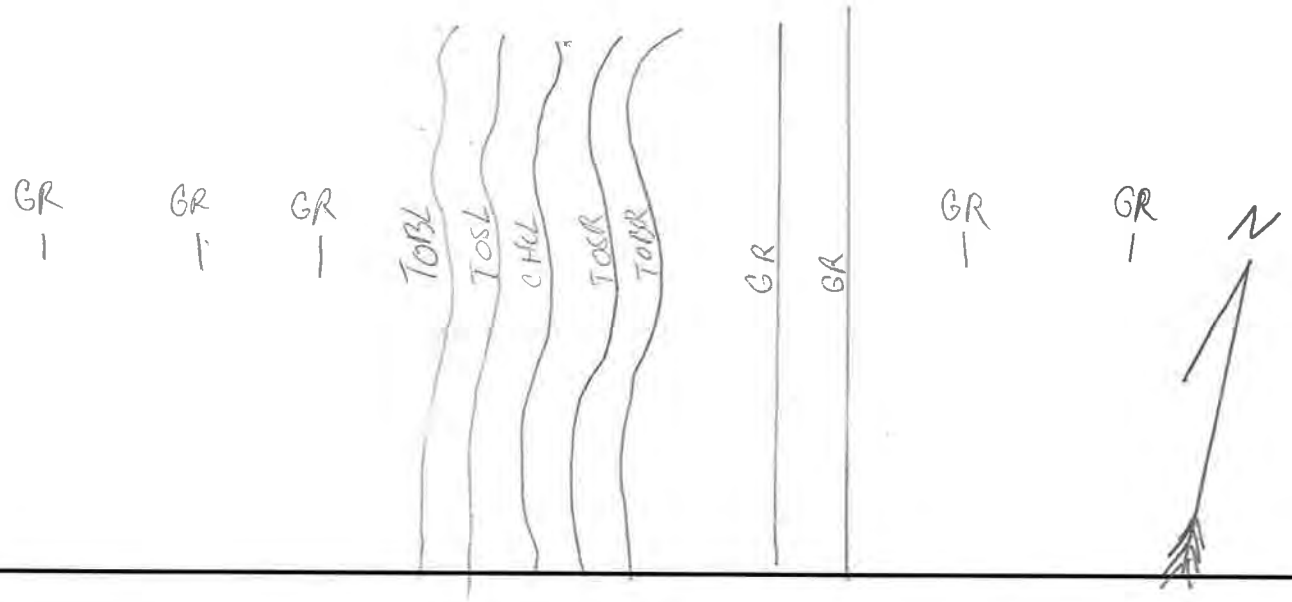


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	Photo ID: Coordinates: Description:	WC_T167_XS_200_DSCH 30.343881, -97.538788 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_T167_XS_300

STREAM NAME: WILBARGER CREEK DATE: 9/9/19

LOCATION: HWY 973 CREW: JJ/CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 510.673 ERM ID: WC167XS301 GEOID: 128

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

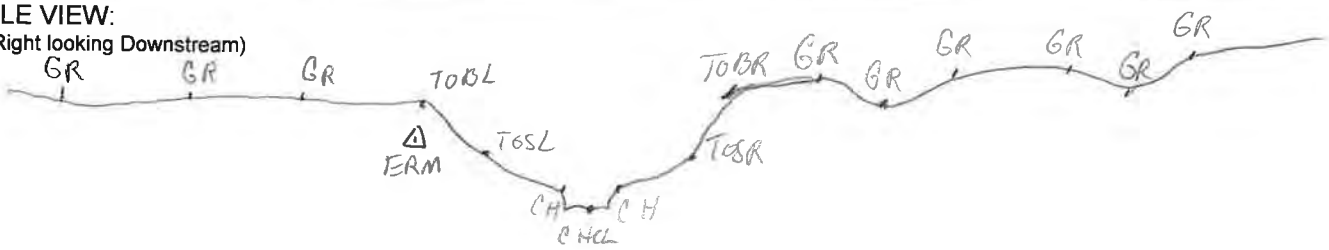
ERM Description: ½ IR w/ HALFF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE _____ OTXS: _____ USFACE _____ USCH: 1

Additional Info: _____

File Name: 190909JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

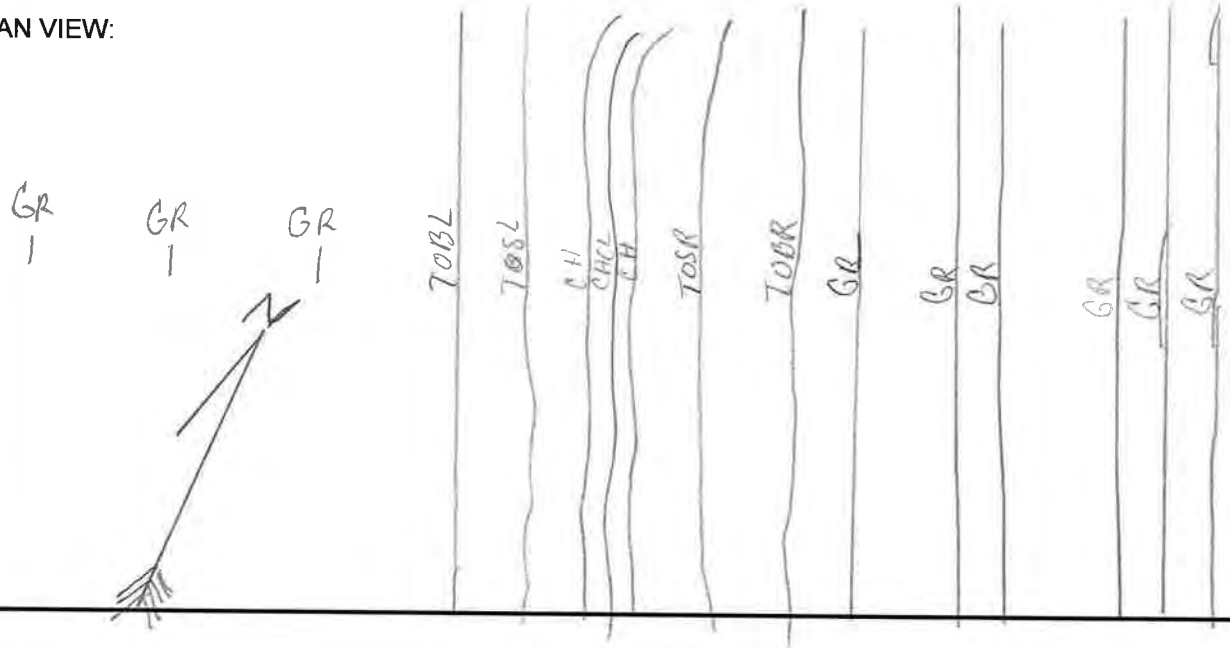


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	Photo ID: Coordinates: Description:	WC_T167_XS_300_DSCH 30.351983, -97.53657 Downstream channel

Survey Field Sheet

PROJECT: FEMA Flood Study SURVEY NAME: WC_T178_XS100

STREAM NAME: WILBARGER CREEK DATE: 8/28/19

LOCATION: Hwy 130 CREW: JJ/CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 647.906 ERM ID: WC178XS101 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

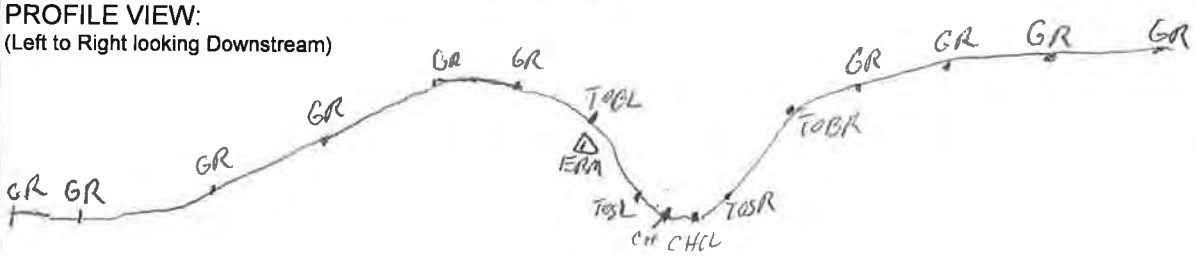
ERM Description: 1/2" IR W/ HALFP TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE _____ OTXS: _____ USFACE _____ USCH: 1

Additional Info: _____

File Name: 190828JJ-35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

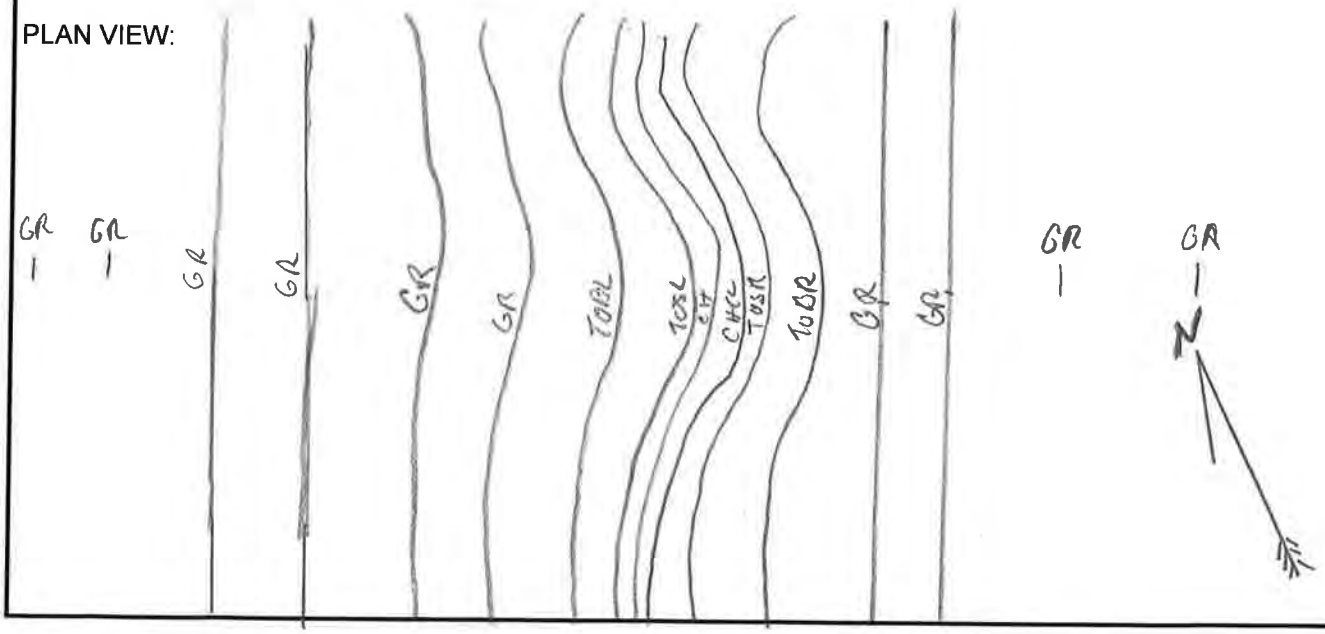


	Photo ID: Coordinates: Description:	WC_T178_XS_100_USCH 30.437273, -97.59755 Upstream channel
	Photo ID: Coordinates: Description:	WC_T178_XS_100_DSCH 30.437273, -97.59755 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_T178_XS_200

STREAM NAME: WILBARGER CREEK DATE: 8/14/19

LOCATION: Hwy 130 CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 644.305 ERM ID: WC178XS201 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

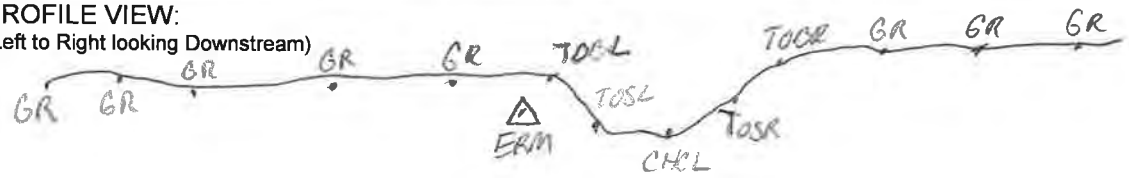
ERM Description: 1/2" IR w/ HALFF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE _____ OTXS: _____ USFACE _____ USCH: 1

Additional Info: _____

File Name: 190814JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

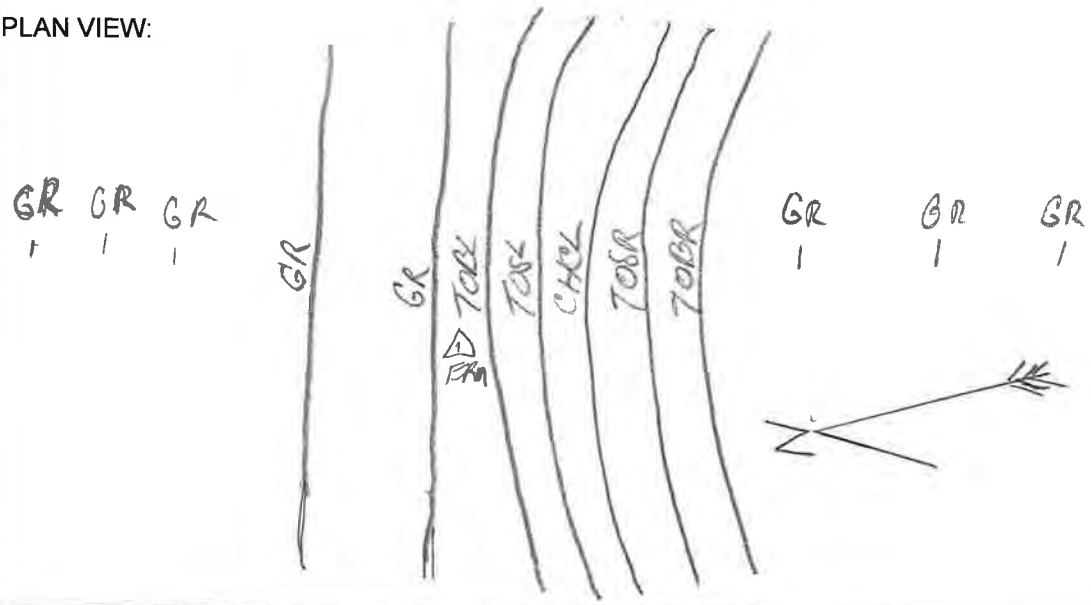


Photo not taken	Photo ID: Coordinates: Description:	WC_T178_XS_200_USCH 30.440349, -97.599611 Upstream channel
	Photo ID: Coordinates: Description:	WC_T178_XS_200_DSCH 30.440349, -97.599611 Downstream channel

Survey Field Sheet

PROJECT: WILBARGER CREEK STUDY SURVEY NAME: WC_T183_XS_100

STREAM NAME: WILBARGER DATE: 7-29-19

LOCATION: Pflugerville, TX CREW: HEATER, LOPEZ

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 739.00 ERM ID: WCTX5183101 GEOID: 12B

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:		Shape:		Length:		Height:	Width:	Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle		
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:
ERM Description:		1/2 IN IRW/TRAV CAP						Coordinate System:	TX-C 4203
Photo Numbers:			DSCH:		DSFACE		OTXS:	USFACE	USCH:
Additional Info:									
File Name:		19072954_35837							

PROFILE VIEW:
(Left to Right looking Downstream)

PLAN VIEW:

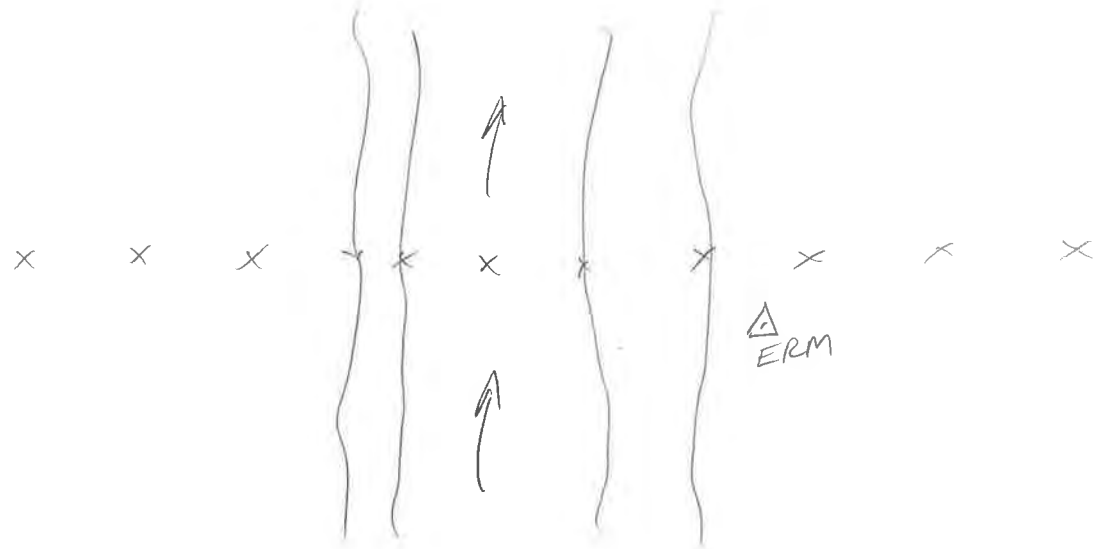


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	Photo ID: Coordinates: Description:	WC_T183_XS_100_DSCH 30.474253, -97.622128 Downstream channel

Survey Field Sheet

PROJECT: WILBARGER CREEK STUDY SURVEY NAME: WC_T185_XS_100

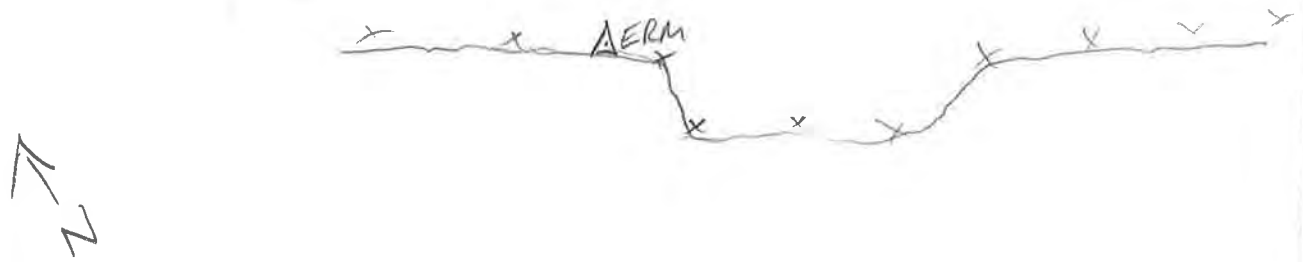
STREAM NAME: WILBARGER DATE: 7-29-19

LOCATION: PFLUGERVILLE, TX CREW: HEATER, LOPEZ

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 735.30 ERM ID: WCTX5185101 GEOID: 12B

BRIDGE:	Rail Height:		Deck:		Width:	Pier(s):	@	Pier Shape:
CULVERT:	Number:		Shape:		Length:	Height:	Width:	Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle	
DAM:	Top Width:		Side Slope		Side Slope	US:	DS:	Outlet:
ERM Description:	1/2 IN IR W/TRAV CAP						Coordinate System:	TX-C 4203
Photo Numbers:			DSCH:	DSFACE		OTXS:	USFACE	USCH:
Additional Info:								
File Name:	190729SH_35837							

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

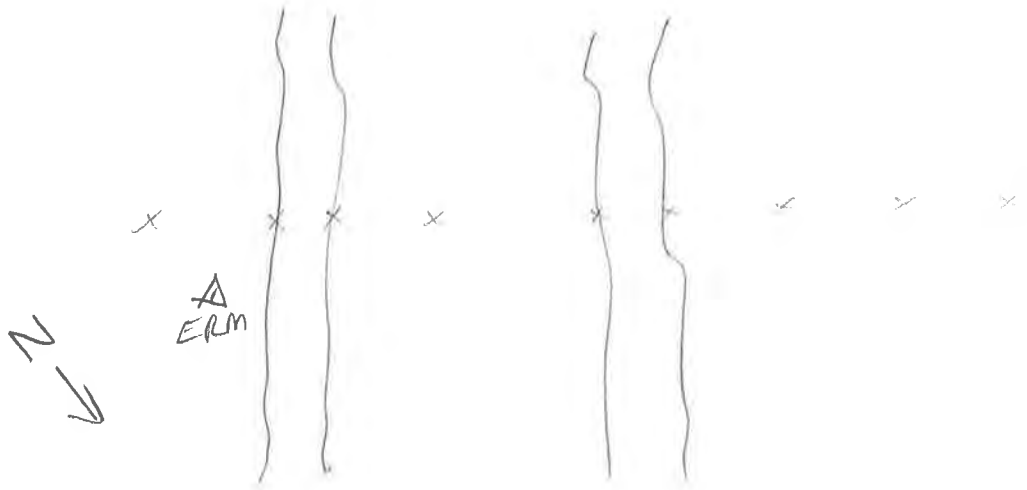


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	Photo ID: Coordinates: Description:	WC_T185_XS_100_DSCH 30.471703, -97.615244 Downstream channel

Survey Field Sheet

PROJECT: WILBARGER CREEK STUDY SURVEY NAME: WC_T186_XS-100

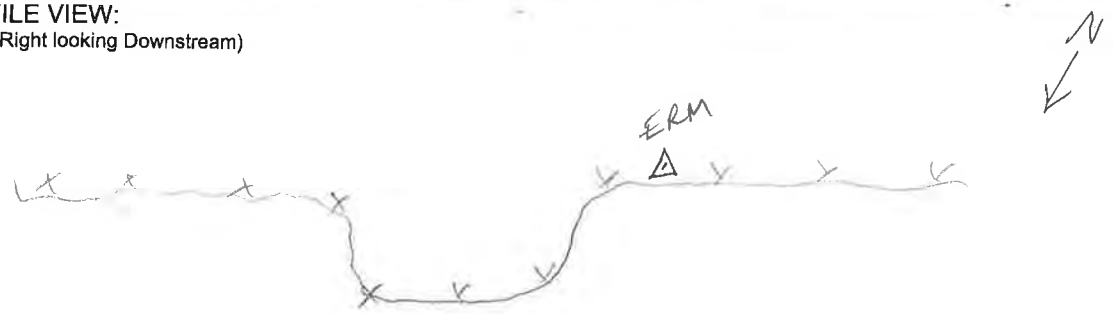
STREAM NAME: WILBARGER DATE: 7-30-19

LOCATION: PFLUGERVILLE, TX CREW: HEATER, CRUZ

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 708.36 ERM ID: WCTXS186101 GEOID: 12B

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:		Shape:		Length:		Height:	Width:	Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle		
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:
ERM Description:		1/2 IN IR W/TRAV CAP						Coordinate System:	TX-C 4203
Photo Numbers:			DSCH:		DSFACE		OTXS:	USFACE	USCH:
Additional Info:									
File Name:		190730SH_35837							

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

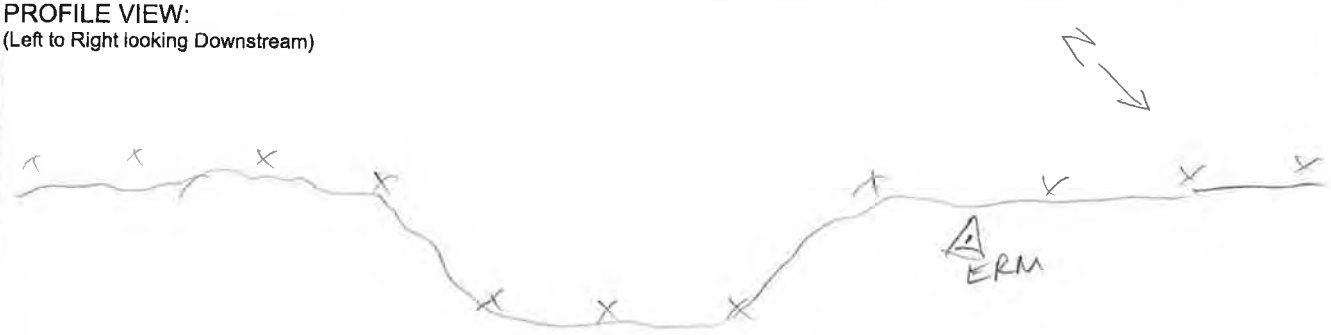
	Photo ID: Coordinates: Description:	WC_T186_XS_100_USCH 30.464175, -97.608057 Upstream channel
	Photo ID: Coordinates: Description:	WC_T186_XS_100_DSCH 30.464175, -97.608057 Downstream channel

Survey Field Sheet

PROJECT: WILBARGER CREEK STUDY
SURVEY NAME: WC-T187_XS-100
STREAM NAME: WILBARGER
DATE: 7-30-19
LOCATION: PFLUGERVILLE, TX
CREW: HEATER, LOPEZ
TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 699.00 ERM ID: WCTXS187101 GEOID: 12B

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:		Shape:		Length:		Height:	Width:	Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle		
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:
ERM Description:	1/2 IN IR W/TRAV CAP							Coordinate System:	TX-C 4203
Photo Numbers:			DSCH:		DSFACE		OTXS:	USFACE	USCH:
Additional Info:									
File Name:	190730SH_35837								

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

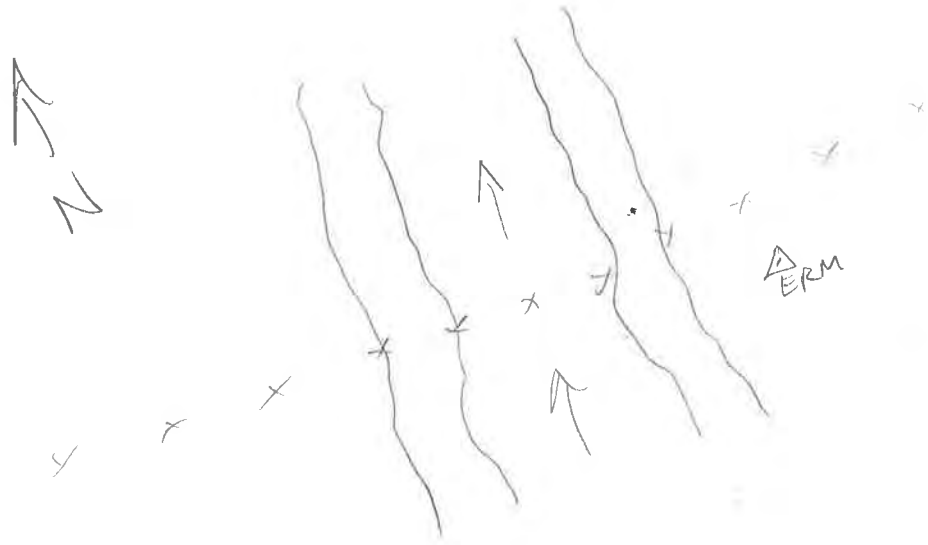


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	Photo ID: Coordinates: Description:	WC_T187_XS_100_DSCH 30.461694, -97.601892 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_T196_XS_200

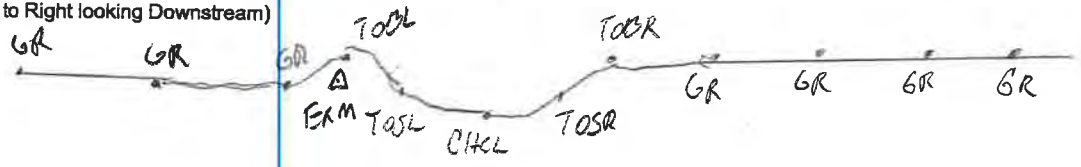
STREAM NAME: WILBARGER CREEK DATE: 8/5/19

LOCATION: JESSE BOHLS DR. CREW: CTJCL

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 597.242 ERM ID: WL196XS201 GEOID: 12A

BRIDGE:	Rail Height:		Deck:		Width:	Pier(s):	@		Pier Shape:
CULVERT:	Number:		Shape:		Length:	Height:	Width:		Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle		
DAM:	Top Width:		Side Slope		Side Slope	US:	DS:		Outlet:
ERM Description:	1/2" IR W/ HALFF TRAV CAP						Coordinate System:	TX-C	
Photo Numbers:			DSCH:	2	DSFACE	OTXS:	USFACE		USCH: 1
Additional Info:									
File Name:	190805CT_35837								

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

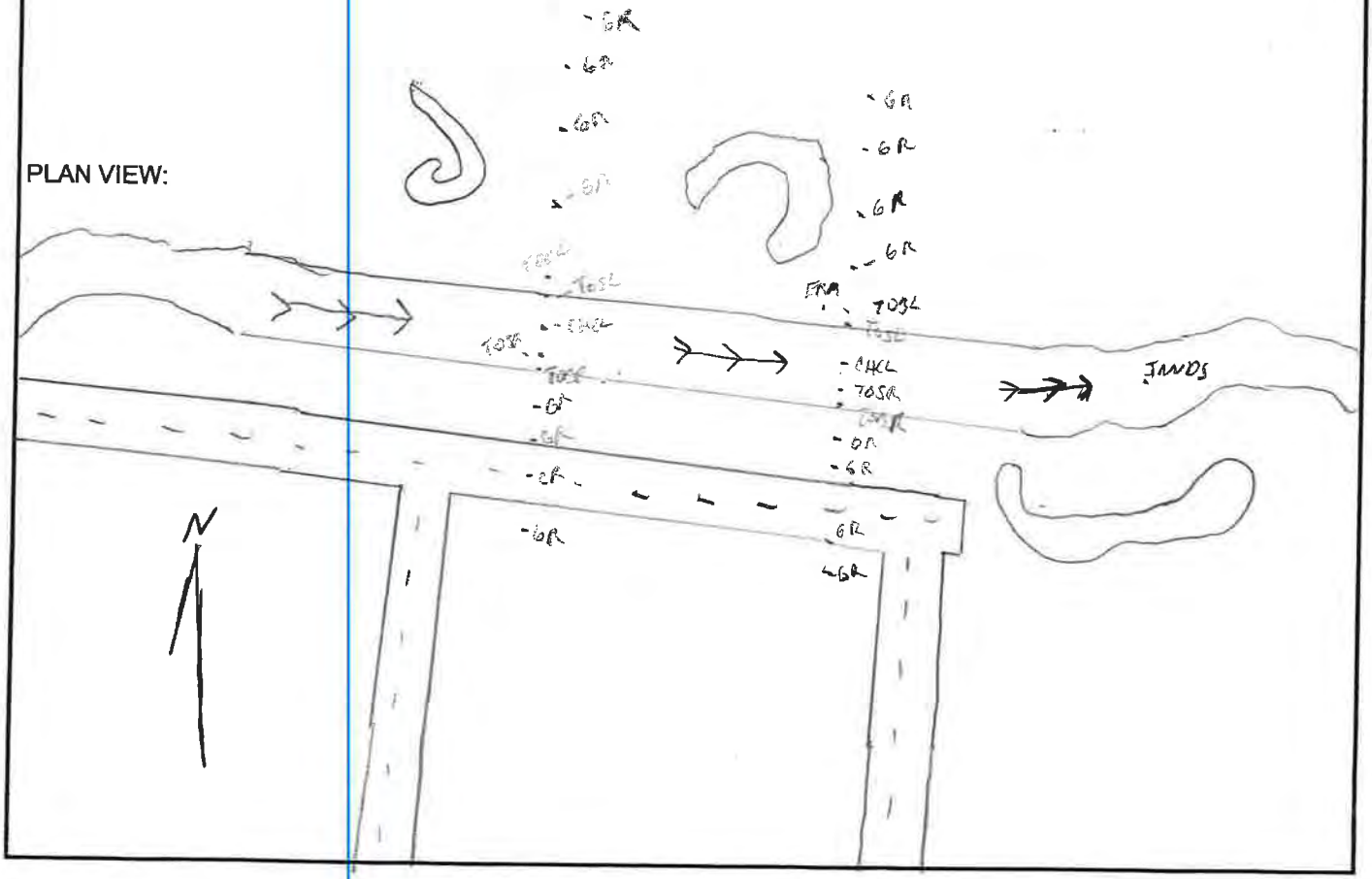

GR
GR
GR

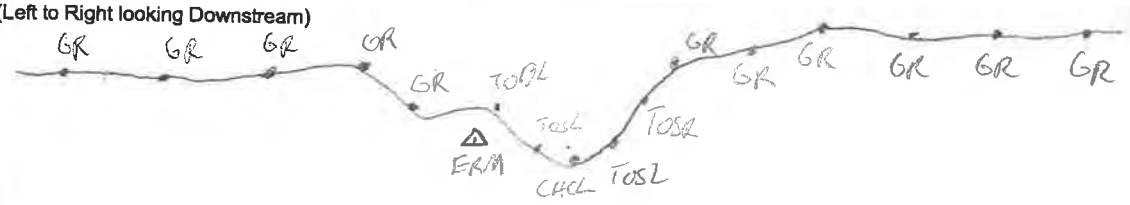
	Photo ID: Coordinates: Description:	WC_T196_XS_200_USCH 30.437512, -97.560119 Upstream channel
	Photo ID: Coordinates: Description:	WC_T196_XS_200_DSCH 30.437512, -97.560119 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY
SURVEY NAME: WL-T196_XS_300
STREAM NAME: WILDARGER CREEK
DATE: 8/7/19
LOCATION: E PFLUGERVILLE PKWY
CREW:
TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 642.901 ERM ID: WC196XS301 GEOID: 12A

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:		Shape:		Length:		Height:	Width:	Skew:
CULVERT:	I/O Type:				Material:			Wingwall Angle	
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:
ERM Description:	1/2" IR W/ HALFF CAP							Coordinate System:	TX-C
Photo Numbers:			DSCH:	2	DSFACE		OTXS:	USFACE	USCH: 1
Additional Info:									
File Name:	190807CT_35837								

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

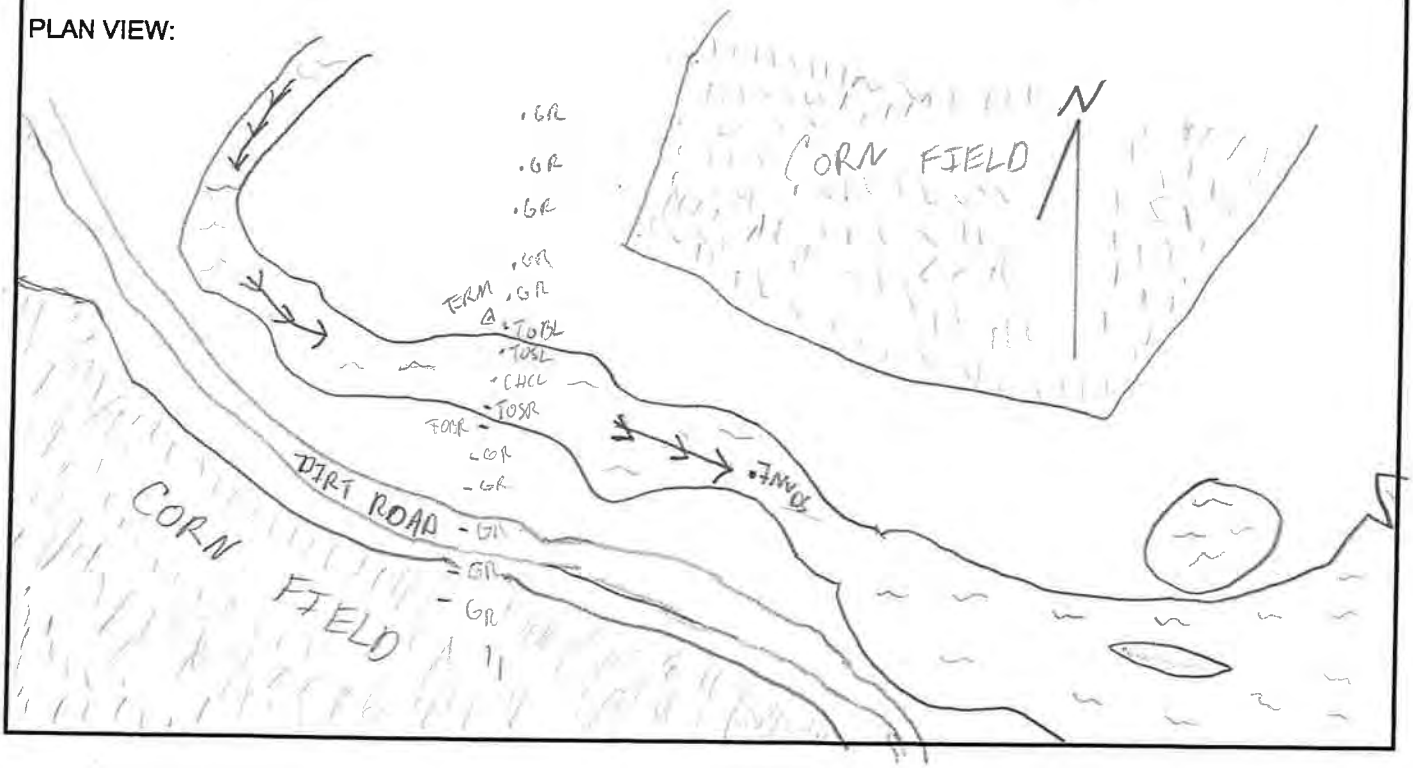


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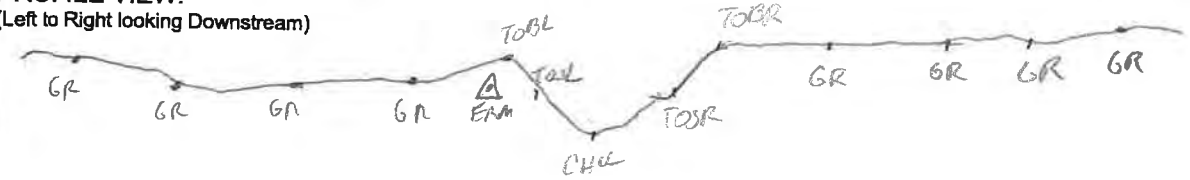
	Photo ID: Coordinates: Description:	WC_T196_XS_300_DSCH 30.448849, -97.582153 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY
SURVEY NAME: WC_T200_XS_100
STREAM NAME: WILBARGER CREEK
DATE: 8/6/19
LOCATION: AVENTURA AVE.
CREW: CT/CL
TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 590.650 ERM ID: WC200XS101 GEOID: 12A

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:		Shape:		Length:		Height:	Width:	Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle		
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:
ERM Description:	1/2" IR W/ HAIFF TRAV CAP							Coordinate System:	TX-C
Photo Numbers:			DSCH: 2		DSFACE		OTXS:	USFACE	USCH: 1
Additional Info:									
File Name:	190806CT_35837								

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

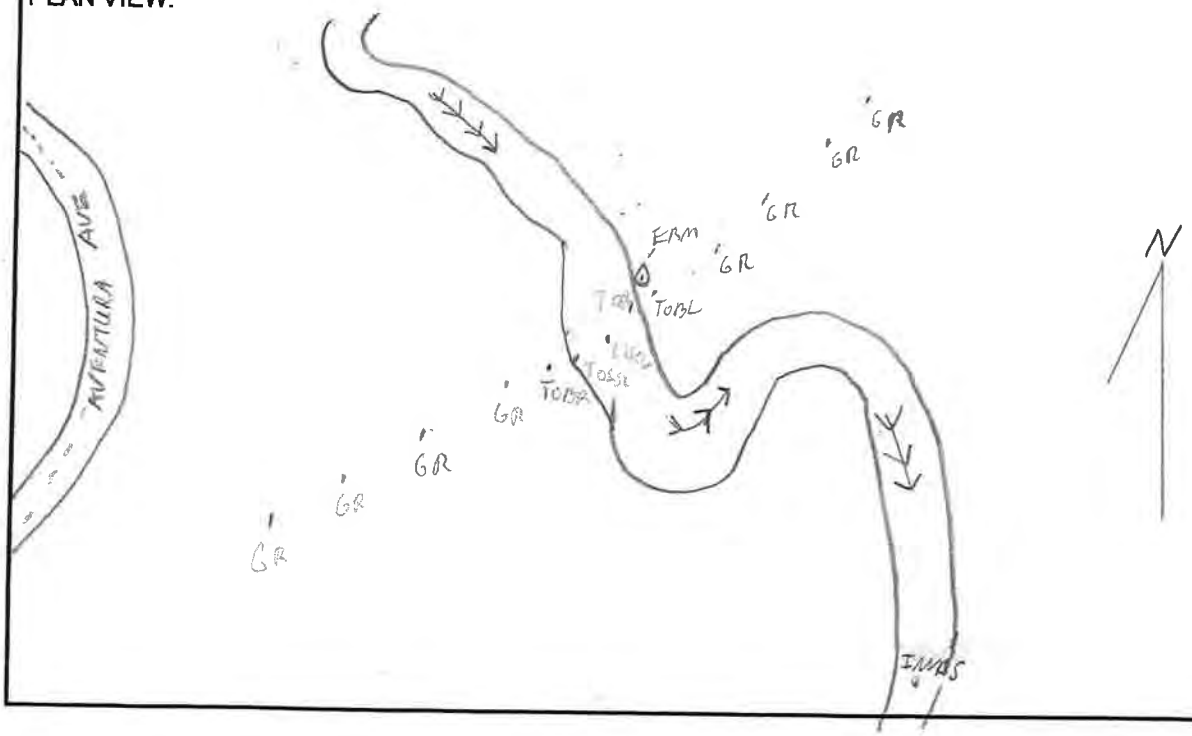


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	Photo ID: Coordinates: Description:	WC_T200_XS_100_DSCH 30.442359, -97.550222 Downstream channel

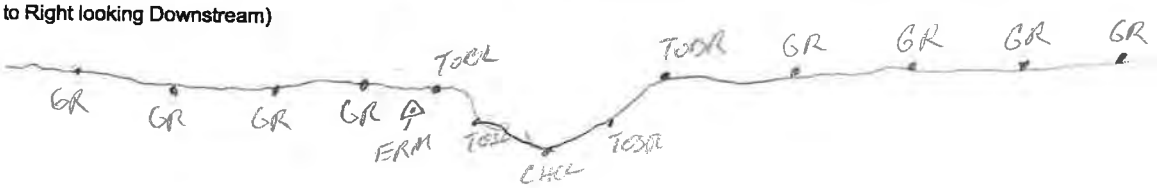
Survey Field Sheet

PROJECT: FEMA FLOOD STUDY
SURVEY NAME: WC_T200_XS_200
STREAM NAME: WILDARGER CREEK
DATE: 8/6/19
LOCATION: BRIDGEFARMER BLVD
CREW: CT, CL
TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 597.114 ERM ID: WC200XS201 GEOID: 12A

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:		Shape:		Length:		Height:	Width:	Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle		
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:

ERM Description: 1/2" IR w/ HALFF TRAV CAP
Coordinate System: TX-C
Photo Numbers:
DSCH: 2 DSFACE OTXS: USFACE USCH: 1
Additional Info:
File Name: 190806CT_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

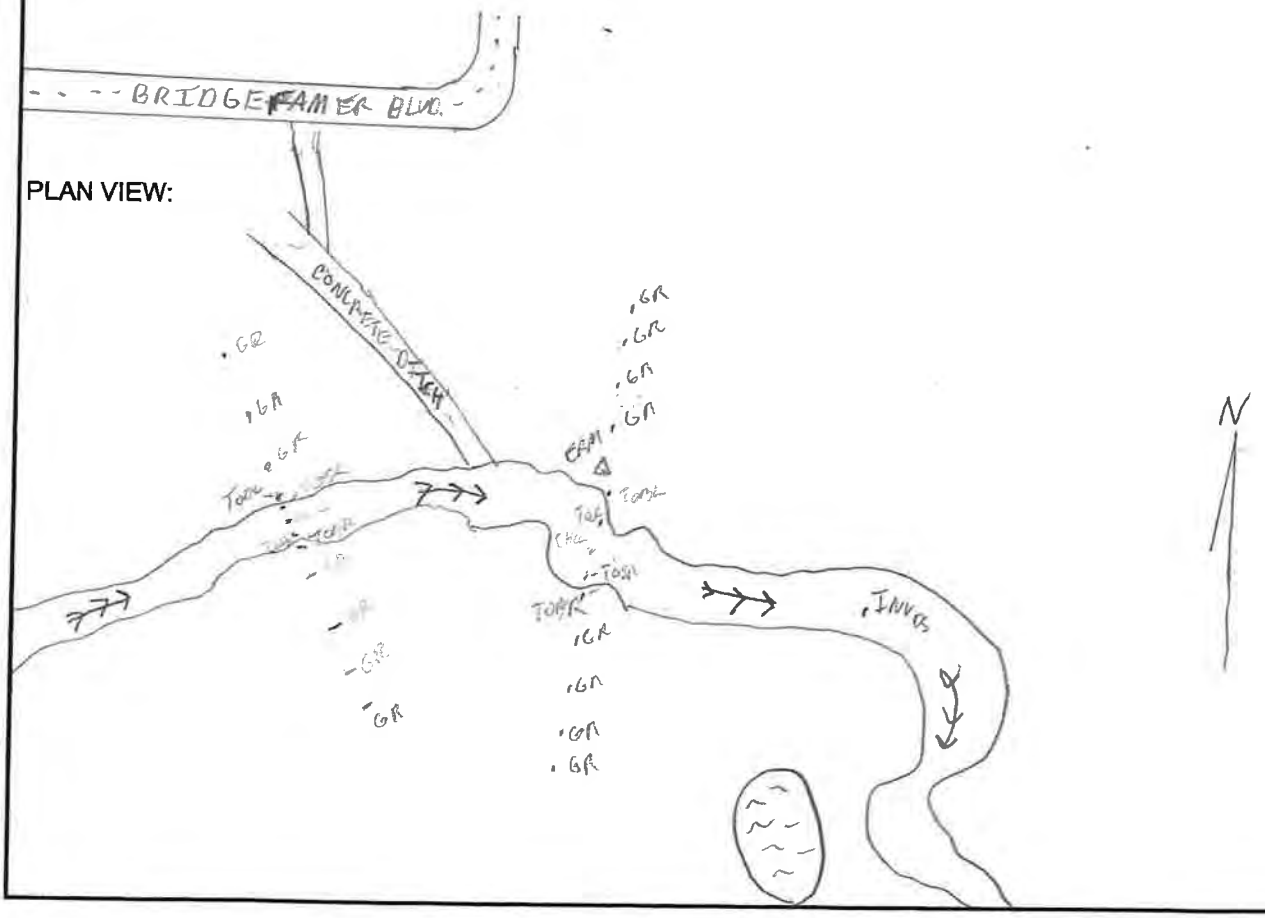


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	Photo ID: Coordinates: Description:	WC_T200_XS_200_DSCH 30.445425, -97.552219 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_T200_XS_300

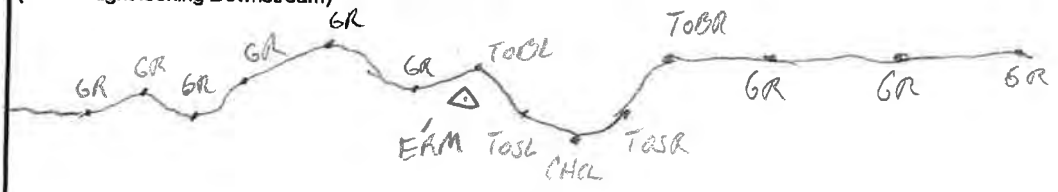
STREAM NAME: WILBARGER CREEK DATE: 8/5/19

LOCATION: BASSANO AVE & AVENTURA AVE CREW: CT/CL

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 607.813 ERM ID: WC200X300 GEOID: 12A

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:		Shape:		Length:		Height:	Width:	Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle		
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:
ERM Description:								Coordinate System:	TX-C
Photo Numbers:			DSCH:	2	DSFACE		OTXS:	USFACE	USCH: 1
Additional Info:									
File Name:	190805CT_35837								

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

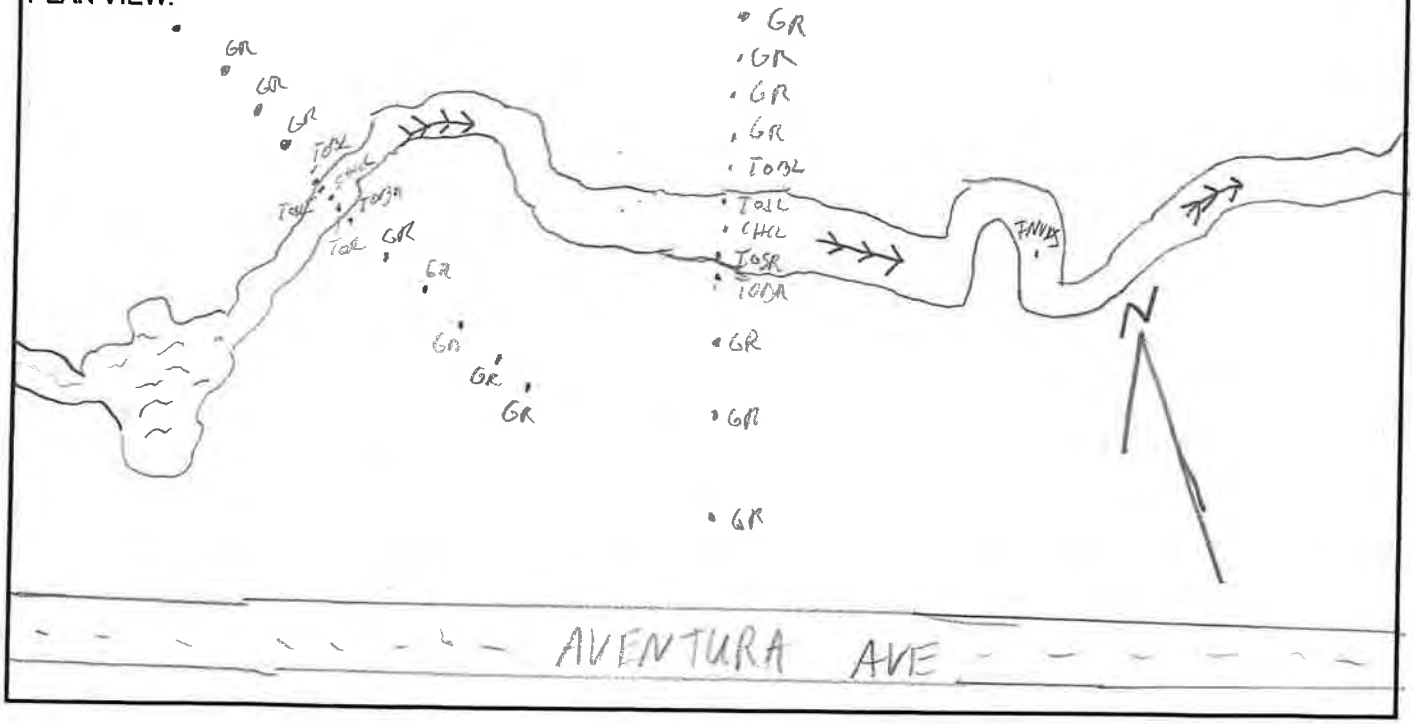


	Photo ID: Coordinates: Description:	WC_T200_XS_300_USCH 30.446622, -97.556432 Upstream channel
	Photo ID: Coordinates: Description:	WC_T200_XS_300_DSCH 30.446622, -97.556432 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_T200_XS-400

STREAM NAME: WILBARGER CREEK DATE: 8/21/19

LOCATION: HIDDEN LAKE PARK CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 622.134 ERM ID: WC200XS40 GEOID: 12B

BRIDGE: Rail Height: ____ Deck: ____ Width: ____ Pier(s): ____ @ ____ Pier Shape: ____

CULVERT: Number: ____ Shape: ____ Length: ____ Height: ____ Width: ____ Skew: ____

CULVERT: I/O Type: ____ Material: ____ Wingwall Angle ____

DAM: Top Width: ____ Side Slope ____ Side Slope ____ US: ____ DS: ____ Outlet: ____

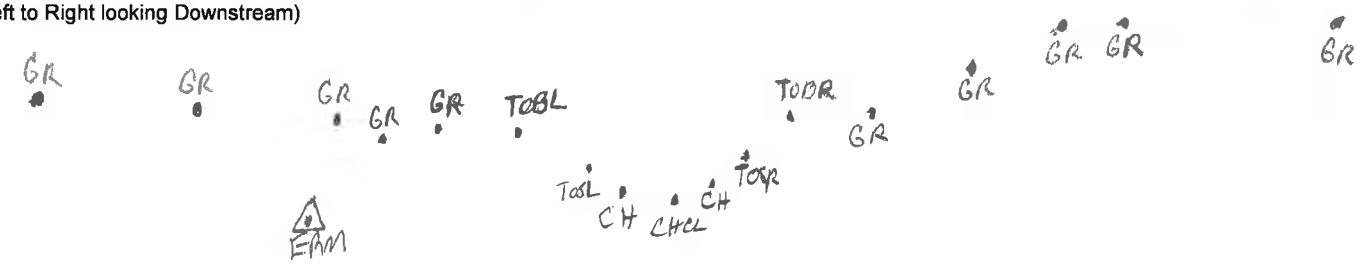
ERM Description: 1/2" IR W/ HAIFF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE ____ OTXS: ____ USFACE ____ USCH: 1

Additional Info: ____

File Name: 19082JJ-35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

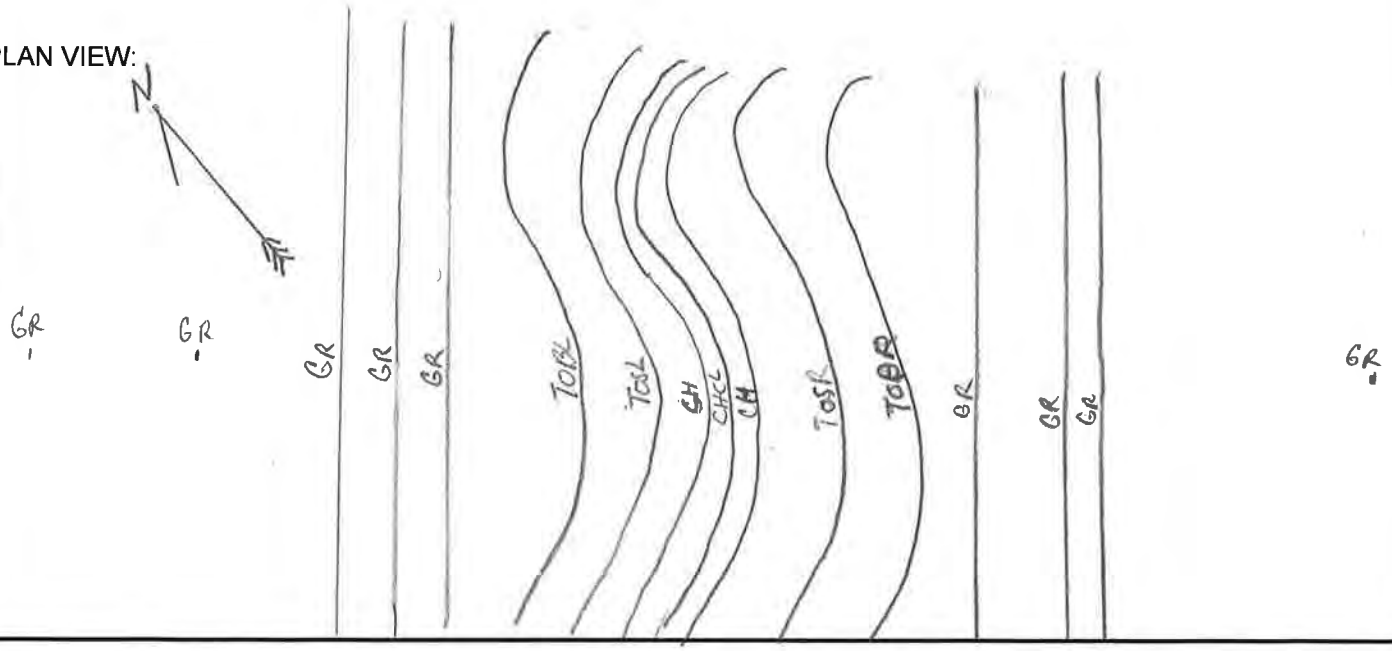


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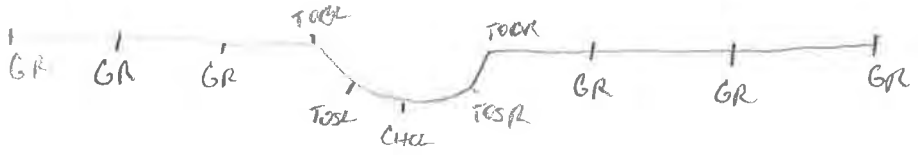
	Photo ID: Coordinates: Description:	WC_T200_XS_400_DSCH 30.451711, -97.56463 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY
SURVEY NAME: WC_T200_XS_500
STREAM NAME: WILBARGER CREEK
DATE: 8/1/19
LOCATION: TRANQUILITY LN.
CREW: JJ, CT
TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 676.536 ERM ID: WC200XS01 GEOID: 12A

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:		Shape:		Length:		Height:	Width:	Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle		
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:
ERM Description:	1/2" IR							Coordinate System:	Tx-C
Photo Numbers:			DSCH:	3	DSFACE		OTXS:	1 USFACE	USCH: 2
Additional Info:									
File Name:	19080IJJ_35837								

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

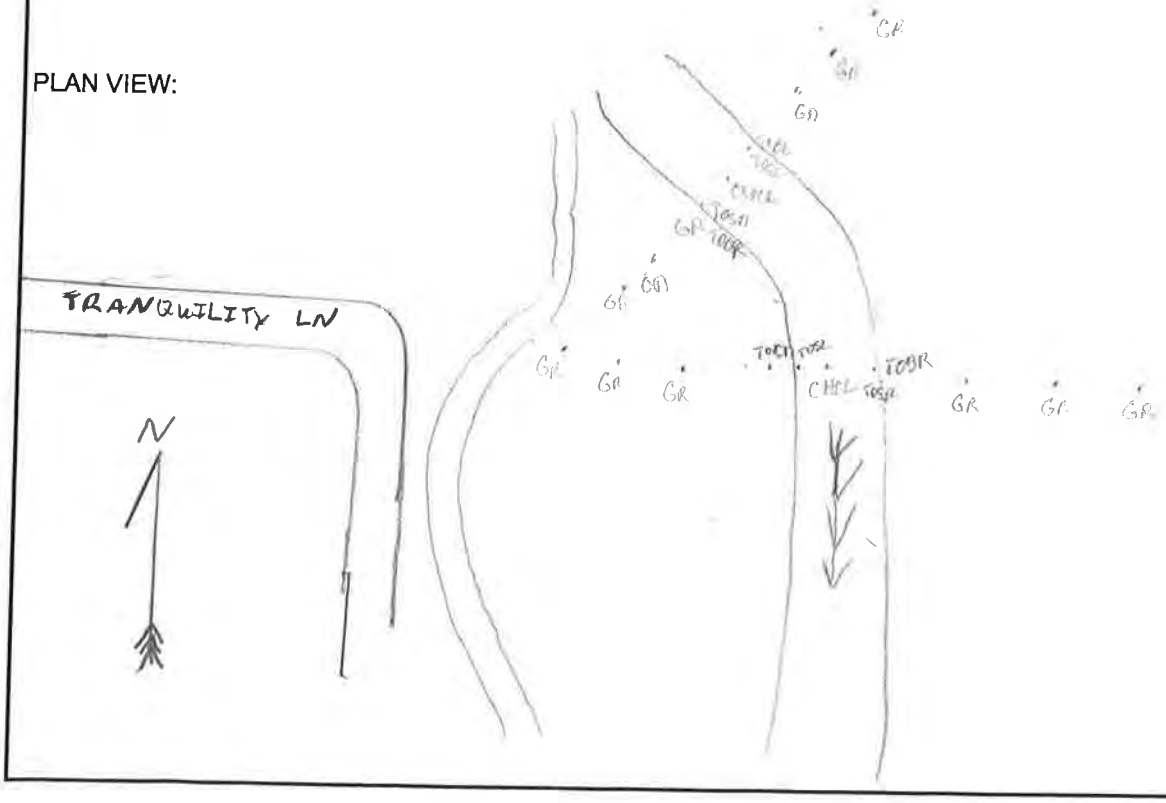


	Photo ID: Coordinates: Description:	WC_T200_XS_500_USCH 30.477972, -97.582531 Upstream channel
	Photo ID: Coordinates: Description:	WC_T200_XS_500_DSCH 30.477972, -97.582531 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WL_T200_XS_600

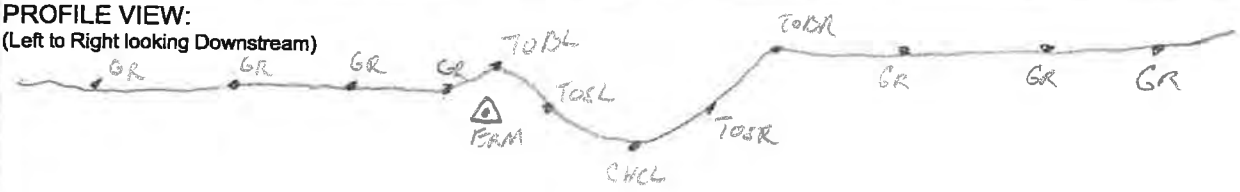
STREAM NAME: WILBARGER CREEK DATE: 8/8/19

LOCATION: PANTHER DR. CREW: CT/CL

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 702.100 ERM ID: WL200XS600 GEOID: 12A

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:		Shape:		Length:		Height:	Width:	Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle		
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:
ERM Description:		12" IR W/ HALFF TRAV CAP						Coordinate System:	TxC
Photo Numbers:		DSCH: 2		DSFACE		OTXS:		USFACE	USCH: 1
Additional Info:									
File Name:		190809CT-35837							

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

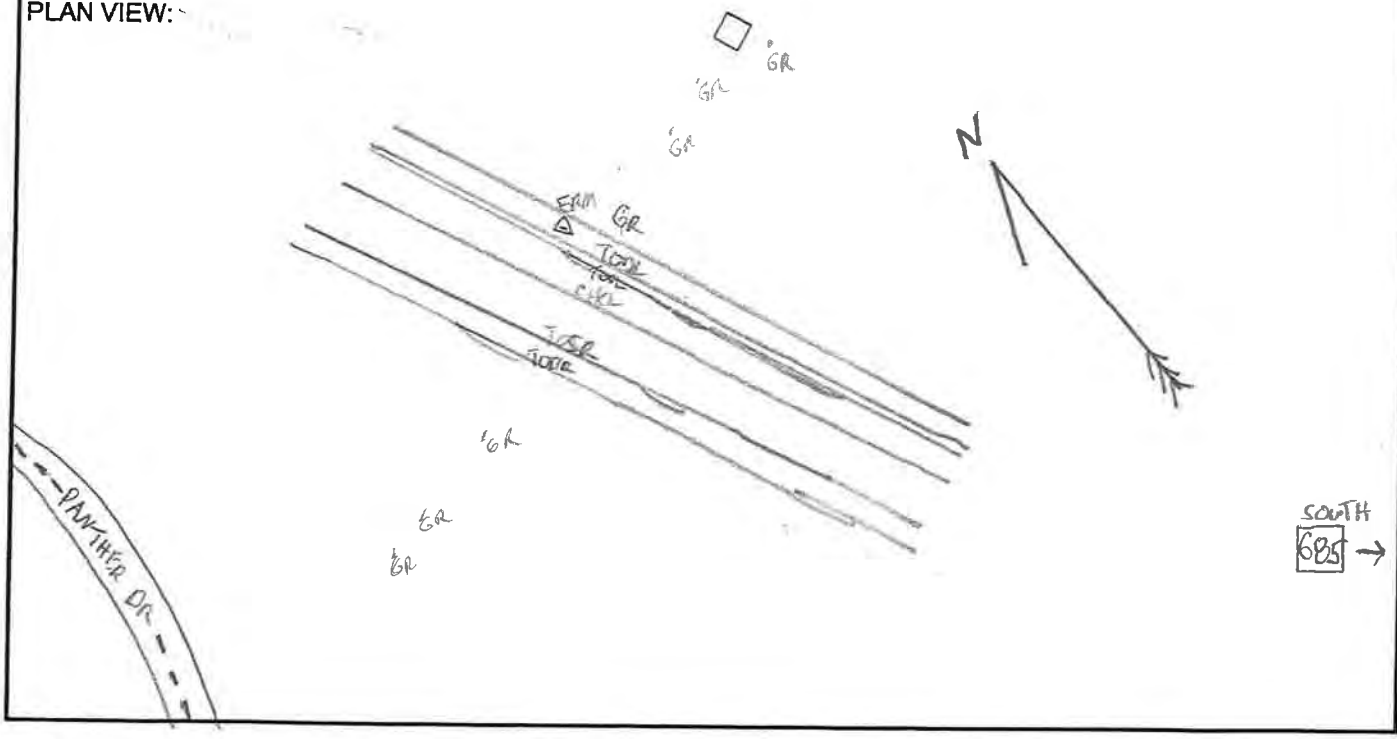


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	Photo ID: Coordinates: Description:	WC_T200_XS_600_DSCH 30.486781, -97.587815 Downstream channel

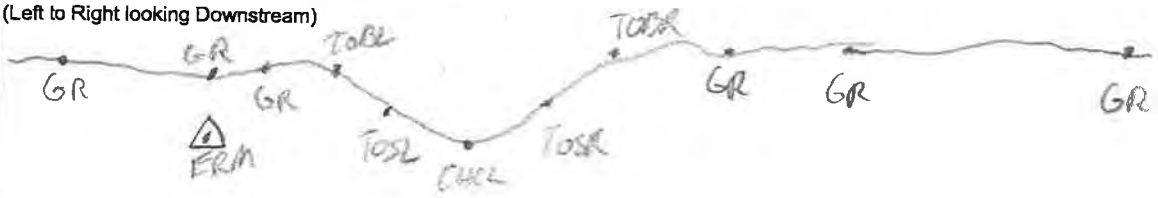
Survey Field Sheet

PROJECT: FEMA FLOOD STUDY
SURVEY NAME: WC_T206_XS_100
STREAM NAME: WILBARGER CREEK
DATE: 8/7/19
LOCATION: HERITAGE WELL LN
CREW: CT/CL
TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 678.572 ERM ID: WC206XS101 GEOID: 12A

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:		Shape:		Length:		Height:	Width:	Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle		
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:

ERM Description: 1/2" IR W/ HALF TRAIL CAP
Coordinate System: TX-C
Photo Numbers: DSCH: 2 DSFACE OTXS: USFACE USCH: 1
Additional Info:
File Name: 190807CT_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

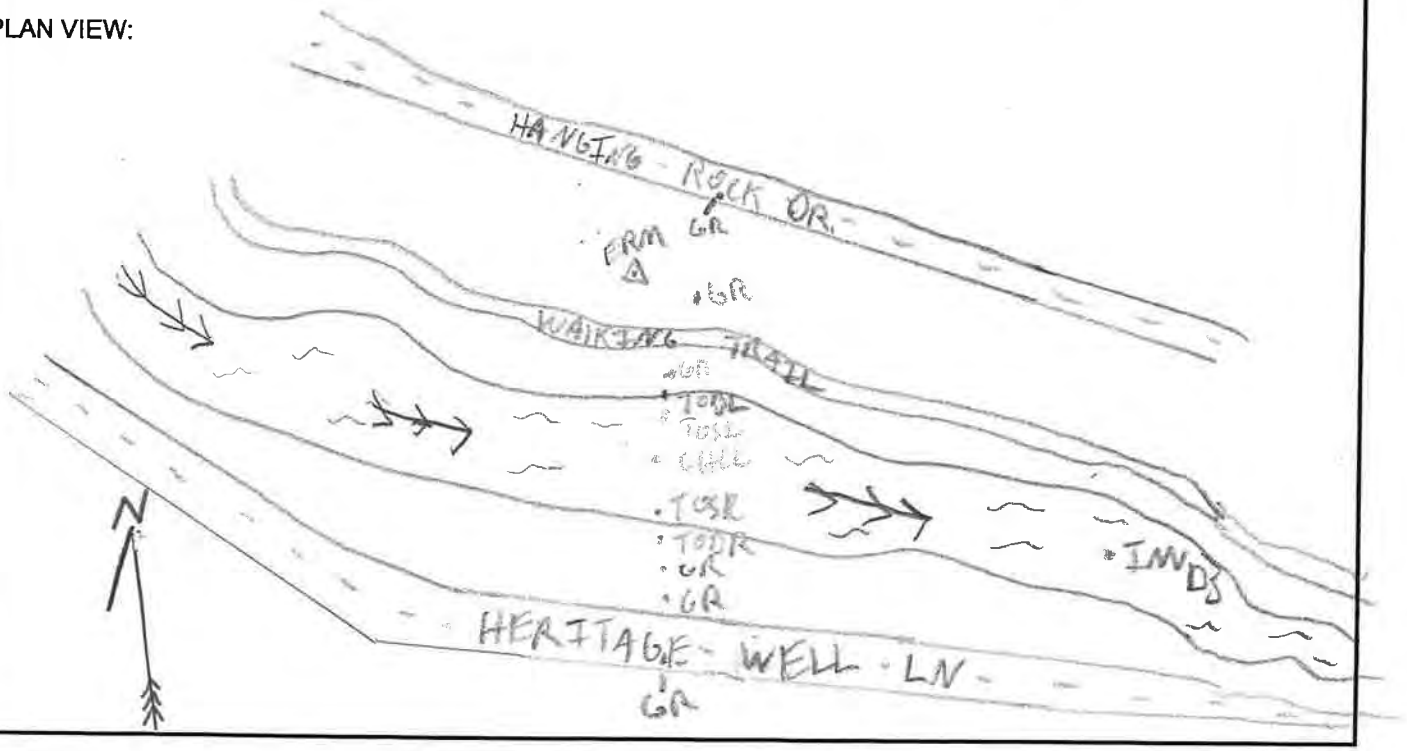


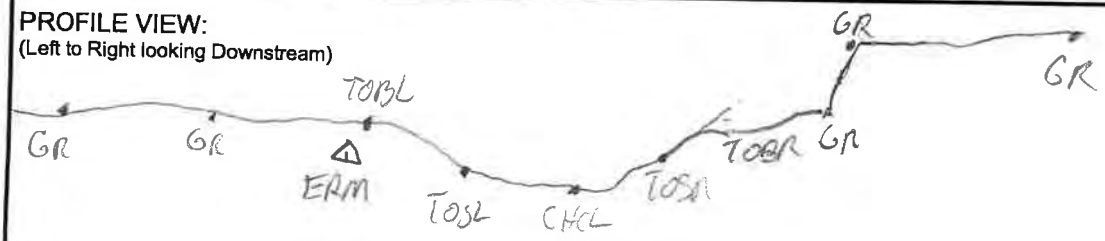
	Photo ID: Coordinates: Description:	WC_T206_XS_100_USCH 30.469671, -97.585837 Upstream channel
	Photo ID: Coordinates: Description:	WC_T206_XS_100_DSCH 30.469671, -97.585837 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY
SURVEY NAME: WC_T206_XS_200
STREAM NAME: WILBARGER CREEK
DATE: 8/8/19
LOCATION: SECLUDED WILLOW COVE
CREW: CT/CL
TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 699.228 ERM ID: WC206XS201 GEOID: 12A

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:		Shape:		Length:		Height:	Width:	Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle		
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:
ERM Description:	MAG NAIL							Coordinate System:	TX-C
Photo Numbers:			DSCH:	2	DSFACE		OTXS:	USFACE	USCH: 1
Additional Info:									
File Name:	190808CT-35837								

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

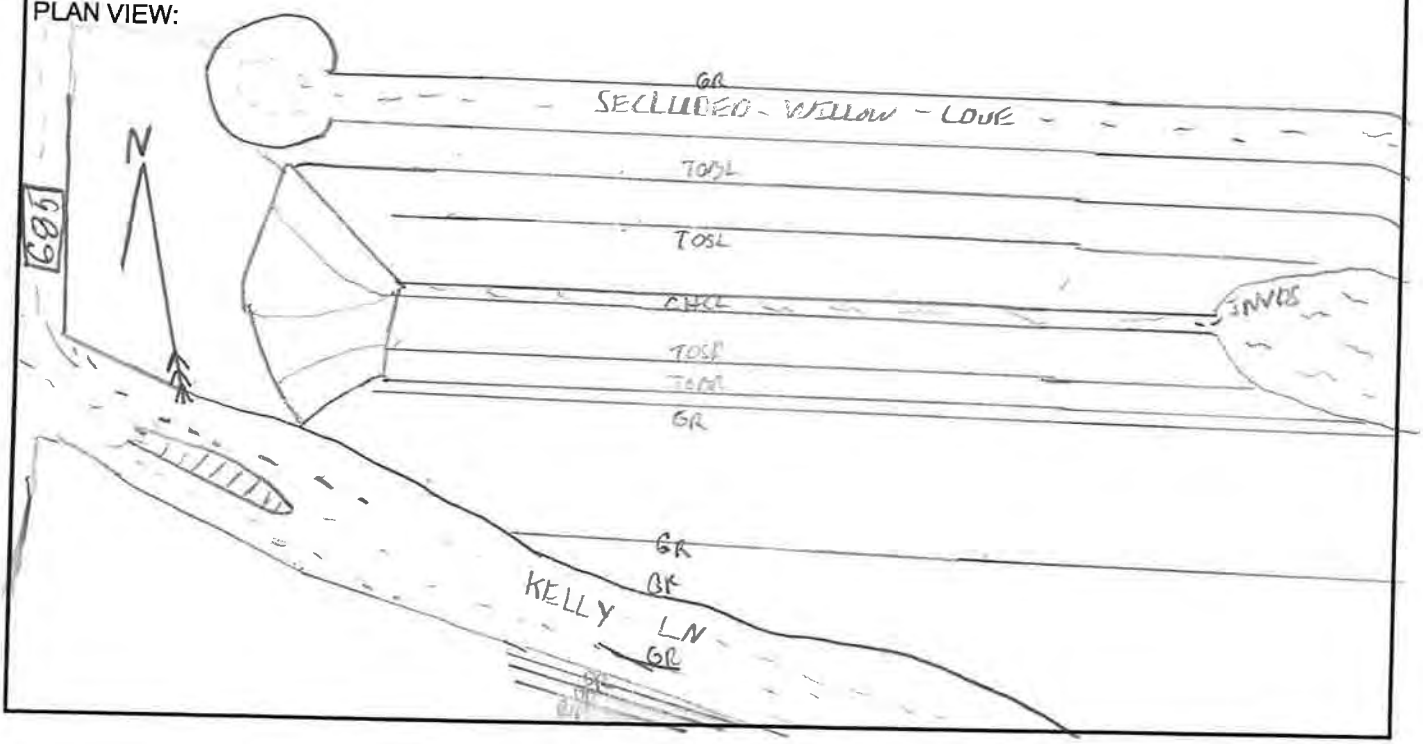


	Photo ID: Coordinates: Description:	WC_T206_XS_200_USCH 30.471822, -97.590697 Upstream channel
	Photo ID: Coordinates: Description:	WC_T206_XS_200_DSCH 30.471822, -97.590697 Downstream channel

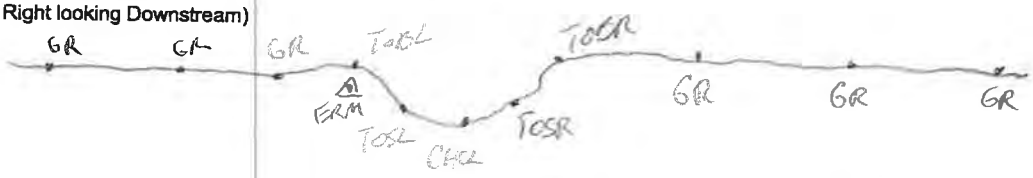
Survey Field Sheet

PROJECT: FEMA FLOOD STUDY
SURVEY NAME: WC_T207_XS_100
STREAM NAME: WILBARGER CREEK
DATE: 8/5/19
LOCATION: BASSANO Ave & AVENTURA AVE
CREW: CT/CL
TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 615.597 ERM ID: WC207XS101 GEOID: 12A

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:		Shape:		Length:		Height:	Width:	Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle		
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:

ERM Description: ½" IR W/ HALFF TRAV CAP
Coordinate System: TX-C
Photo Numbers:
DSCH: 2 DSFACE: OTXS: USFACE: USCH: 1
Additional Info:
File Name: 190805CT_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

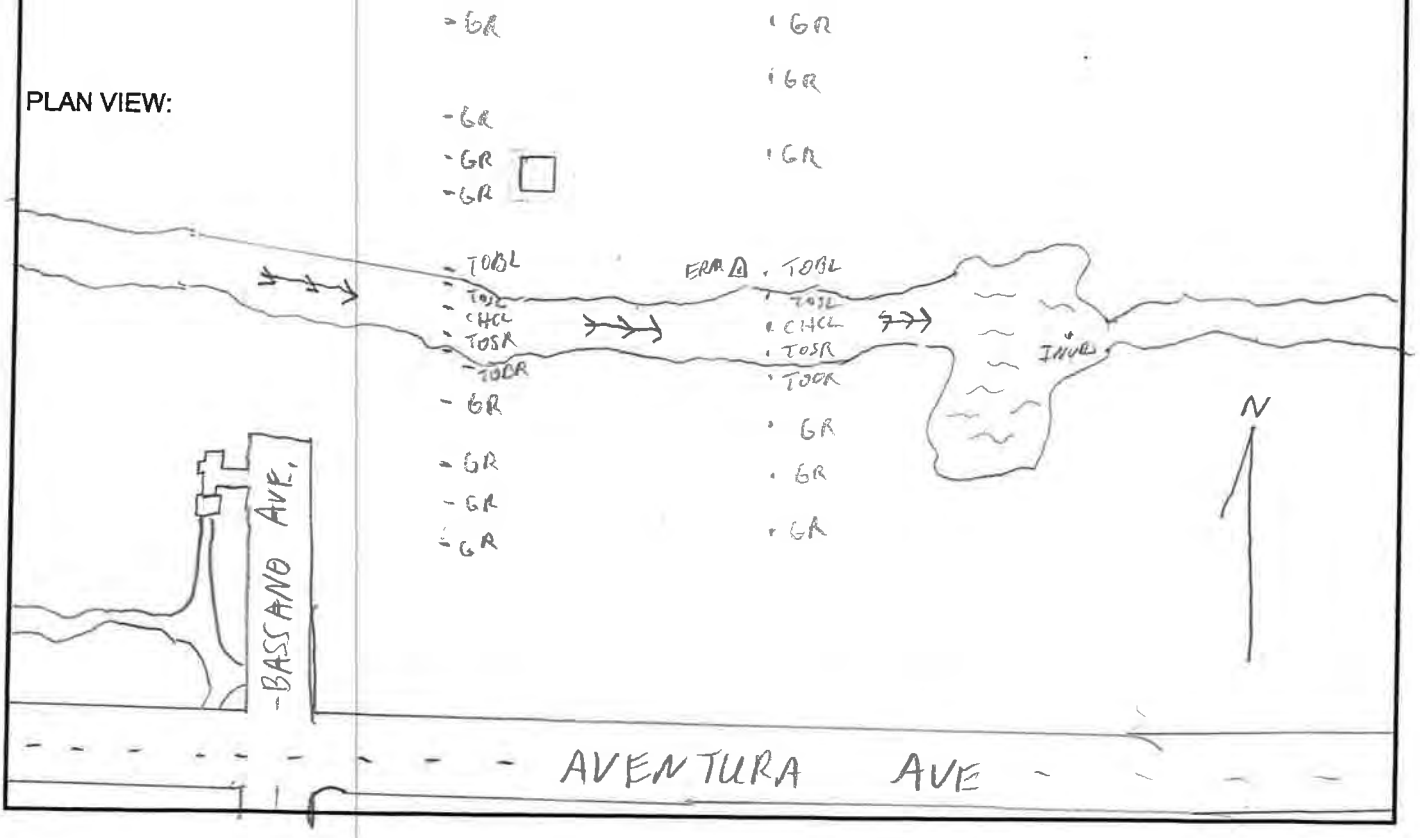


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	Photo ID: Coordinates: Description:	WC_T207_XS_100_DSCH 30.446428, -97.558627 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_T210_XS_100

STREAM NAME: WILBARGER CREEK DATE: 8-30-2019

LOCATION: PFLUGERVILLE CEMETARY CREW: JJ CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 556.808 ERM ID: WC210XS101 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

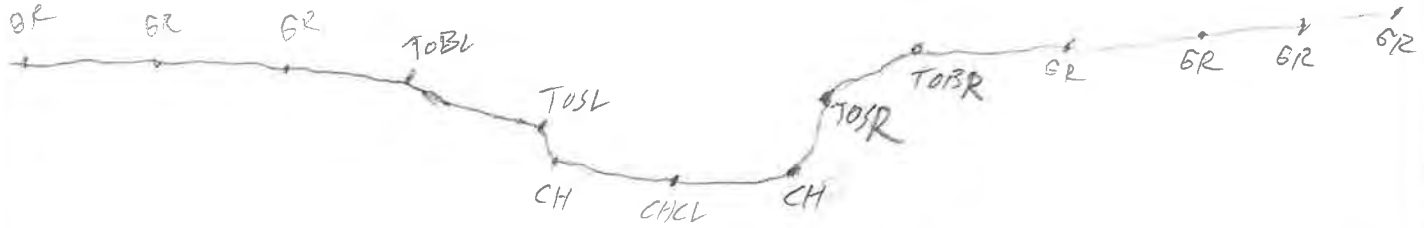
ERM Description: ½IN IR W/ HALFF TRAV Coordinate System: TxC

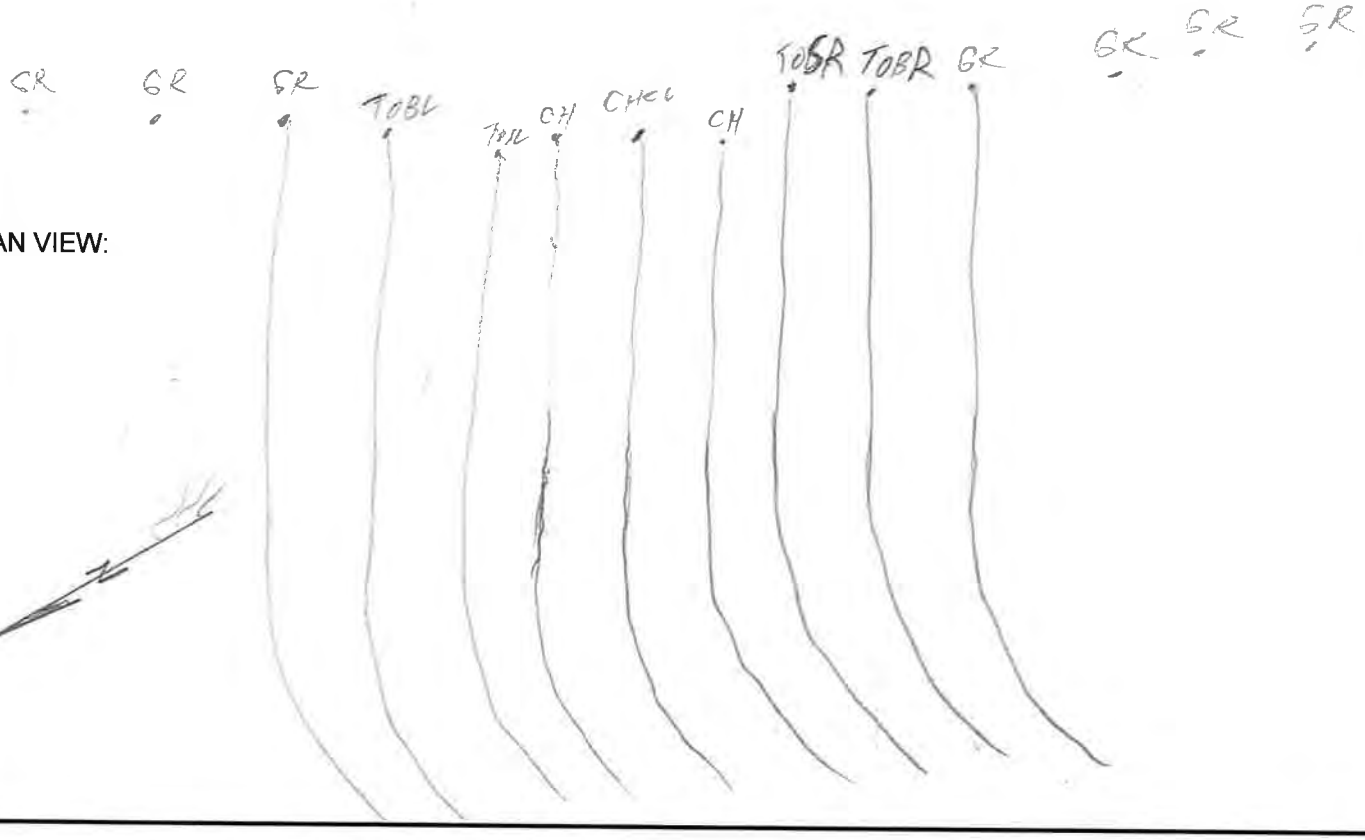
Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: 190830JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)





PLAN VIEW:

	Photo ID: Coordinates: Description:	WC_T210_XS_100_USCH 30.418366, -97.547531 Upstream channel
	Photo ID: Coordinates: Description:	WC_T210_XS_100_DSCH 30.418366, -97.547531 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_T210_XS_500

STREAM NAME: WILBARGER CREEK DATE: 8/28/19

LOCATION: ELK HORN DR CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 583.819 ERM ID: WC210XS501 GEOID: 12B

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):		@		Pier Shape:
CULVERT:	Number:		Shape:		Length:		Height:		Width:		Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle				
DAM:	Top Width:		Side Slope		Side Slope		US:		DS:		Outlet:

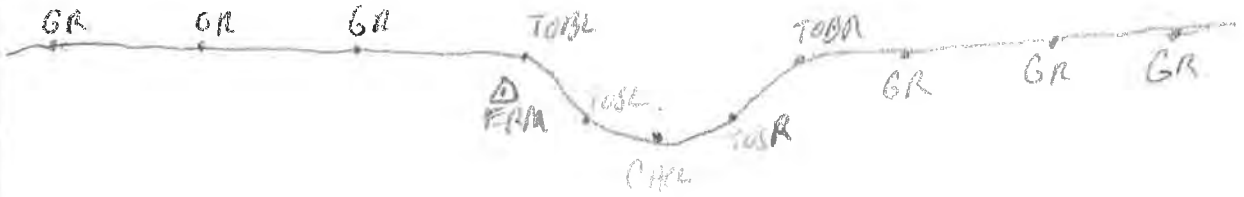
ERM Description: 1/2" IR W/ HALFF IRON CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE OTXS: USFACE USCH: 1

Additional Info:

File Name: 190828JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

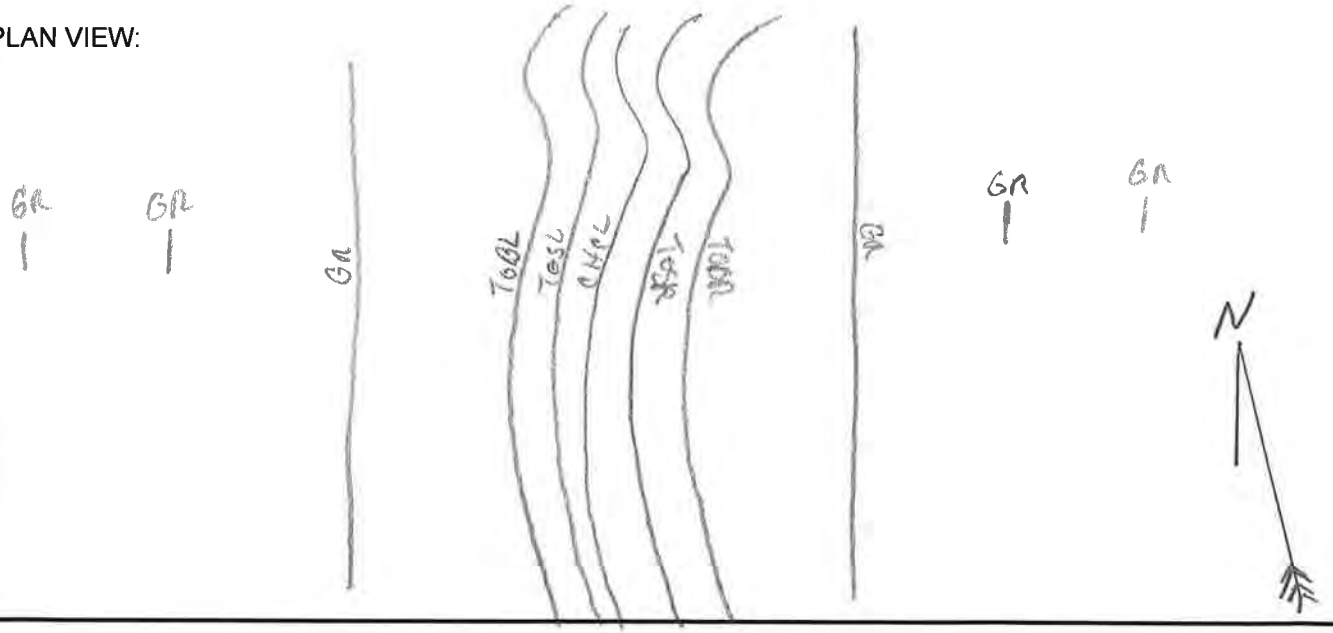


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	Photo ID: Coordinates: Description:	WC_T210_XS_500_DSCH 30.437715, -97.546933 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_T210_XS_600

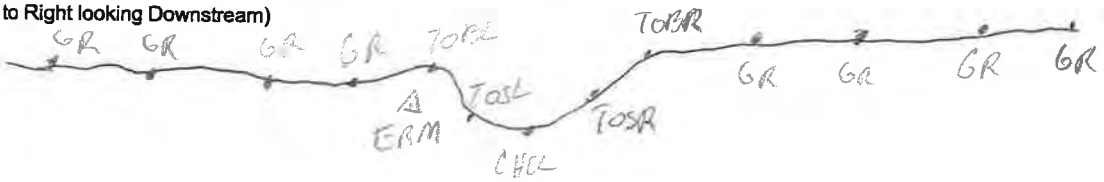
STREAM NAME: WILDARGER CREEK DATE: 8/7/19

LOCATION: ELK HORN DR. CREW: CT/CL

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 593.606 ERM ID: WC210XS60 GEOID: 12A

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:		Shape:		Length:		Height:	Width:	Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle		
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:
ERM Description:	1/2" IR W/ HALFF TRAV CAP							Coordinate System:	Tx-C
Photo Numbers:			DSCH: 2		DSFACE		OTXS:	USFACE	USCH: 1
Additional Info:									
File Name:	190807CL-35837								

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

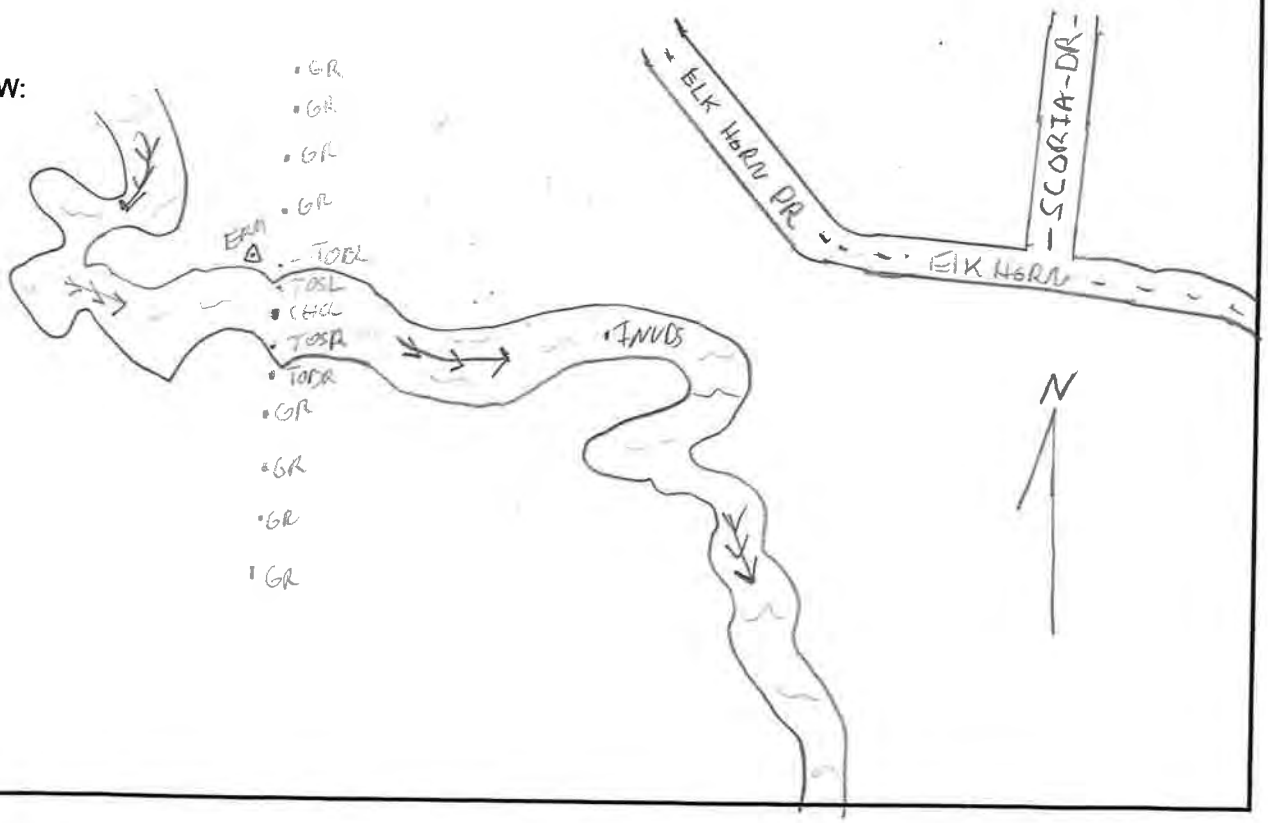


	Photo ID: Coordinates: Description:	WC_T210_XS_600_USCH 30.443697, -97.547583 Upstream channel
	Photo ID: Coordinates: Description:	WC_T210_XS_600_DSCH 30.443697, -97.547583 Downstream channel

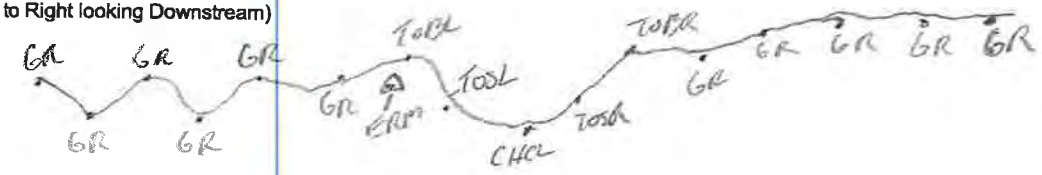
Survey Field Sheet

PROJECT: FEMA FLOOD STUDY
SURVEY NAME: WC_T210_XS-700
STREAM NAME: WILBARGER CREEK
DATE: 8/6/19
LOCATION: ELK HORN DR.
CREW: CT/CL
TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 597.111 ERM ID: WC210XS700 GEOID: 12A

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:		Shape:		Length:		Height:	Width:	Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle		
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:

ERM Description: 1/2" IR w/ HALFF TRAV CAP
Coordinate System: TX-C
Photo Numbers: DSCH: 2 DSFACE OTXS: USFACE USCH: 1
Additional Info:
File Name: 190806CT_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

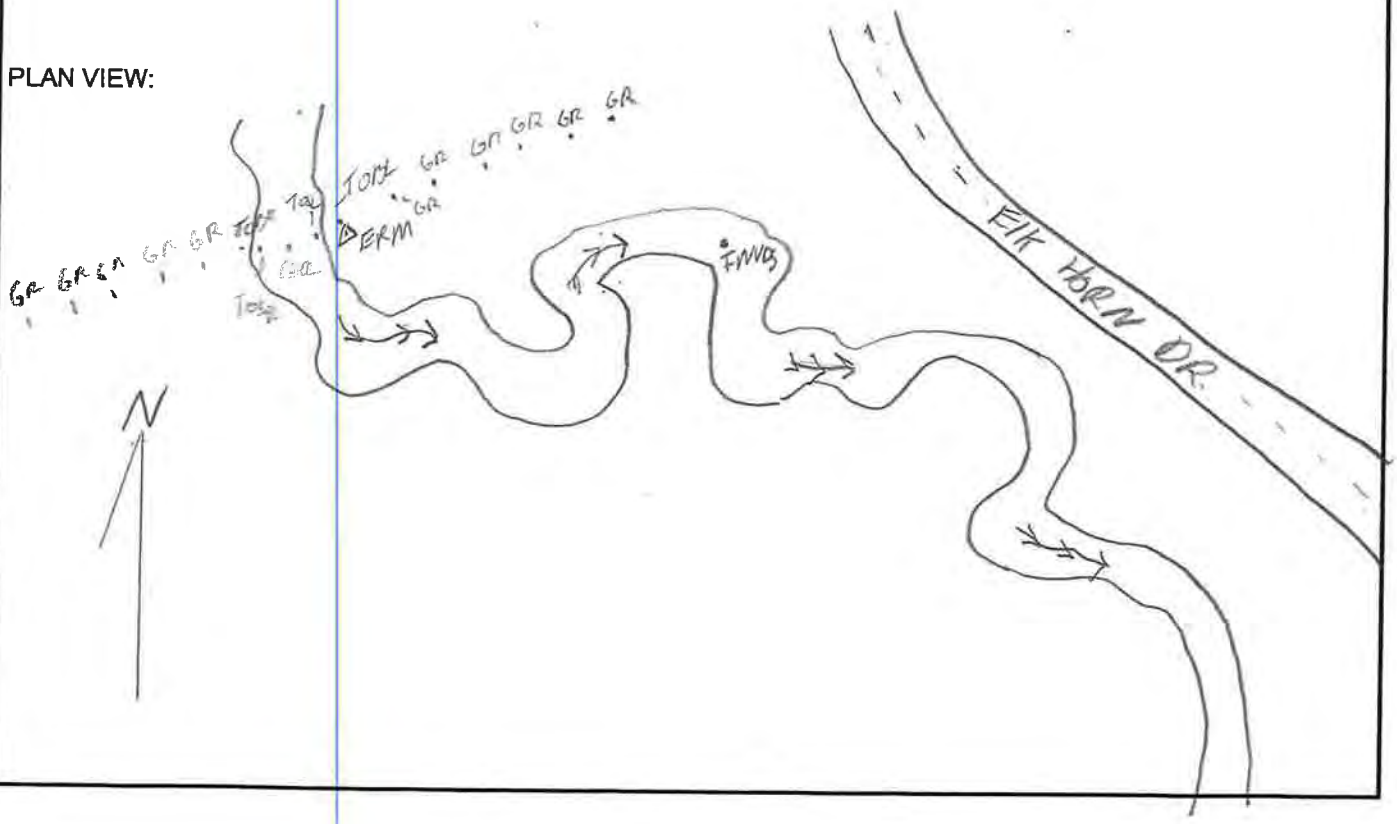


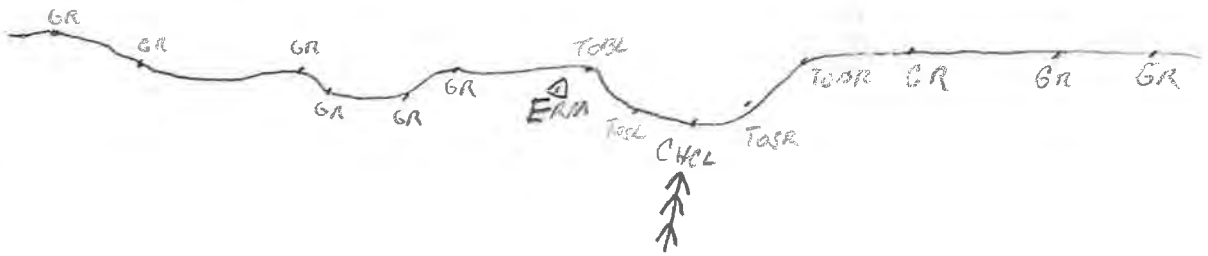
	Photo ID: Coordinates: Description:	WC_T210_XS_700_USCH 30.447431, -97.548725 Upstream channel
	Photo ID: Coordinates: Description:	WC_T210_XS_700_DSCH 30.447431, -97.548725 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY
SURVEY NAME: WC_T210_XS_800
STREAM NAME: WILBARGER CREEK
DATE: 8/2/19
LOCATION: NICOLE LN.
CREW: JJ, CT
TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 604.393 ERM ID: WC210XS801 GEOID: 12A

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:		Shape:		Length:		Height:	Width:	Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle		
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:
ERM Description:	1/2" IR W/ HALFF TRAV CAP							Coordinate System:	TXC
Photo Numbers:			DSCH:	3	DSFACE		OTXS: 1	USFACE	USCH: 2
Additional Info:									
File Name:	190802JJ_35837								

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

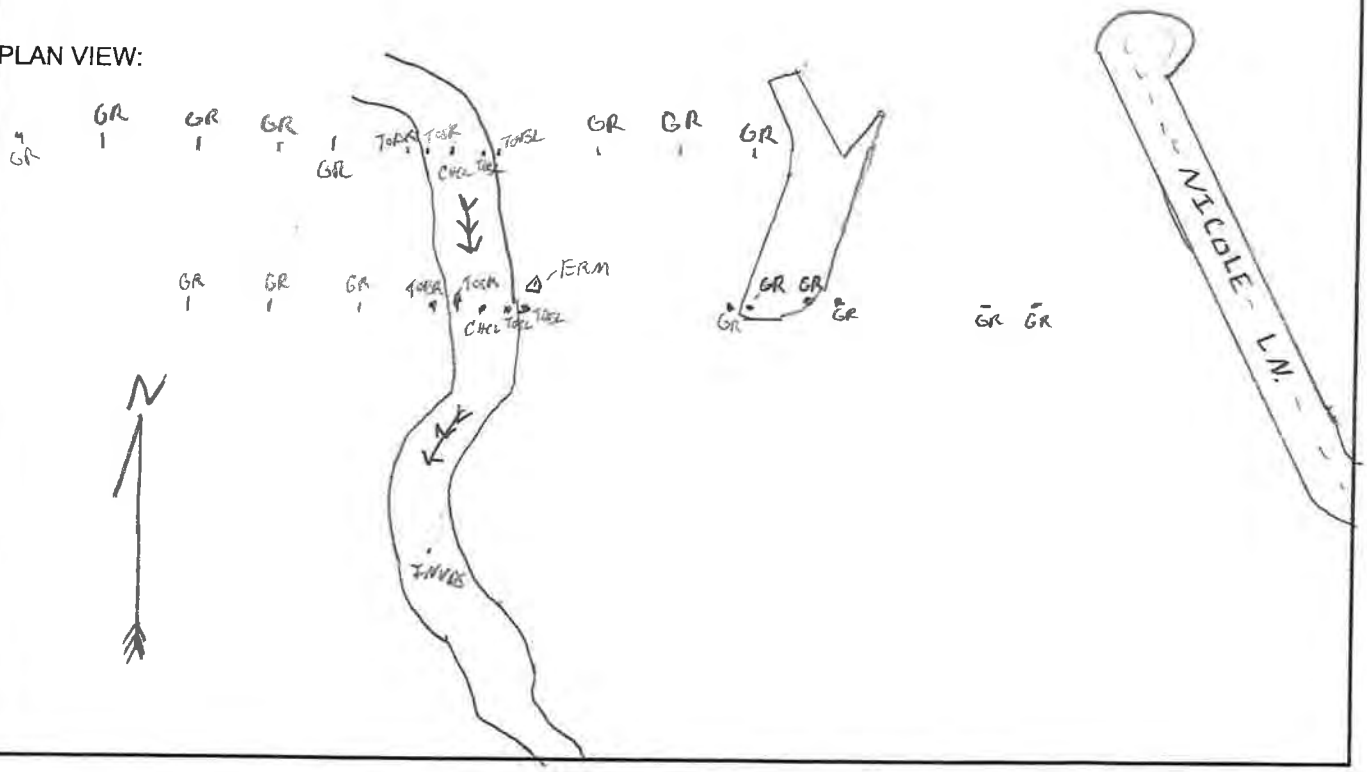

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	Photo ID: Coordinates: Description:	WC_T210_XS_800_USCH 30.450951, -97.549212 Upstream channel
	Photo ID: Coordinates: Description:	WC_T210_XS_800_DSCH 30.450951, -97.549212 Downstream channel

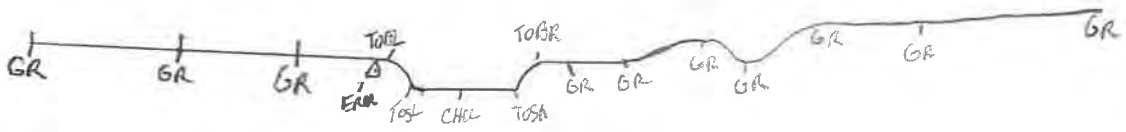
Survey Field Sheet

PROJECT: FEMA FLOOD STUDY
SURVEY NAME: WC_T210_XS_900
STREAM NAME: WILGARGER CREEK
DATE: 8/2/19
LOCATION: CAMLANN PI
CREW: JJ, CT
TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 620.399 ERM ID: WC210XS901 GEOID: 12A

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:		Shape:		Length:		Height:	Width:	Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle		
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:

ERM Description: 1/2" IR W/ HALFF TRAV CAP
Coordinate System: TX-C
Photo Numbers: DSCH: 3 DSFACE: OTXS: 1 USFACE: USCH: 2
Additional Info:
File Name: 190802JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

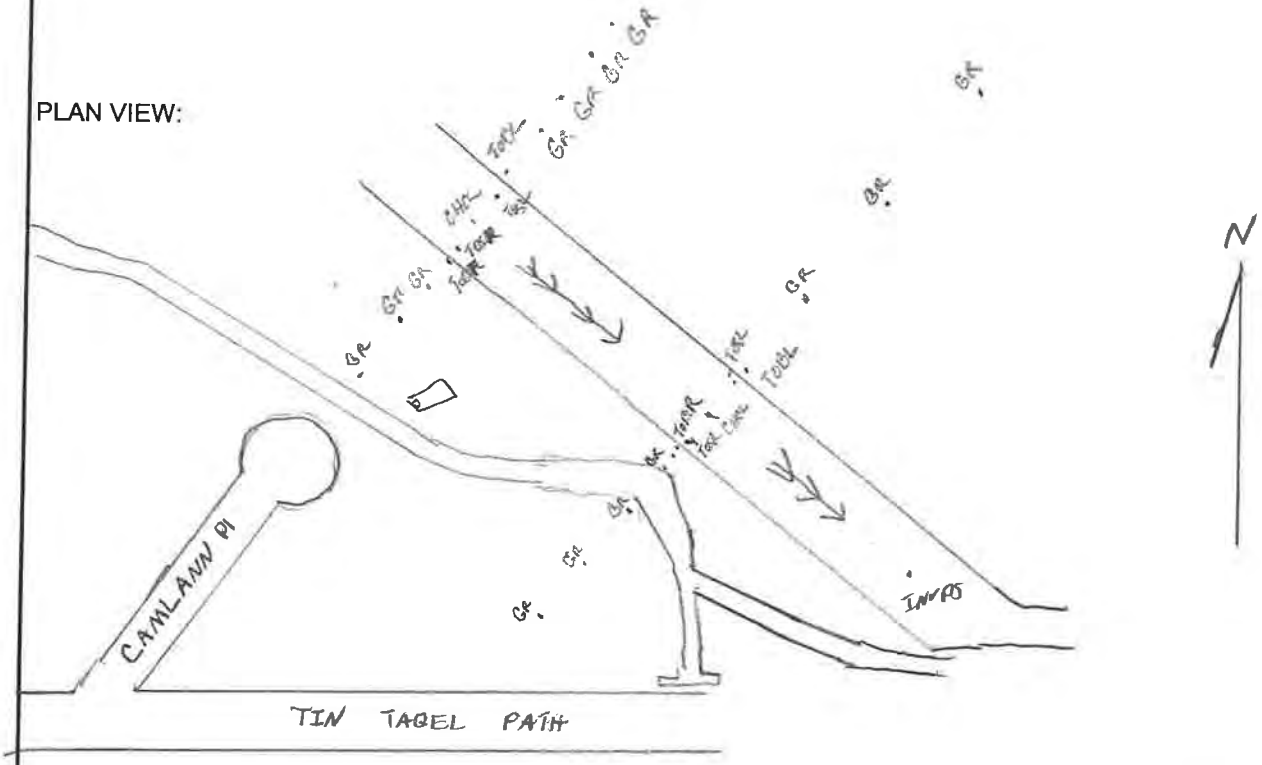


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	Photo ID: Coordinates: Description:	WC_T210_XS_900_DSCH 30.458766, -97.560005 Downstream channel

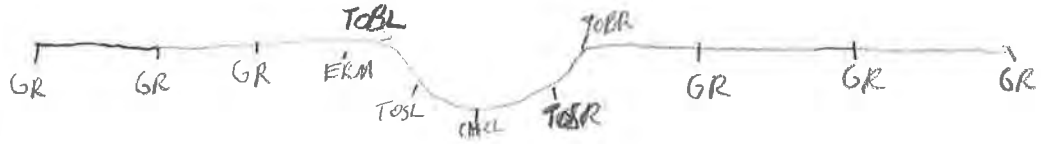
Survey Field Sheet

PROJECT: FEMA FLOOD STUDY
SURVEY NAME: WC_210_XS_1000
STREAM NAME: WILBARGER CREEK
DATE: 8/1/19
LOCATION: WINDMILL AVE & STEED CROSSING
CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 694.413 ERM ID: WC210XS1001 GEOID: 12A

BRIDGE: Rail Height: ____ Deck: ____ Width: ____ Pier(s): ____ @ ____ Pier Shape: ____
CULVERT: Number: ____ Shape: ____ Length: ____ Height: ____ Width: ____ Skew: ____
CULVERT: I/O Type: ____ Material: ____ Wingwall Angle ____
DAM: Top Width: ____ Side Slope ____ Side Slope ____ US: ____ DS: ____ Outlet: ____
ERM Description: 1/2" IR W/ HALF TRAV CAP Coordinate System: TX-C
Photo Numbers: DSCH: 3 DSFACE ____ OTXS: 1 USFACE ____ USCH: 2
Additional Info:
File Name: 190801JJ-35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

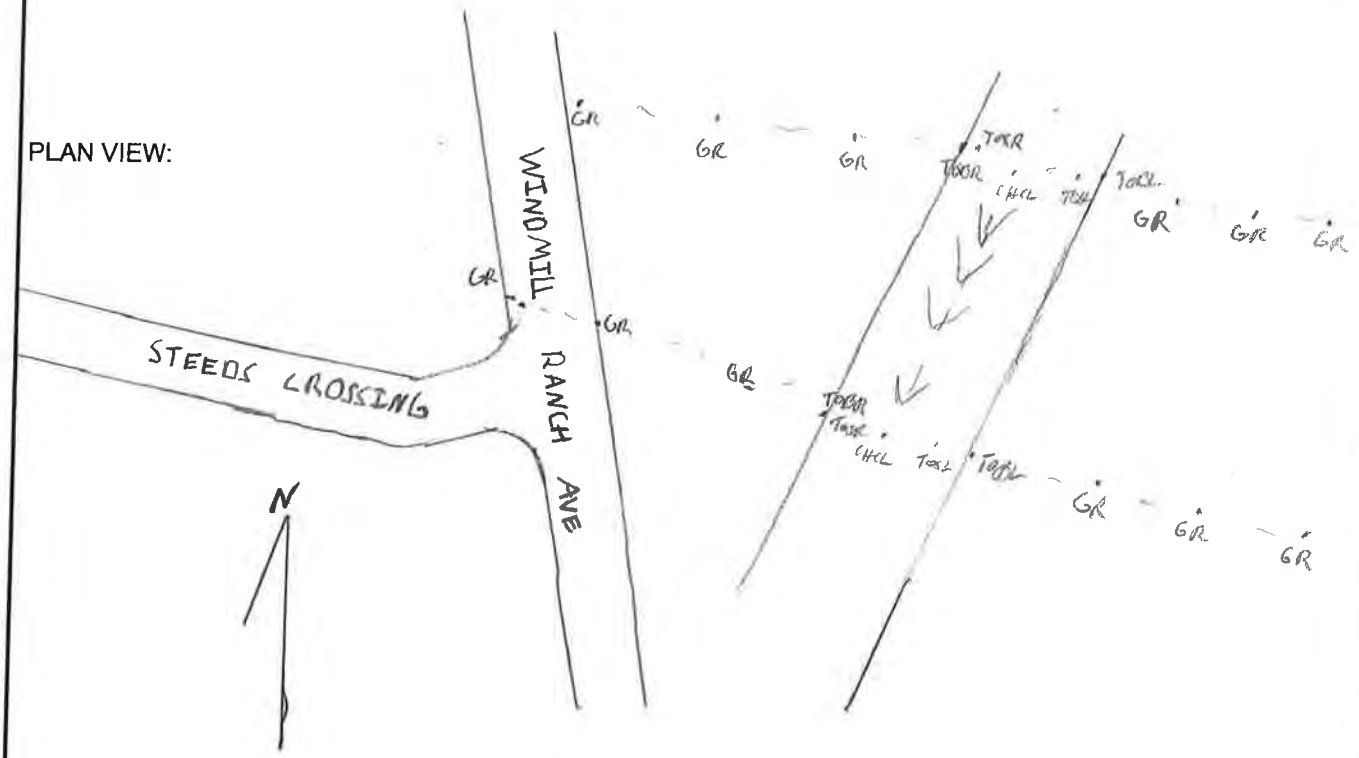


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	Photo ID: Coordinates: Description:	WC_T210_XS_1000_DSCH 30.491534, -97.571818 Downstream channel

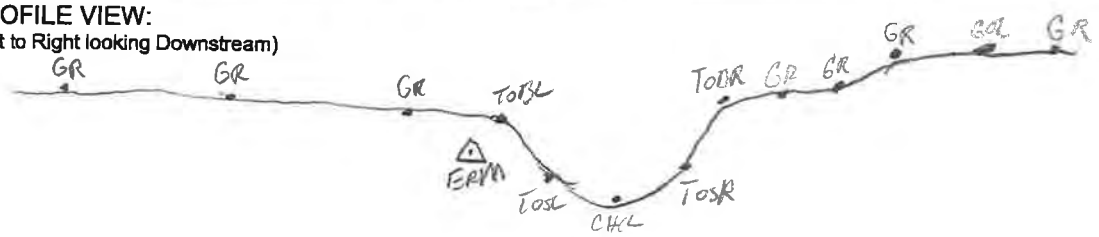
Survey Field Sheet

PROJECT: FEMA FLOOD STUDY
SURVEY NAME: WC_T216_XS_100
STREAM NAME: WILBARGER CREEK
DATE: 8/8/19
LOCATION: BURROW BRIDGE RD
CREW: CT/CL
TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 616,201 ERM ID: WC216XS101 GEOID: 12A

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:		Shape:		Length:		Height:	Width:	Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle		
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:

ERM Description: 1/2" IR W/ HALFF TRAV CAP
Coordinate System: TX-C
Photo Numbers: DSCH: 2 DSFACE OTXS: USFACE USCH: 1
Additional Info:
File Name: 190809CT-35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

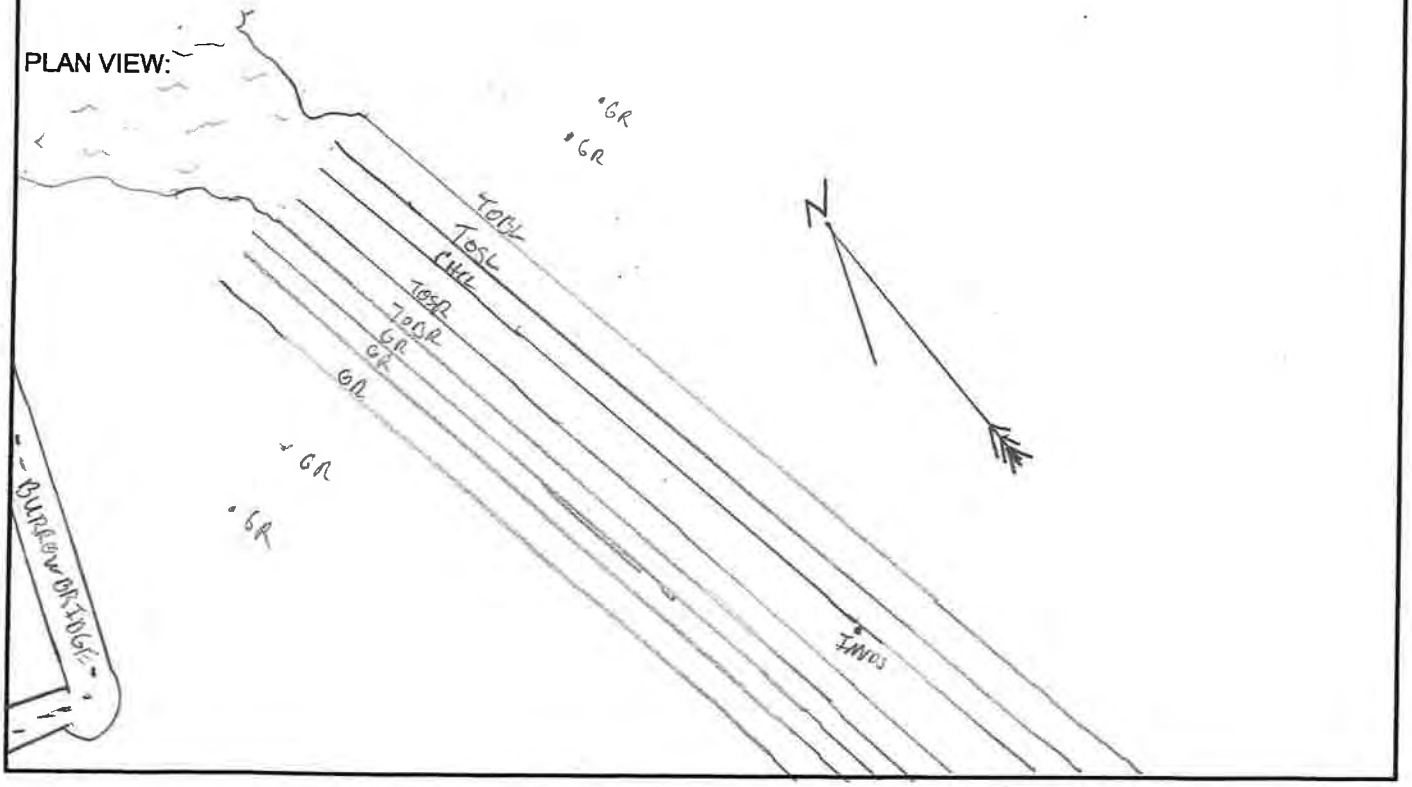


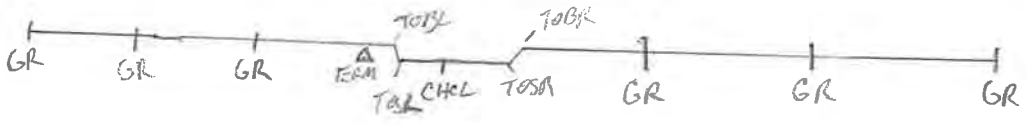
	Photo ID: Coordinates: Description:	WC_T216_XS_100_USCH 30.461428, -97.555672 Upstream channel
	Photo ID: Coordinates: Description:	WC_T216_XS_100_DSCH 30.461428, -97.555672 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY
SURVEY NAME: WC_T216_XS_200
STREAM NAME: WILBARGER CREEK
DATE: 8/2/19
LOCATION: SPEIDEL OR
CREW: JJ, CT
TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 637.956 ERM ID: WC216XS201 GEOID: 12A

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:
CULVERT: Number: Shape: Length: Height: Width: Skew:
CULVERT: I/O Type: Material: Wingwall Angle
DAM: Top Width: Side Slope Side Slope US: DS: Outlet:
ERM Description: 1/2" IR W/ HALFF TRAV Coordinate System: TX-C
Photo Numbers: DSCH: 2 DSFACE OTXS: USFACE USCH: 1
Additional Info:
File Name: 190802JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

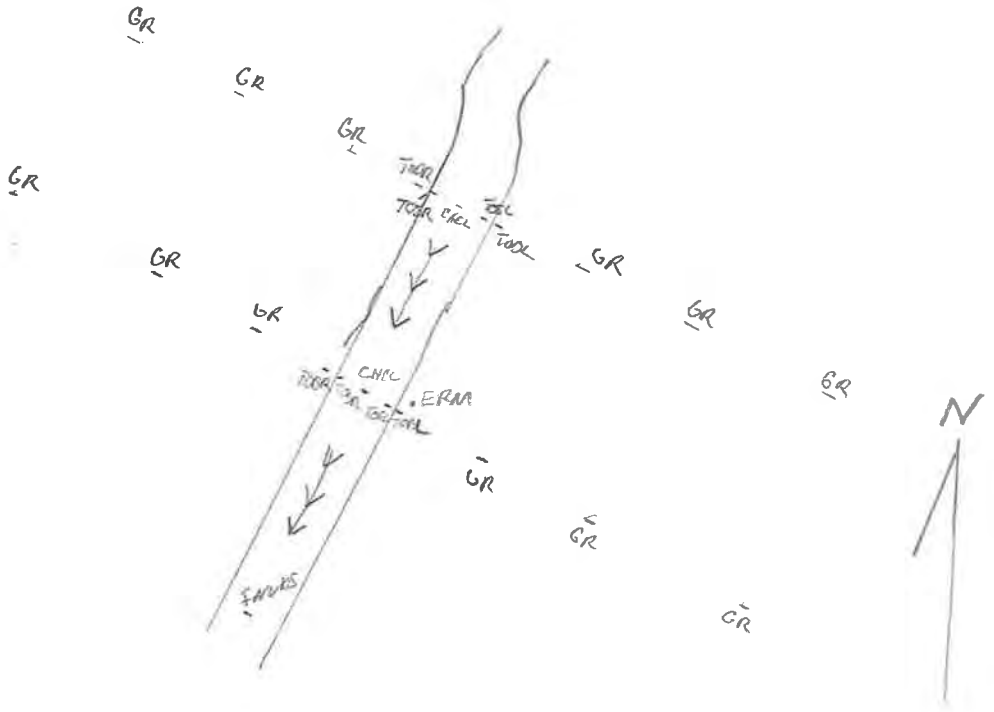


	Photo ID: Coordinates: Description:	WC_T216_XS_200_USCH 30.475233, -97.554314 Upstream channel
	Photo ID: Coordinates: Description:	WC_T216_XS_200_DSCH 30.475233, -97.554314 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC-XS_300

STREAM NAME: WILBARGER DATE: 12-13-2019

LOCATION: BITTING SCHOOL RD. CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 419.988 ERM ID: WCXS301 GEOID: 1213

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

ERM Description: 1/2 IN IR W/HALFF TRAV Coordinate System: TxC

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: 191213JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)

PLAN VIEW:

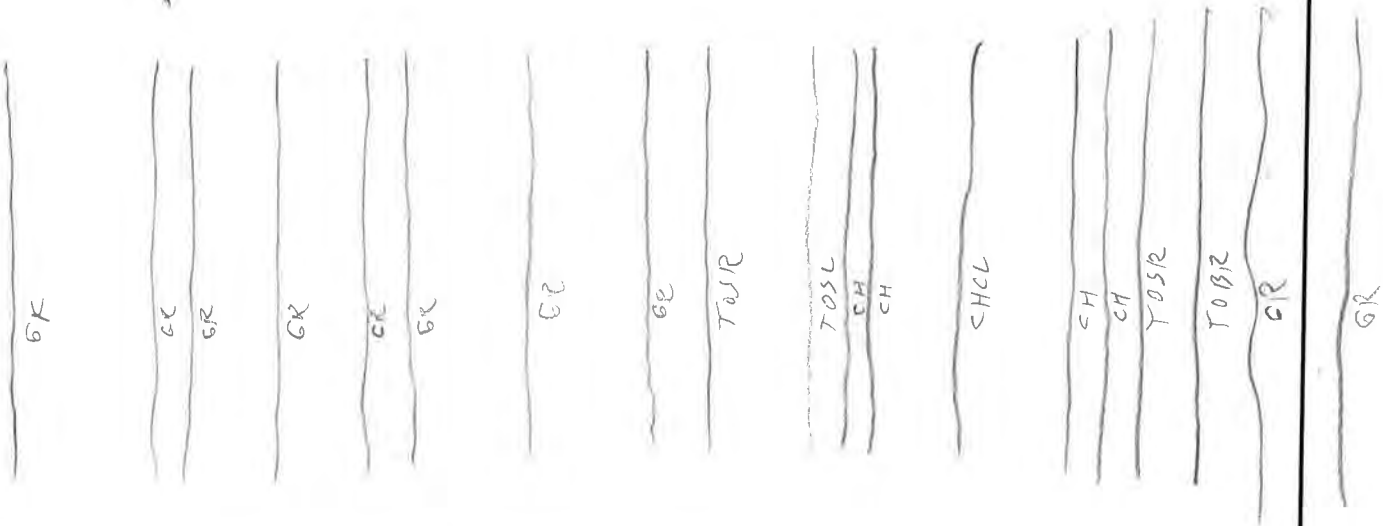


	Photo ID: Coordinates: Description:	WC_XS_300_USCH 30.300526, -97.452111 Upstream channel
	Photo ID: Coordinates: Description:	WC_XS_300_DSCH 30.300526, -97.452111 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC-XS-400

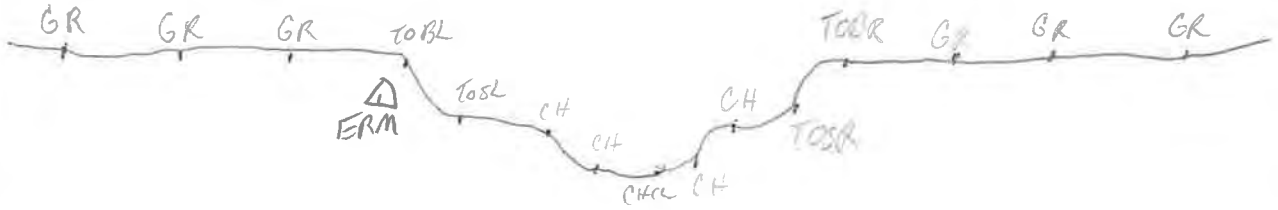
STREAM NAME: WILBANGER CREEK DATE: 9/18/19

LOCATION: BITTING SCHOOL RD CREW: JJ/CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 420.464 ERM ID: WCXS401 GEOID: 12B

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@		Pier Shape:	
CULVERT:	Number:		Shape:		Length:		Height:	Width:		Skew:	
CULVERT:	I/O Type:				Material:		Wingwall Angle				
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:		Outlet:	
ERM Description:	1/2" IR W/ HALFF TRAV CAP							Coordinate System:	TX-C		
Photo Numbers:			DSCH:	2	DSFACE		OTXS:	USFACE		USCH:	1
Additional Info:											
File Name:	19091955_35837										

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

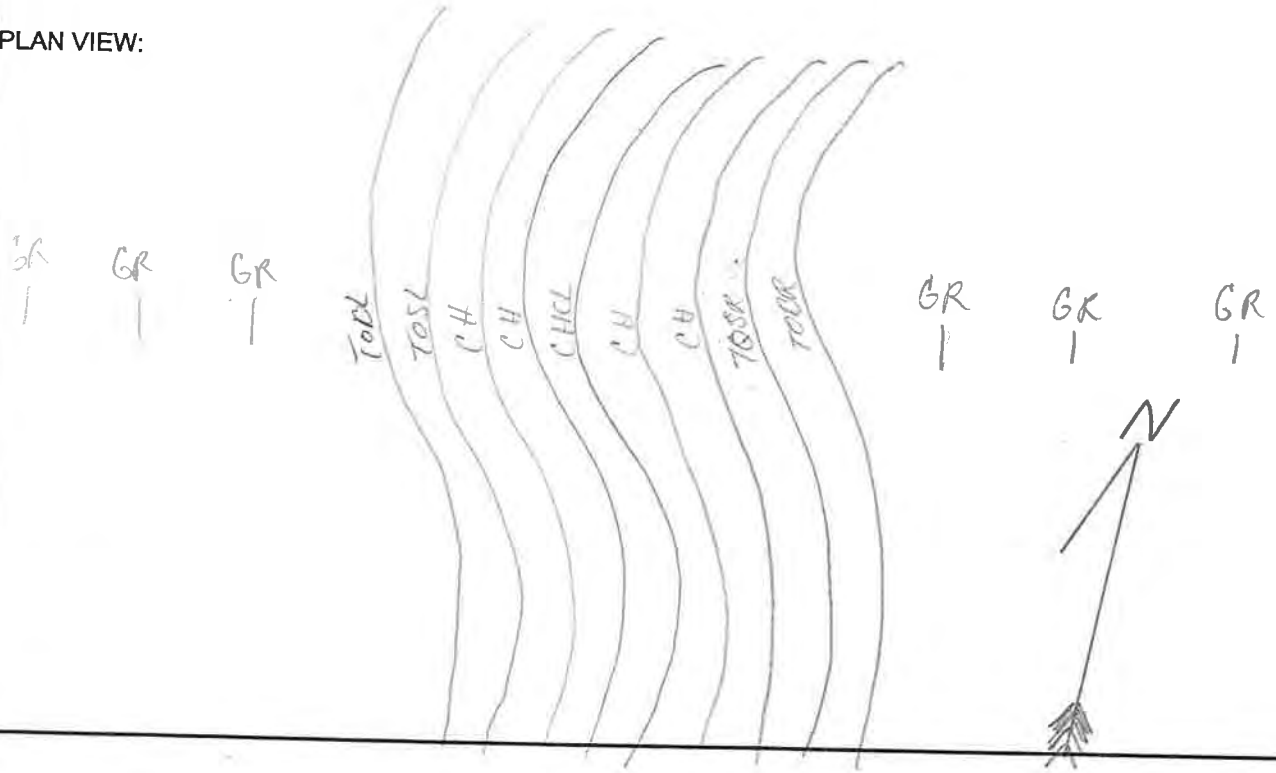


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	Photo ID: Coordinates: Description:	WC_XS_400_DS 30.305722, -97.450324 Downstream channel

	Photo ID: Coordinates: Description:	WC_XS_2000_USC 30.338276, -97.5421 Upstream channel
	Photo ID: Coordinates: Description:	WC_XS_2000_DSC 30.338276, -97.5421 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_XS_2100

STREAM NAME: WILBARGER CREEK DATE: 12-05-2019

LOCATION: OLD HWY 20 CREW: JJ CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 490.691 ERM ID: WC2101 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

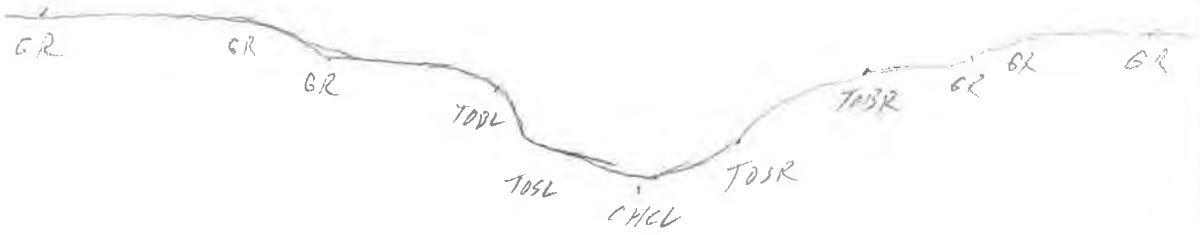
ERM Description: 1/2 IN IR W/ HALFE Coordinate System: TxC

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: 191205JJ_35836

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

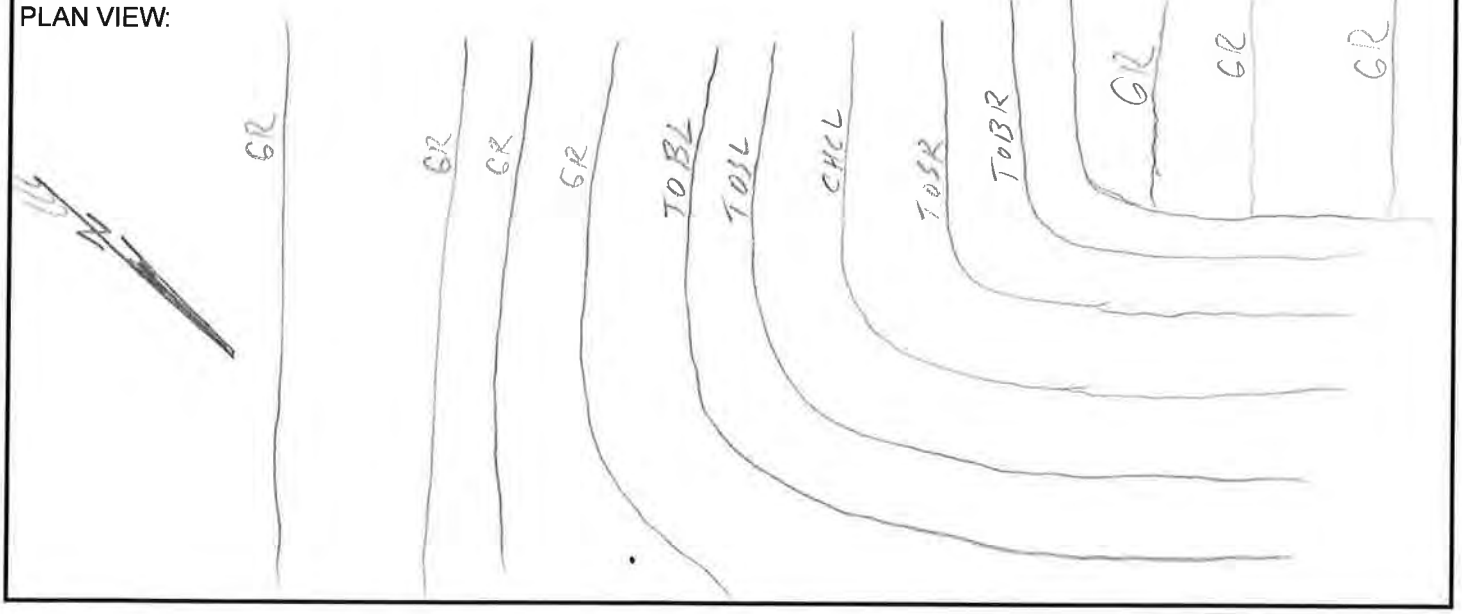


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	Photo ID: Coordinates: Description:	WC_XS_2100_DSCH 30.340966, -97.543984 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: EC_XS_2200

STREAM NAME: WILBARGER CREEK DATE: 9/9/19

LOCATION: Hwy 290 CREW: JJ/CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 505.622 ERM ID: EXS2201 GEOID: 123

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

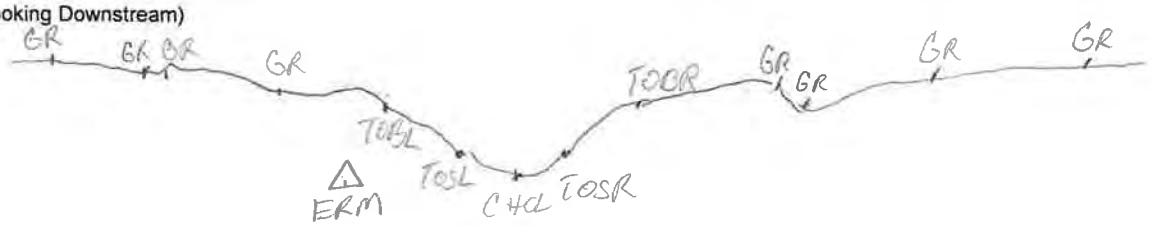
ERM Description: 1/2" IR W/ HALFF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE _____ OTXS: _____ USFACE _____ USCH: 1

Additional Info: _____

File Name: 190909JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

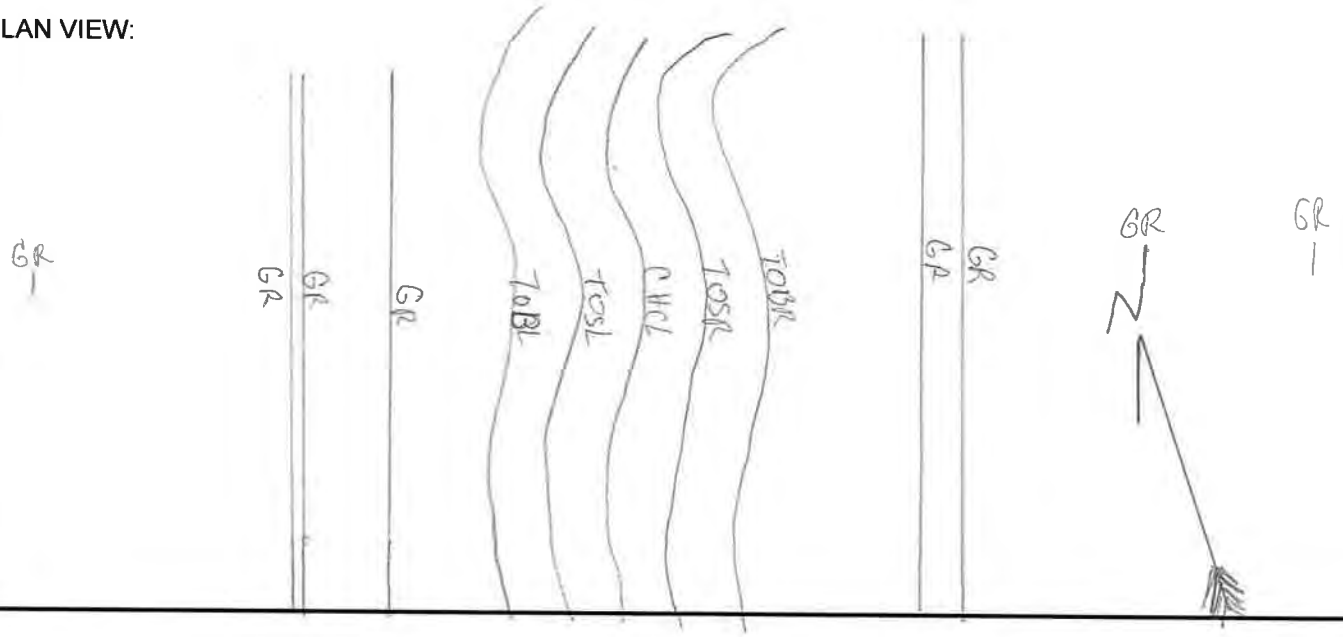


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	Photo ID: Coordinates: Description:	WC_XS_2200_DSCH 30.34698, -97.545088 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_XS_2300

STREAM NAME: WILDARGER CREEK DATE: 9/9/19

LOCATION: LLANO ST. CREW: JJ/CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 496.25 ERM ID: WCXS2301 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

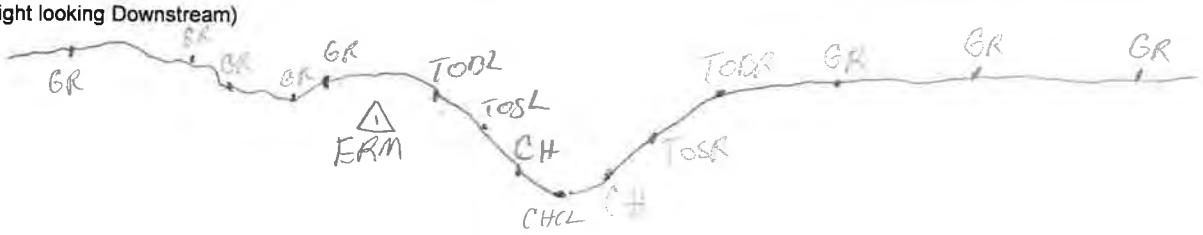
ERM Description: 1/2" IR W/ HALFF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE _____ OTXS: _____ USFACE _____ USCH: 1

Additional Info: _____

File Name: 19090933-35937

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

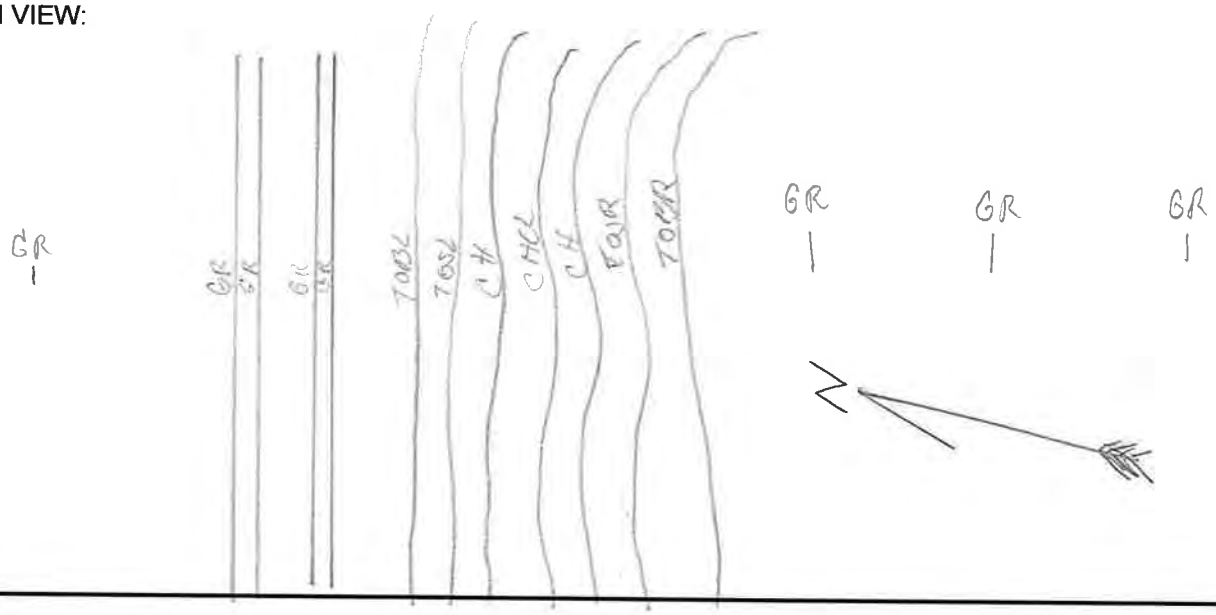


	Photo ID: Coordinates: Description:	WC_XS_2300_USCH 30.346592, -97.550441 Upstream channel
	Photo ID: Coordinates: Description:	WC_XS_2300_DSCH 30.346592, -97.550441 Downstream channel

	Photo ID: Coordinates: Description:	WC_XS_2400_USC 30.351585, -97.549837 Upstream channel
	Photo ID: Coordinates: Description:	WC_XS_2400_DSC 30.351585, -97.549837 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC-XS-2500

STREAM NAME: WILBARGER CREEK DATE: 9/11/19

LOCATION: HWY 290 CREW: JJ/CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 503.646 ERM ID: WCXS2501 GEOID: 120

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

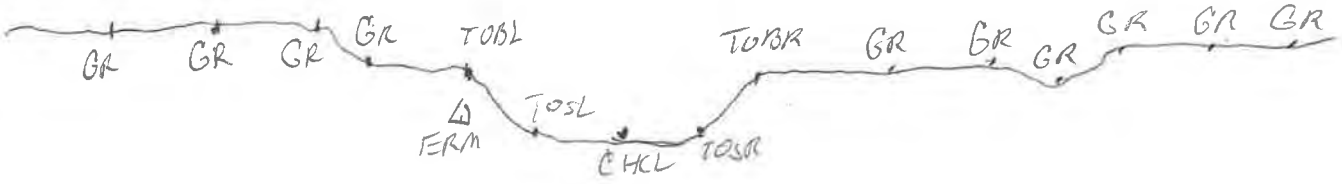
ERM Description: 1/2" IR W/ HALF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE _____ OTXS: _____ USFACE _____ USCH: 1

Additional Info: _____

File Name: 190911JJ-35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

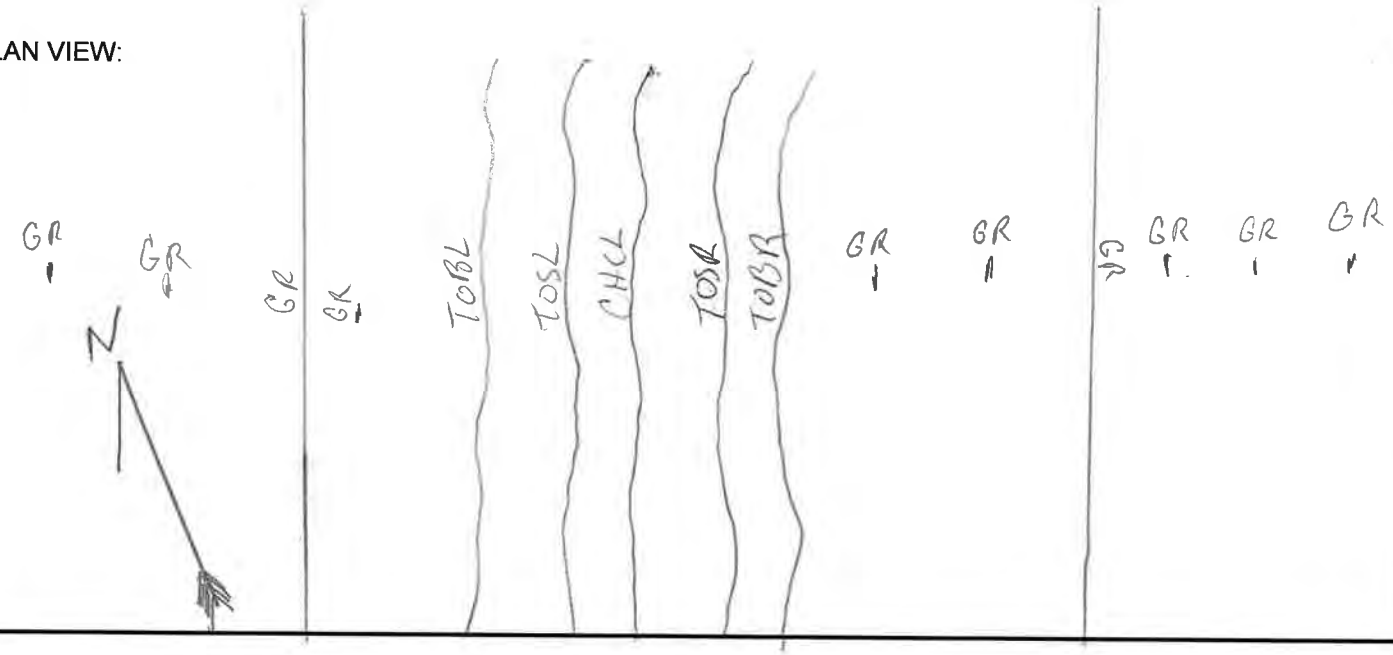


	Photo ID: Coordinates: Description:	WC_XS_2500_USCH 30.358519, -97.55543 Upstream channel
	Photo ID: Coordinates: Description:	WC_XS_2500_DSCH 30.358519, -97.55543 Downstream channel

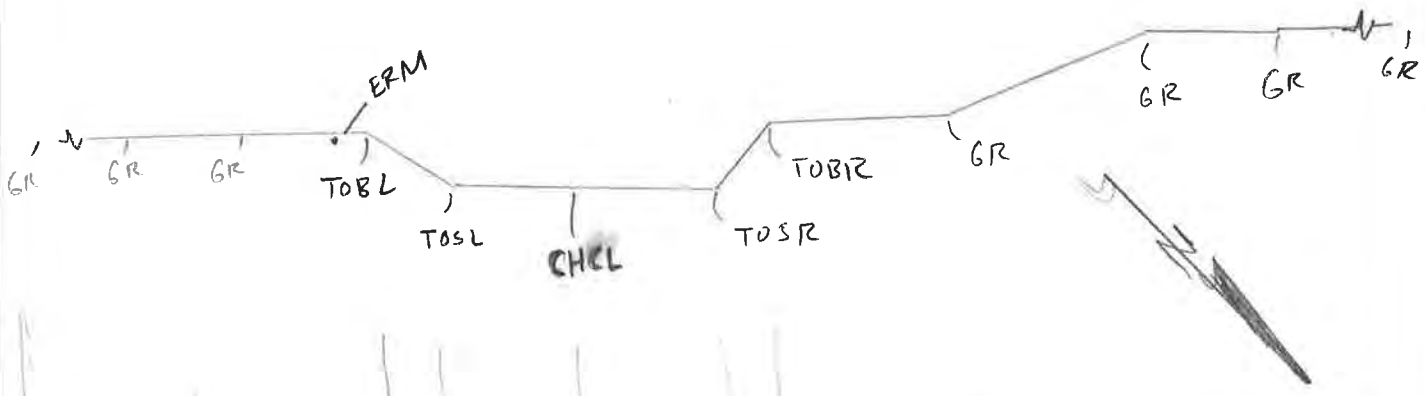
Survey Field Sheet

PROJECT: FEMA FLOOD STUDY
SURVEY NAME: WC_XS_7600
STREAM NAME: WILBARGER CREEK
DATE: 12/07/2019
LOCATION: SHADOW RUN GOLF COURSE
CREW: JJ, CL.
TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 505.823 ERM ID: WCXS2601 GEOID: 12B

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):		@		Pier Shape:
CULVERT:	Number:		Shape:		Length:		Height:		Width:		Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle				
DAM:	Top Width:		Side Slope		Side Slope		US:		DS:		Outlet:

ERM Description: 1/2 IN IR W/ HALFF CAP
Coordinate System: TX C
Photo Numbers: DSCH: DSFACE OTXS: USFACE USCH:
Additional Info:
File Name: 191207 JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

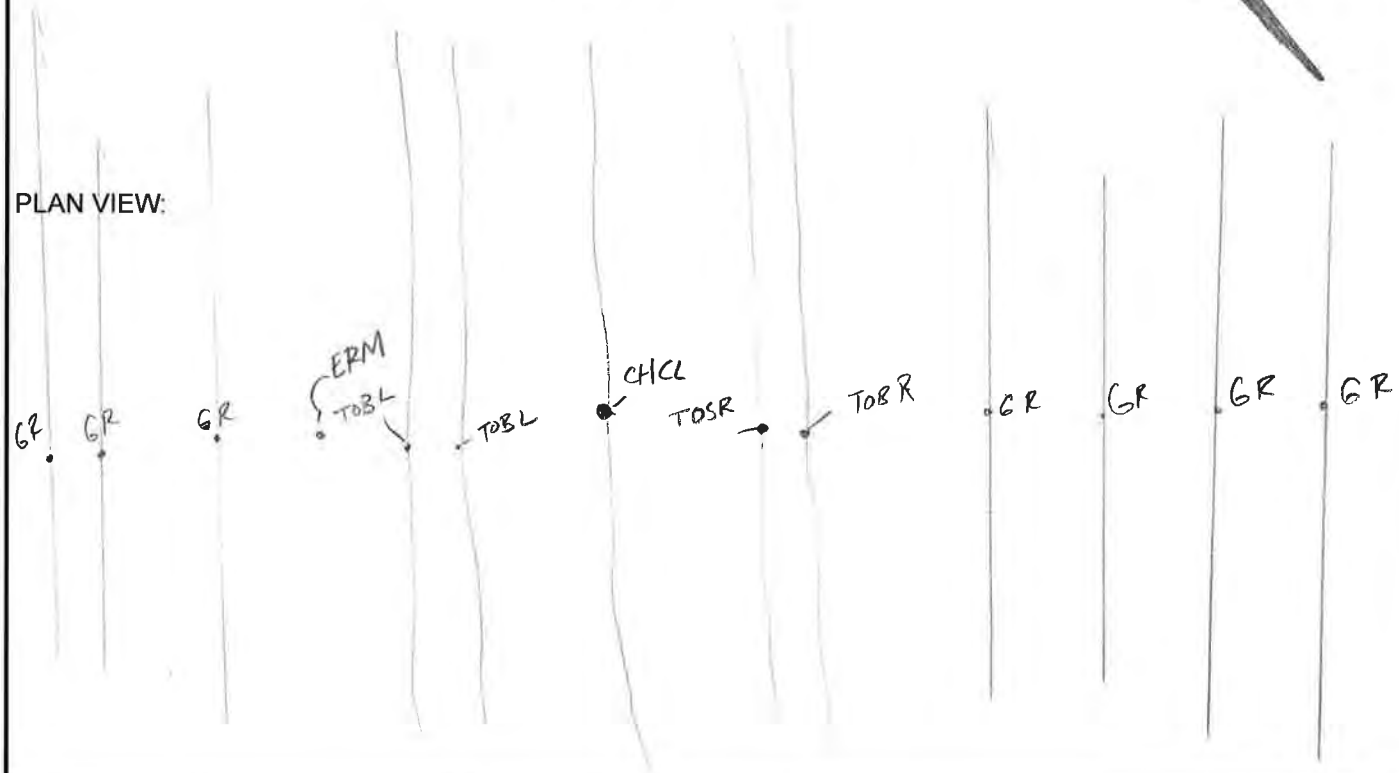


	Photo ID: Coordinates: Description:	WC_XS_2600_USCH 30.361968, -97.556962 Upstream channel
	Photo ID: Coordinates: Description:	WC_XS_2600_DSCH 30.361968, -97.556962 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_XS_2700

STREAM NAME: WILBARGER CREEK DATE: 12-9-19

LOCATION: RECTOR LOOP CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 509.388 ERM ID: WCXS2701 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

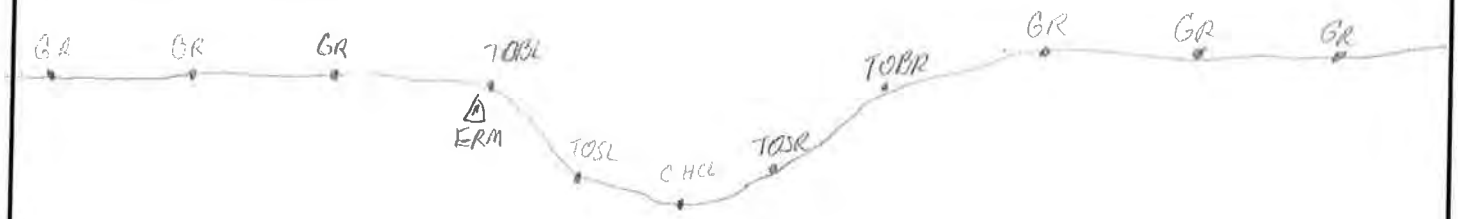
ERM Description: 1/2" IR W/ HALF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: 191209JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

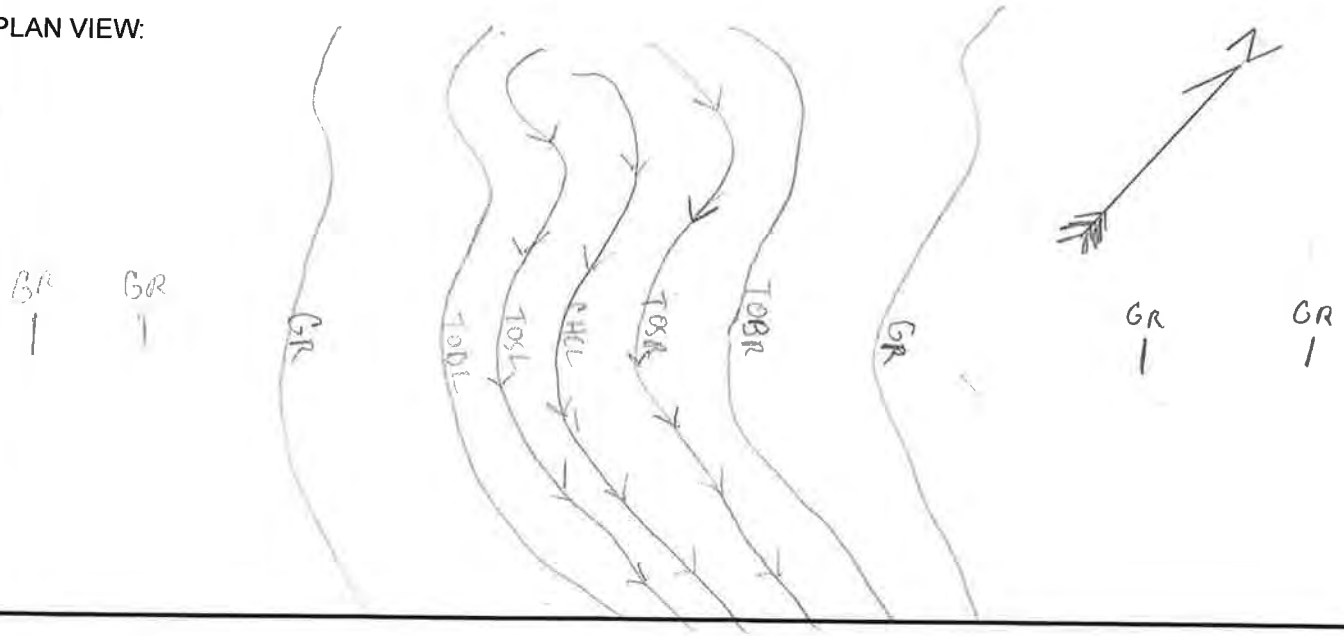


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	Photo ID: Coordinates: Description:	WC_XS_2700_DSCH 30.367063, -97.554574 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_XS_2800

STREAM NAME: WILBARGER CREEK DATE: 9/10/19

LOCATION: SHADOWGLEN TRACE CREW: JJ/CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 517.889 ERM ID: WCXS2801 GEOID: 12B

BRIDGE: Rail Height: ____ Deck: ____ Width: ____ Pier(s): ____ @ ____ Pier Shape: ____

CULVERT: Number: ____ Shape: ____ Length: ____ Height: ____ Width: ____ Skew: ____

CULVERT: I/O Type: ____ Material: ____ Wingwall Angle ____

DAM: Top Width: ____ Side Slope ____ Side Slope ____ US: ____ DS: ____ Outlet: ____

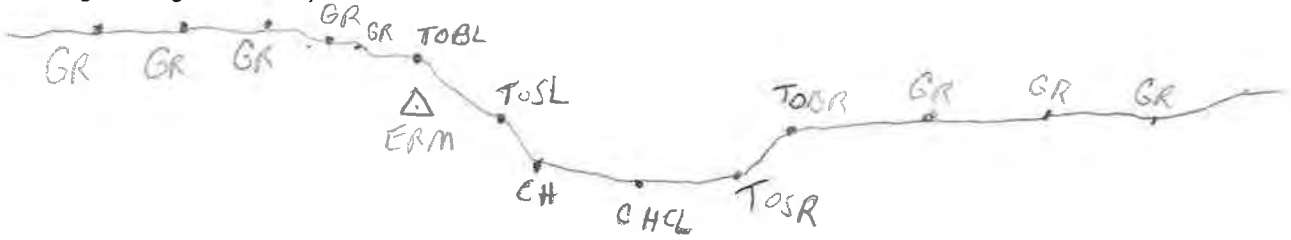
ERM Description: 1/2" IR w/ HALFF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE ____ OTXS: ____ USFACE ____ USCH: 1

Additional Info: ____

File Name: 190910JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

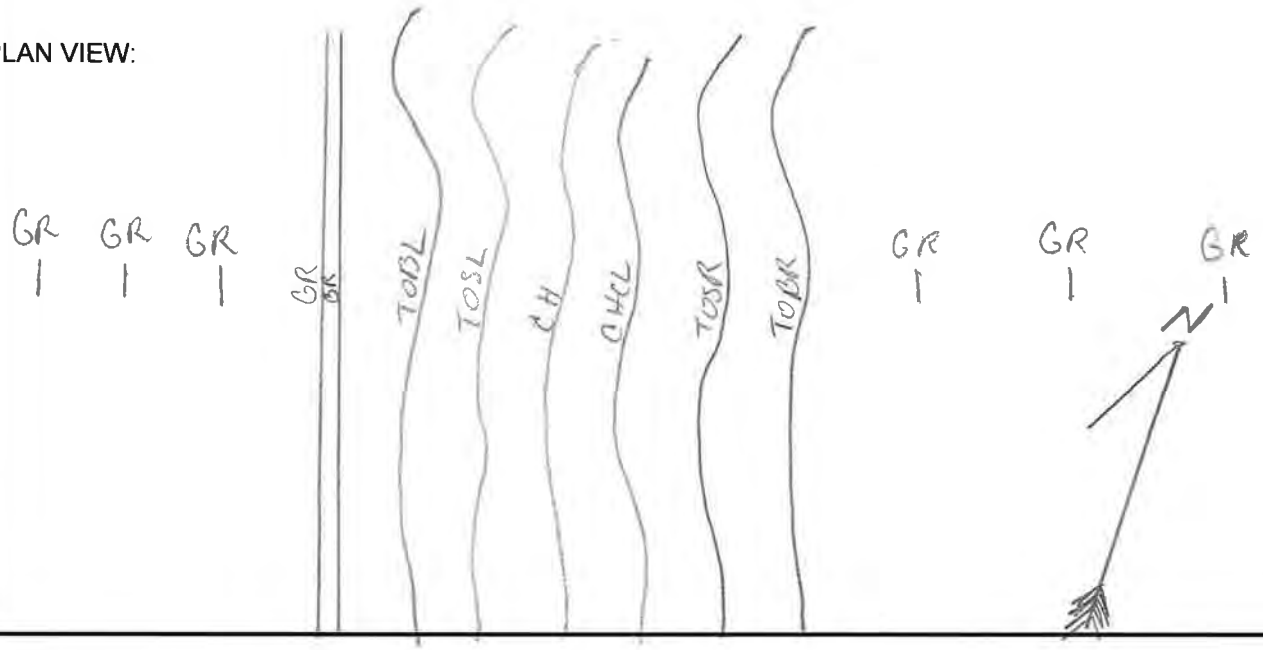


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	Photo ID: Coordinates: Description:	WC_XS_2800_DSCH 30.365749, -97.548816 Downstream channel

Survey Field Sheet

PROJECT: Wilbarger | SURVEY NAME: WC_XS_3600

STREAM NAME: Wilbarger Creek | DATE: 11-22-19

LOCATION: Travis County | CREW: Adolfo U. / Anwar R.

TYPE: BR( ) CUL( ) DAM( ) XS(X) | ERM ELEV.: _____ | ERM ID: _____ | GEOID: G12AUS

BRIDGE: Rail Height: X | Deck: X | Width: X | Pier(s): X | @ X | Pier Shape: X

CULVERT: Number: X | Shape: _____ | Length: _____ | Height: _____ | Width: _____ | Skew: _____

CULVERT: I/O Type: _____ | Material: _____ | Wingwall Angle _____

DAM: Top Width: _____ | Side Slope | Side Slope | US: _____ | DS: _____ | Outlet: _____

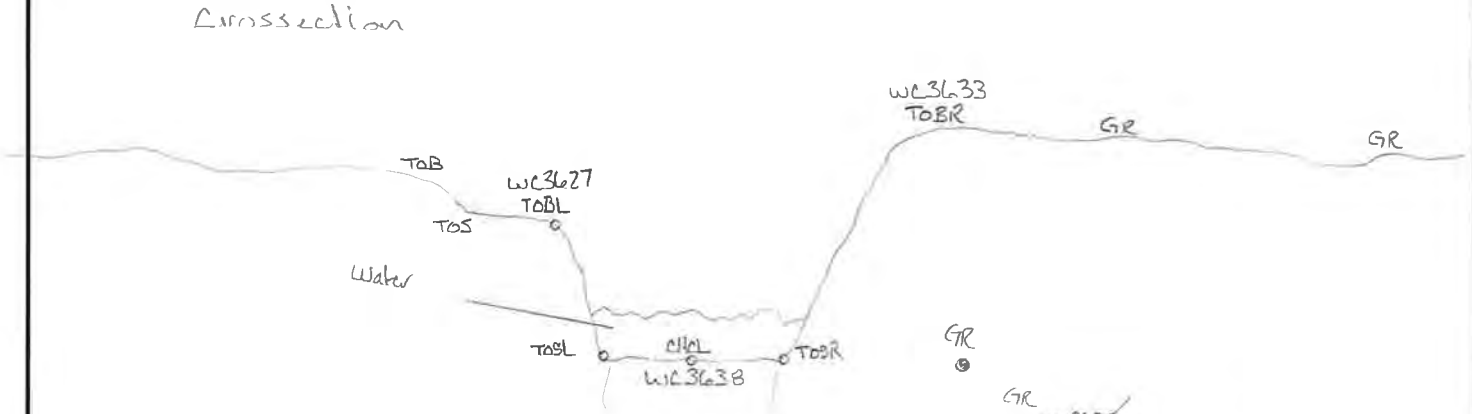
ERM Description: _____ | Coordinate System: 4203

Photo Numbers: | DSCH: _____ | DSFACE _____ | OTXS: _____ | USFACE _____ | USCH: _____

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

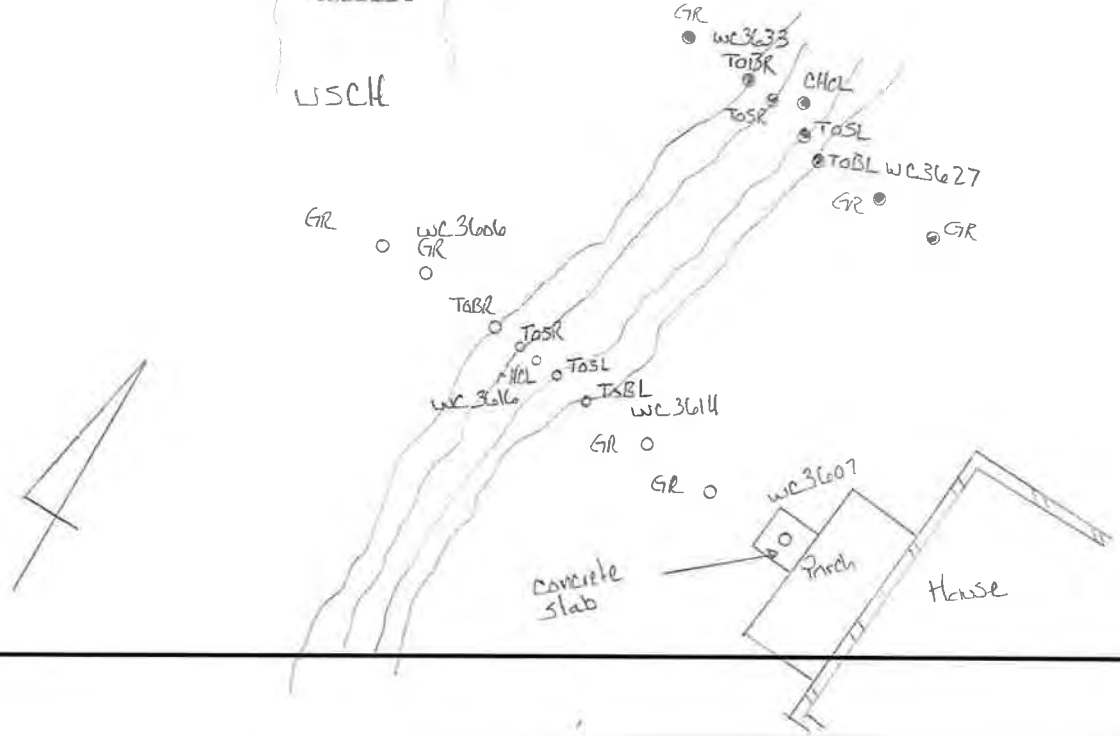


	Photo ID: Coordinates: Description:	WC_XS_3600_USCH 30.409106, -97.545134 Upstream channel
	Photo ID: Coordinates: Description:	WC_XS_3600_USCH 30.409106, -97.545134 Upstream channel

	Photo ID: Coordinates: Description:	WC_XS_3600_DSCH 30.409106, -97.545134 Downstream channel
	Photo ID: Coordinates: Description:	WC_XS_3600_DS 30.409106, -97.545134 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_XS_3700

STREAM NAME: WILBARGER DATE: 12-10-2019

LOCATION: JIM BOHLS RD / PFLUGER CEMETARY CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 554.367 ERM ID: WCXS3701 GEOID: 1213

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

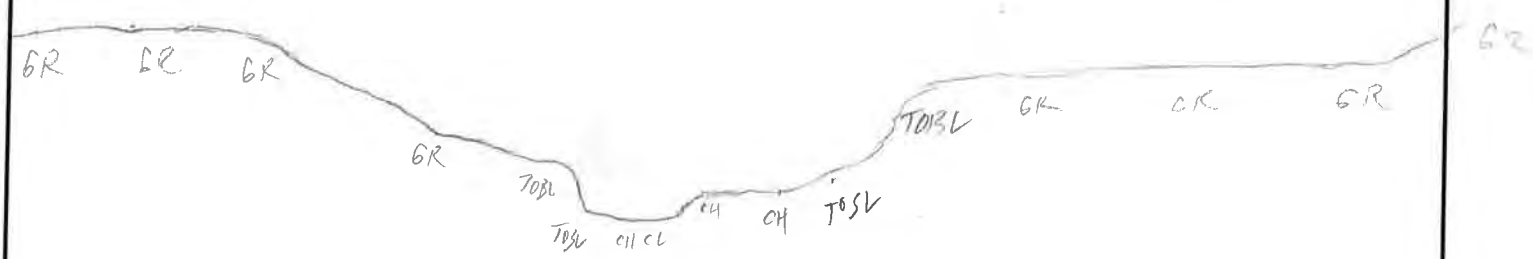
ERM Description: ½ IN IR W/ HIVIS TRAV Coordinate System: TxC

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: 191210JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

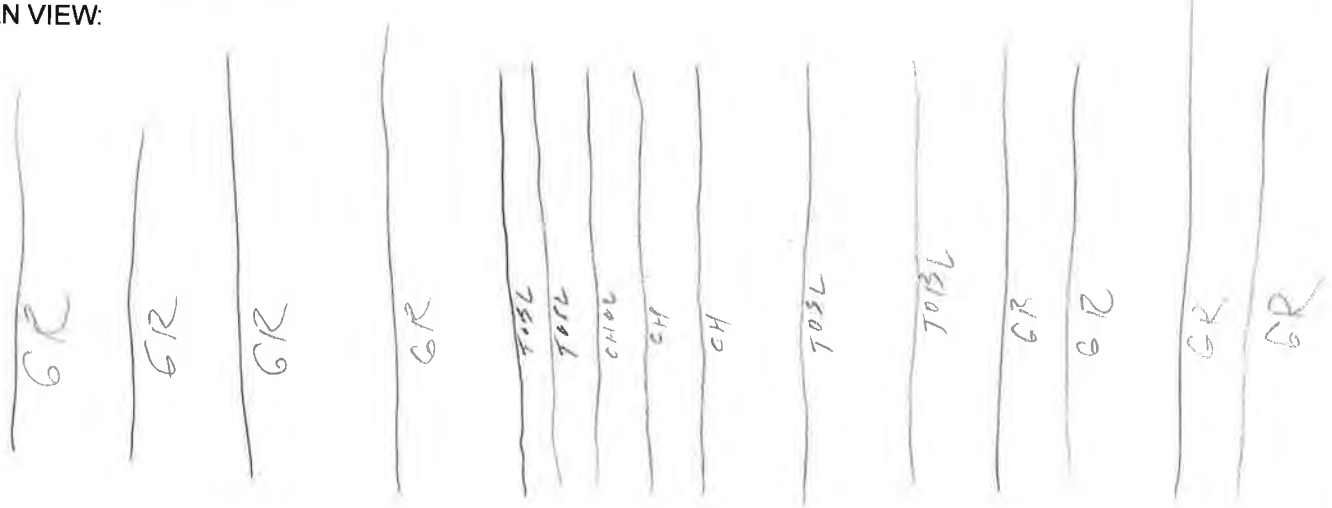


	Photo ID: Coordinates: Description:	WC_XS_3700_USCH 30.415948, -97.545877 Upstream channel
	Photo ID: Coordinates: Description:	WC_XS_3700_DSCH 30.415948, -97.545877 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_XS_3800

STREAM NAME: WILBARGER DATE: 12-09-2019

LOCATION: PLEASONTON PKWY (PFLUGER CEMETARY) CREW: JJ CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 555.677 ERM ID: WCXS3801 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

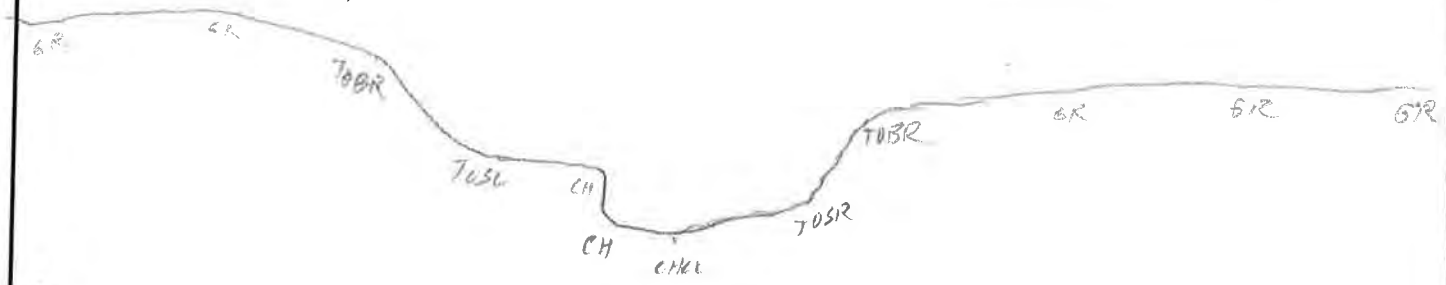
ERM Description: 1/2 IN IR W/HALF TRAY Coordinate System: TxC

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: 191209JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

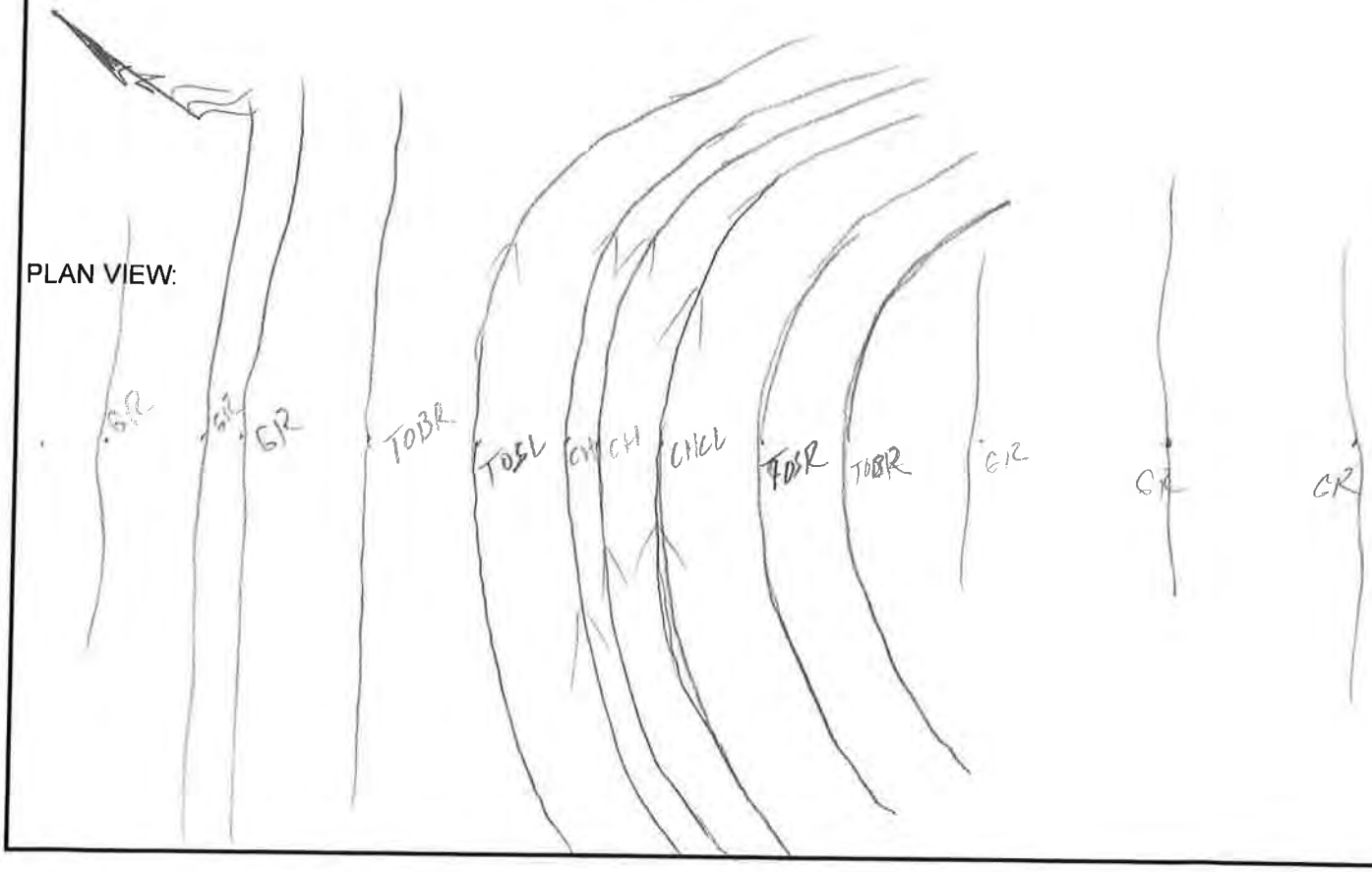
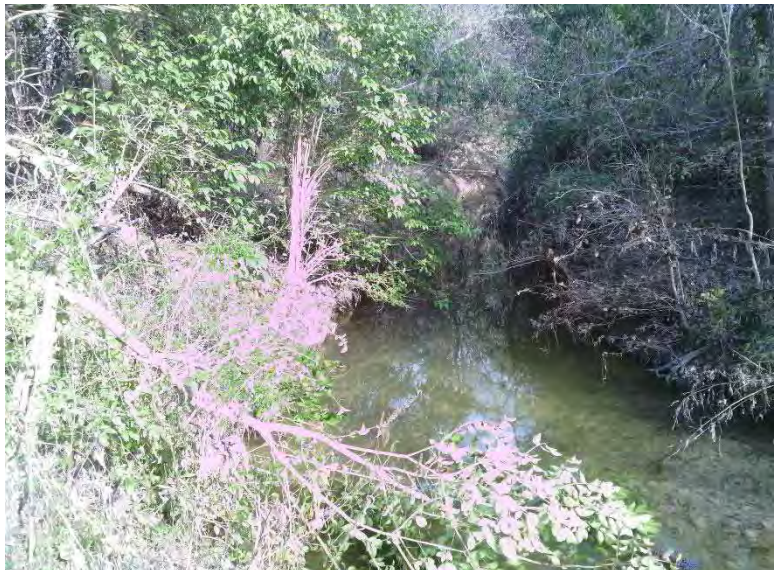


	Photo ID: Coordinates: Description:	WC_XS_3800_USCH 30.41737, -97.550509 Upstream channel
	Photo ID: Coordinates: Description:	WC_XS_3800_DSCH 30.41737, -97.550509 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_XS_3900

STREAM NAME: WILBARGER CREEK DATE: 12-11-19

LOCATION: PLEASANTON PKWY/PFLUGER CEMETERY CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 565.004 ERM ID: WCXS3901 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

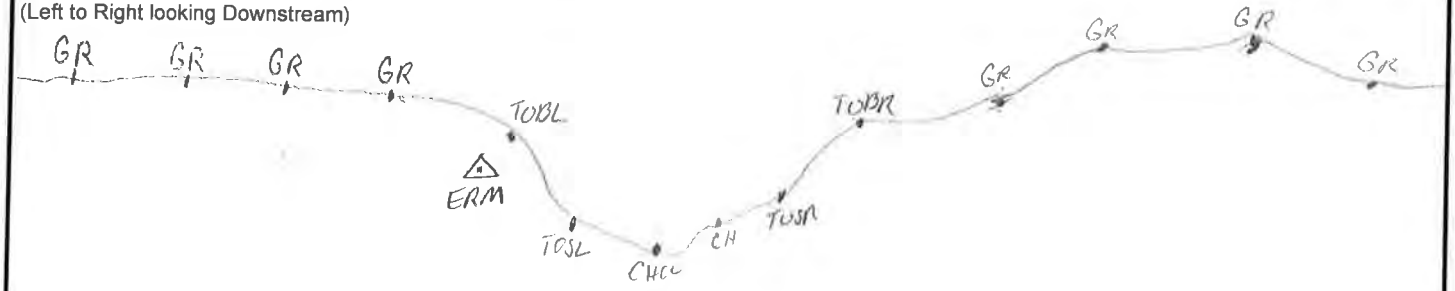
ERM Description: 1/2" IR W/ HALFF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE _____ OTXS: _____ USFACE _____ USCH: 1

Additional Info: _____

File Name: 191211JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

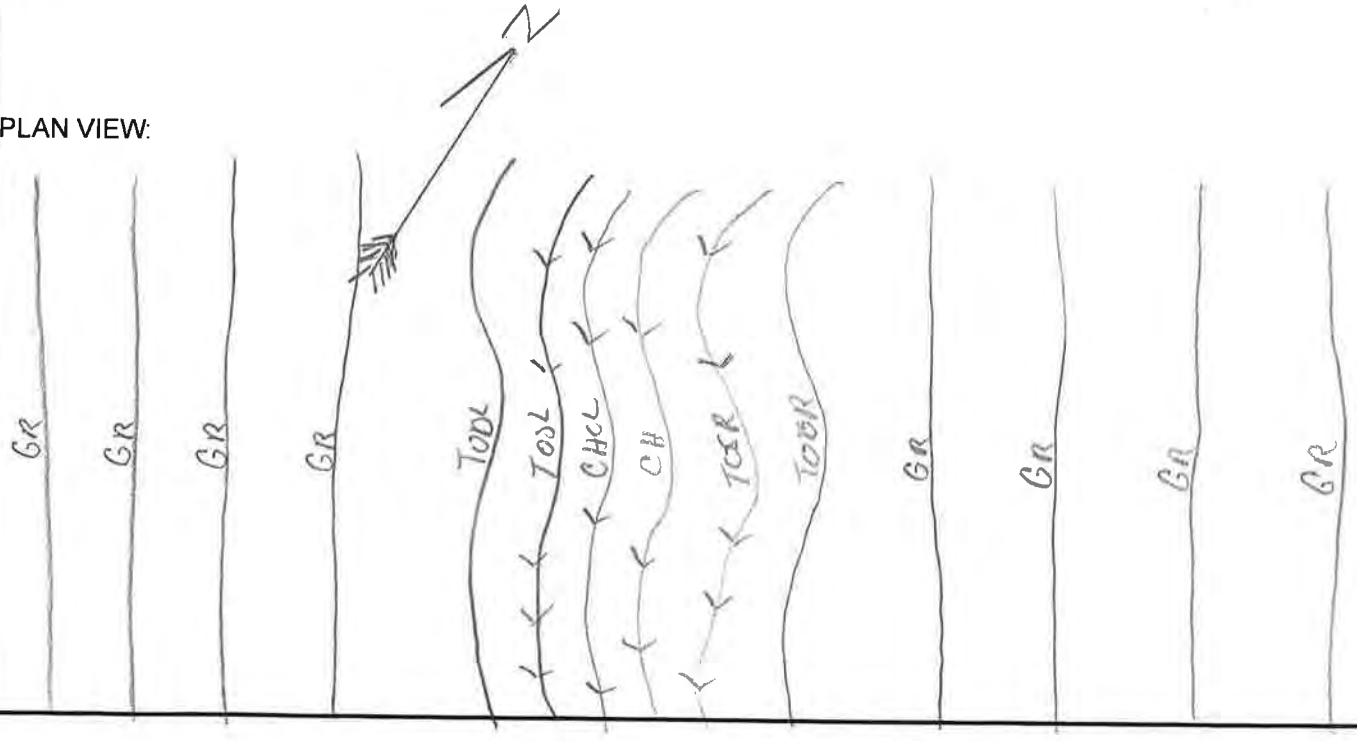


	Photo ID: Coordinates: Description:	WC_XS_3900_USCH 30.415303, -97.554436 Upstream channel
	Photo ID: Coordinates: Description:	WC_XS_3900_DSCH 30.415303, -97.554436 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_XS_4000

STREAM NAME: WILBARGER DATE: 12-10-2019

LOCATION: PLEASANTON PKWY / PFLUGER CEMETARY CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 571.717 ERM ID: WCXS4001 GEOID: 123

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

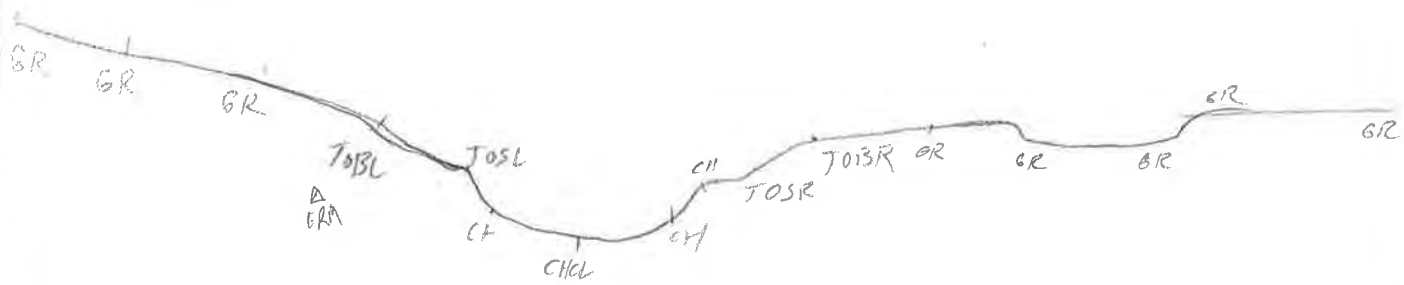
ERM Description: ½ IN IR W/ PLUG TRAV Coordinate System: TxC

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: 191210JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

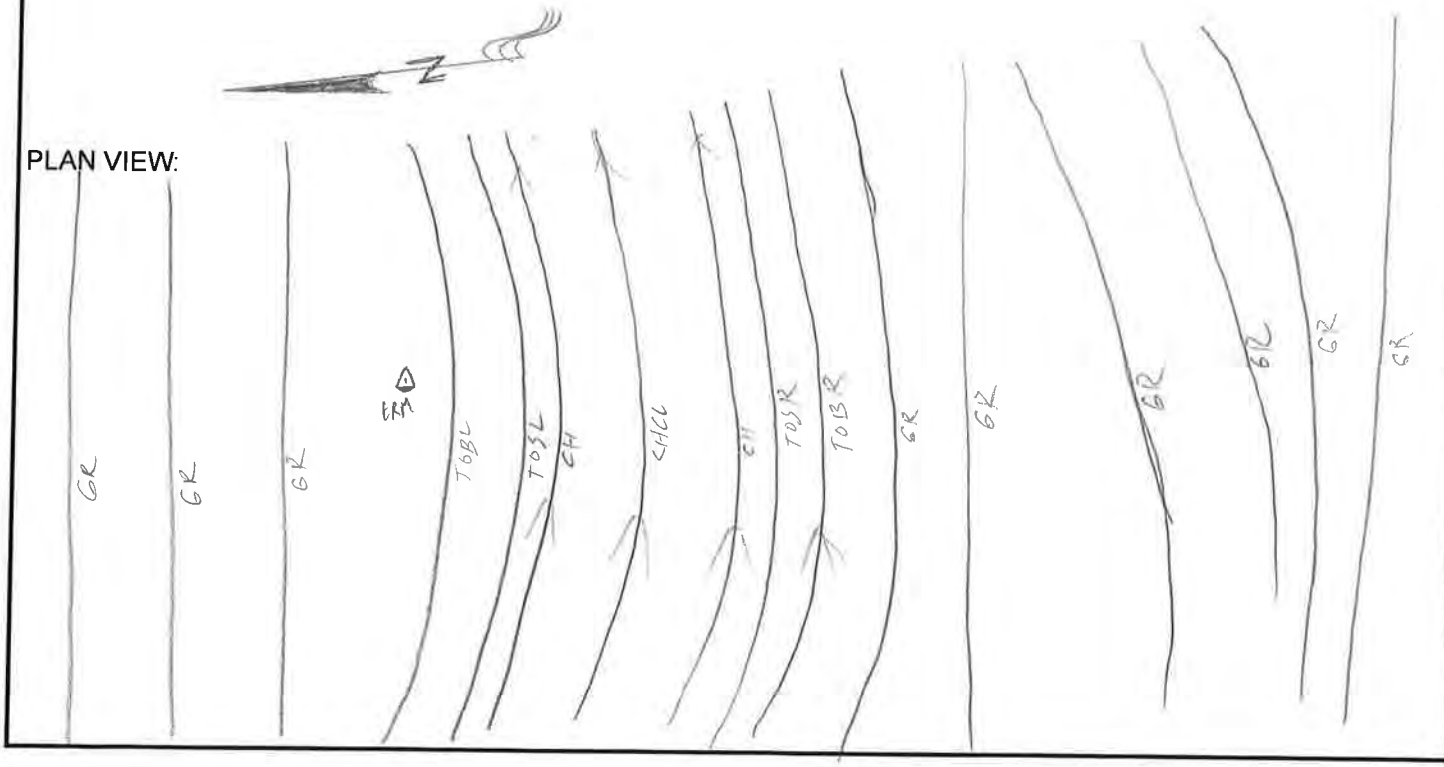


	Photo ID: Coordinates: Description:	WC_XS_4000_USCH 30.418292, -97.554911 Upstream channel
	Photo ID: Coordinates: Description:	WC_XS_4000_DSCH 30.418292, -97.554911 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_XS_4100

STREAM NAME: WILBARGER CREEK DATE: 12-12-19

LOCATION: CAPERI DR / BORROMEO AVE CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 579.480 ERM ID: WCXS4101 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

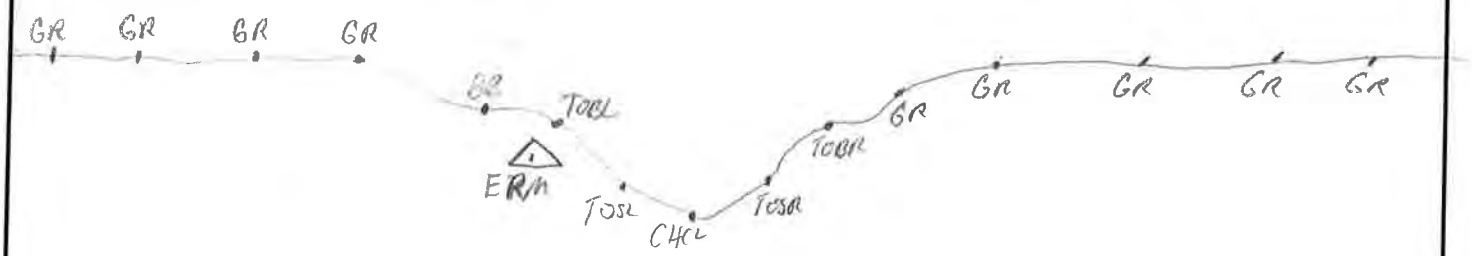
ERM Description: 1/2" IR W/ HALFF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE _____ OTXS: _____ USFACE _____ USCH: 1

Additional Info: _____

File Name: 191217 JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

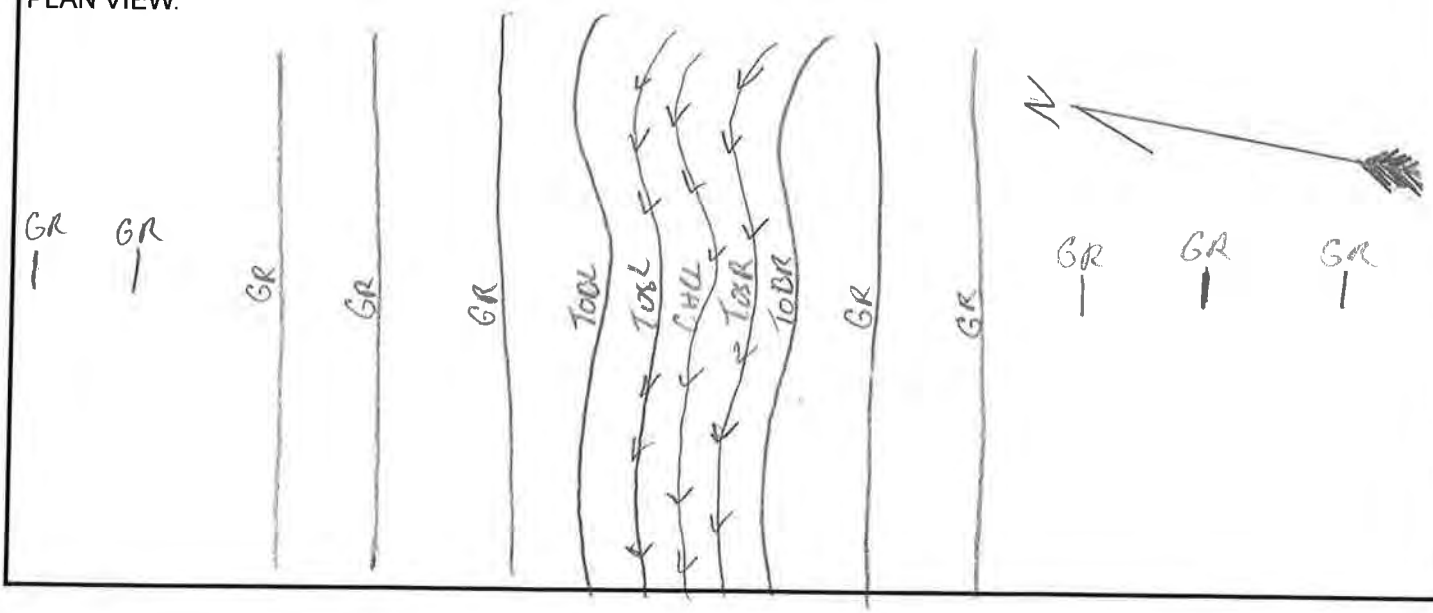


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	Photo ID: Coordinates: Description:	WC_XS_4100_DSCH 30.417296, -97.560315 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_XS_4300

STREAM NAME: WILBARGER CREEK DATE: 12-12-19

LOCATION: FRESNO AVE/BENICA ST CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 587.507 ERM ID: wcxs4301 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

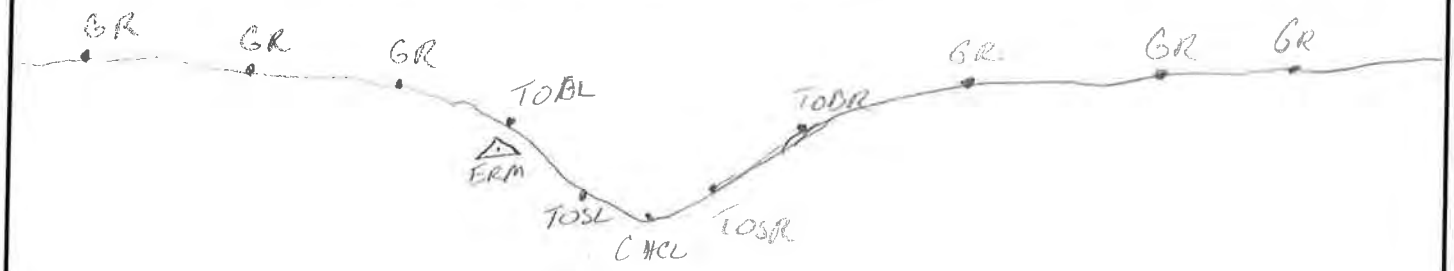
ERM Description: ½" JR W/ HALFF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE _____ OTXS: _____ USFACE _____ USCH: 1

Additional Info: _____

File Name: 191212 JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

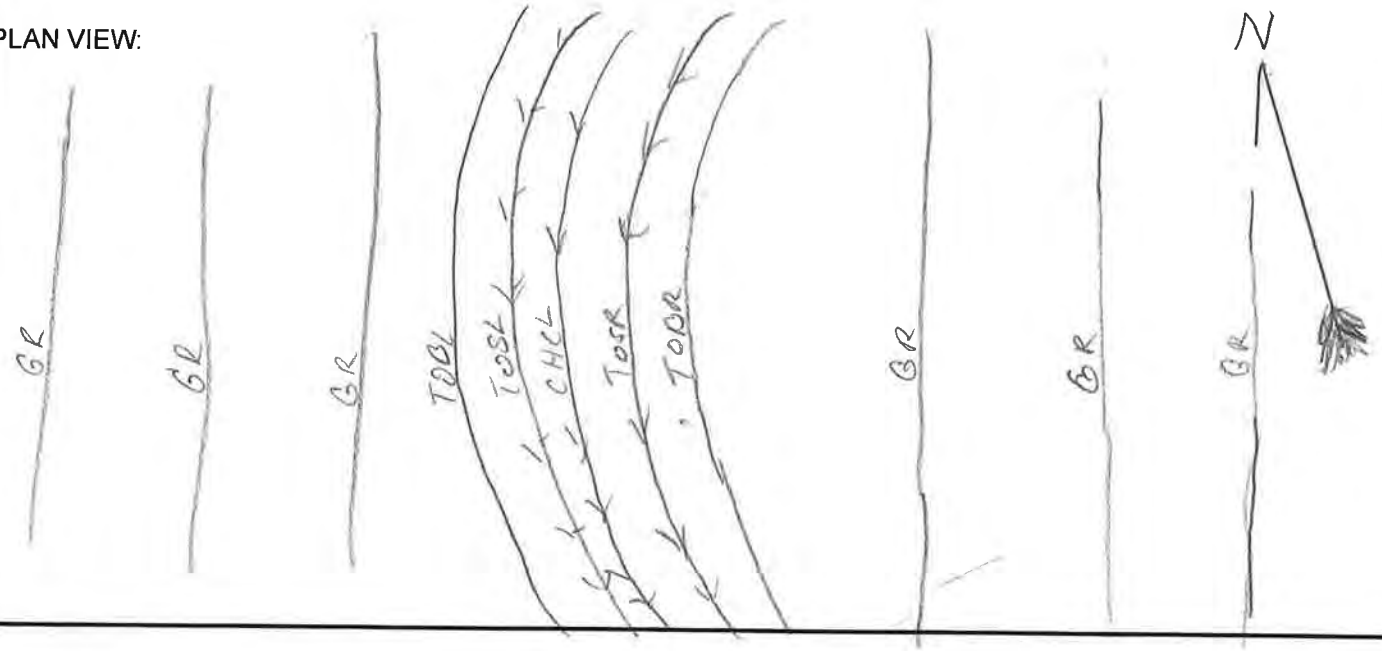


	Photo ID: Coordinates: Description:	WC_XS_4300_USCH 30.419611, -97.568997 Upstream channel
	Photo ID: Coordinates: Description:	WC_XS_4300_DSCH 30.419611, -97.568997 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_XS_4400

STREAM NAME: WILBARGER CREEK DATE: 12-12-19

LOCATION: PRATER LN. PFLUGERVILLE CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 594.363 ERM ID: WCXS4401 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

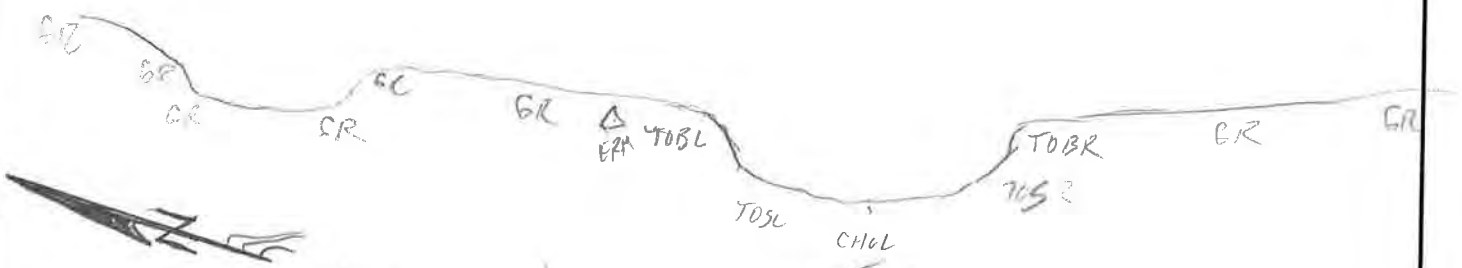
ERM Description: ½" IR W/ HALFF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2&3 DSFACE _____ OTXS: _____ USFACE _____ USCH: 1

Additional Info: _____

File Name: 191212 JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

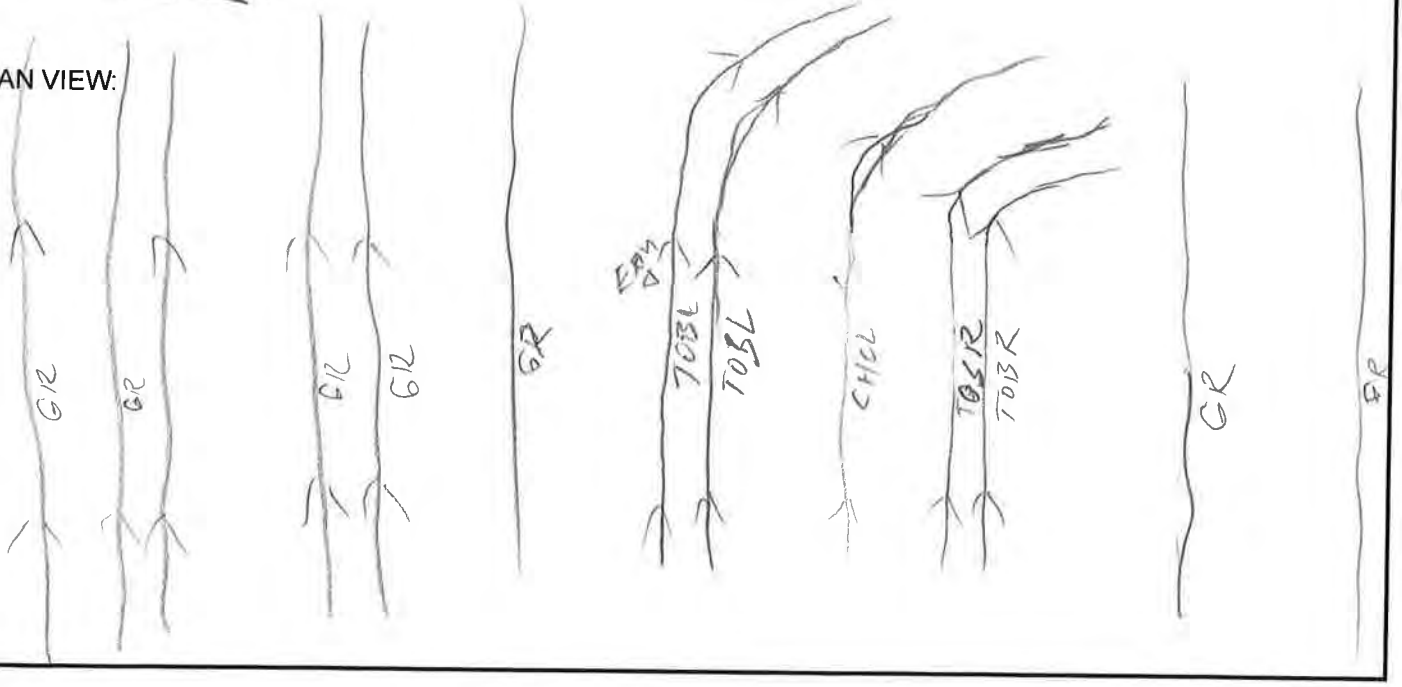


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	Photo ID: Coordinates: Description:	WC_XS_4400_DSCH 30.421577, -97.57257 Downstream channel

	Photo ID: Coordinates: Description:	WC_XS_4400_DSCH2 30.421577, -97.57257 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_XS_4500

STREAM NAME: WILBARGER CREEK DATE: 8/23/19

LOCATION: WEISS LN CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 606.431 ERM ID: WCXS 4501 GEOID: 128

BRIDGE: Rail Height: ____ Deck: ____ Width: ____ Pier(s): ____ @ ____ Pier Shape: ____

CULVERT: Number: ____ Shape: ____ Length: ____ Height: ____ Width: ____ Skew: ____

CULVERT: I/O Type: ____ Material: ____ Wingwall Angle ____

DAM: Top Width: ____ Side Slope ____ Side Slope ____ US: ____ DS: ____ Outlet: ____

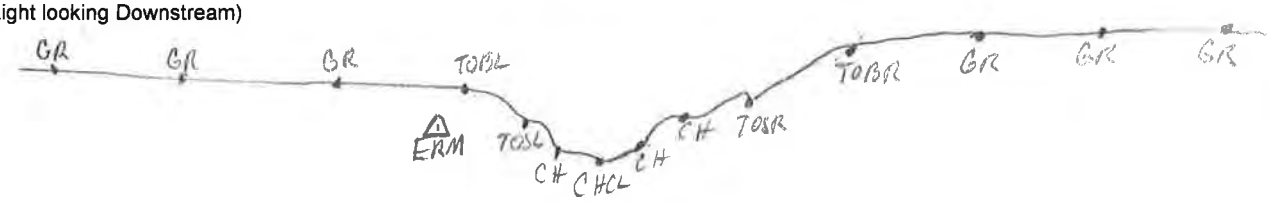
ERM Description: 1/2" IR W/ HALFF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE ____ OTXS: ____ USFACE ____ USCH: 1

Additional Info: ____

File Name: 190823JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

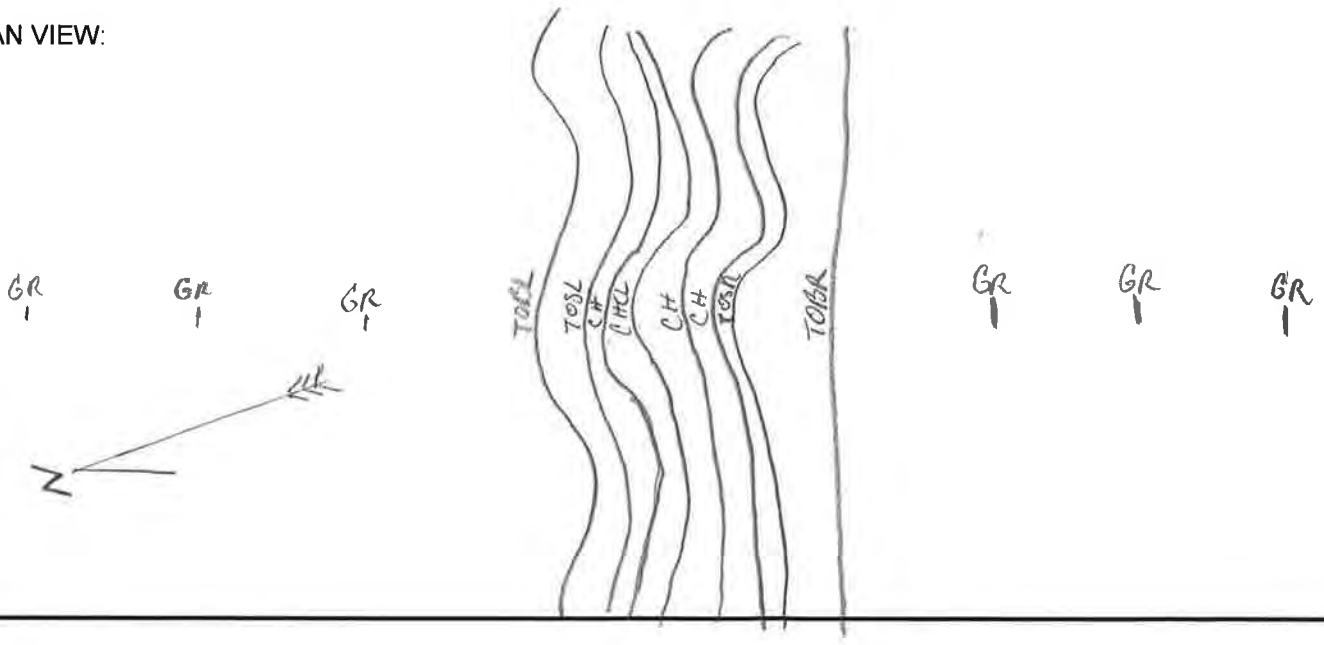


	Photo ID: Coordinates: Description:	WC_XS_4500_USCH 30.424571, -97.580132 Upstream channel
	Photo ID: Coordinates: Description:	WC_XS_4500_DSCH 30.424571, -97.580132 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_XS_4600

STREAM NAME: WILBARGER CREEK DATE: 8/14/19

LOCATION: Hwy 130 & E PECAN ST CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 612.394 ERM ID: WCXS4601 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

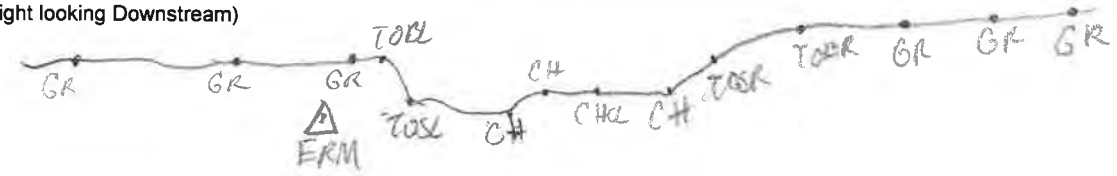
ERM Description: 1/2" IR W/ HALFF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE _____ OTXS: _____ USFACE _____ USCH: 1

Additional Info: _____

File Name: 190814JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

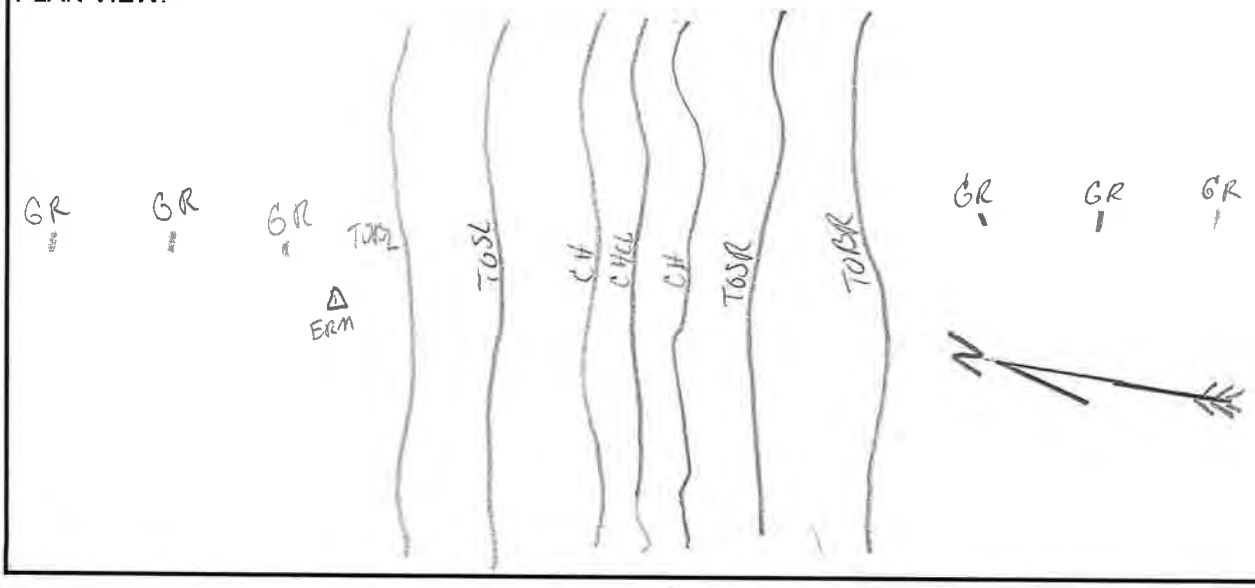


	Photo ID: Coordinates: Description:	WC_XS_4600_USCH 30.425428, -97.585532 Upstream channel
	Photo ID: Coordinates: Description:	WC_XS_4600_DSCH 30.425428, -97.585532 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_XS_4700

STREAM NAME: WILBARGER CREEK DATE: 8/13/19

LOCATION: HWY 130 CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 622.328 ERM ID: WCXS4701 GEOID: 128

BRIDGE: Rail Height: ____ Deck: ____ Width: ____ Pier(s): ____ @ ____ Pier Shape: ____

CULVERT: Number: ____ Shape: ____ Length: ____ Height: ____ Width: ____ Skew: ____

CULVERT: I/O Type: ____ Material: ____ Wingwall Angle ____

DAM: Top Width: ____ Side Slope ____ Side Slope ____ US: ____ DS: ____ Outlet: ____

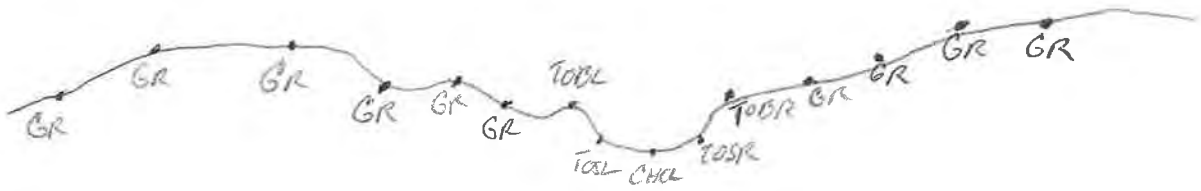
ERM Description: 1/2 IR W/ HALF-TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE ____ OTXS: ____ USFACE ____ USCH: 1

Additional Info: ____

File Name: 190813JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

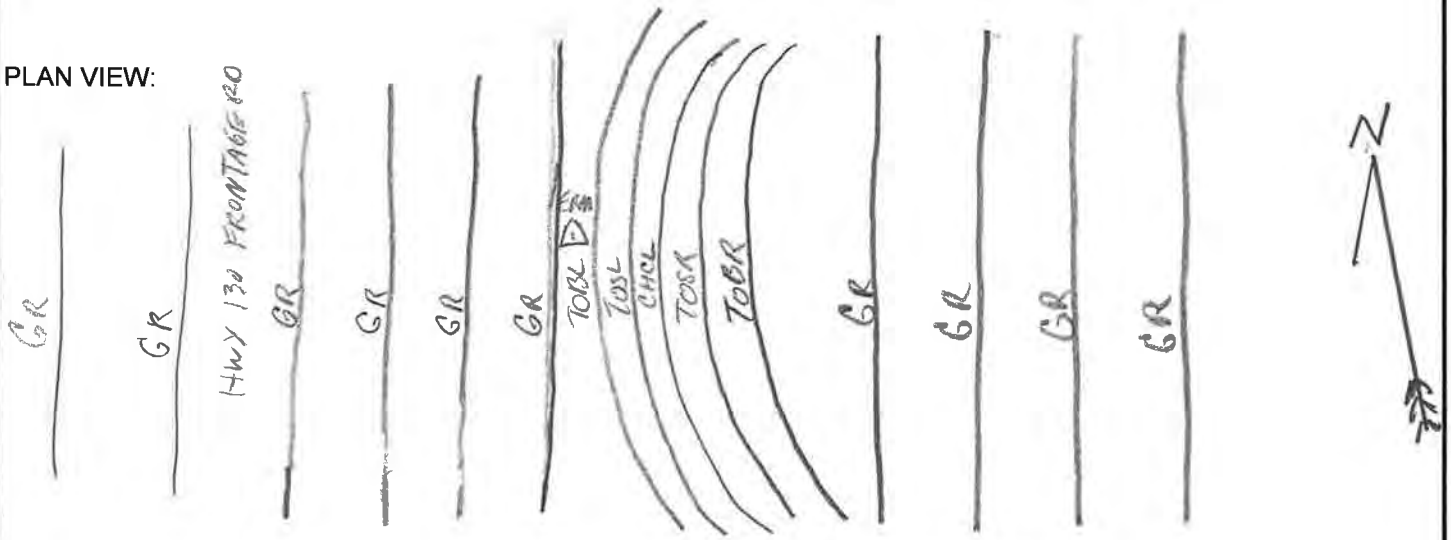


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	Photo ID: Coordinates: Description:	WC_XS_4700_DSCH 30.431137, -97.591439 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_XS_4800

STREAM NAME: WIBARGER CREEK DATE: 8/13/19

LOCATION: HWY 130 CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 631.480 ERM ID: WCXS4801 GEOID: 12B

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:		Shape:		Length:		Height:	Width:	Skew:
CULVERT:	I/O Type:				Material:			Wingwall Angle	
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:

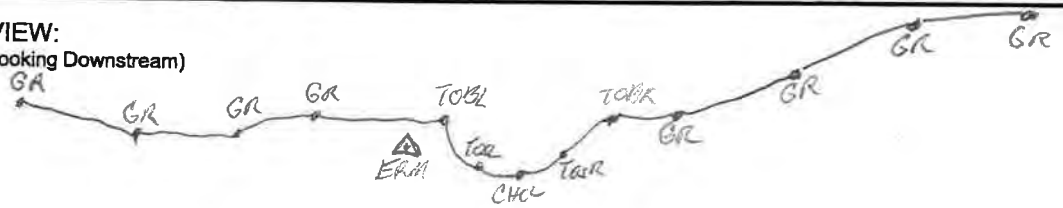
ERM Description: 1/2" IR W/ HALF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE: OTXS: USFACE: USCH: 1

Additional Info:

File Name: 190813JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

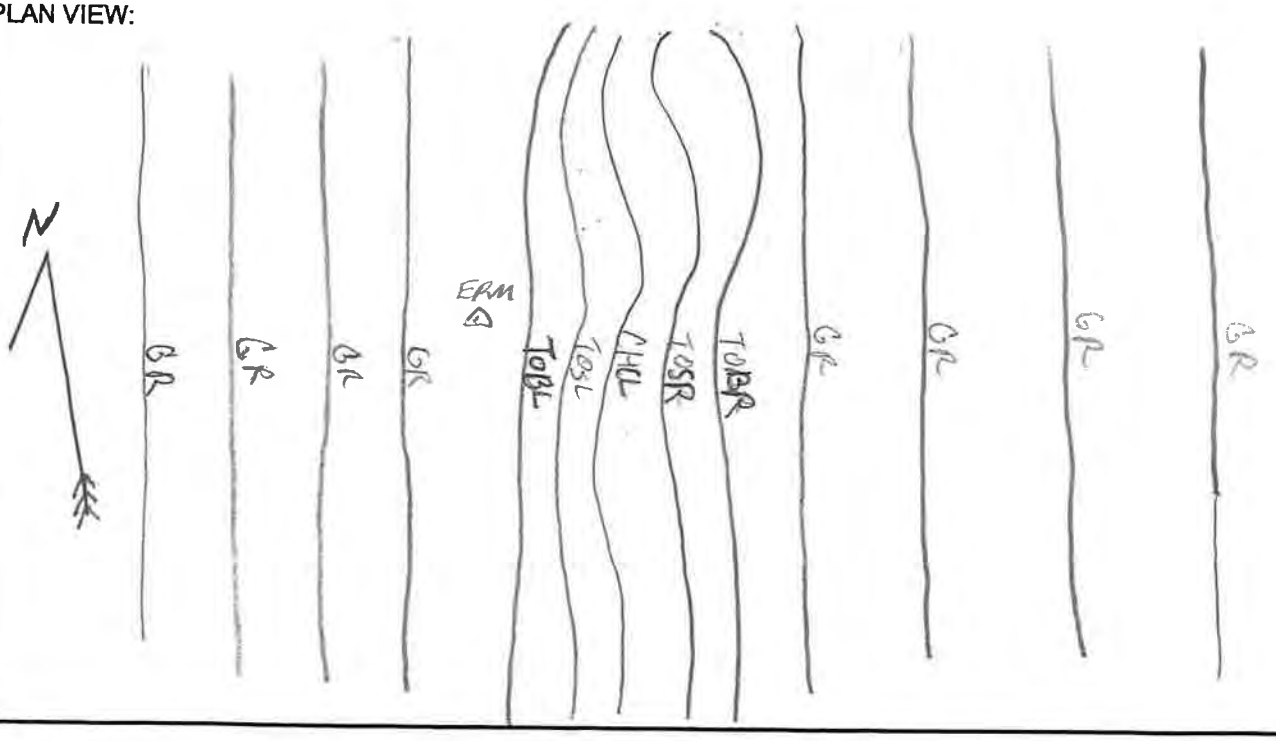


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	Photo ID: Coordinates: Description:	WC_XS_4800_DSCH 30.435695, -97.596391 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_XS-4900

STREAM NAME: WILBARGER CREEK DATE: 8/13/19

LOCATION: HWY 130 CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 632.335 ERM ID: WCXS4901 GEOID: 128

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:		Shape:		Length:		Height:	Width:	Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle		
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:

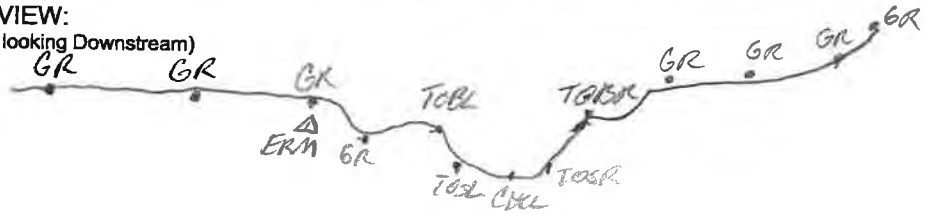
ERM Description: 1/2" FR W/ HALFF TRAV CAP Coordinate System: TXSC

Photo Numbers: DSCH: 2 DSFACE OTXS: USFACE USCH: 1

Additional Info:

File Name: 10091335J-35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

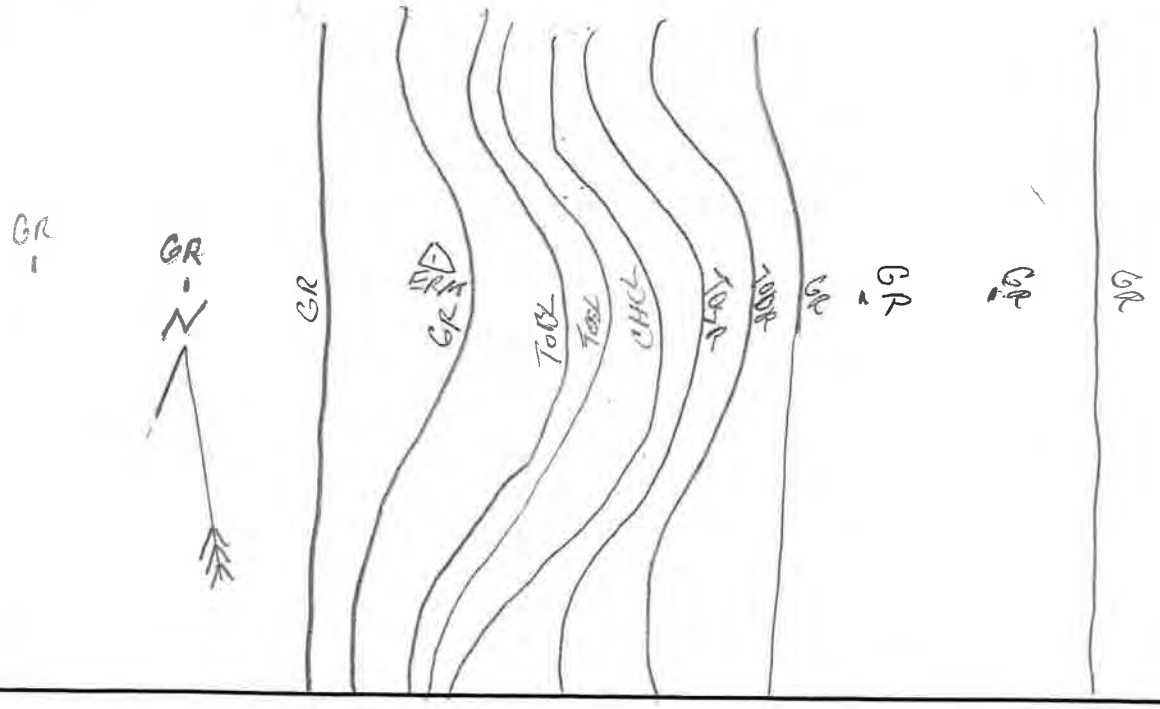


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	Photo ID: Coordinates: Description:	WC_XS_4900_DSCH 30.438297, -97.596734 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_XS_5000

STREAM NAME: WILBARGER CREEK DATE: 8/12/19

LOCATION: HWY 1130 CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 648.031 ERM ID: WCXS5001 GEOID: 128

BRIDGE: Rail Height: ____ Deck: ____ Width: ____ Pier(s): ____ @ ____ Pier Shape: ____

CULVERT: Number: ____ Shape: ____ Length: ____ Height: ____ Width: ____ Skew: ____

CULVERT: I/O Type: ____ Material: ____ Wingwall Angle ____

DAM: Top Width: ____ Side Slope ____ Side Slope ____ US: ____ DS: ____ Outlet: ____

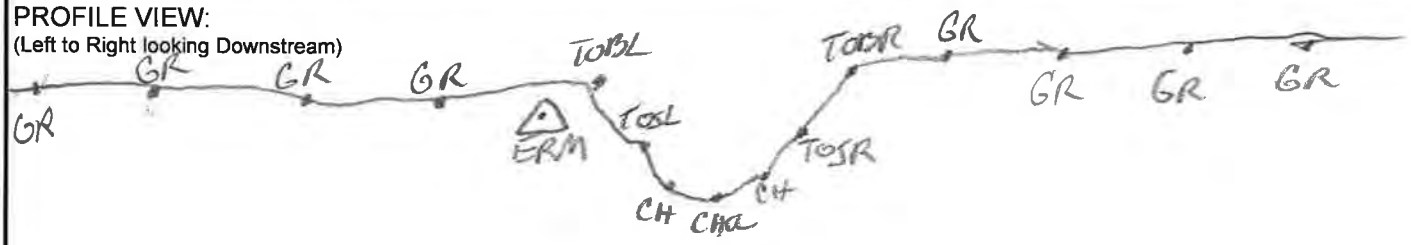
ERM Description: 1/2" IR w/ HALFF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE ____ OTXS: ____ USFACE ____ USCH: 1

Additional Info: ____

File Name: 190812JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

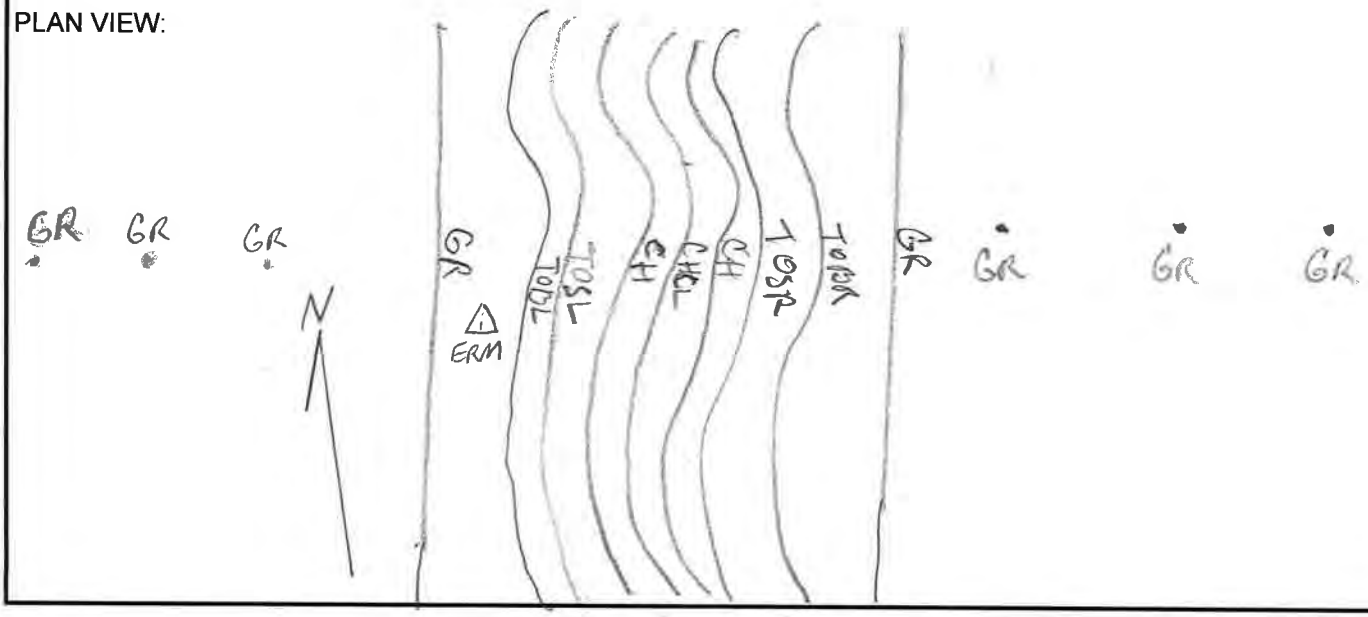


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	Photo ID: Coordinates: Description:	WC_XS_5000_DSCH 30.440586, -97.595748 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_XS_5100

STREAM NAME: WILBARGER CREEK DATE: 9/12/19

LOCATION: HWY 130 CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 650.192 ERM ID: WCXS 5101 GEOID: 12B

BRIDGE: Rail Height: ____ Deck: ____ Width: ____ Pier(s): ____ @ ____ Pier Shape: ____

CULVERT: Number: ____ Shape: ____ Length: ____ Height: ____ Width: ____ Skew: ____

CULVERT: I/O Type: ____ Material: ____ Wingwall Angle ____

DAM: Top Width: ____ Side Slope ____ Side Slope ____ US: ____ DS: ____ Outlet: ____

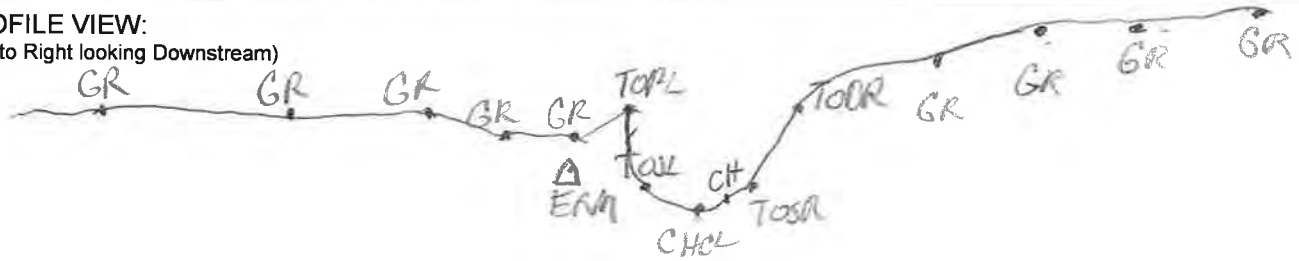
ERM Description: 1/2" IR W HALFF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: 2 DSFACE ____ OTXS: ____ USFACE ____ USCH: 1

Additional Info: ____

File Name: 190812JJ-35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

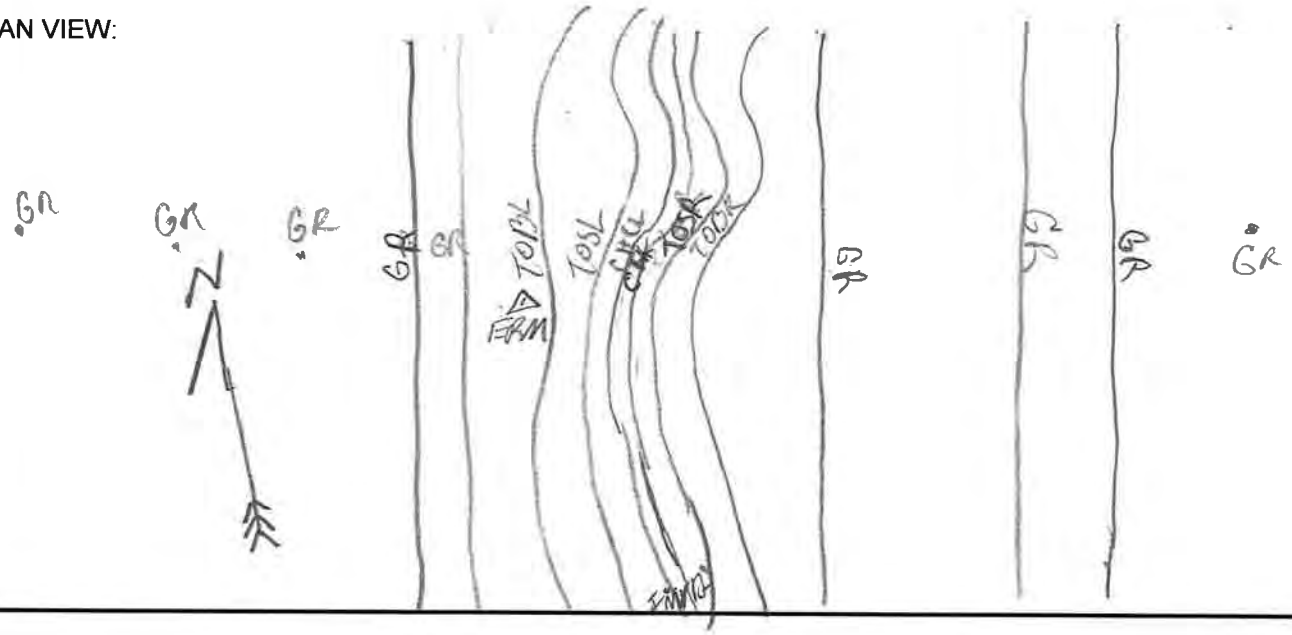


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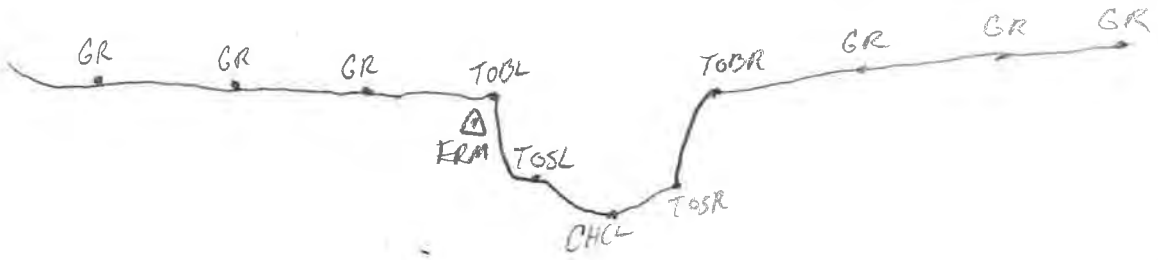
	Photo ID: Coordinates: Description:	WC_XS_5100_DSCH 30.443882, -97.598557 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY
SURVEY NAME: WC_XS_5200
STREAM NAME: WILDARGER CREEK
DATE: 8/9/19
LOCATION: TX-130 SERVICE RD,
CREW: CT/CL
TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 665.638 ERM ID: WCXS5201 GEOID: 12A

BRIDGE: Rail Height: ____ Deck: ____ Width: ____ Pier(s): ____ @ ____ Pier Shape: ____
CULVERT: Number: ____ Shape: ____ Length: ____ Height: ____ Width: ____ Skew: ____
CULVERT: I/O Type: ____ Material: ____ Wingwall Angle ____
DAM: Top Width: ____ Side Slope ____ Side Slope ____ US: ____ DS: ____ Outlet: ____
ERM Description: 1/2" IR w/ HALFF TRAV CAP Coordinate System: Tx-C
Photo Numbers: DSCH: 2 DSFACE ____ OTXS: ____ USFACE ____ USCH: 1
Additional Info: ____
File Name: 190809CT_35937

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

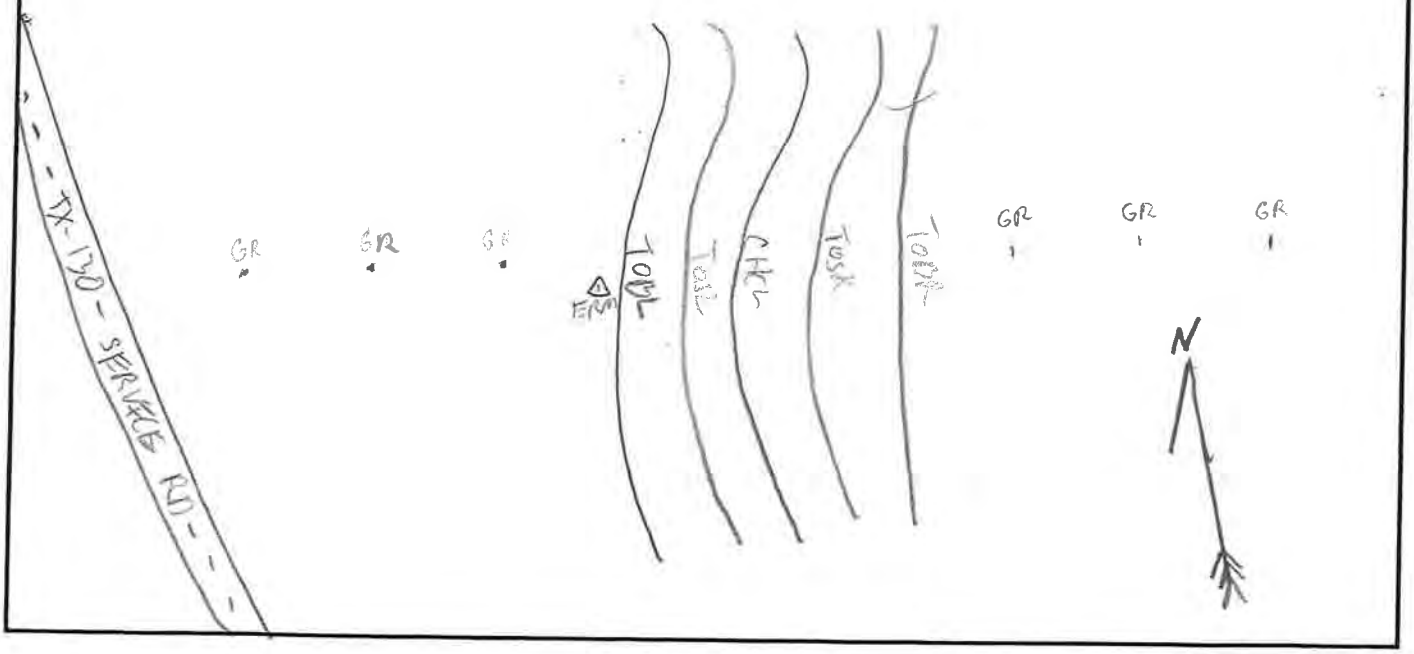


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	Photo ID: Coordinates: Description:	WC_XS_5200_DSCH 30.448112, -97.595879 Downstream channel

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC-XS-5300

STREAM NAME: WILBARGER CREEK DATE: 8/12/19

LOCATION: HWY 130 & E PFLUGERVILLE PKWY CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 670.140 ERM ID: WCXS5301 GEOID: 12A

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

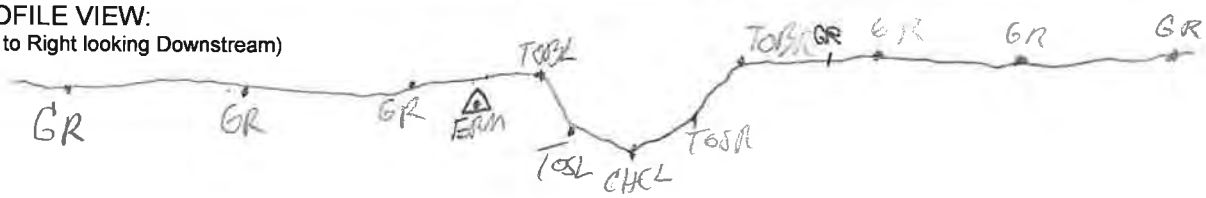
ERM Description: 1/2" IR w/ WAIFF TRAU CAP Coordinate System: TXC

Photo Numbers: DSCH: 2 DSFACE _____ OTXS: _____ USFACE _____ USCH: 1

Additional Info: _____

File Name: 190812JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

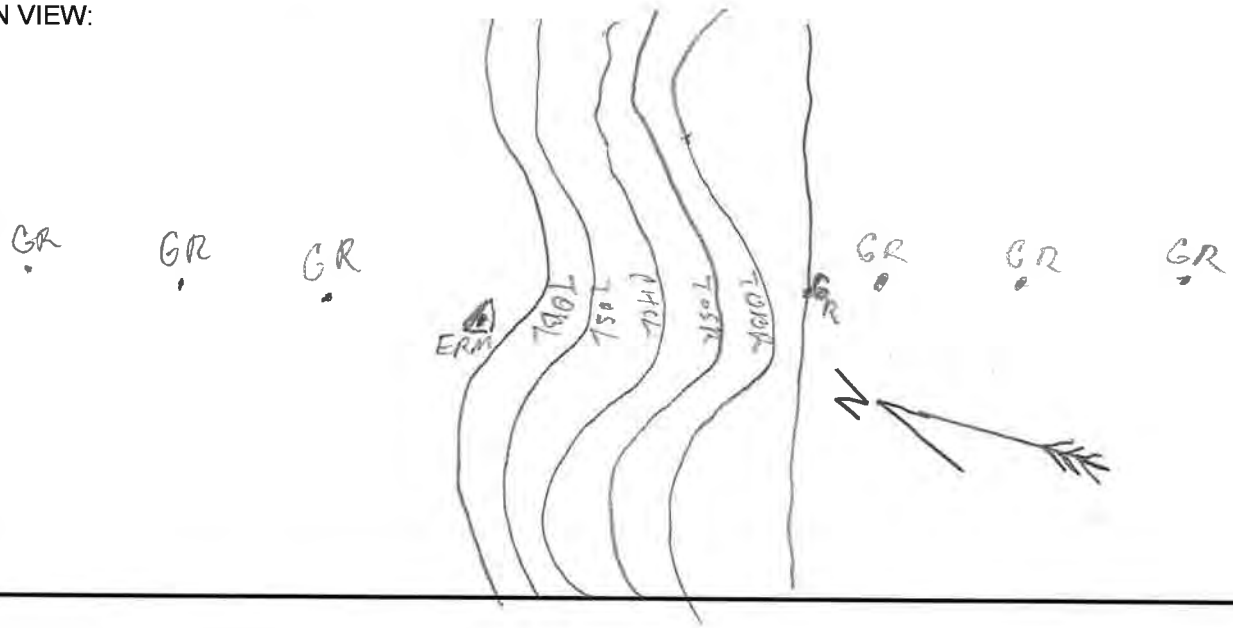


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	Photo ID: Coordinates: Description:	WC_XS_5300_DSCH 30.451837, -97.599316 Downstream channel

Survey Field Sheet

PROJECT: WILBARGER CREEK STUDY SURVEY NAME: WC_XS.5500

STREAM NAME: WILBARGER DATE: 7-30-19

LOCATION: PFLUGERVILLE, TX CREW: HUNTER, LOPEZ

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 712.00 ERM ID: WCXS5500 GEOID: 12B

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:		Shape:		Length:		Height:	Width:	Skew:
CULVERT:	I/O Type:				Material:			Wingwall Angle	
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:
ERM Description:		1/2 IN IR W/TRN CAP						Coordinate System:	TX-C 4203
Photo Numbers:			DSCH:		DSFACE		OTXS:	USFACE	USCH:
Additional Info:									
File Name:		190726_54_35837							

PROFILE VIEW:
(Left to Right looking Downstream)

PLAN VIEW:

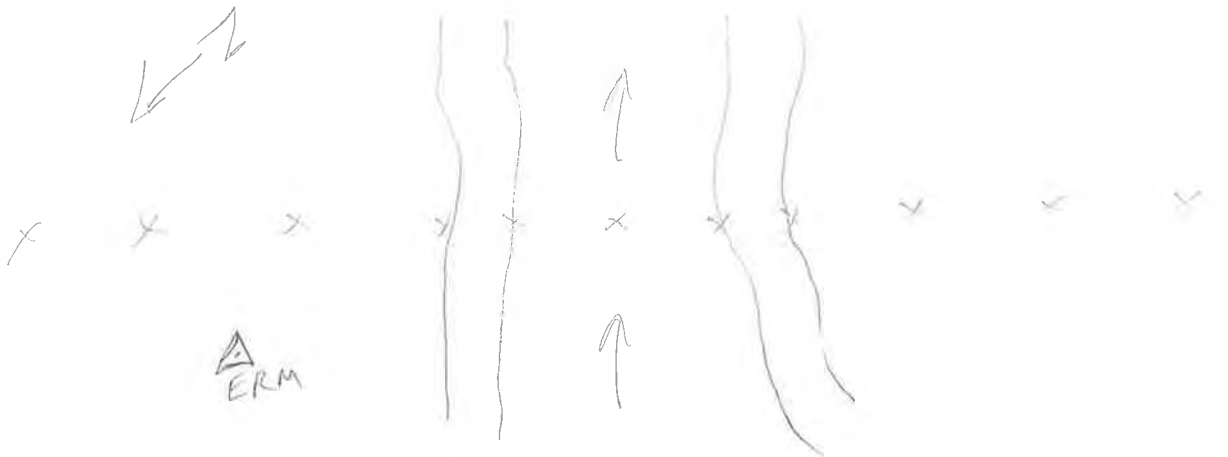

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	Photo ID: Coordinates: Description:	WC_XS_5500_DSCH 30.463864, -97.616325 Downstream channel

Survey Field Sheet

PROJECT: WILBARGER CREEK STUDY SURVEY NAME: WC-XS-5600

STREAM NAME: WILBARGER CREEK DATE: 7-29-19

LOCATION: PFLUGERVILLE, TX CREW: HEATER, LOPEZ

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 745.60 ERM ID: WCXS5601 GEOID: 12B

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:		Shape:		Length:		Height:	Width:	Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle		
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:
ERM Description:	1/2 IN IRW/TRAU CAP							Coordinate System:	TX-C 4203
Photo Numbers:			DSCH:		DSFACE		OTXS:	USFACE	USCH:
Additional Info:									
File Name:	190729SH_35837								

PROFILE VIEW:
(Left to Right looking Downstream)

PLAN VIEW:

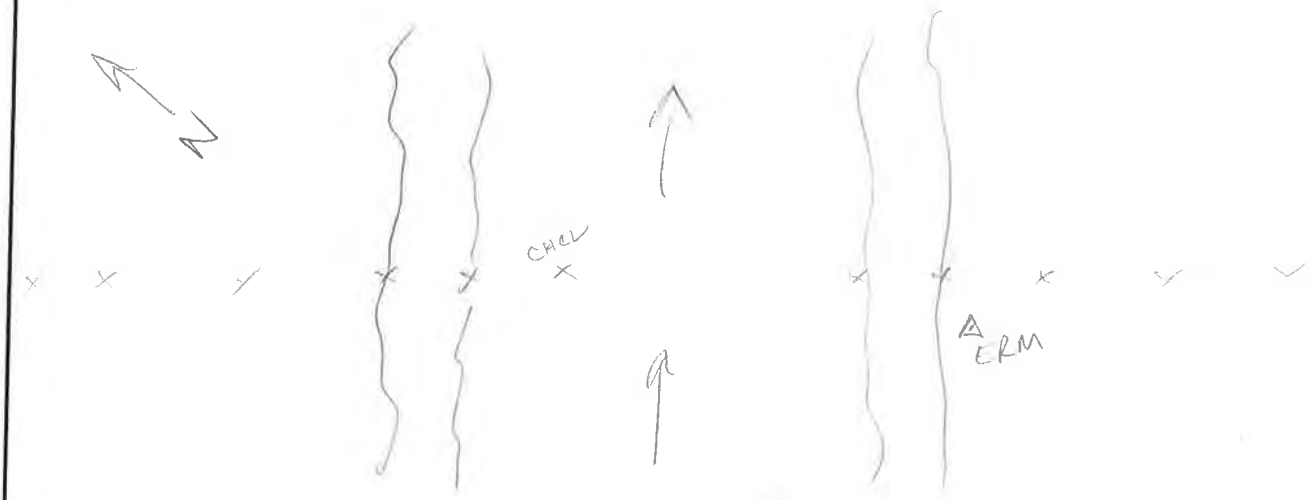


	Photo ID: Coordinates: Description:	WC_XS_5600_USCH 30.472547, -97.625473 Upstream channel
	Photo ID: Coordinates: Description:	WC_XS_5600_DSCH 30.472547, -97.625473 Downstream channel

Survey Field Sheet

PROJECT: WILBARGER CREEK STUDY SURVEY NAME: WC_XS_5700

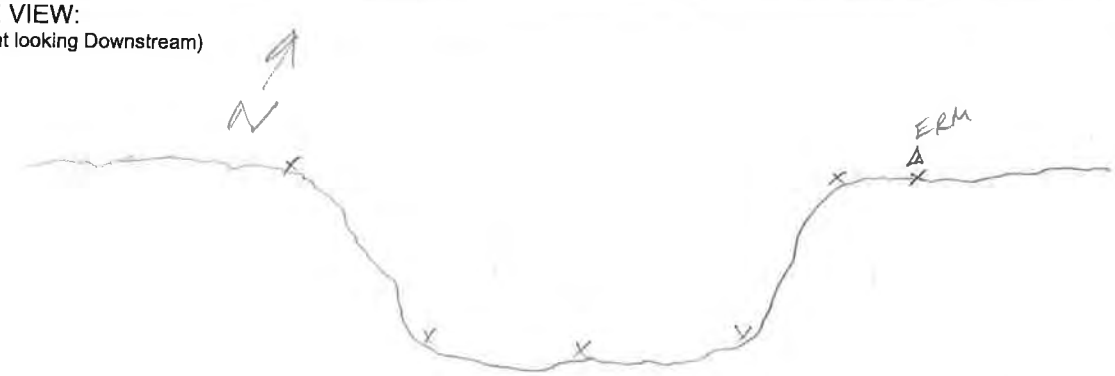
STREAM NAME: WILBARGER DATE: 7-29-19

LOCATION: PFLUGERVILLE, TX CREW: HEATER, LOPEZ

TYPE: BR( ) CUL( ) DAM( ) XS(X) ERM ELEV.: 768.31 ERM ID: WCXS5701 GEOID: 18

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:	
CULVERT:	Number:		Shape:		Length:		Height:	Width:	Skew:	
CULVERT:	I/O Type:				Material:		Wingwall Angle			
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:	
ERM Description:		1/2 IN IR W/TRAV CAP						Coordinate System:	TX-C 4203	
Photo Numbers:			DSCH:	DSFACE		OTXS:		USFACE	USCH:	
Additional Info:										
File Name:		190729SH_35837								

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

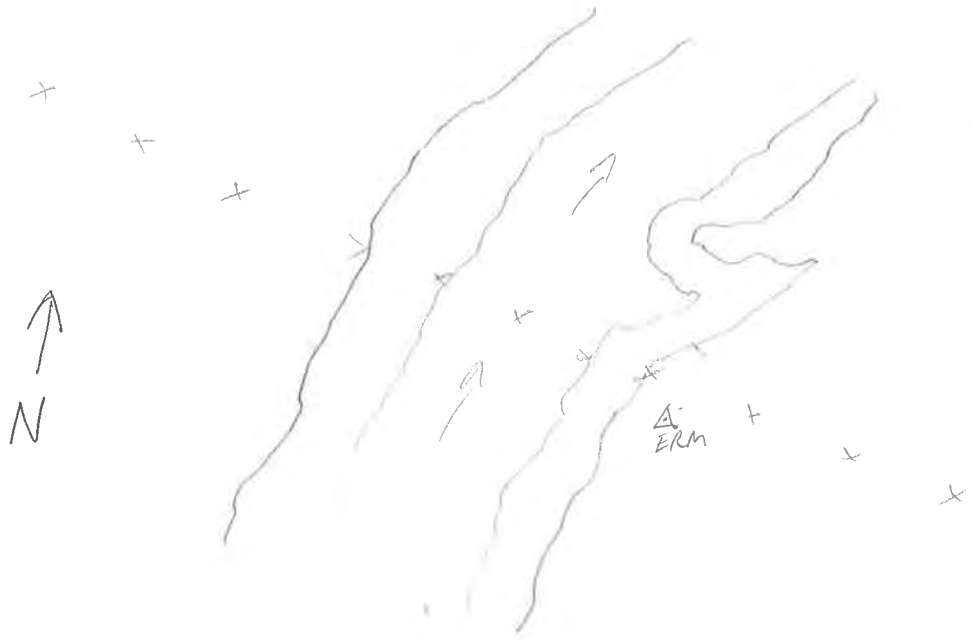


	Photo ID: Coordinates: Description:	WC_XS_5700_USCH 30.476135, -97.631407 Upstream channel
	Photo ID: Coordinates: Description:	WC_XS_5700_DSCH 30.476135, -97.631407 Downstream channel

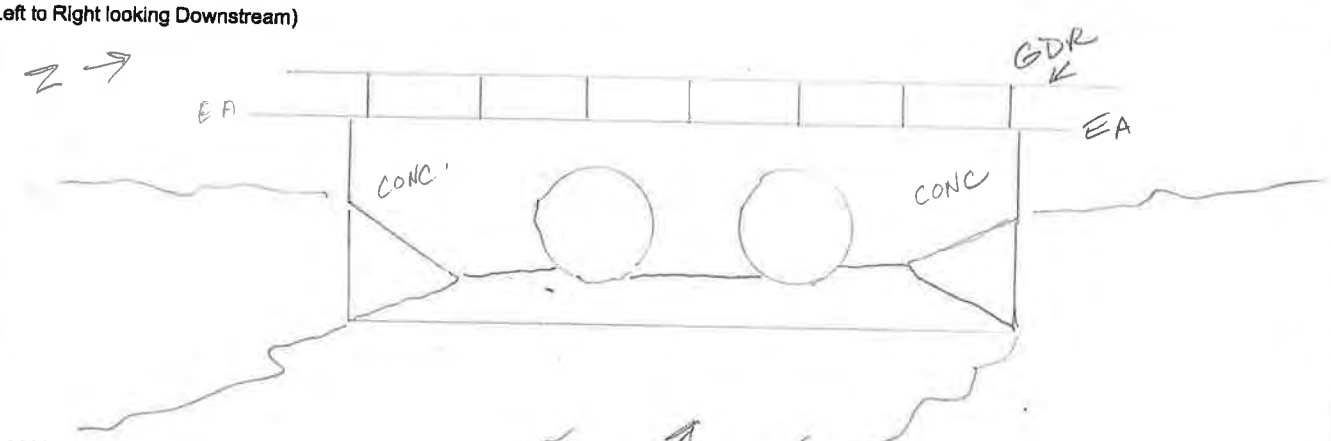
Appendix C-2: Surveyed Structures

Survey Field Sheet

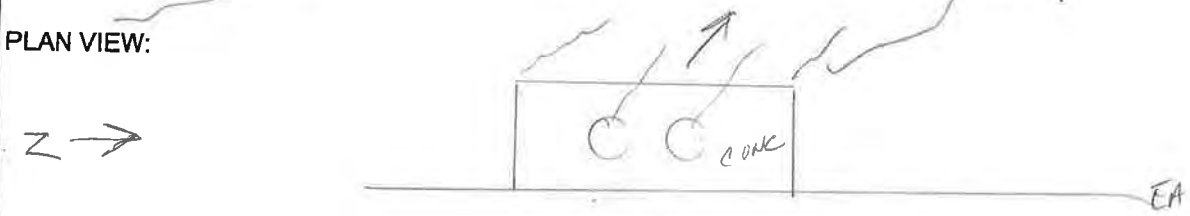
PROJECT: WILBARGER CREEK STUDY
SURVEY NAME: EC_STR_1000
STREAM NAME:
DATE: 6-25-19
LOCATION: COUNTY LINE RD.
CREW: HEATER, JOHNSON
TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: 482.44 ERM ID: EC101 GEOID: 12B

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:
CULVERT: Number: 2 Shape: ELLIP. Length: Height: 5.5' Width: 7.5' Skew:
CULVERT: I/O Type: CMP Material: METAL Wingwall Angle
DAM: Top Width: Side Slope Side Slope US: DS: Outlet:
ERM Description: 1/2 IN IR W/TRAV CAP Coordinate System: TX-C4203
Photo Numbers: DSCH: DSFACE OTXS: USFACE USCH:
Additional Info:
File Name: 190625SH_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:



COUNTY LINE RD

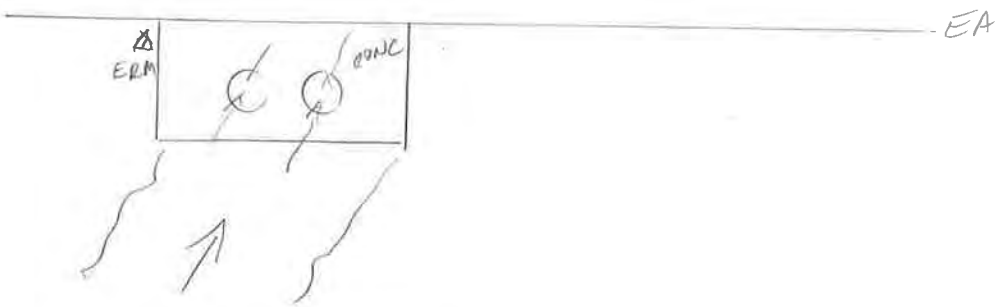


	Photo ID: Coordinates: Description:	EC_STR_1000_USFACE 30.348674, -97.414211 Upstream face
	Photo ID: Coordinates: Description:	EC_STR_1000_DSFACE 30.348674, -97.414211 Downstream face

Survey Field Sheet

PROJECT: WILBARGER FLOOD STUDY SURVEY NAME: EC_STR-1500

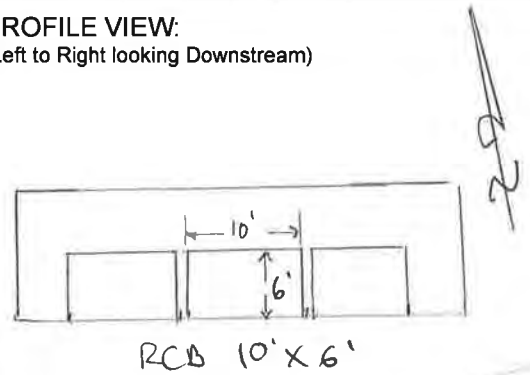
STREAM NAME: ELM CREEK DATE: 7-9-20

LOCATION: COUNTY LINE RD, BASTROP CO. CREW: SH, LS

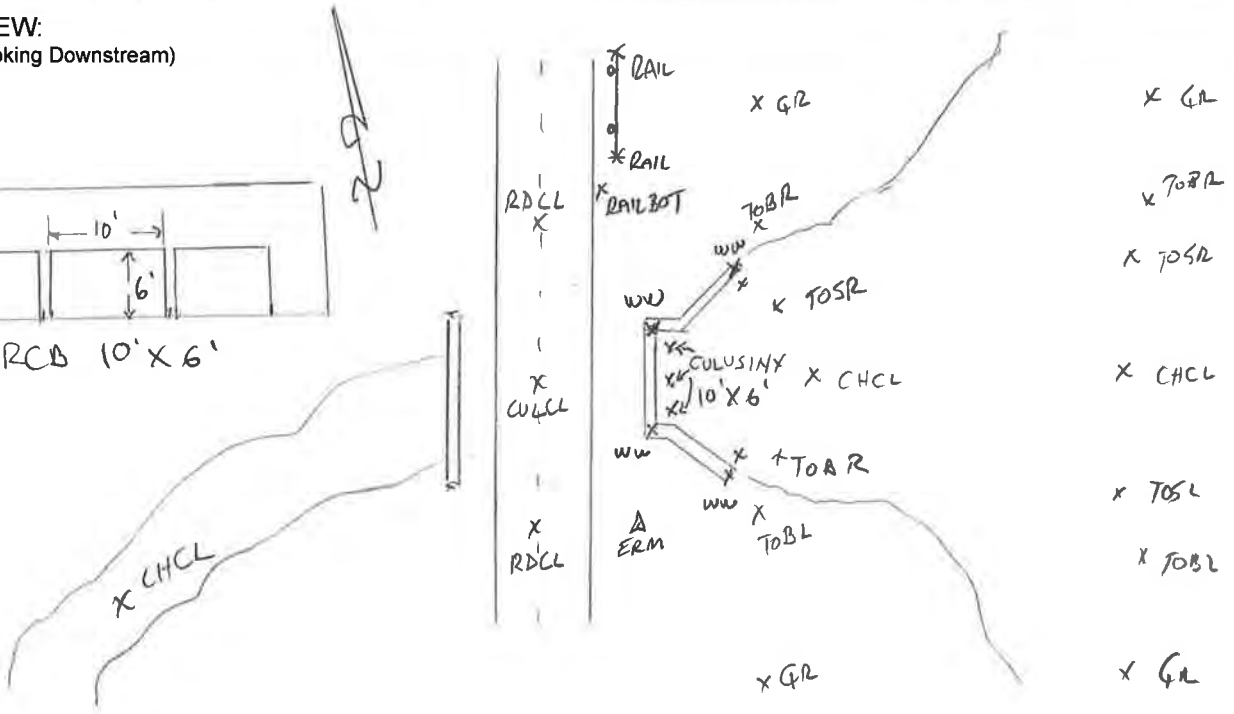
TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: 482.84 ERM ID: ECSTR1501 GEOID: 12B

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):		@	Pier Shape:
CULVERT:	Number:	3	Shape:	RCB	Length:	32.40	Height:	6'	Width: 10'	Skew:
CULVERT:	I/O Type:	RCB			Material:	CONC	Wingwall Angle			
DAM:	Top Width:		Side Slope		Side Slope		US:		DS:	Outlet:
ERM Description:		1/2 IN I.R. W/TRAV CAP							Coordinate System:	TX-C 4203
Photo Numbers:			DSCH:		DSFACE		OTXS:		USFACE	USCH:
Additional Info:										
File Name:		20070915H-35837								

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:



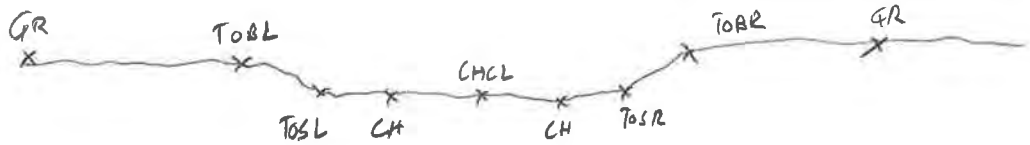


	Photo ID: Coordinates: Description:	EC_STR_1500_USFACE 30.348371, -97.414399 Upstream face
	Photo ID: Coordinates: Description:	EC_STR_1500_DSFACE_1 30.348371, -97.414399 Downstream face

	Photo ID: Coordinates: Description:	EC_STR_1500_DSFACE_2 30.348371, -97.414399 Downstream face
	Photo ID: Coordinates: Description:	EC_STR_1500_DSFACE_3 30.348371, -97.414399 Downstream face

Survey Field Sheet

PROJECT: WILBARGER CREEK STUDY SURVEY NAME: EC_STR. 2000

STREAM NAME: DATE: 6-25-19

LOCATION: HWY 290 E. CREW: HEATER, JOHNSON

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: 499.45 ERM ID: EC2001 GEOID: GEOID 12B

BRIDGE: Rail Height: 2.9" Deck: 12" Width: Pier(s): 24 @ 16" Pier Shape: ROUND

CULVERT: Number: Shape: Length: Height: 8 Width: 12" Skew: 1-BEAM

CULVERT: I/O Type: Material: Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

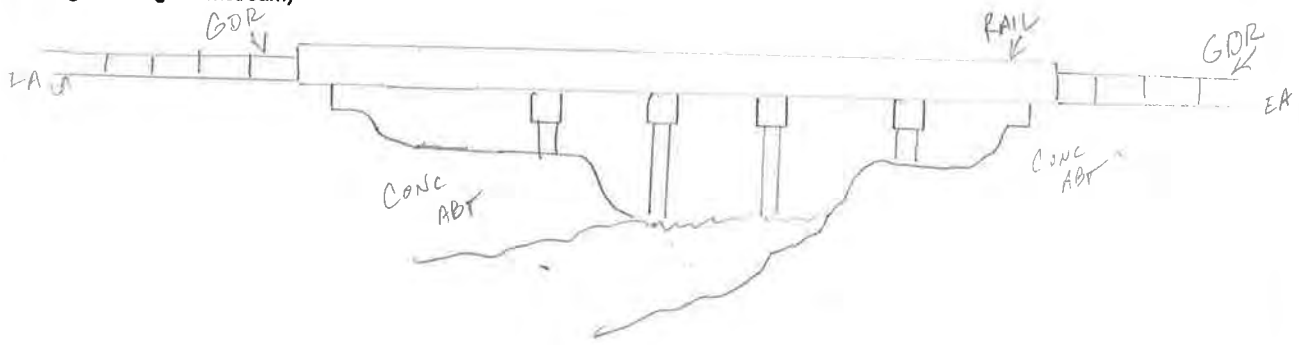
ERM Description: 1/2" IR W/TRAV CAP Coordinate System: TX-C 4203

Photo Numbers: DSCH: DSFACE OTXS: USFACE USCH:

Additional Info: 32 total PIERS, 8 are steel I-BEAM, 24 CONCRETE

File Name:

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

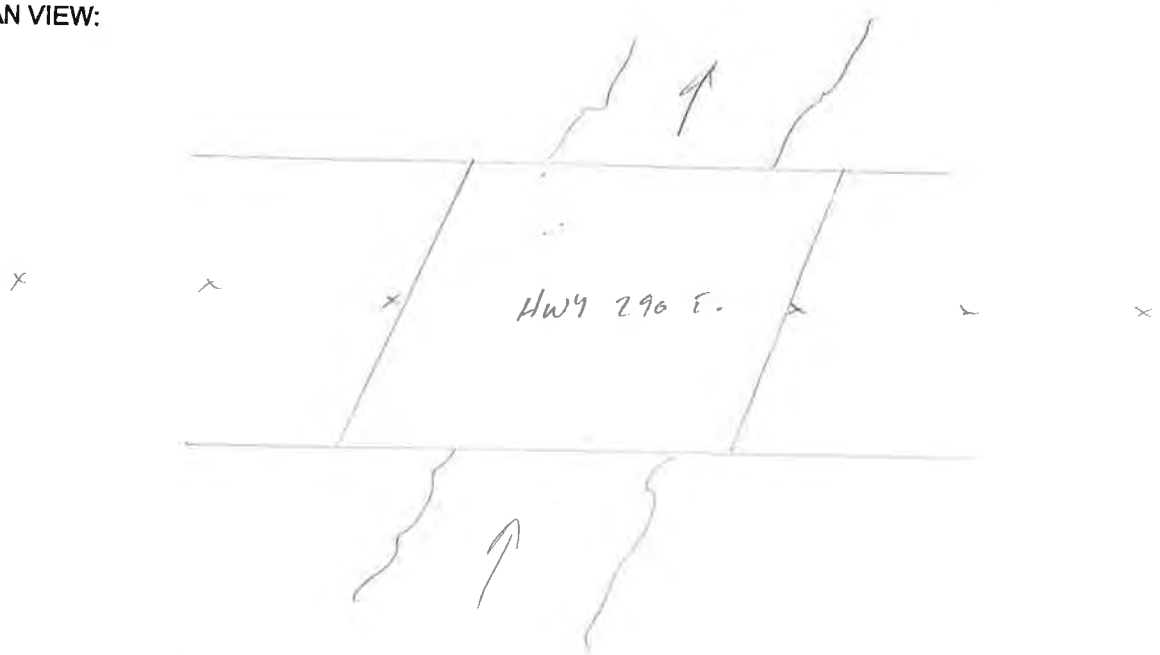


	Photo ID: Coordinates: Description:	EC_STR_2000_USFACE 30.35195, -97.402861 Upstream face
	Photo ID: Coordinates: Description:	EC_STR_2000_DSFACE 30.35195, -97.402861 Downstream face

Survey Field Sheet

PROJECT: WILBARGER CREEK STUDY SURVEY NAME: EC STR 3000

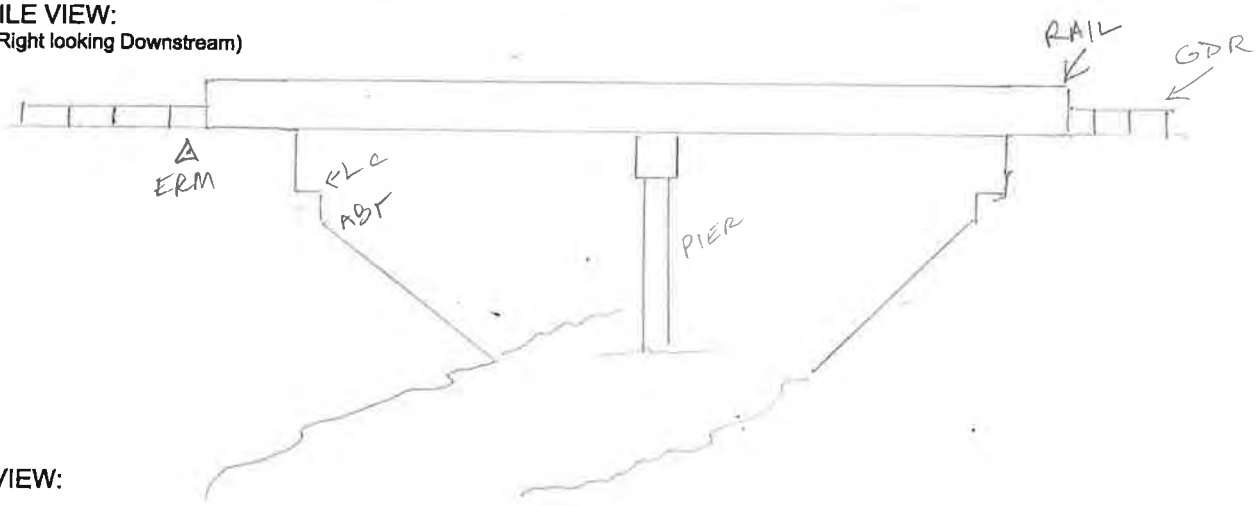
STREAM NAME: DATE: 6-24-19

LOCATION: HWY 290 E. CREW: HEATER, JOHNSON

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: 501.406 ERM ID: EC3001 GEOID: 12B

BRIDGE:	Rail Height:	2.6"	Deck:	7"	Width:		Pier(s):	3	@	30.5"	Pier Shape: ROUND
CULVERT:	Number:		Shape:		Length:		Height:		Width:		Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle				
DAM:	Top Width:		Side Slope		Side Slope		US:		DS:		Outlet:
ERM Description:		1/2 IN IRW/TRAV CAP							Coordinate System:		TX-C 4203
Photo Numbers:			DSCH:		DSFACE		OTXS:		USFACE		USCH:
Additional Info:											
File Name:		1906245H_35837									

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

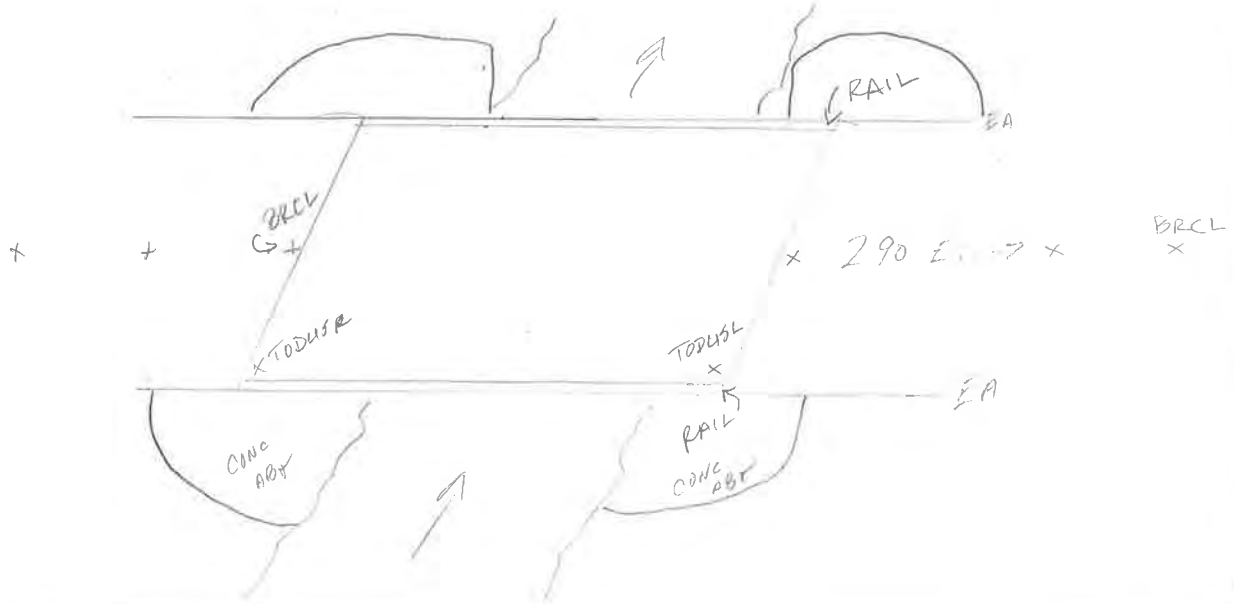


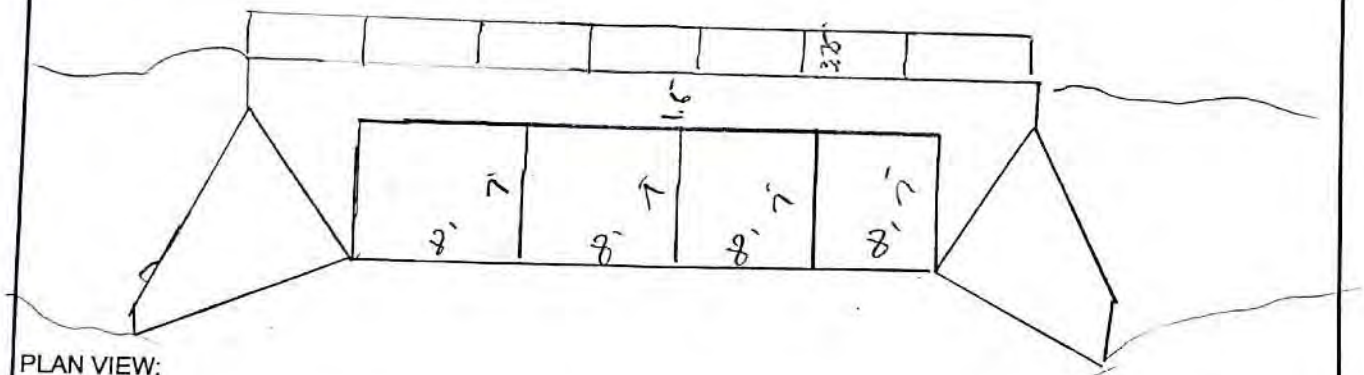
	Photo ID: Coordinates: Description:	EC_STR_3000_USFACE 30.352219, -97.402723 Upstream face
	Photo ID: Coordinates: Description:	EC_STR_3000_DSFACE 30.352219, -97.402723 Downstream face

y Field Sheet

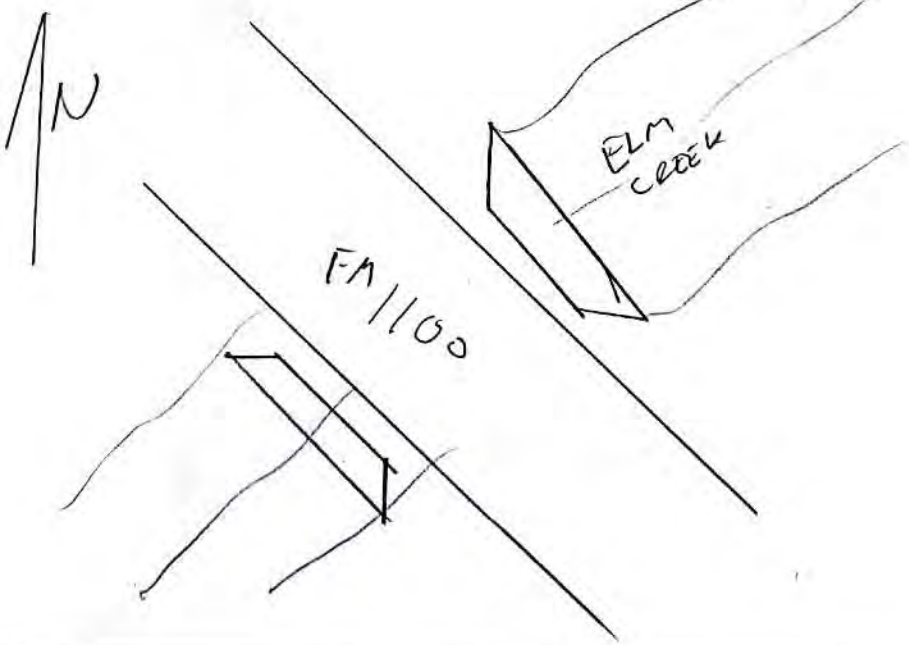
PROJECT: WILB ARLER CREEK
SURVEY NAME: EC_STR_4000
STREAM NAME: ELM CREEK
DATE: 06-21-2019
LOCATION: FM 1100
CREW: JO, CT
TYPE: BR( ) CUL(✓) DAM( ) XS( ) ERM ELEV.: 507.748 ERM ID: EC4001 GEOID: 12B

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:	4	Shape:	□	Length:		Height: 7'	Width: 8'	Skew:
CULVERT:	I/O Type:				Material: CONC		Wingwall Angle		
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:
ERM Description:								Coordinate System:	
Photo Numbers:		DSCH: 4	DSFACE 5		OTXS: 1		USFACE 3	USCH: 2	
Additional Info:									
File Name:		190621JO_35837							

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:



Scanned by CamScanner

	Photo ID: Coordinates: Description:	EC_STR_4000_USFACE 30.362435, -97.398292 Upstream face
	Photo ID: Coordinates: Description:	EC_STR_4000_DSFACE 30.362435, -97.398292 Downstream face

Survey Field Sheet

PROJECT: 35837 WILBARGER SURVEY NAME: 6000

STREAM NAME: WILBARGER DATE: 11-27-19

LOCATION: BITTING SCHOOL RD CREW: JO, CTL

TYPE: BR(✓) CUL( ) DAM( ) XS( ) ERM ELEV.: 422.2 ERM ID: WC6000 GEOID: 12B

BRIDGE: Rail Height: 2.4FT Deck: 15.5FT Width: 77.5FT Pier(s): 0 @ ____ Pier Shape: ____

CULVERT: Number: ____ Shape: ____ Length: ____ Height: ____ Width: ____ Skew: ____

CULVERT: I/O Type: ____ Material: ____ Wingwall Angle ____

DAM: Top Width: ____ Side Slope Side Slope US: ____ DS: ____ Outlet: ____

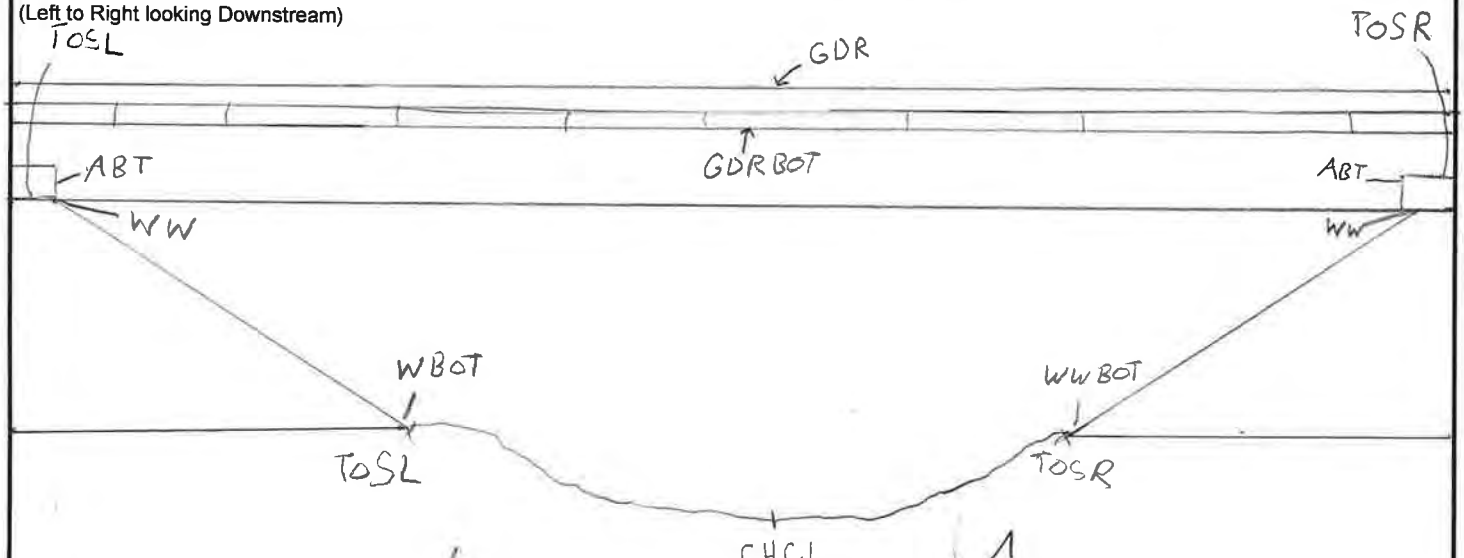
ERM Description: ____ Coordinate System: TXC

Photo Numbers: DSCH: ____ DSFACE ____ OTXS: ____ USFACE ____ USCH: ____

Additional Info: ____

File Name: 191126JO-35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

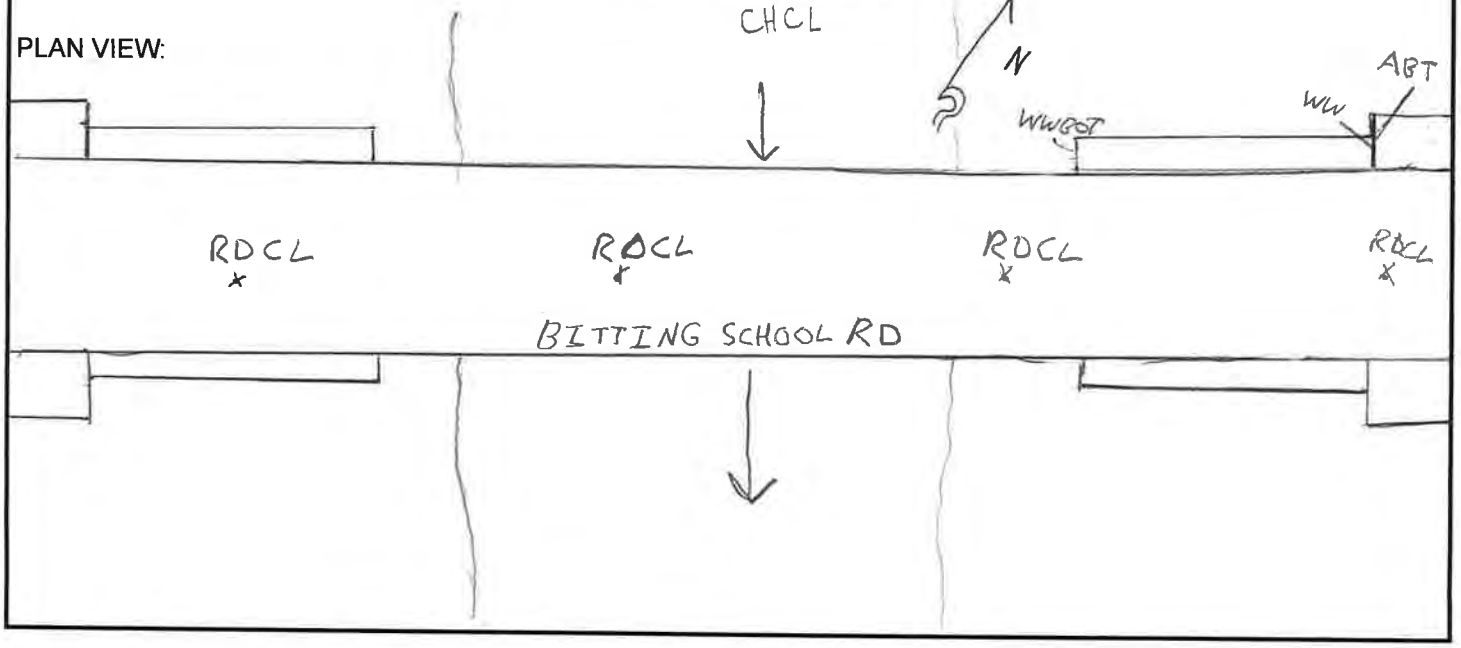


	Photo ID: Coordinates: Description:	WC_STR_6000_USF 30.309111, -97.452916 Upstream face
	Photo ID: Coordinates: Description:	WC_STR_6000_DSF 30.309111, -97.452916 Downstream face

Survey Field Sheet

PROJECT: WILBARGER CREEK STUDY SURVEY NAME: WC_STR_6500

STREAM NAME: WILBARGER CREEK DATE: 7-10-20

LOCATION: BITTING SCHOOL RD., BASTROP CO. CREW: CL, SH

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: 421.27 ERM ID: WCSTR6501 GEOID: 128

BRIDGE: Rail Height: ____ Deck: ____ Width: ____ Pier(s): ____ @ ____ Pier Shape: ____

CULVERT: Number: 4 Shape: ROUND Length: ____ Height: ____ Width: 60" Skew: ____

CULVERT: I/O Type: ____ Material: CMP Wingwall Angle ____

DAM: Top Width: ____ Side Slope ____ Side Slope ____ US: ____ DS: ____ Outlet: ____

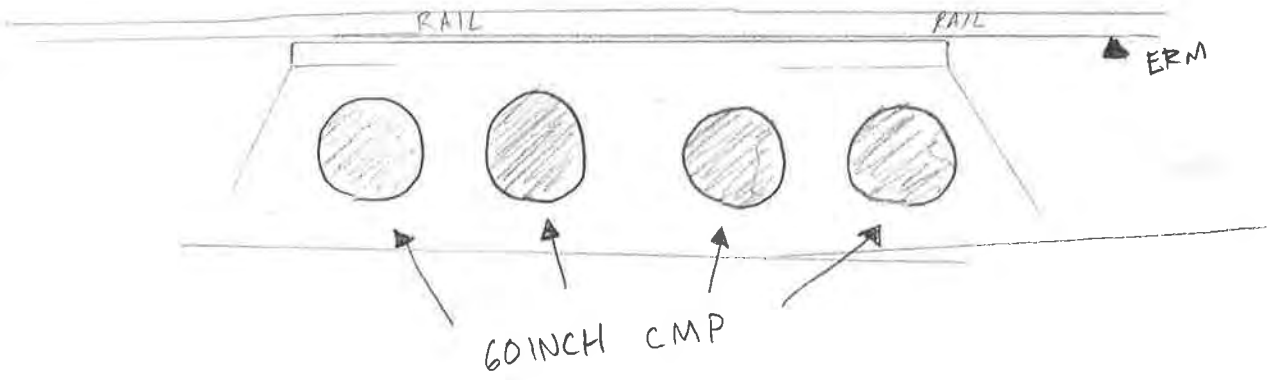
ERM Description: 1/2 IN I.R. W/TRAV CAP Coordinate System: TX-C 4203

Photo Numbers: DSCH: ____ DSFACE ____ OTXS: ____ USFACE ____ USCH: ____

Additional Info: ____

File Name: 20071OCL_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

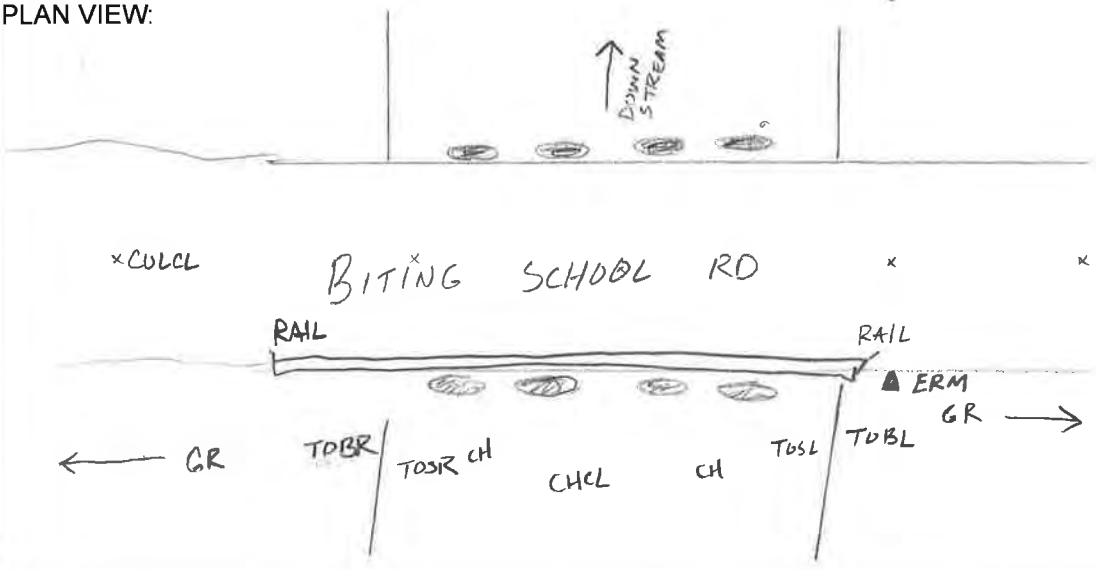


	Photo ID: Coordinates: Description:	WC_STR_6500_USF 30.306822, -97.454354 Upstream face
	Photo ID: Coordinates: Description:	WC_STR_6500_DSF 30.306822, -97.454354 Downstream face

Survey Field Sheet

PROJECT: 35837 WILL BARGER SURVEY NAME: WC_STR_7000

STREAM NAME: WILL BARGER DATE: 11-25-19

LOCATION: JONES CREW: J. OAKS

TYPE: BR(✓) CUL( ) DAM( ) XS( ) ERM ELEV.: 448.345 ERM ID: 7000 GEOID: 12B

BRIDGE: Rail Height: 3.0 Deck: 15.61 Width: 44.94' Pier(s): 0 @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

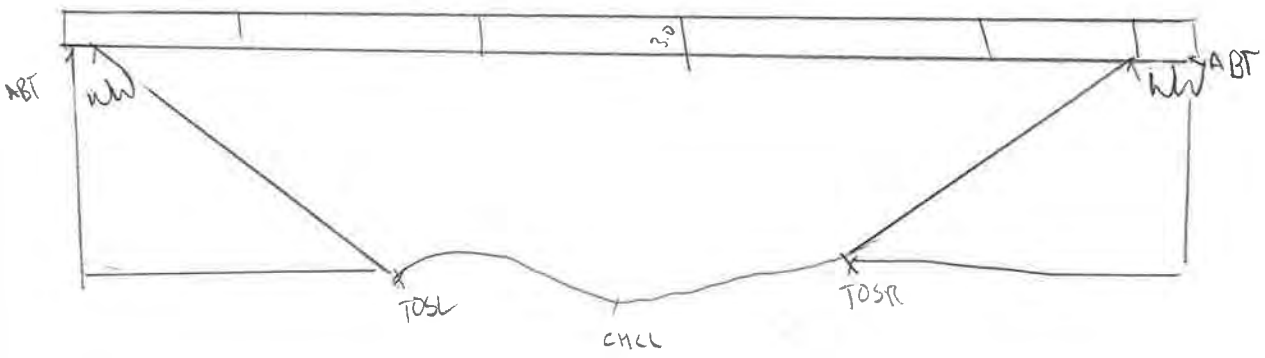
ERM Description: _____ Coordinate System: _____

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: 19112520_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

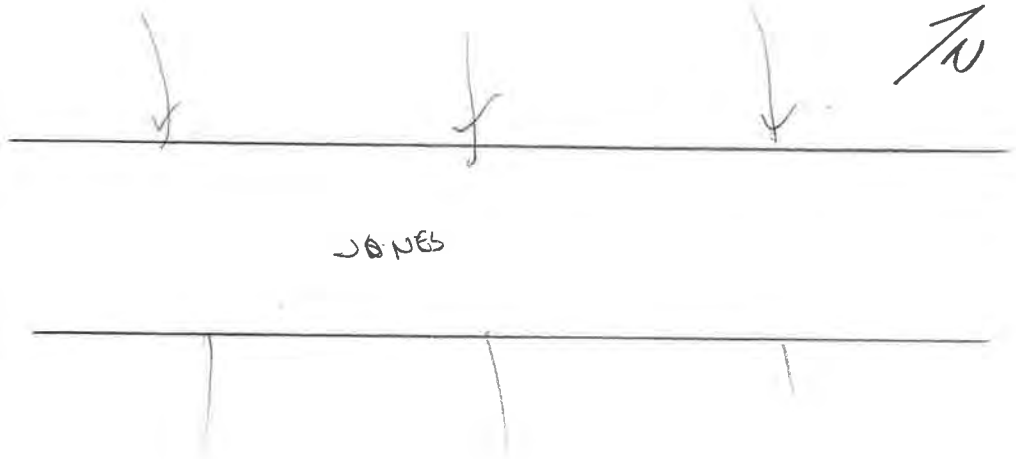


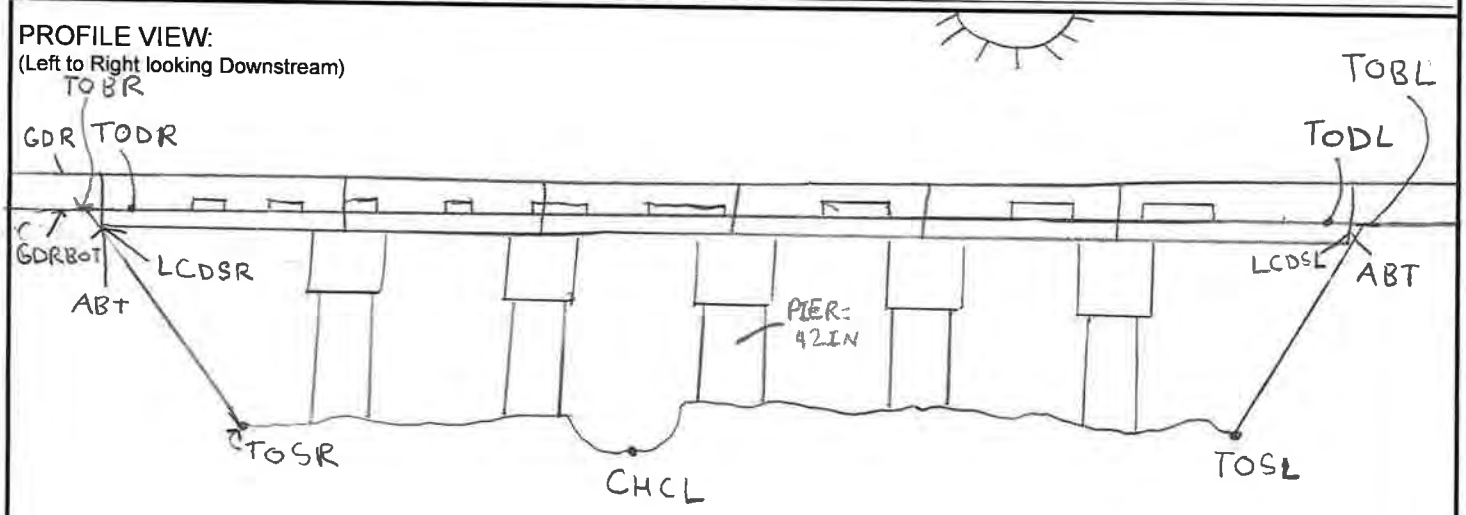
	Photo ID: Coordinates: Description:	WC_STR_7000_USF 30.320083, -97.479569 Upstream face
	Photo ID: Coordinates: Description:	WC_STR_7000_DSF 30.320083, -97.479569 Downstream face

Survey Field Sheet

PROJECT: TRAVIS COUNTY FEMA
SURVEY NAME: WC_STR_8000
STREAM NAME: WILBARGER CREEK
DATE: 11-23-2019
LOCATION: PARSONS ROAD
CREW: JO, CL, CJL
TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: 12B

BRIDGE: Rail Height: 2-6 Deck: 599.2 Width: 51.76 Pier(s): 20 @ 42IN Pier Shape: ROUND
CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____
CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____
DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____
ERM Description: MAG NAIL Coordinate System: TXC
Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____
Additional Info:
File Name: 191123JO_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

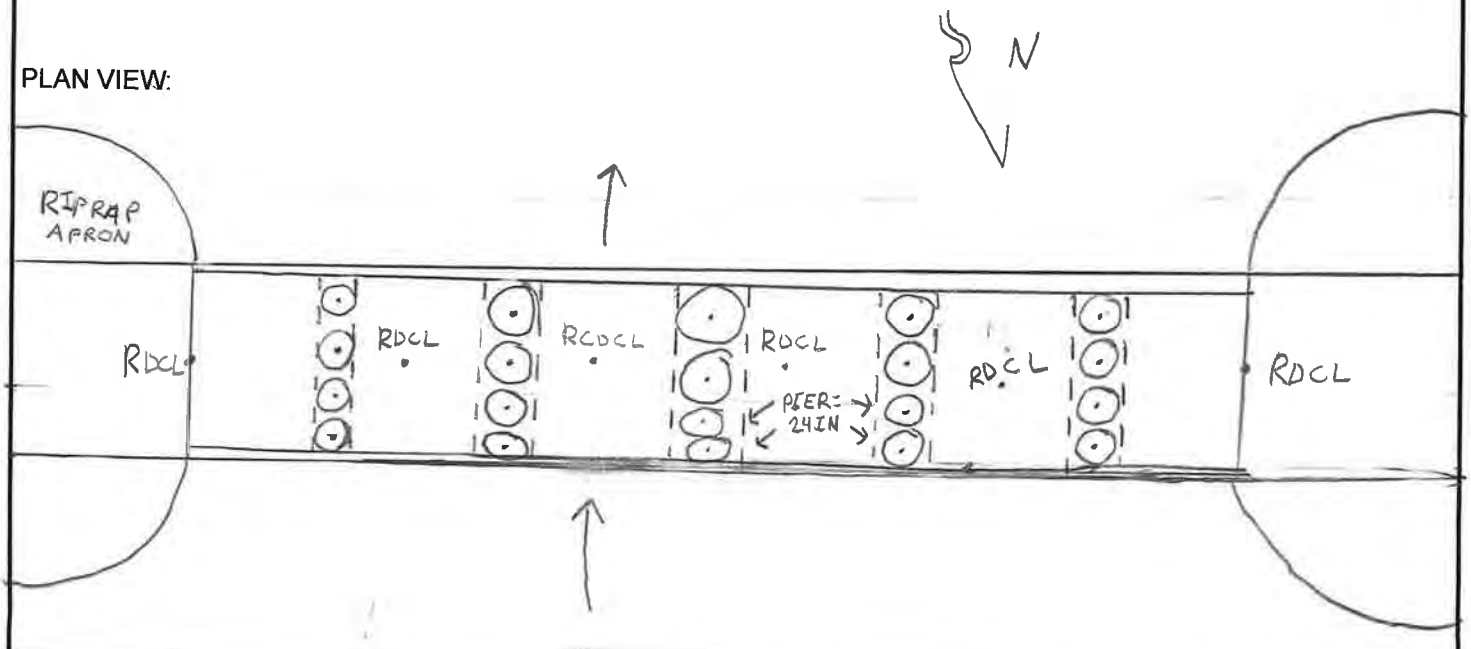


	Photo ID: Coordinates: Description:	WC_STR_8000_USF 30.322433, -97.511001 Upstream face
No photo taken	Photo ID: Coordinates: Description:	WC_STR_8000_DSF 30.322433, -97.511001 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_STR_9000

STREAM NAME: WILBARGER CREEK DATE: 02/13/2020

LOCATION: TRAVIS COUNTY MANOR, TX CREW: W. Griffin, J. Johnson, C. TIPPIN

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: 500.102 ERM ID: WC9001 GEOID: 12B

BRIDGE: ~~Rail~~ Height: _____ Deck: _____ Width: _____ Pier(s): Wood @ 24" Pier Shape: Wooden CIRCLE

~~CULVERT~~: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

~~CULVERT~~: I/O Type: _____ Material: _____ Wingwall Angle _____

~~DAM~~: Top Width: _____ Side Slope _____ Side Slope _____ US: _____ DS: _____ Outlet: _____

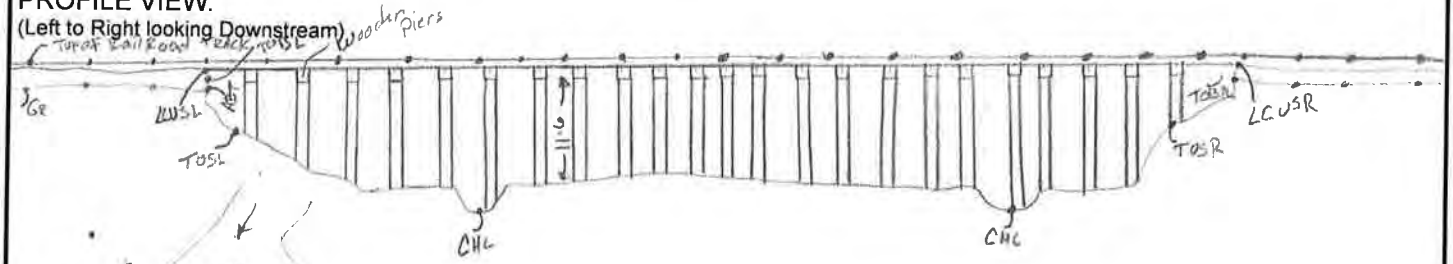
ERM Description: 1/2" IRON ROD W/ HALFF TRAV Coordinate System: _____

Photo Numbers: DSCH: 1 DSFACE 2 OTXS: 3 USFACE 4 USCH: 5

Additional Info: _____

File Name: 20021366_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

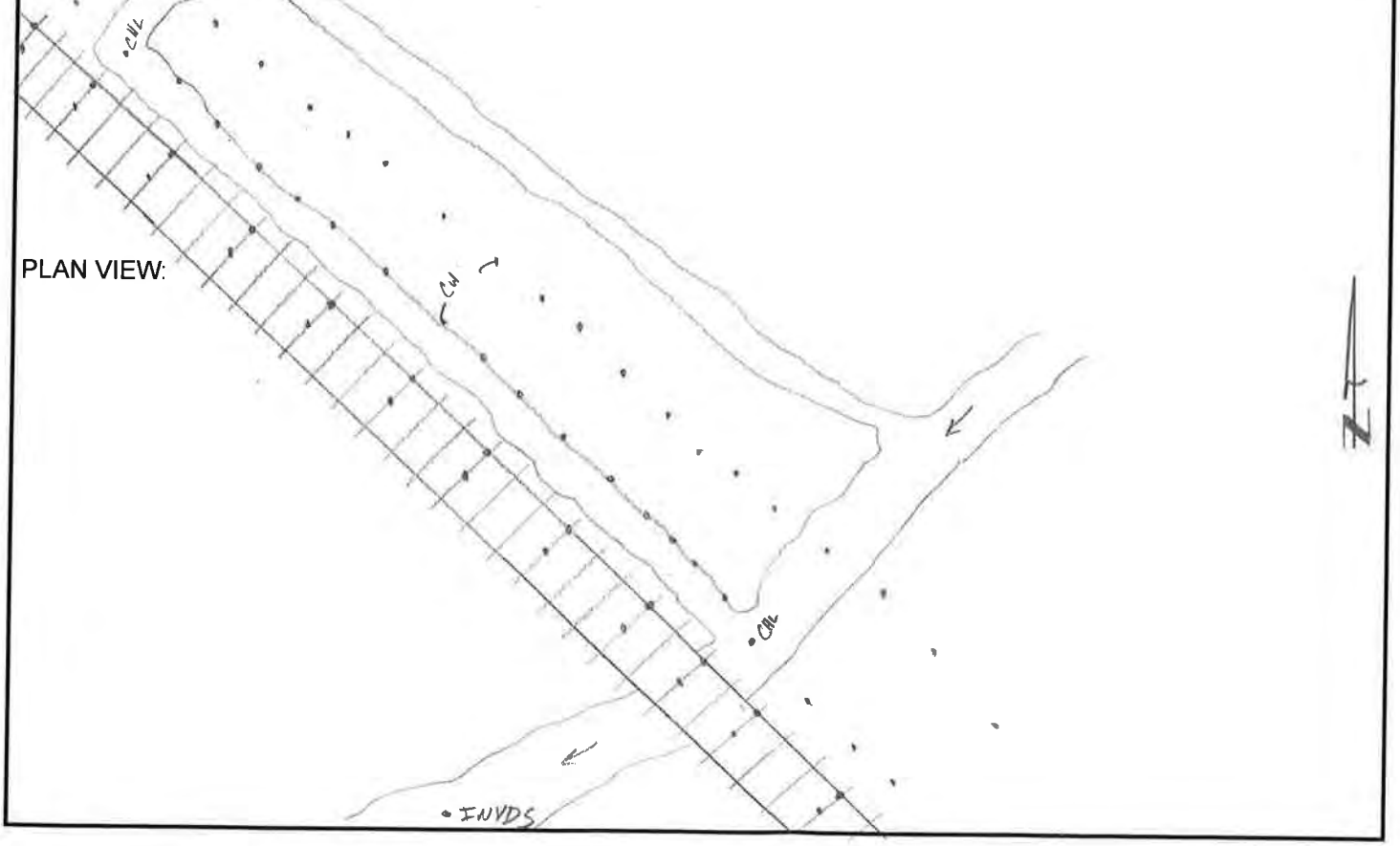


	Photo ID: Coordinates: Description:	WC_STR_9000_USFACE1 30.343279, -97.545089 Upstream face
	Photo ID: Coordinates: Description:	WC_STR_9000_USFACE2 30.343279, -97.545089 Upstream face

	Photo ID: Coordinates: Description:	WC_STR_9000_DSFACE1 30.343279, -97.545089 Downstream face
	Photo ID: Coordinates: Description:	WC_STR_9000_DSFACE2 30.343279, -97.545089 Downstream face

Survey Field Sheet

PROJECT: 35837 SURVEY NAME: WC_STR_100000

STREAM NAME: WILBARGER DATE: 12-02-19

LOCATION: 212 CREW: J. OGLE

TYPE: BR(✓) CUL( ) DAM( ) XS( ) ERM ELEV.: 506.99 ERM ID: WC10000 GEOID: 12B

BRIDGE: Rail Height: 2.63 Deck: 13.99 Width: 386.276 Pier(s): 90 @ 1FT Pier Shape: SQUARE

CULVERT: Number: ____ Shape: ____ Length: ____ Height: ____ Width: ____ Skew: ____

CULVERT: I/O Type: ____ Material: ____ Wingwall Angle ____

DAM: Top Width: ____ Side Slope Side Slope US: ____ DS: ____ Outlet: ____

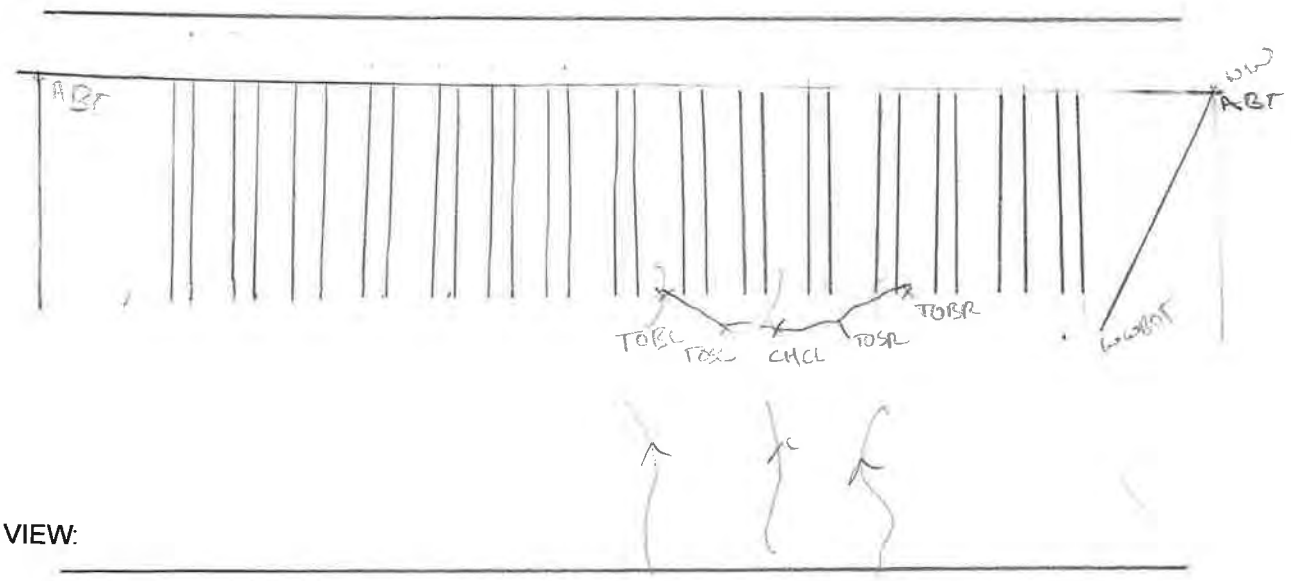
ERM Description: ____ Coordinate System: ____

Photo Numbers: DSCH: ____ DSFACE ____ OTXS: ____ USFACE ____ USCH: ____

Additional Info: ____

File Name: 191202JO_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

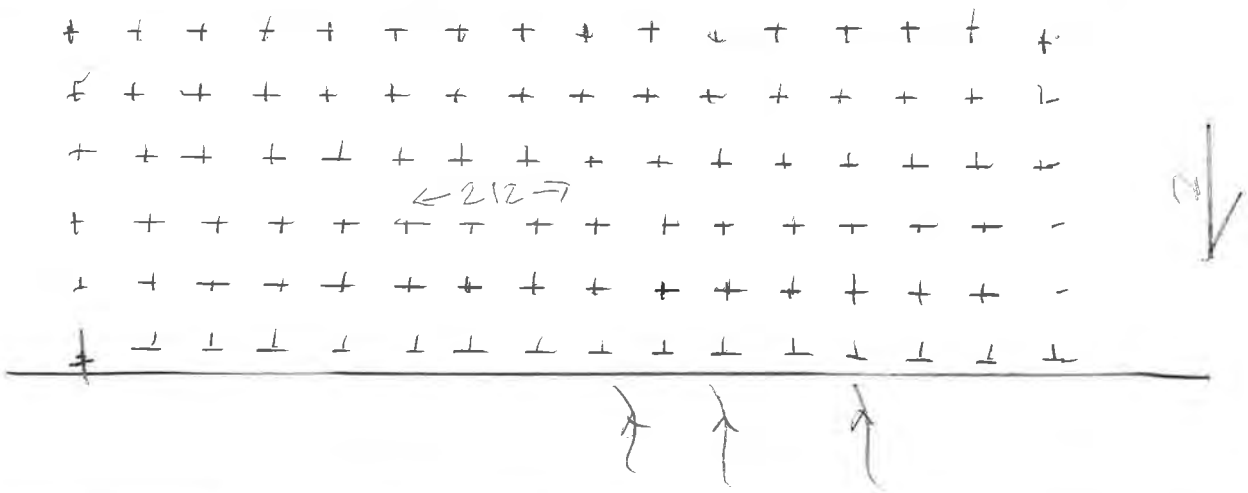


	Photo ID: Coordinates: Description:	WC_STR_10000_USF 30.343488, -97.544942 Upstream face
	Photo ID: Coordinates: Description:	WC_STR_10000_DSF 30.343488, -97.544942 Downstream face

Survey Field Sheet

PROJECT: Wilbarger | SURVEY NAME: WC_STR_11000

STREAM NAME: Wilbarger Creek | DATE: 11-22-19

LOCATION: Travis County | CREW: A. Narvaez / A. Ramirez

TYPE: BR(X) CUL( ) DAM( ) XS( ) | ERM ELEV.: _____ | ERM ID: _____ | GEOID: G12AUS

BRIDGE: Rail Height: 2.3 | Deck: 0.60 | Width: 42.0 | Pier(s): 78 @ 18" | Pier Shape: Round

CULVERT: Number: _____ | Shape: _____ | Length: _____ | Height: _____ | Width: _____ | Skew: _____

CULVERT: I/O Type: _____ | Material: _____ | Wingwall Angle _____

DAM: Top Width: _____ | Side Slope | Side Slope | US: _____ | DS: _____ | Outlet: _____

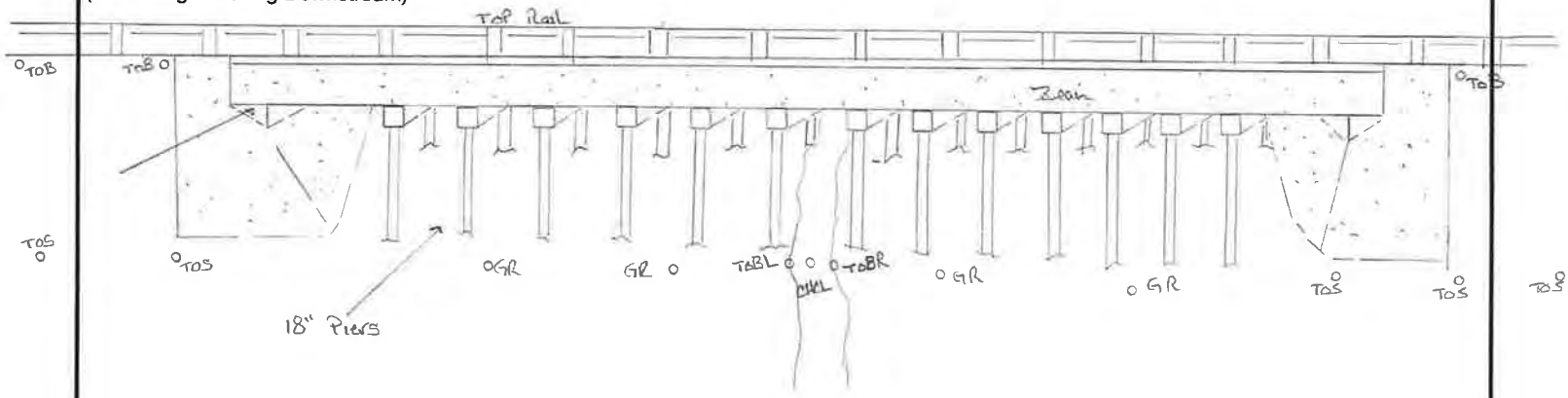
ERM Description: _____ | Coordinate System: 4203

Photo Numbers: | DSCH: _____ | DSFACE _____ | OTXS: _____ | USFACE _____ | USCH: _____

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

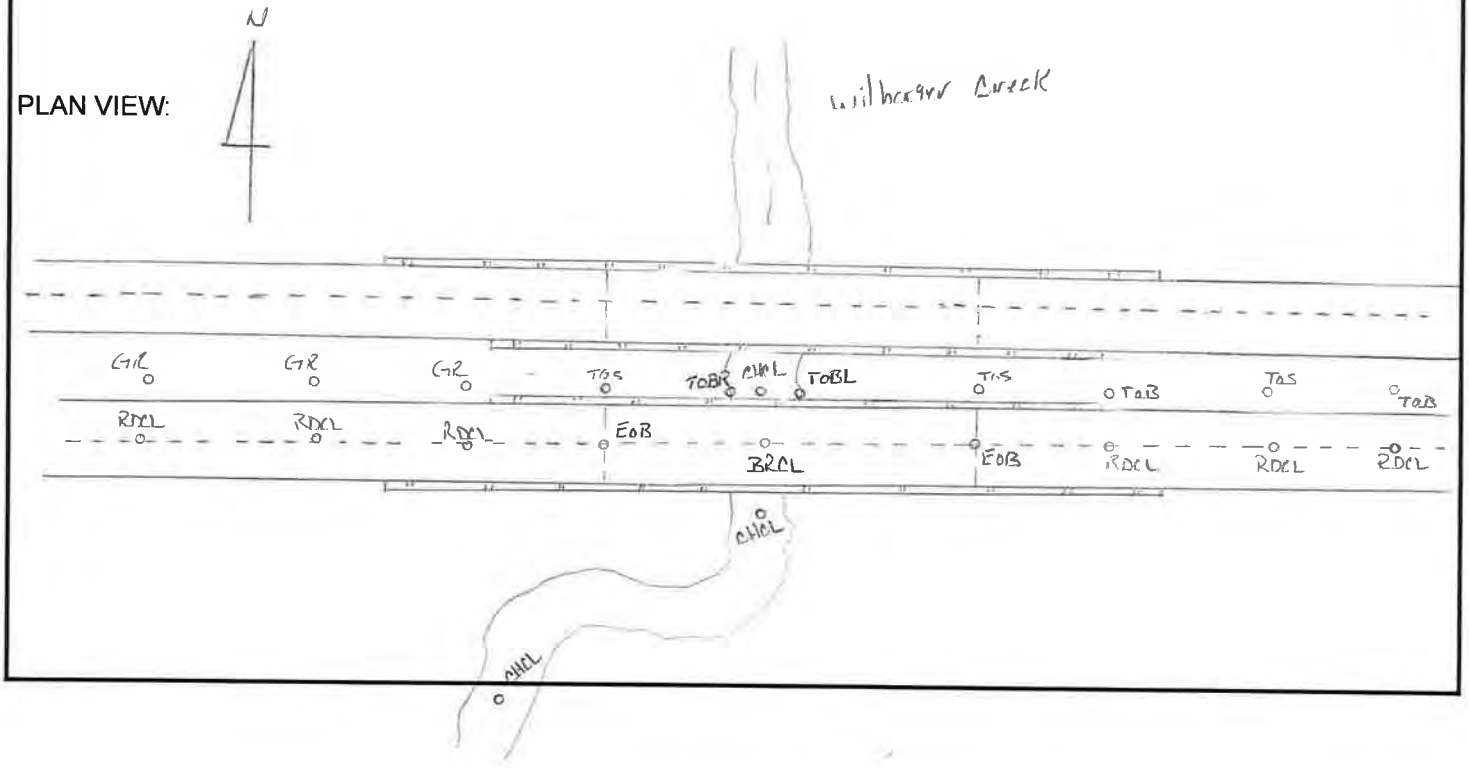


	Photo ID: Coordinates: Description:	WC_STR_11000_USFACE 30.348933, -97.549738 Upstream face
	Photo ID: Coordinates: Description:	WC_STR_11000_DSFACE 30.348933, -97.549738 Downstream face

Survey Field Sheet

PROJECT: Wilbarger | SURVEY NAME: WC_STR_12000

STREAM NAME: Wilbarger Creek | DATE: 11-22-19

LOCATION: Travis County | CREW: A. Vacas / A. Ramirez

TYPE: BR(X) CUL( ) DAM( ) XS( ) | ERM ELEV.: _____ | ERM ID: _____ | GEOID: G12AUS

BRIDGE: Rail Height: 2.3 | Deck: 0.70 | Width: 42.0 | Pier(s): 18 @ 30" | Pier Shape: Round

CULVERT: Number: _____ | Shape: _____ | Length: _____ | Height: _____ | Width: _____ | Skew: _____

CULVERT: I/O Type: _____ | Material: _____ | Wingwall Angle _____

DAM: Top Width: _____ | Side Slope | Side Slope | US: _____ | DS: _____ | Outlet: _____

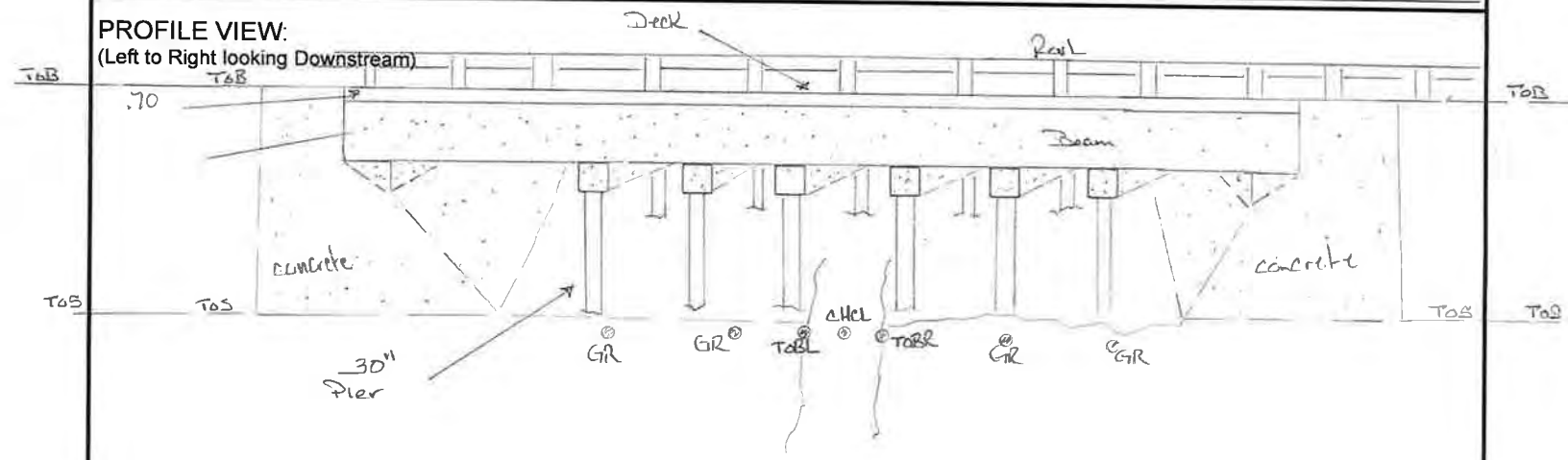
ERM Description: _____ | Coordinate System: 4203

Photo Numbers: | DSCH: _____ | DSFACE _____ | OTXS: _____ | USFACE _____ | USCH: _____

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW: N

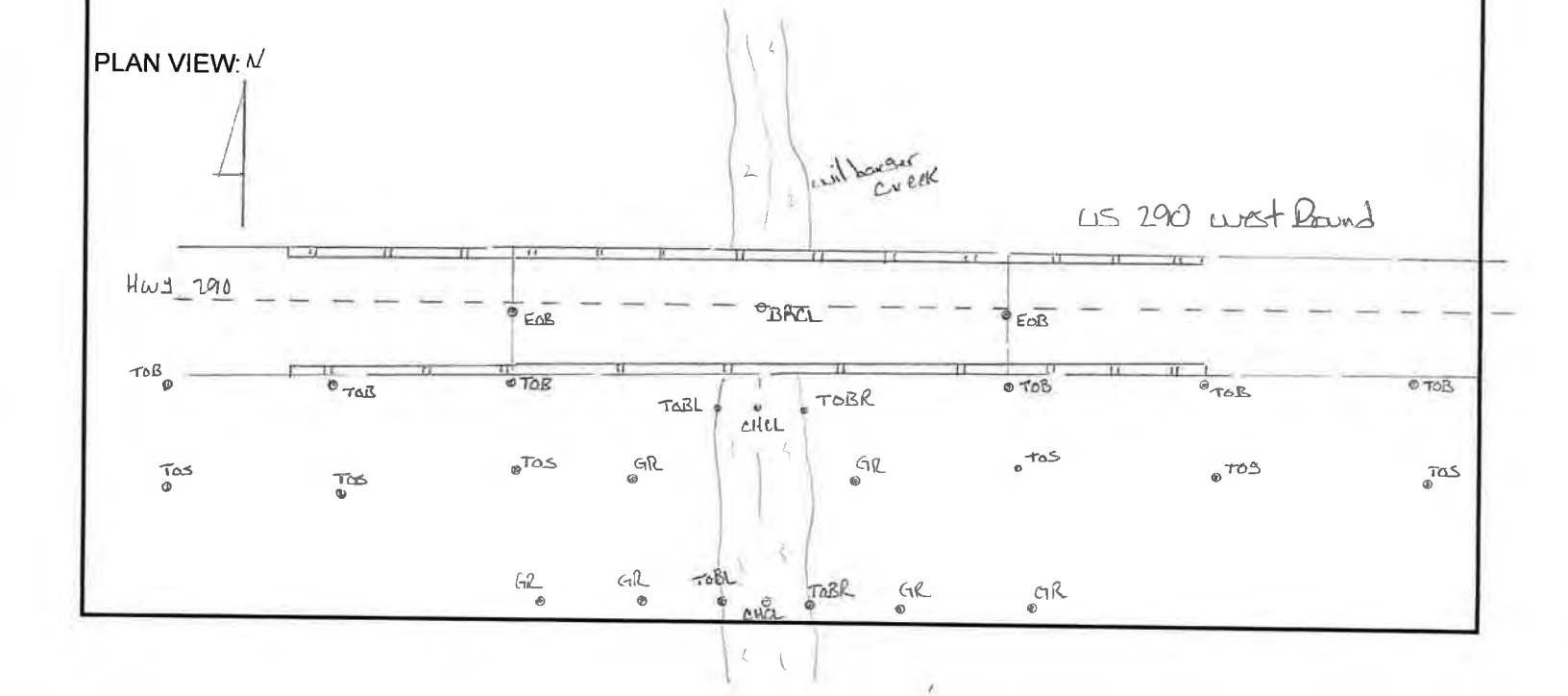


	Photo ID: Coordinates: Description:	WC_STR_12000_USFACE 30.349173, -97.549688 Upstream face
	Photo ID: Coordinates: Description:	WC_STR_12000_DSFACE 30.349173, -97.549688 Downstream face

Survey Field Sheet

PROJECT: Wilbarger — SURVEY NAME: WC_STR_12500

STREAM NAME: Wilbarger Creek — DATE: 11-21-19

LOCATION: Travis County — CREW: Adolfo Vargas / A. Ramirez

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 0.70 Deck: 0.20 Width: 10' Pier(s): 4 @ 8" Pier Shape: Wood Post Round

CULVERT: Number: X Shape: X Length: X Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: X Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

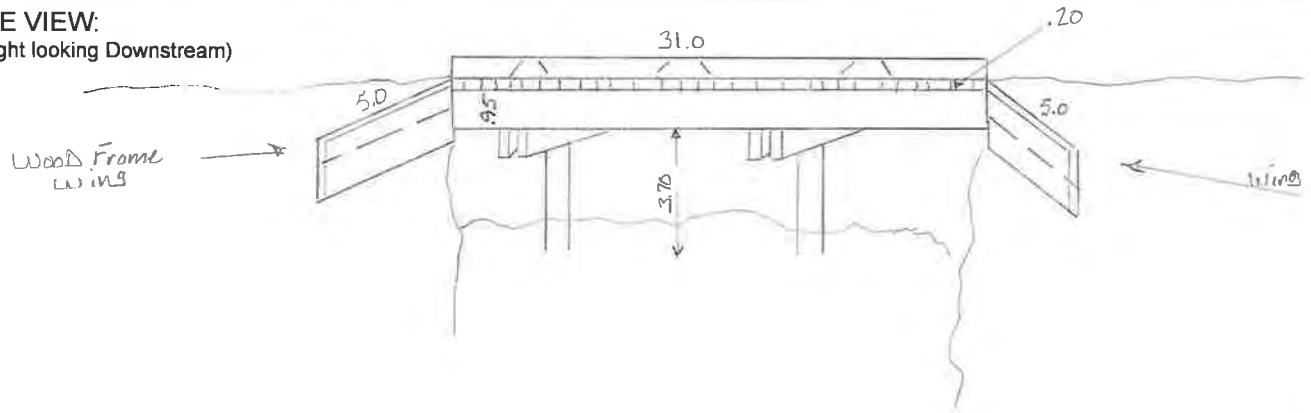
ERM Description: _____ Coordinate System: TX Central 4203

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: 5

File Name: 191121AV1 - 35837

PROFILE VIEW:
(Left to Right looking Downstream)



31.0 L

Shadow Glen Golf club

PLAN VIEW:

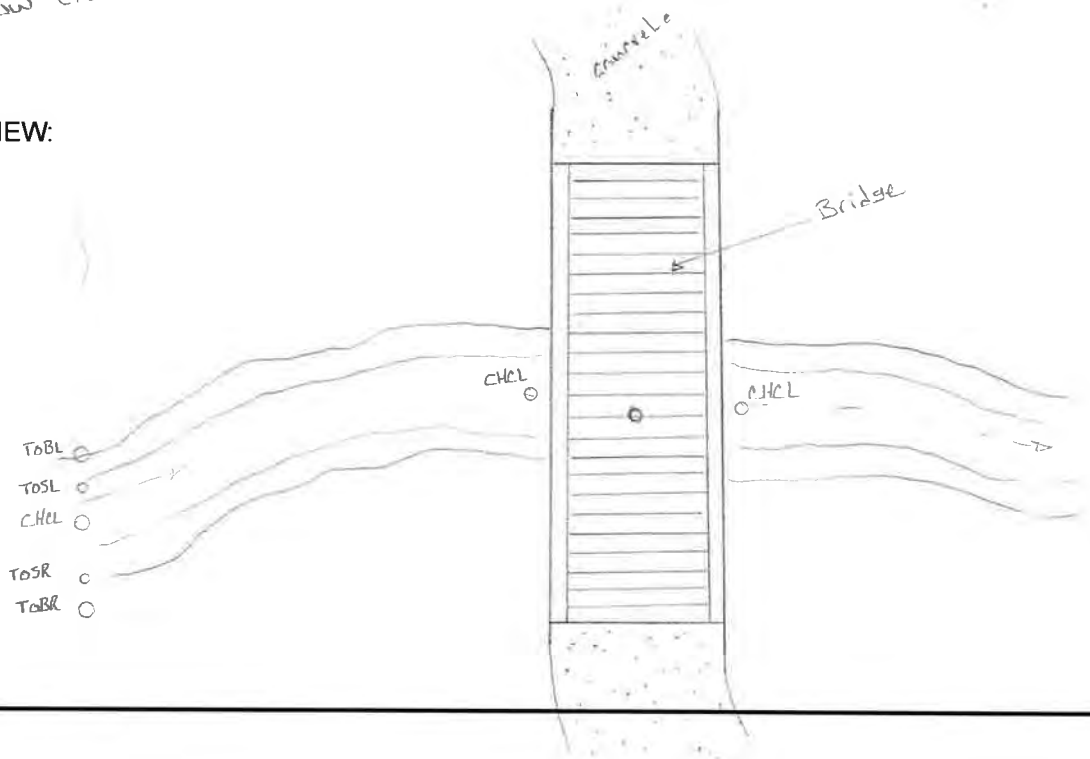


	Photo ID: Coordinates: Description:	WC_STR_12500_USFACE 30.354754, -97.555651 Upstream face
	Photo ID: Coordinates: Description:	WC_STR_12500_DSFACE 30.354754, -97.555651 Downstream face

Survey Field Sheet

PROJECT: w. Bouger | SURVEY NAME: WC_STR_13000

STREAM NAME: w. Bouger Creek | DATE: 11-21-19

LOCATION: Travis County | CREW: A. Vargas / A. Ramirez

TYPE: BR( ) CUL(X) DAM( ) XS( ) | ERM ELEV.: _____ | ERM ID: _____ | GEOID: _____

BRIDGE: Rail Height: 3.50 | Deck: X | Width: X | Pier(s): X | @ X | Pier Shape: X

CULVERT: Number: _____ | Shape: RCB | Length: 80' | Height: / | Width: / | Skew: _____

CULVERT: I/O Type: RCB | Material: Concrete | Wingwall Angle: 45°

DAM: Top Width: _____ | Side Slope | Side Slope | US: _____ | DS: _____ | Outlet: _____

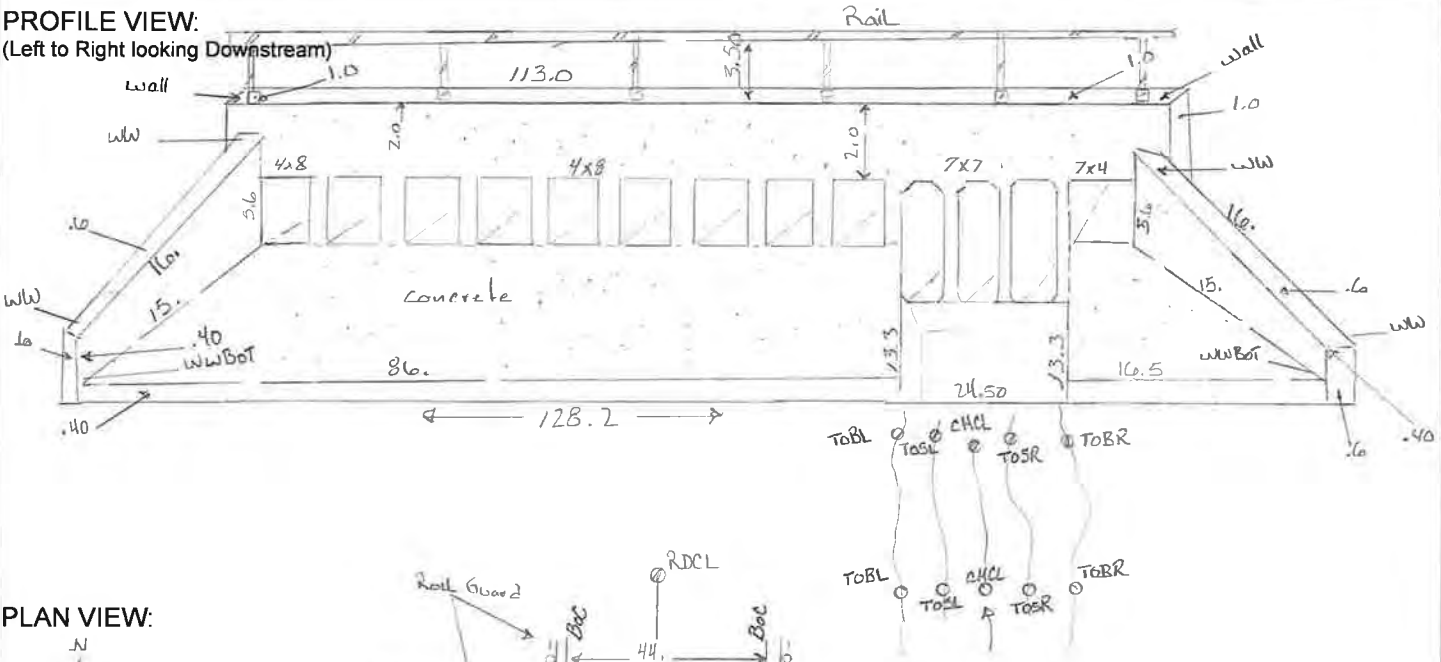
ERM Description: _____ | Coordinate System: TX central 4203

Photo Numbers: 7 | DSCH: _____ | DSFACE _____ | OTXS: _____ | USFACE _____ | USCH: _____

Additional Info: _____

File Name: 191121AV-35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

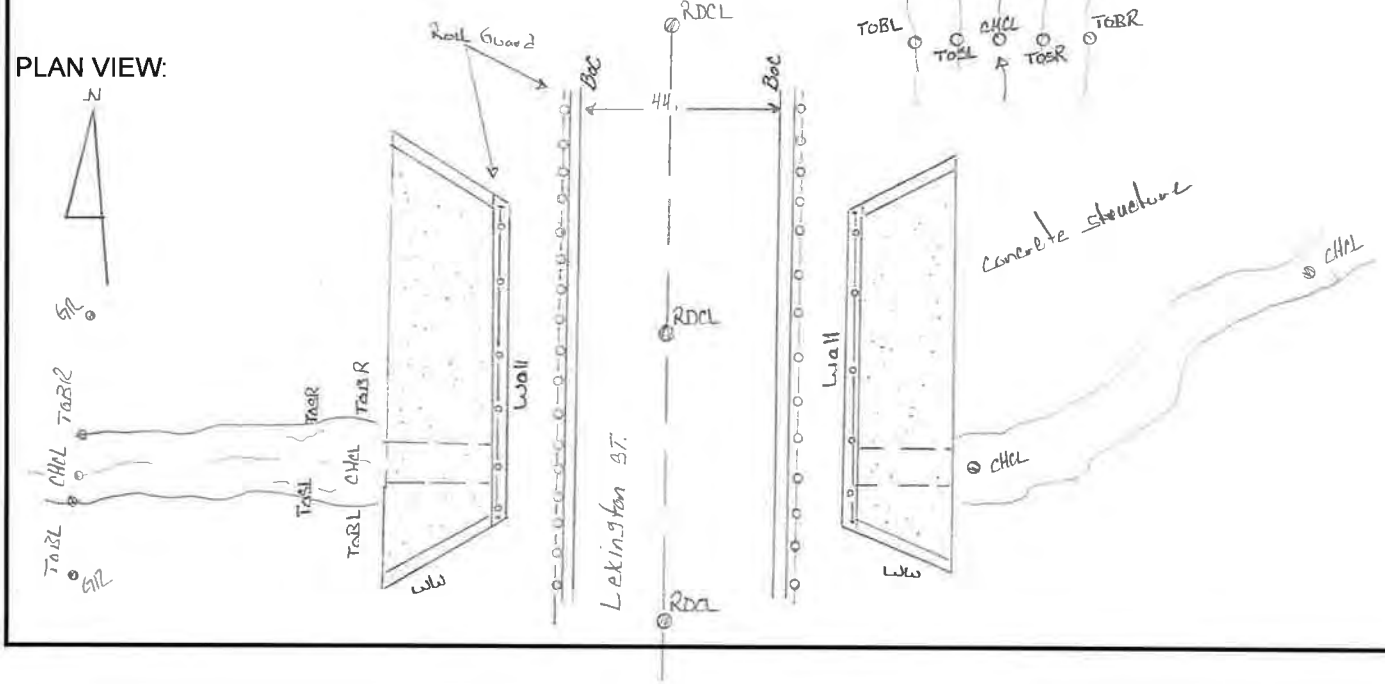


	Photo ID: Coordinates: Description:	WC_STR_13000_USFACE 30.354653, -97.555371 Upstream face
	Photo ID: Coordinates: Description:	WC_STR_13000_USFACE 30.354653, -97.555371 Upstream face

	Photo ID: Coordinates: Description:	WC_STR_13000_DSFACE 30.354653, -97.555371 Downstream face
	Photo ID: Coordinates: Description:	WC_STR_13000_DSFACE 30.354653, -97.555371 Downstream face

Survey Field Sheet

PROJECT: Wilbarger | SURVEY NAME: WC_STR_140010

STREAM NAME: Wilbarger creek | DATE: 11-20-19

LOCATION: Travis County | CREW: Adolfo Vargas / A. Ramirez

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 0.75 Deck: 0.20 Width: 10' Pier(s): 6 @ 8" Pier Shape: Wood Round

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

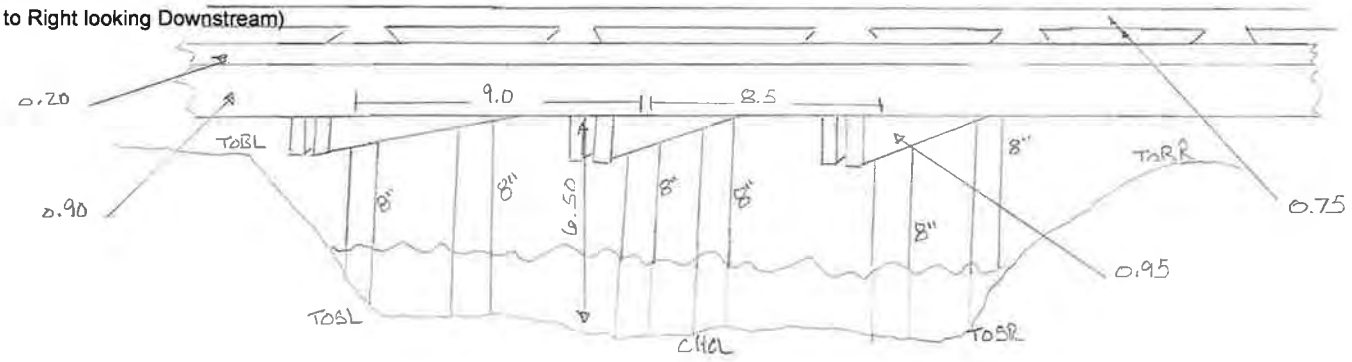
ERM Description: _____ Coordinate System: _____

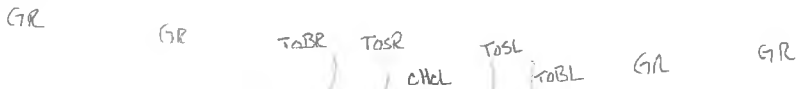
Photo Numbers: 5 DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)





PLAN VIEW:

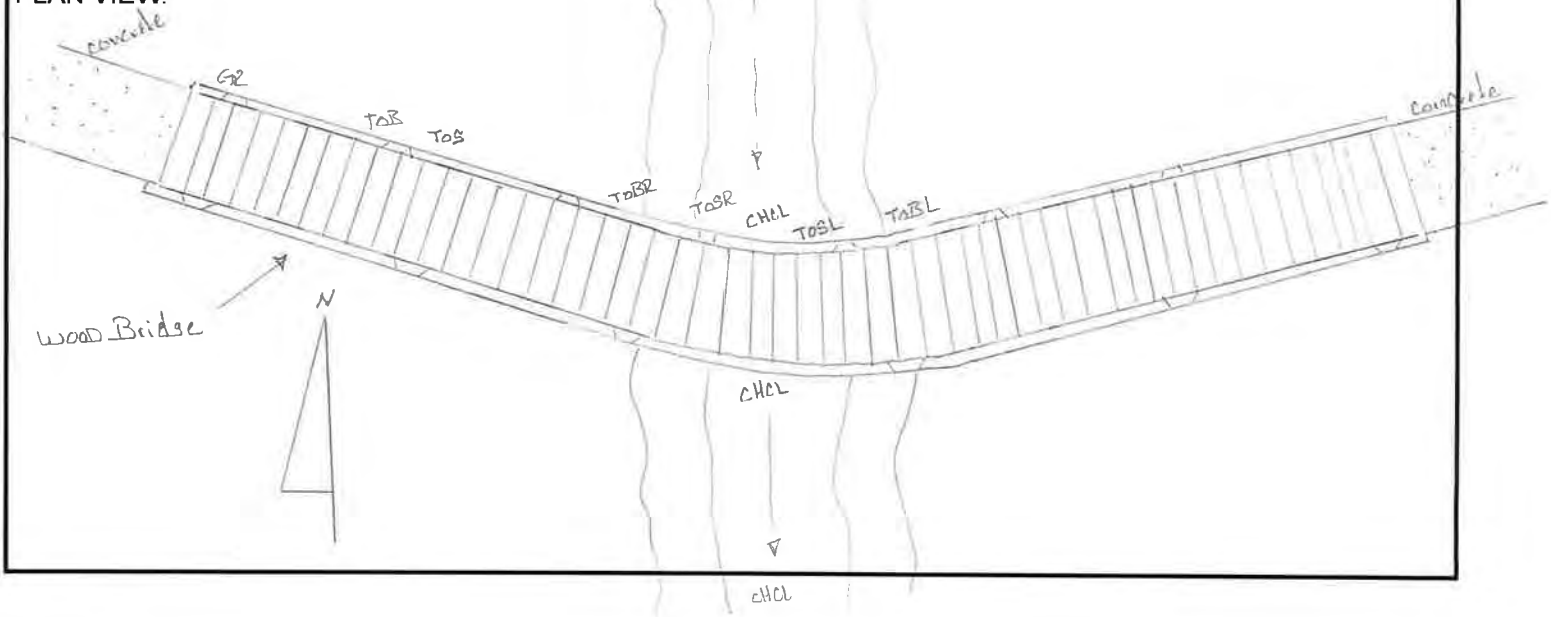


	Photo ID: Coordinates: Description:	WC_STR_14000_USFACE 30.362395, -97.553079 Upstream face
	Photo ID: Coordinates: Description:	WC_STR_14000_DSFACE 30.362395, -97.553079 Downstream face

Survey Field Sheet

PROJECT: Wilbarger | SURVEY NAME: WC_STR_15000

STREAM NAME: Wilbarger Creek | DATE: 11-20-19

LOCATION: Travis County | CREW: Adolfo Uribes / A. Ramirez

TYPE: BR( ) CUL(X) DAM( ) XS( ) | ERM ELEV.: _____ | ERM ID: _____ | GEOID: G12AUS

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: WC15003 Shape: Round Length: 31.5 Height: _____ Width: 64" Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

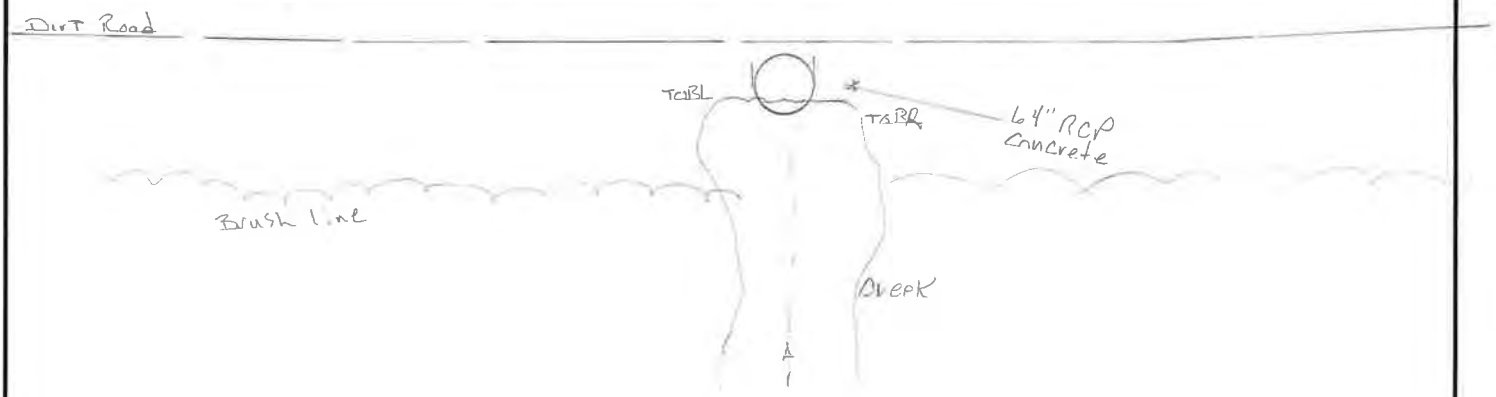
ERM Description: _____ Coordinate System: TX Central 4203

Photo Numbers: 6 DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

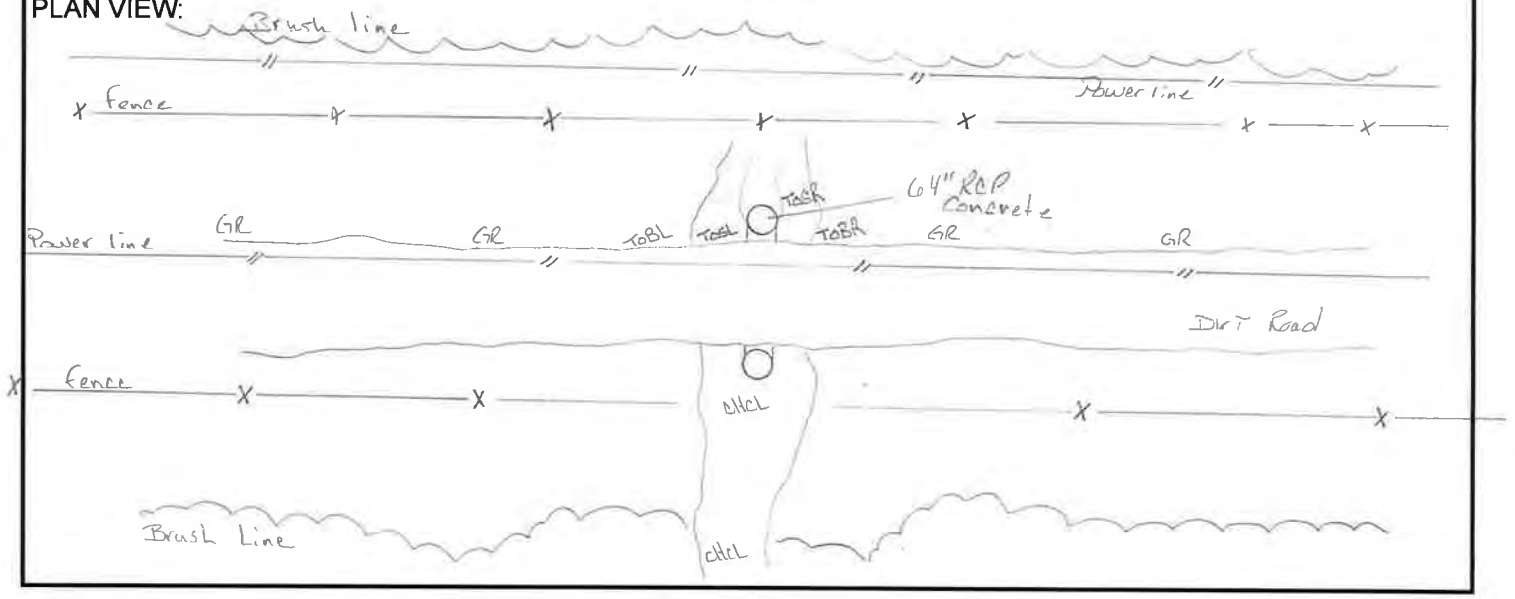


	Photo ID: Coordinates: Description:	WC_STR_15000_USFACE 30.362839, -97.552628 Upstream face
	Photo ID: Coordinates: Description:	WC_STR_15000_DSFACE 30.362839, -97.552628 Downstream face

Survey Field Sheet

PROJECT: Wilbarger | SURVEY NAME: WB_STR_16000

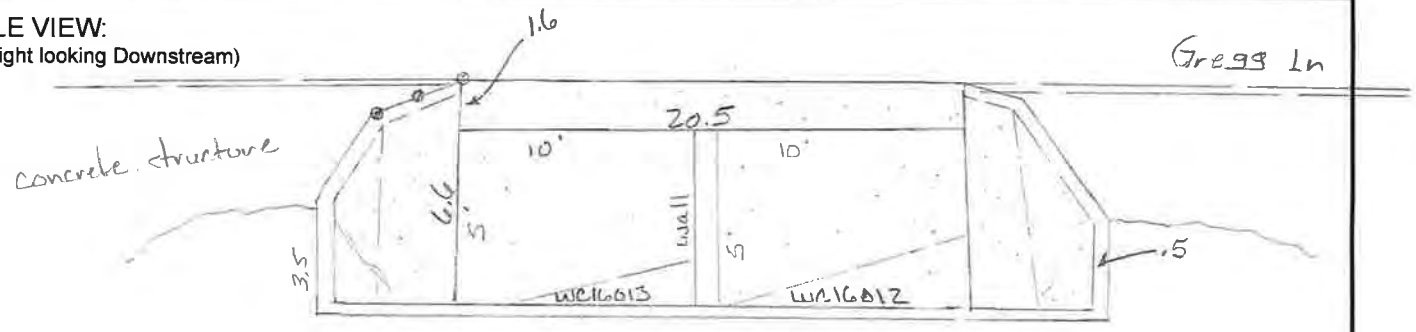
STREAM NAME: Wilbarger Creek | DATE: 11-19-19

LOCATION: Travis County | CREW: Adolfo Vargas / A. Ramirez

TYPE: BR( ) CUL(X) DAM( ) XS( ) | ERM ELEV.: | ERM ID: | GEOID: G12AUS

BRIDGE:	Rail Height:	X	Deck:	X	Width:		Pier(s):		@		Pier Shape:
CULVERT:	Number:		Shape:	RCB	Length:	24'	Height:	5'	Width:	10'	Skew:
CULVERT:	I/O Type:	RCB			Material:	Concrete	Wingwall Angle				
DAM:	Top Width:		Side Slope		Side Slope		US:		DS:		Outlet:
ERM Description:									Coordinate System:		
Photo Numbers:	5		DSCH:	✓	DSFACE	✓	OTXS:	✓	USFACE	✓	USCH: ✓
Additional Info:											
File Name:	191119AV1 - 35837										

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

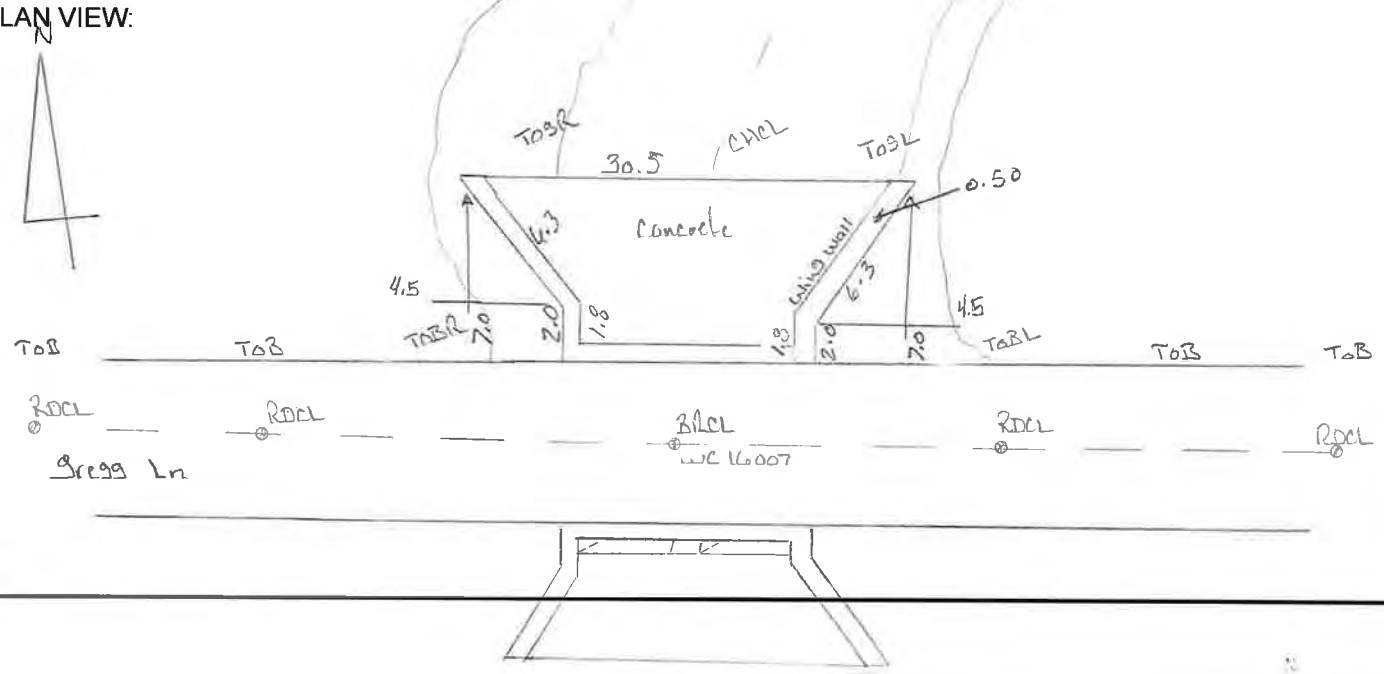


	Photo ID: Coordinates: Description:	WC_STR_16000_USFACE 30.381404, -97.540751 Upstream face
	Photo ID: Coordinates: Description:	WC_STR_16000_DSFACE 30.381404, -97.540751 Downstream face

Survey Field Sheet

PROJECT: Wilbarger | SURVEY NAME: WC-STR_17000

STREAM NAME: Wilbarger Creek | DATE: 11-18-19

LOCATION: Pflugerville TX | CREW: Adlfo Vargas / A. Romero

TYPE: BR(X) CUL( ) DAM( ) XS( ) | ERM ELEV.: _____ | ERM ID: _____ | GEOID: G12AUS

BRIDGE:	Rail Height:	2.30	Deck:	.60	Width:	30'	Pier(s):	2	@	18"	Pier Shape: Round
CULVERT:	Number:		Shape:		Length:		Height:		Width:		Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle				
DAM:	Top Width:		Side Slope		Side Slope		US:		DS:		Outlet:

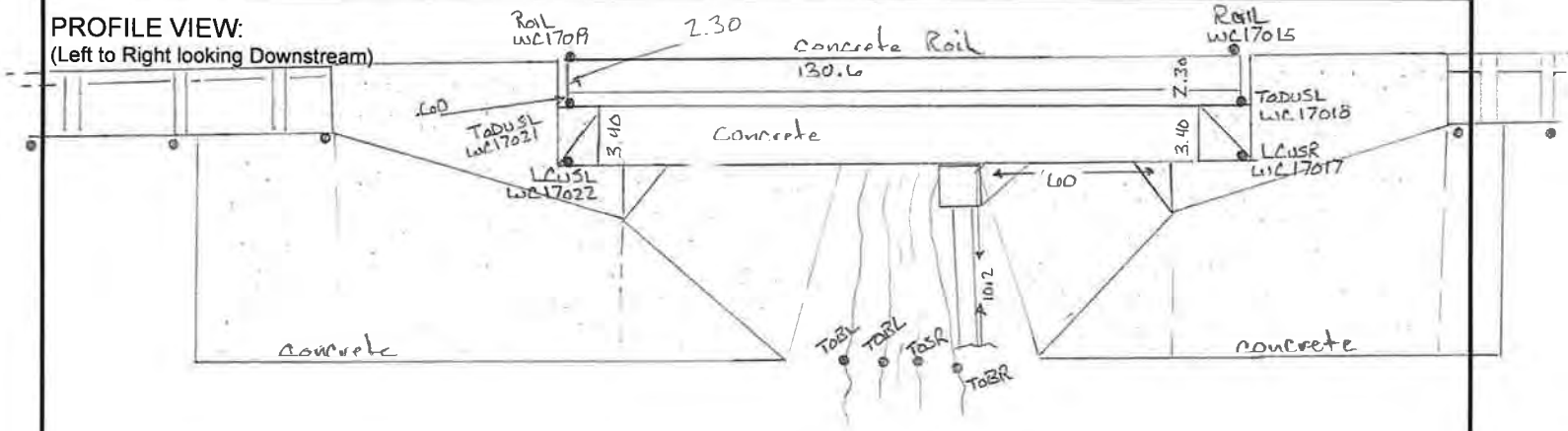
ERM Description: _____ | Coordinate System: TX Central 4203

Photo Numbers: 7 | DSCH: ✓ | DSFACE ✓ | OTXS: ✓ | USFACE ✓ | USCH: ✓

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

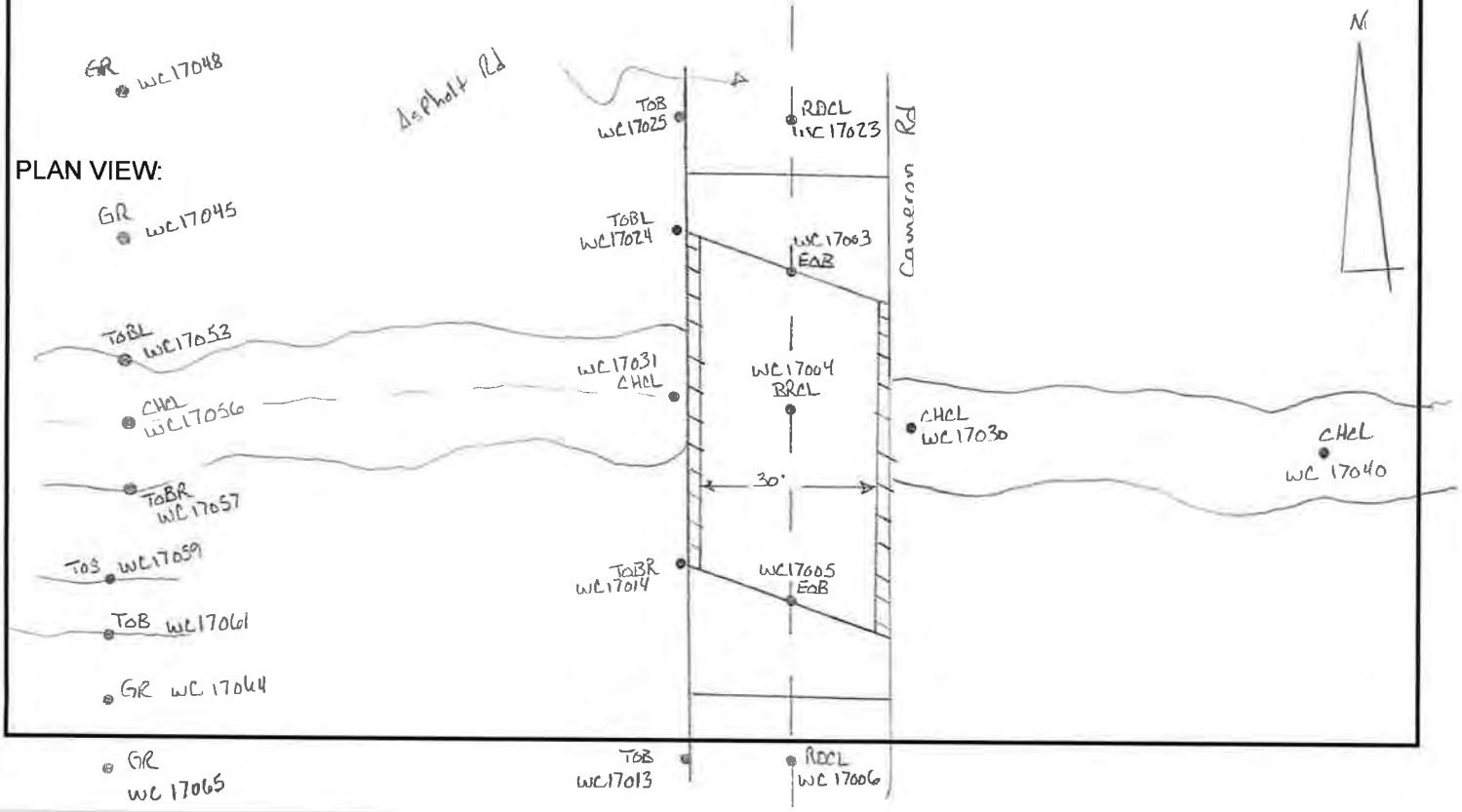


	Photo ID: Coordinates: Description:	WC_STR_17000_USFACE 30.40438, -97.543354 Upstream face
	Photo ID: Coordinates: Description:	WC_STR_17000_USFACE 30.40438, -97.543354 Upstream face

	Photo ID: Coordinates: Description:	WC_STR_17000_DSFACE 30.40438, -97.543354 Downstream face
	Photo ID: Coordinates: Description:	WC_STR_17000_DSFACE 30.40438, -97.543354 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY PUILLE SURVEY NAME: WC_STR_18000

STREAM NAME: UNKNOWN DATE: 6/27/2019

LOCATION: WEISS LN. 2.0 MILES N. OF PFLUGERVILLE PKWY CREW: J. DODD & C. LAMB

TYPE: BR(✓) CUL( ) DAM( ) XS( ) ERM ELEV.: 614.828 ERM ID: WC_STR_18000 GEOID: 12A

BRIDGE: Rail Height: 3.75 Deck: CONC. Width: 50° Pier(s): N/A @ N/A Pier Shape: N/A

CULVERT: Number: N/A Shape: N/A Length: N/A Height: N/A Width: N/A Skew: N/A

CULVERT: I/O Type: Material: Wingwall Angle

DAM: N/A Top Width: Side Slope Side Slope US: DS: Outlet:

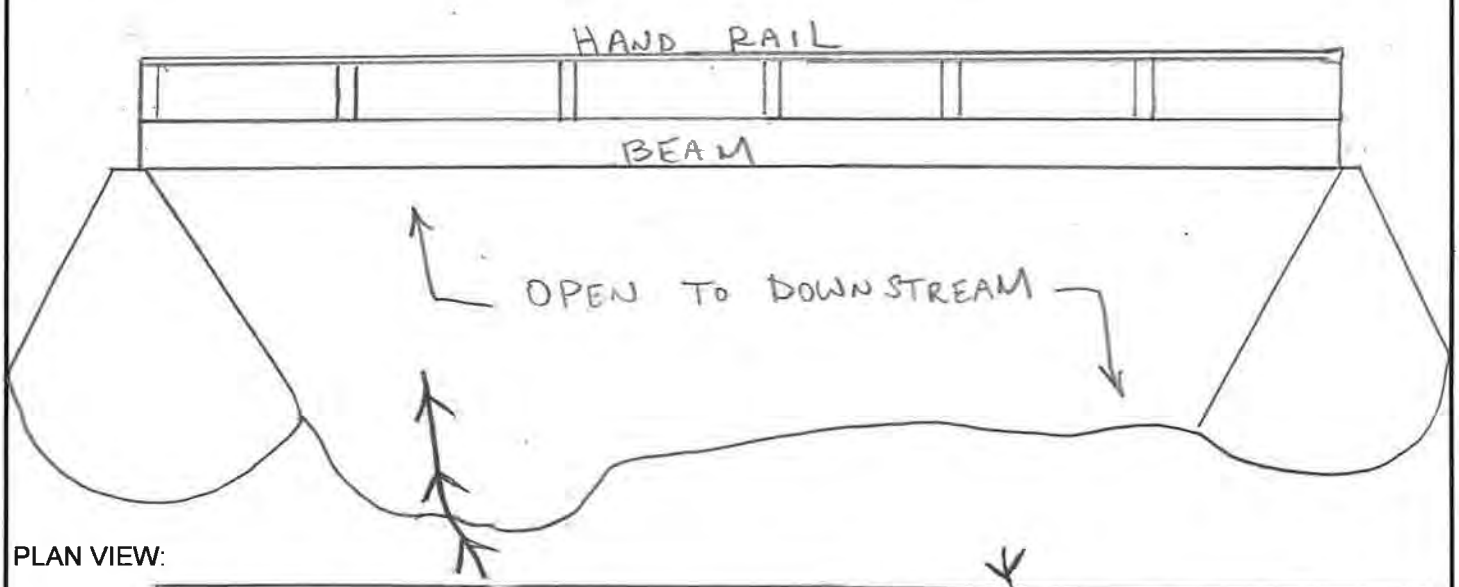
ERM Description: PK NAIL SET IN ASPHALT @ NW CNR OF BRIDGE Coordinate System: TX CENTRAL 4203

Photo Numbers: DSCH: ✓ DSFACE ✓ OTXS: ✓ USFACE ✓ USCH: ✓

Additional Info:

File Name: 190628JD - 35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

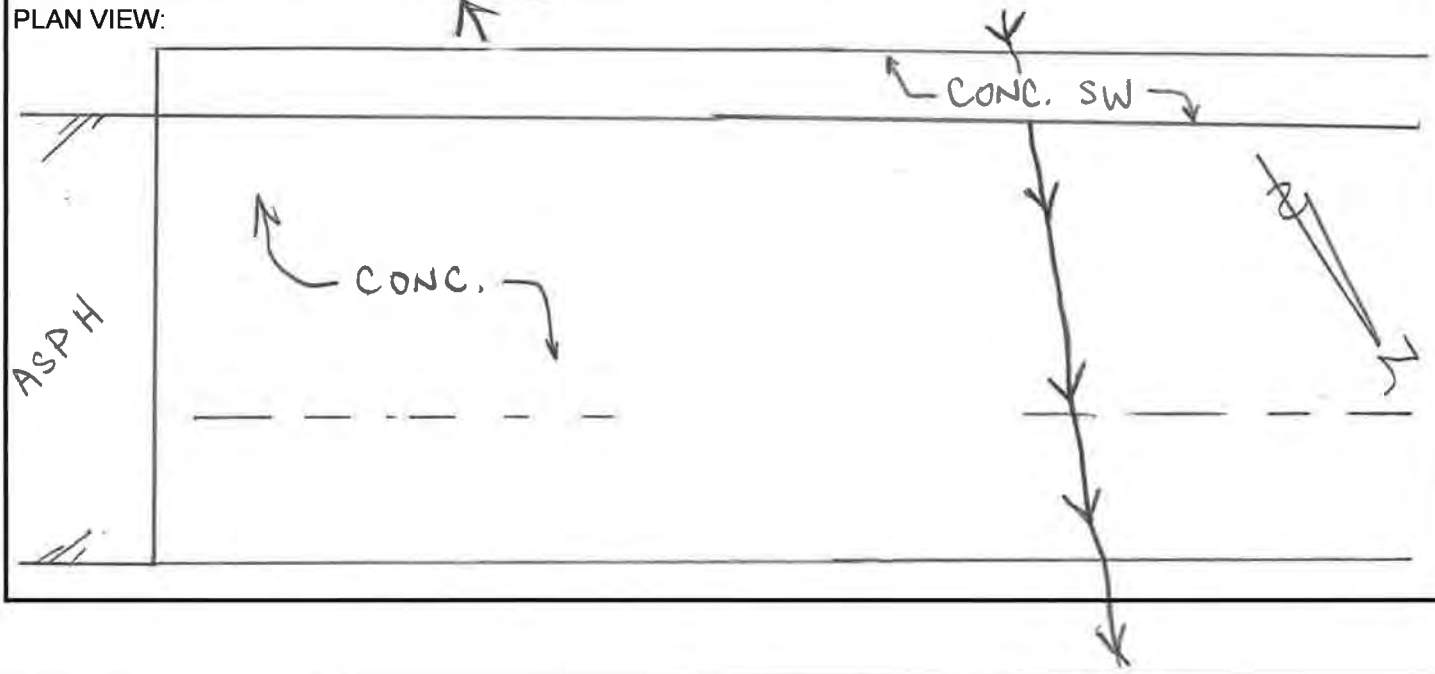


	Photo ID: Coordinates: Description:	WC_STR_18000_USFACE 30.42531, -97.575708 Upstream face
	Photo ID: Coordinates: Description:	WC_STR_18000_DSFACE 30.42531, -97.575708 Downstream face

Survey Field Sheet

PROJECT: WILBARGER CREEK STUDY SURVEY NAME: WC_STR_19000

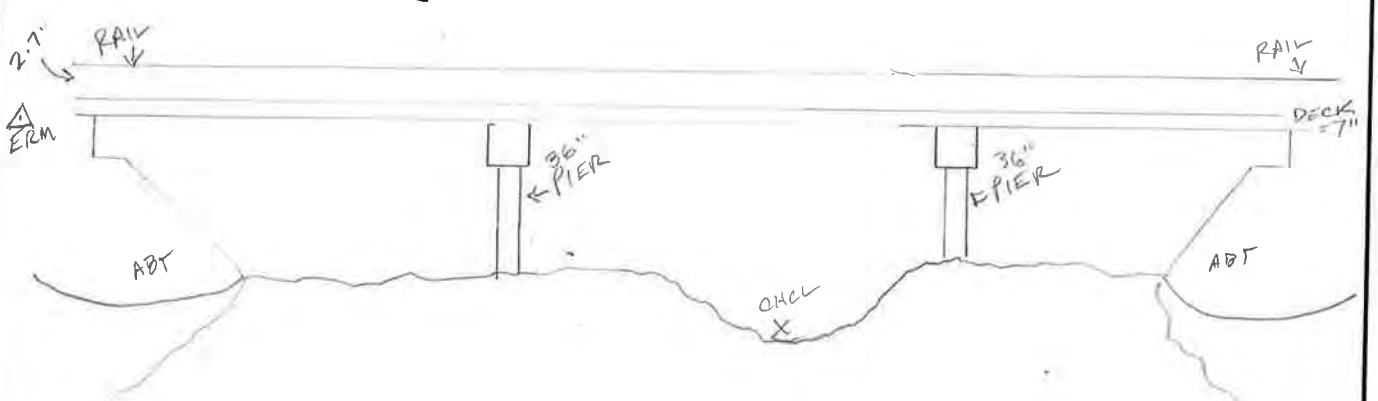
STREAM NAME: DATE: 7-1-19

LOCATION: PFLUGERVILLE, TX SH-130 FRONTAGE CREW: HEATER, JOHNSON

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: 637.19 ERM ID: WC19001 GEOID: 12A

BRIDGE:	Rail Height:	2.7"	Deck:	7"	Width:	33.4'	Pier(s):	6	@	36"	Pier Shape: ROUND
CULVERT:	Number:		Shape:		Length:		Height:		Width:		Skew:
CULVERT:	I/O Type:				Material:				Wingwall Angle		
DAM:	Top Width:		Side Slope		Side Slope		US:		DS:		Outlet:
ERM Description:		MAG NAIL IN ASPH.							Coordinate System:		TX-C 4203
Photo Numbers:			DSCH:		DSFACE		OTXS:		USFACE		USCH:
Additional Info:											
File Name:		190701SH_35837									

PROFILE VIEW:
(Left to Right looking Downstream) ← Z



PLAN VIEW:

	Photo ID: Coordinates: Description:	WC_STR_19000_USFACE 30.429149, -97.588644 Upstream face
	Photo ID: Coordinates: Description:	WC_STR_19000_USFACE1 30.429149, -97.588644 Upstream face

	Photo ID: Coordinates: Description:	WC_STR_19000_DSFACE 30.429149, -97.588644 Downstream face
	Photo ID: Coordinates: Description:	WC_STR_19000_DSFACE1 30.429149, -97.588644 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_STR_20000

STREAM NAME: WILBARGER CREEK DATE: 7/3/19

LOCATION: PFLUGERVILLE, Tx CREW: JJ JD

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: 637.728 ERM ID: 20001 GEOID: 12A

BRIDGE: Rail Height: 3.55 Deck: 359.64 Width: _____ Pier(s): 2 @ 36" Pier Shape: Cylinder

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

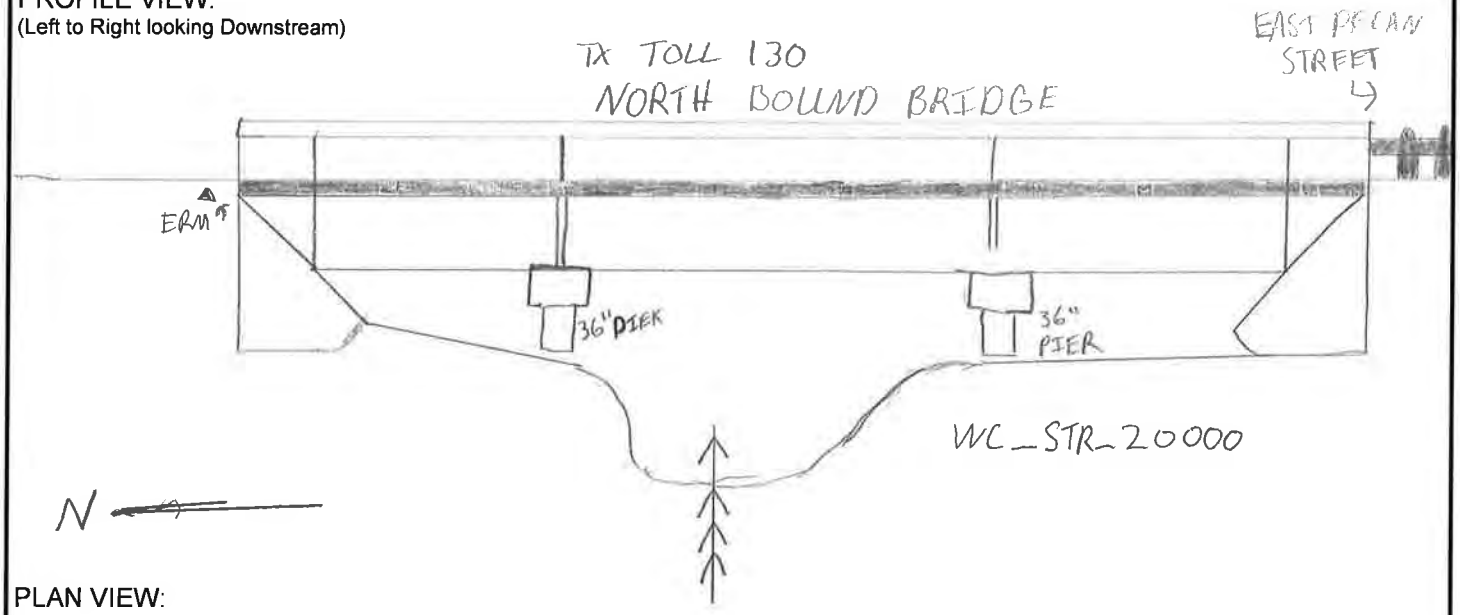
ERM Description: 1/2" SIRC4 Coordinate System: TX-C 4203

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: 190703JJ-35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

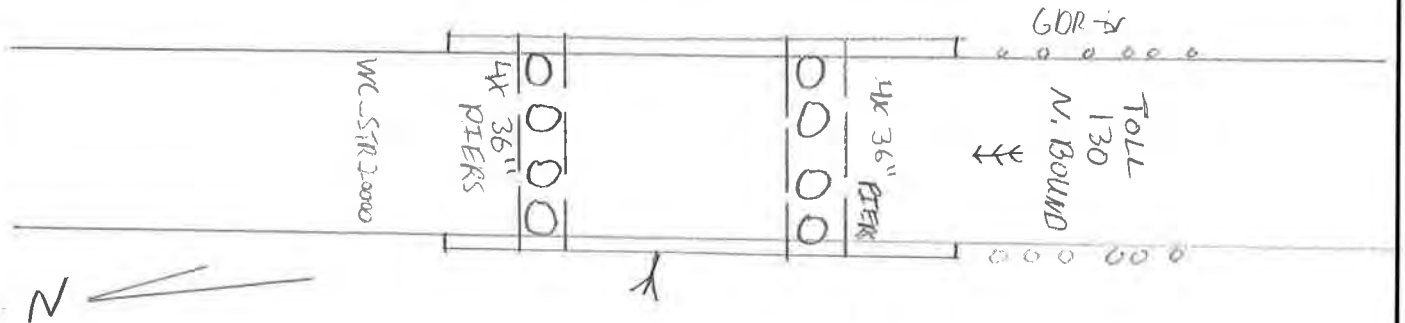


	Photo ID: Coordinates: Description:	WC_STR_20000_USFACE 30.429297, -97.589152 Upstream face
	Photo ID: Coordinates: Description:	WC_STR_20000_DSFACE 30.429297, -97.589152 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_STR_21000

STREAM NAME: WILBARGER CREEK DATE: 7-3-2019

LOCATION: TX 130 Pflugerville, Tx CREW: JD JJ

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: 638.536 ERM ID: WC21001 GEOID: 12A

BRIDGE: Rail Height: 3.24' Deck: 359.49 Width: _____ Pier(s): 2 @ 36" Pier Shape: CYLINDER

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

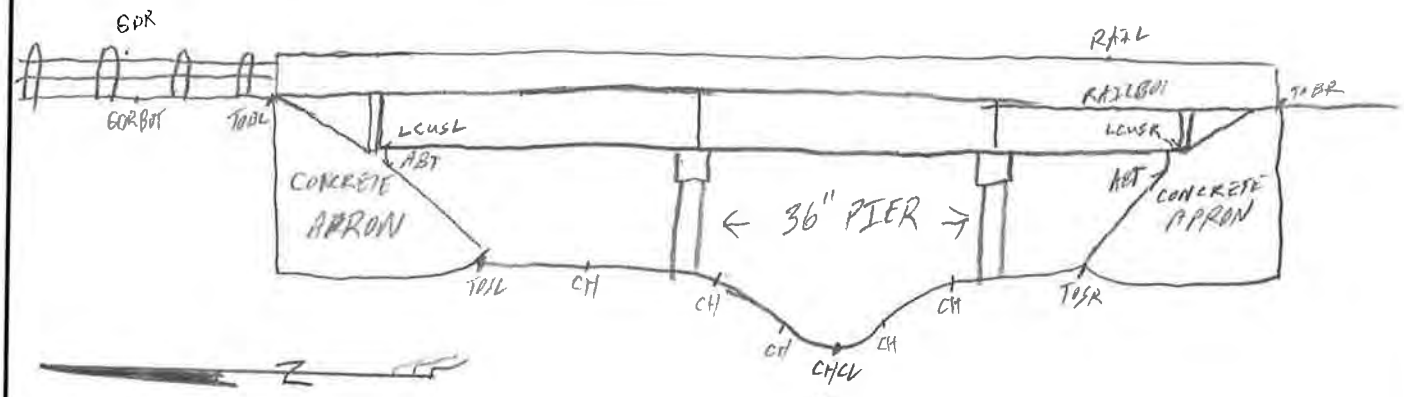
ERM Description: 1/2" Iron Rod W/HALFF TRAV Coordinate System: Tx C

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: 190703JD_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

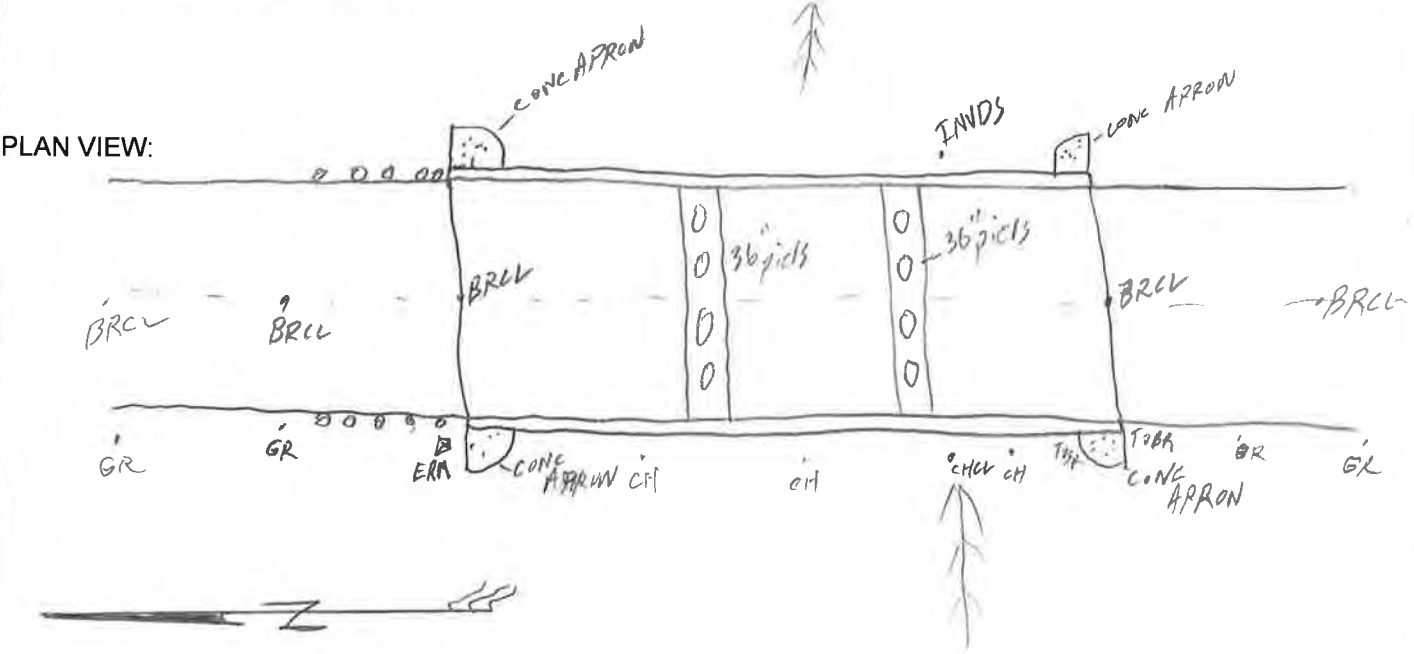


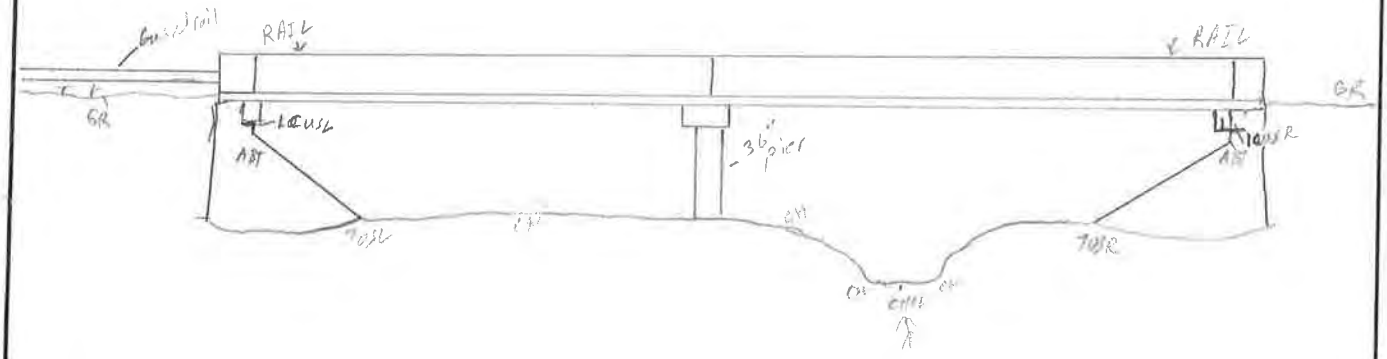
	Photo ID: Coordinates: Description:	WC_STR_21000_USFACE 30.429283, -97.589775 Upstream face
	Photo ID: Coordinates: Description:	WC_STR_21000_DSFACE 30.429283, -97.589775 Downstream face

Survey Field Sheet

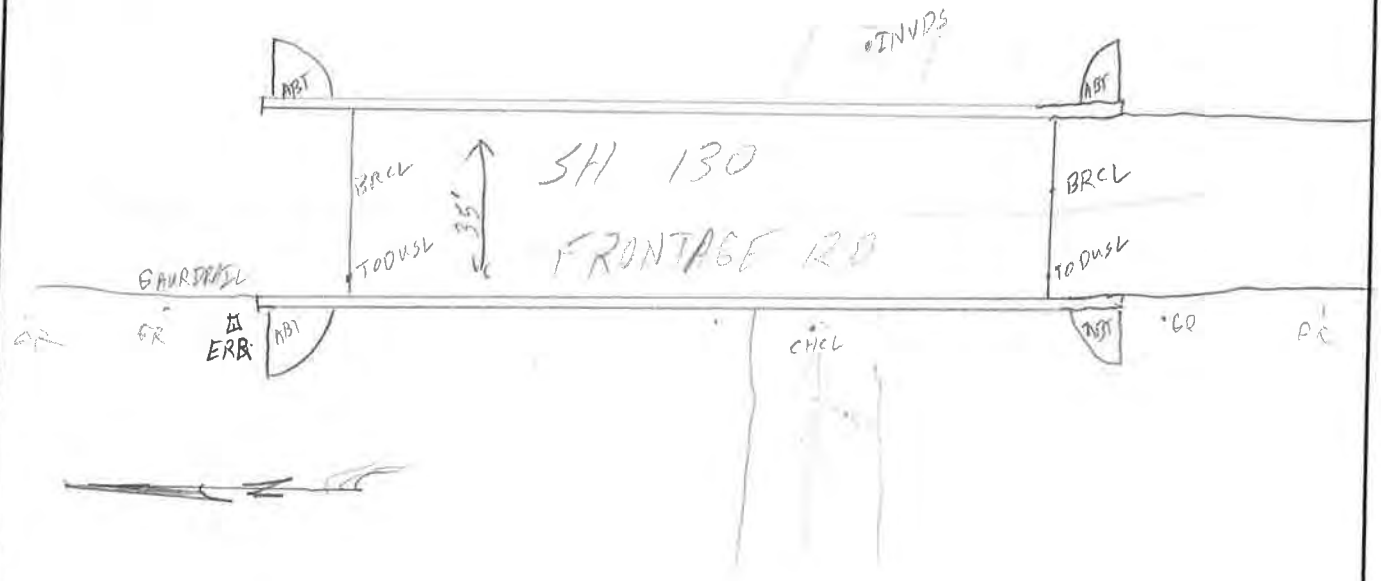
PROJECT: FEMA Flood Study
SURVEY NAME: WC_STR_22000
STREAM NAME: WILBARGER CREEK
DATE: 7-8-2019
LOCATION: SH 130 Pflugerville
CREW: JJ, CT
TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: 636.48FT ERM ID: WC22001 GEOID: 12A

BRIDGE: Rail Height: 3.05 FT Deck: 239.22 FT Width: 35FT Pier(s): 1 @ 36" Pier Shape: CYLINDER
CULVERT: Number: Shape: Length: Height: Width: Skew:
CULVERT: I/O Type: Material: Wingwall Angle
DAM: Top Width: Side Slope Side Slope US: DS: Outlet:
ERM Description: 1/2" IR W/ HALF TRAV Coordinate System: TxC
Photo Numbers: DSCH: DSFACE OTXS: USFACE USCH:
Additional Info:
File Name: 190708JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:



GR GR TOBL TOSL CHCL TOSR TOBR CR

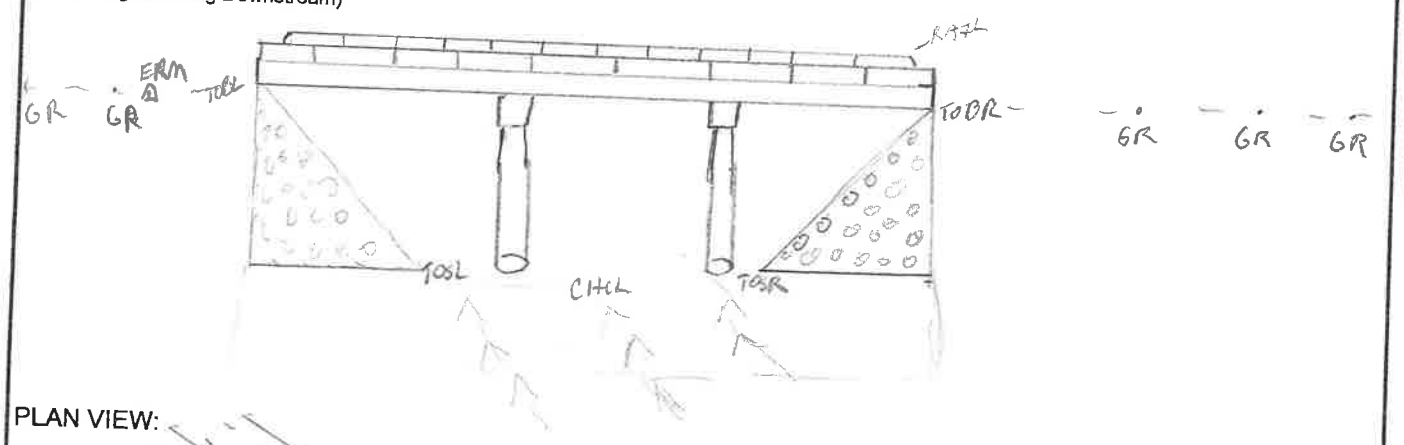
	Photo ID: Coordinates: Description:	WC_STR_22000_USFACE 30.429268, -97.590362 Upstream face
	Photo ID: Coordinates: Description:	WC_STR_22000_DSFACE 30.429268, -97.590362 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY
SURVEY NAME: WC_STR_23000
STREAM NAME: WILBARGER CREEK
DATE: 7/16/19
LOCATION: PFLUGERVILLE, TX
CREW: JJ, CT
TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: 684,626 ERM ID: WC23001 GEOID: 12A

BRIDGE: Rail Height: 3.47 Deck: 149.68 Width: 88.537 Pier(s): 2 @ 36" Pier Shape: CYLINDER
CULVERT: Number: Shape: Length: Height: Width: Skew:
CULVERT: I/O Type: Material: Wingwall Angle
DAM: Top Width: Side Slope Side Slope US: DS: Outlet:
ERM Description: 1/2" IR W/ HALFF TRAV CAP Coordinate System: TX-C
Photo Numbers: DSCH: 4 DSFACE 5 OTXS: 1 USFACE 3 USCH: 2
Additional Info:
File Name: 190716JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

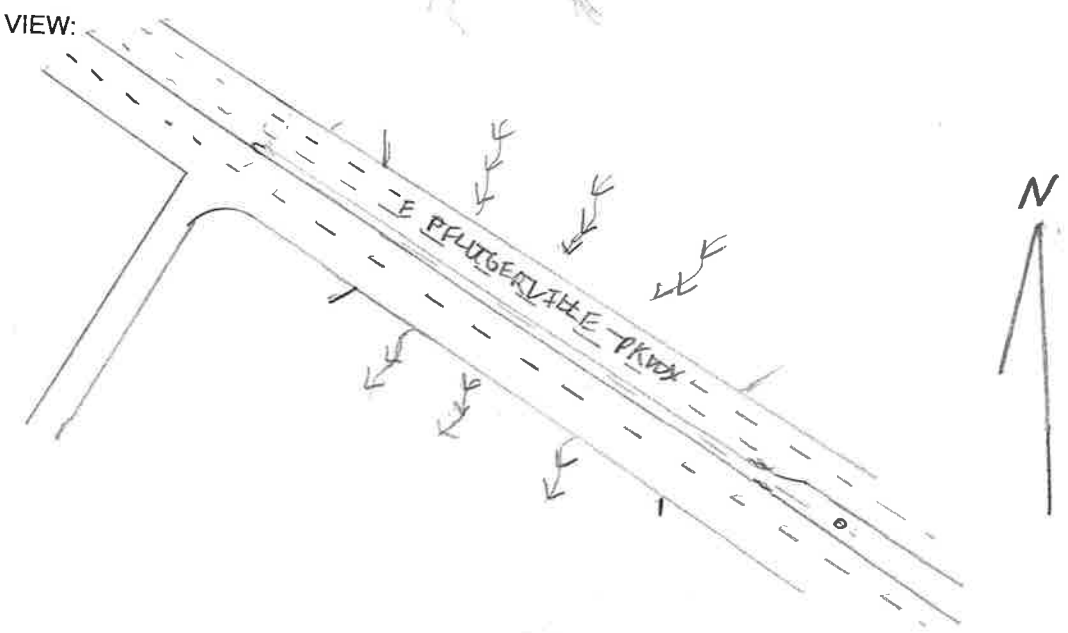


	Photo ID: Coordinates: Description:	WC_STR_23000_USFACE 30.455353, -97.600993 Upstream face Concrete drop structure in front of the bridge
	Photo ID: Coordinates: Description:	WC_STR_23000_DSFACE 30.455353, -97.600993 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_STR_24000

STREAM NAME: WILBARGER CREEK DATE: 7-17-2019

LOCATION: FM 685 & PFLUGERVILLE PKWY CREW: JJ CT

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: 686.563 ERM ID: WC24001 GEOID: 12A

BRIDGE: Rail Height: 3.585' Deck: 99.535' Width: 87.843' Pier(s): 1 @ _____ Pier Shape: Cylinder

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope _____ Side Slope _____ US: _____ DS: _____ Outlet: _____

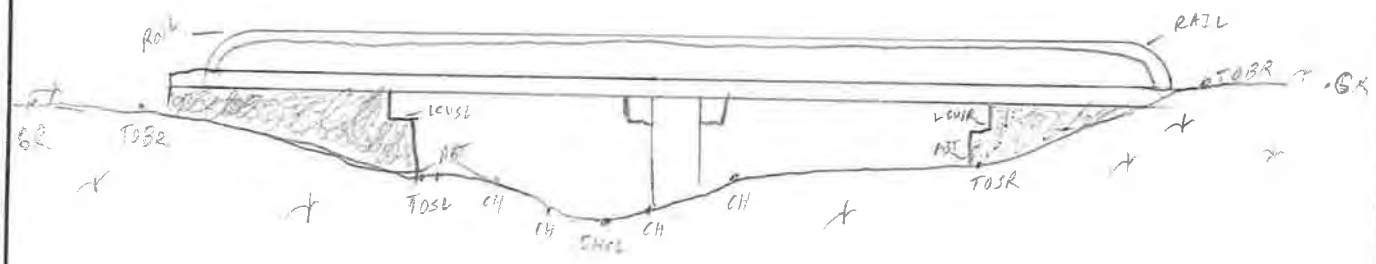
ERM Description: MAG NAIL IN CONCRETE Coordinate System: Tx C

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: 190717JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

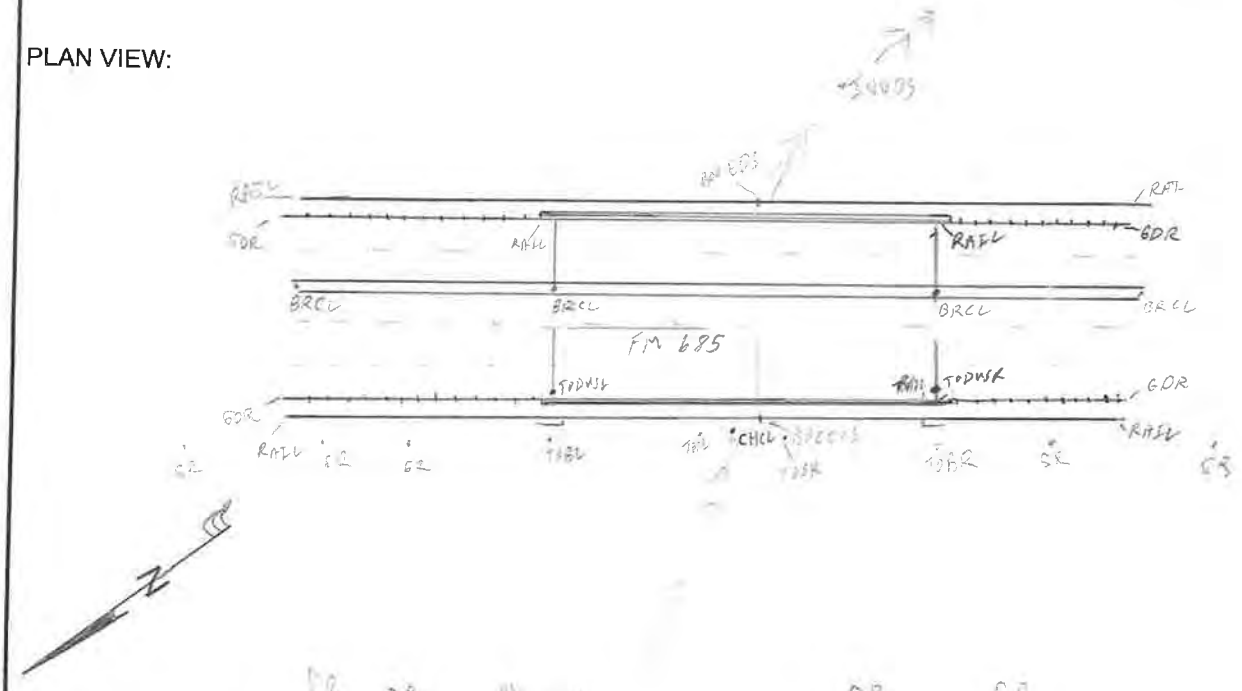


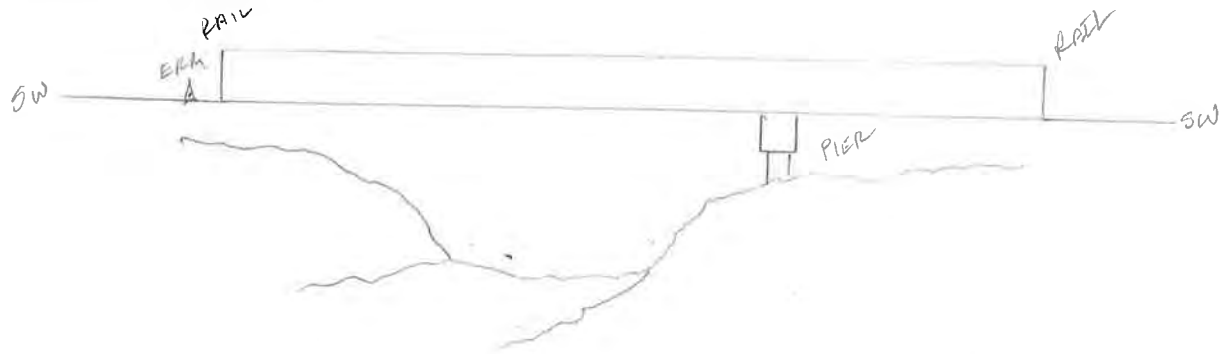
	Photo ID: Coordinates: Description:	WC_STR_24000_USFACE 30.457182, -97.601303 Upstream face
	Photo ID: Coordinates: Description:	WC_STR_24000_DSFACE 30.457182, -97.601303 Downstream face

Survey Field Sheet

PROJECT: WILBARGER CREEK STUDY
SURVEY NAME: WC_STR_25000
STREAM NAME:
DATE: 6-26-19
LOCATION: PFLUGER FARM LN
CREW: HEATER, JOHNSON
TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: 704.88 ERM ID: WC25001 GEOID: 12B

BRIDGE: Rail Height: 2.6' Deck: 1.1' Width: Pier(s): 5 @ 36" Pier Shape: ROUND
CULVERT: Number: Shape: Length: Height: Width: Skew:
CULVERT: I/O Type: Material: Wingwall Angle
DAM: Top Width: Side Slope Side Slope US: DS: Outlet:
ERM Description: "X" ON CONC Coordinate System: TX-C 4203
Photo Numbers: DSCH: DSFACE OTXS: USFACE USCH:
Additional Info:
File Name: 190626SH_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

PFLUGER FARM LN

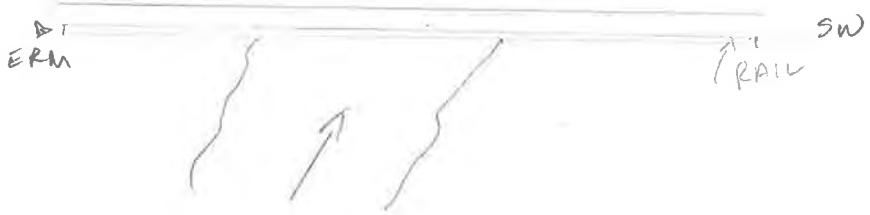


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	Photo ID: Coordinates: Description:	WC_STR_25000_USFACE1 30.458612, -97.610305 Upstream face

	Photo ID: Coordinates: Description:	WC_STR_25000_DSFACE 30.458612, -97.610305 Downstream face

Survey Field Sheet

PROJECT: WillBarger | SURVEY NAME: WC STR 260000

STREAM NAME: WILL Barger Creek | DATE: 11-15-19

LOCATION: Pflugerville, TX | CREW: Mcallen Crew / Adolfo Vargas / A. Ramirez

TYPE: BR(✓) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: G12 AUS

BRIDGE: Rail Height: 3.55 Deck: .67 Width: 48.0 Pier(s): X @ _____ Pier Shape: _____

CULVERT: Number: 5 Shape: arches Length: _____ Height: 10' Width: 25' Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope _____ Side Slope _____ US: _____ DS: _____ Outlet: _____

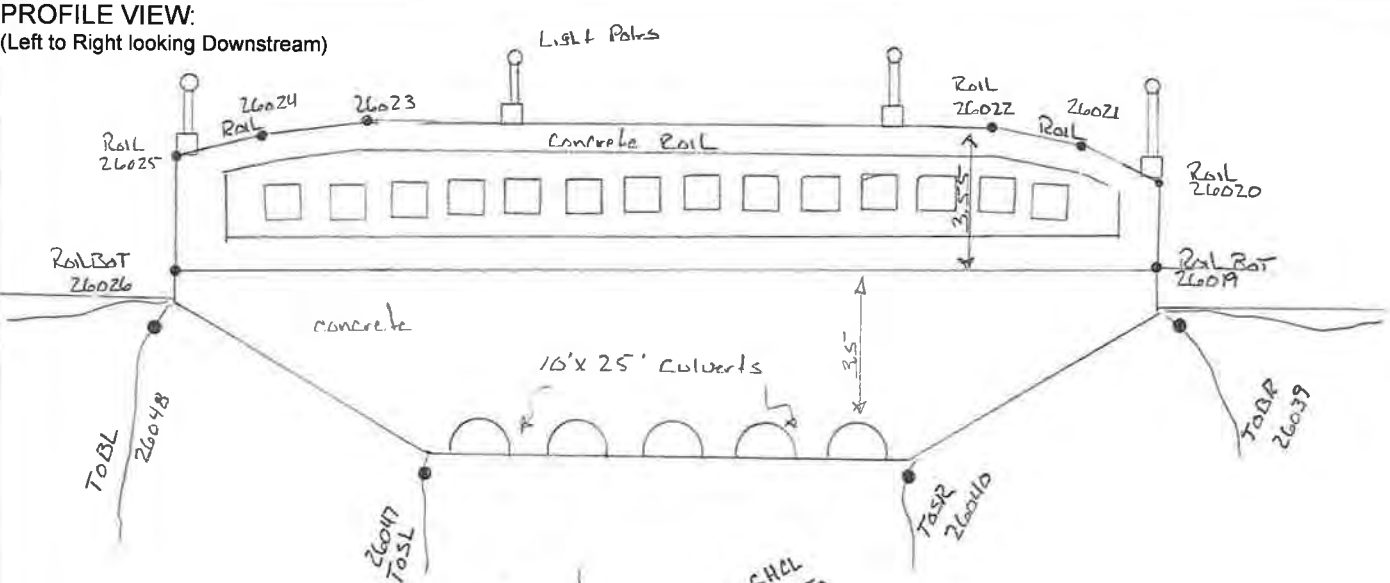
ERM Description: _____ Coordinate System: TX Central 4203

Photo Numbers: 7 DSCH: / DSFACE / OTXS: / USFACE / USCH: /

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

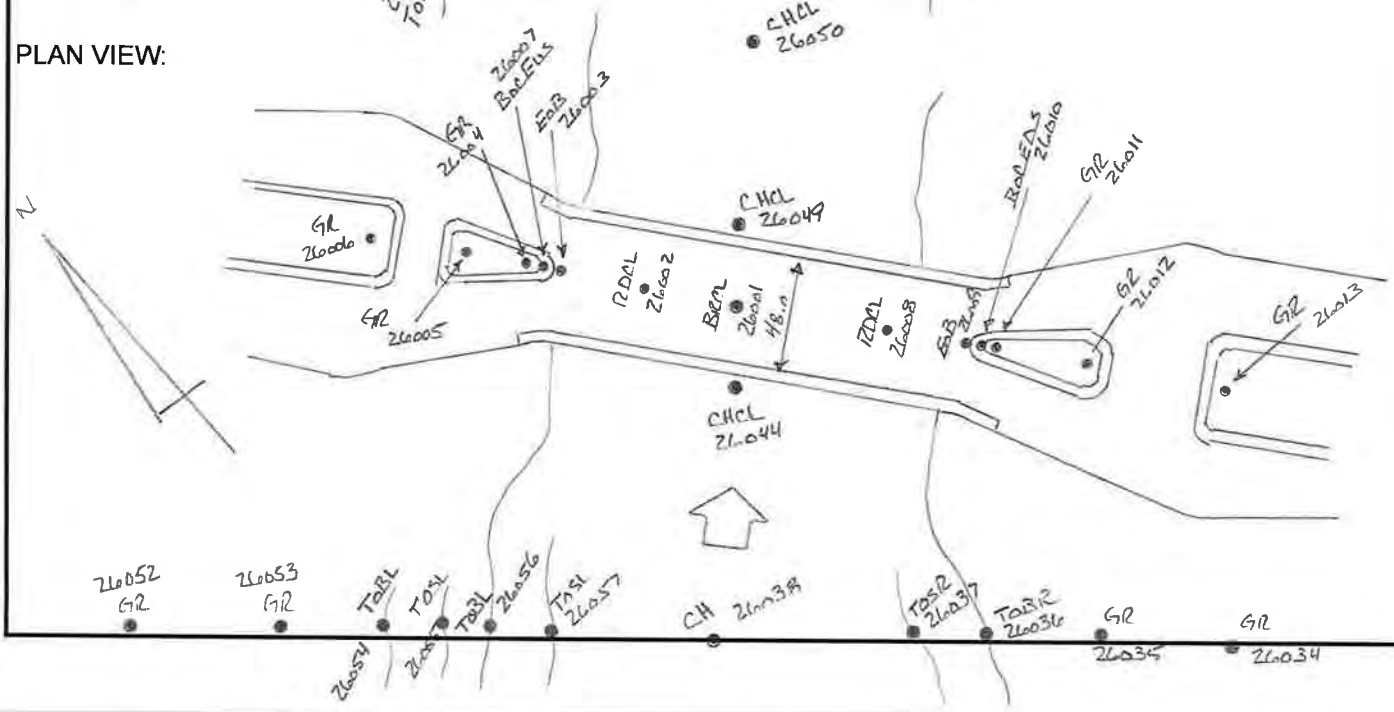


	Photo ID: Coordinates: Description:	WC_STR_26000_USFACE 30.461212, -97.614751 Upstream face
	Photo ID: Coordinates: Description:	WC_STR_26000_USFACE-2 30.461212, -97.614751 Upstream face

	Photo ID: Coordinates: Description:	WC_STR_26000_DSFACE 30.461212, -97.614751 Downstream face
	Photo ID: Coordinates: Description:	WC_STR_26000_DSFACE-2 30.461212, -97.614751 Downstream face

Survey Field Sheet

PROJECT: WILBARGER CREEK STUDY SURVEY NAME: WC_STR-27000

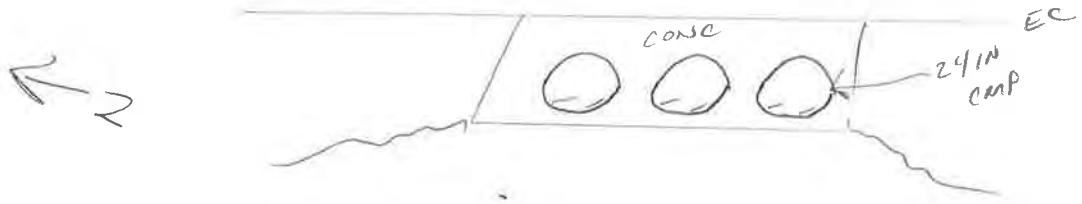
STREAM NAME: DATE: 6-27-19

LOCATION: MIRROR LAKE PARK TRAIL CREW: HEATER, JOHNSON

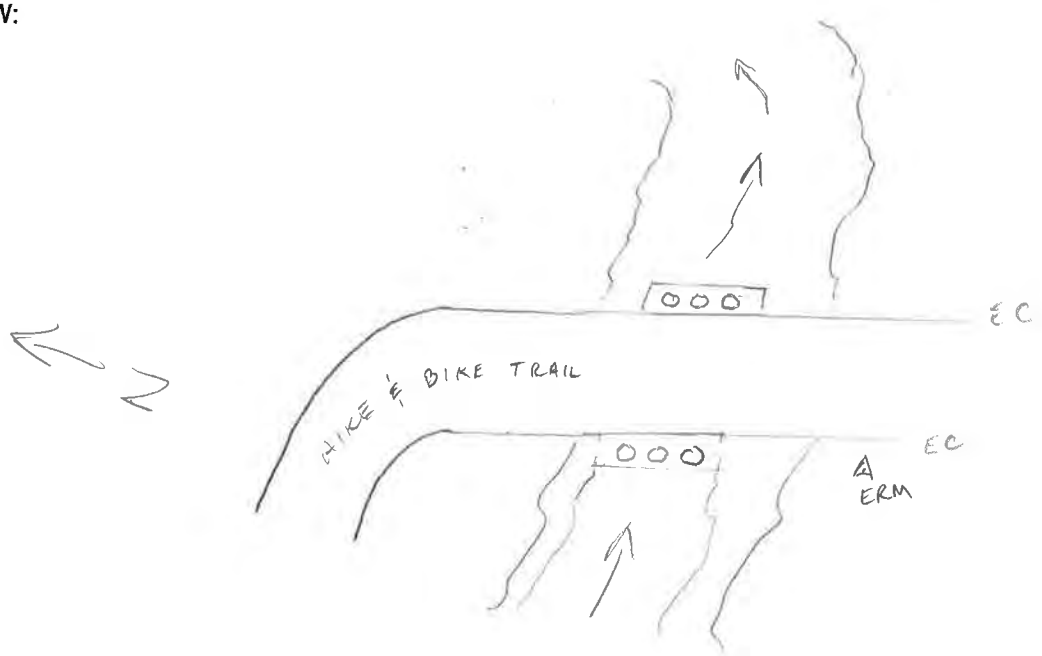
TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: 718.48 ERM ID: WC27001 GEOID: 12B

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:	3	Shape:	ROUND	Length:		Height:	24"	Width:	24"	Skew:
CULVERT:	I/O Type:				Material:	CMP	Wingwall Angle				
DAM:	Top Width:		Side Slope		Side Slope		US:		DS:		Outlet:
ERM Description:		1/2 IN IR W/TRAFCAP							Coordinate System:		
Photo Numbers:		DSCH:		DSFACE		OTXS:		USFACE		USCH:	
Additional Info:											
File Name:		1906275H_35837									

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:



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Survey Field Sheet

PROJECT: CROSSINGS IN PLUGERVILLE SURVEY NAME: AUG 35837

STREAM NAME: WILBARGER CREEK DATE: 6-12-19

LOCATION: WC_STR_28000 CREW: LS JJ

TYPE: BR( ) CUL(✓) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: WC28000 GEOID: G12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 28000 Shape: ☐ Length: _____ Height: 5' 8" Width: 9' 10' ✓ Skew: N/A

CULVERT: I/O Type: RCB Material: CONC Wingwall Angle _____

DAM: Top Width: _____ Side Slope _____ Side Slope _____ US: _____ DS: _____ Outlet: _____

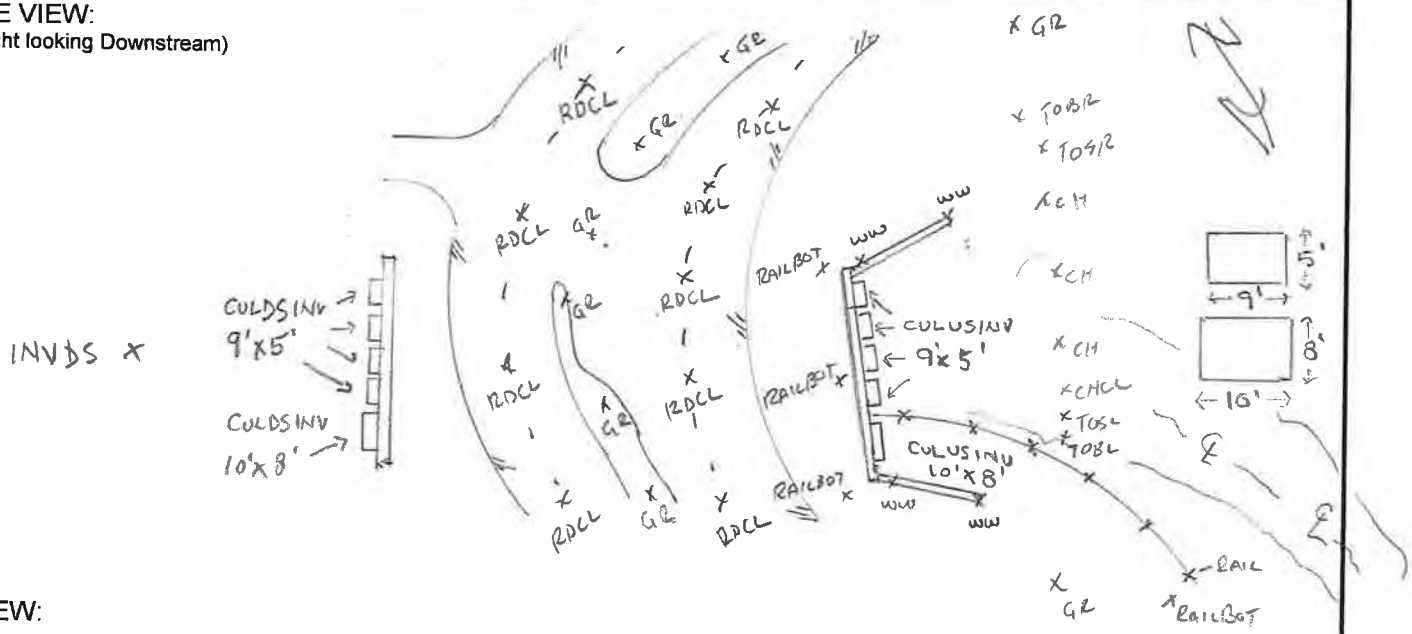
ERM Description: 1/2" IRSC "HALFF TRAN" Coordinate System: i

Photo Numbers: DSCH: ✓ DSFACE ✓ OTXS: ✓ USFACE ✓ USCH: ✓

Additional Info: _____

File Name: 190612LS_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

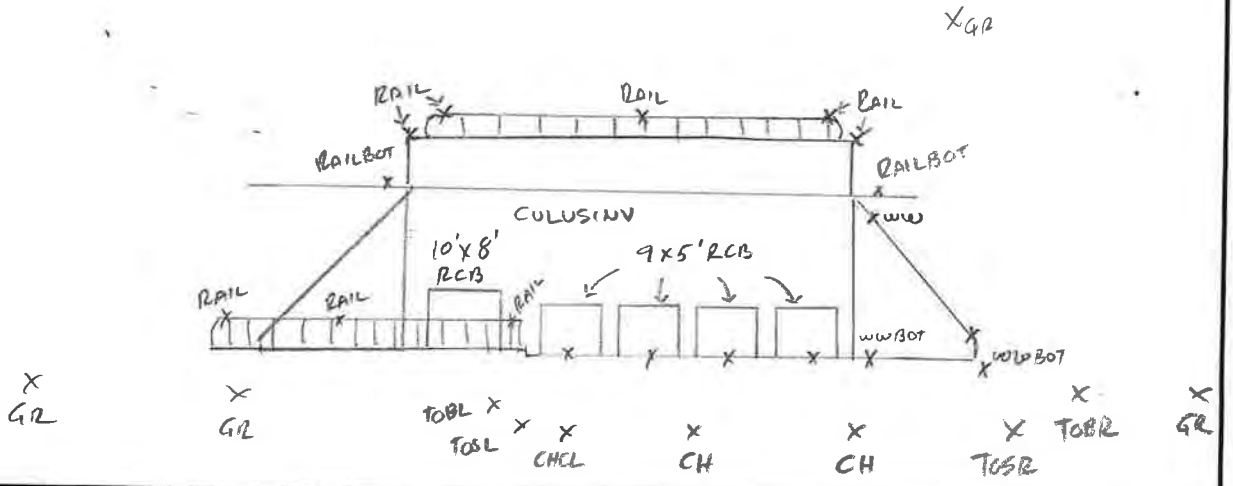


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	Photo ID: Coordinates: Description:	WC_STR_28000_DSFACE 30.471039, -97.621548 Downstream face

Survey Field Sheet

PROJECT: WILLBARGER CREEK SURVEY NAME: AVO 35837

STREAM NAME: WC-STR-29000 DATE: 6-11-19

LOCATION: SPRINGBROOK DR CREW: LS JJ

TYPE: BR( ) CUL(✓) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: WC29000 GEOID: G12A

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):		@		Pier Shape:
CULVERT:	Number:	29000	Shape:	□	Length:		Height:	4'	Width:	10'	Skew: N/A
CULVERT:	I/O Type:	RCB	Material:	CONC	Wingwall Angle						
DAM:	Top Width:		Side Slope		Side Slope		US:		DS:		Outlet:

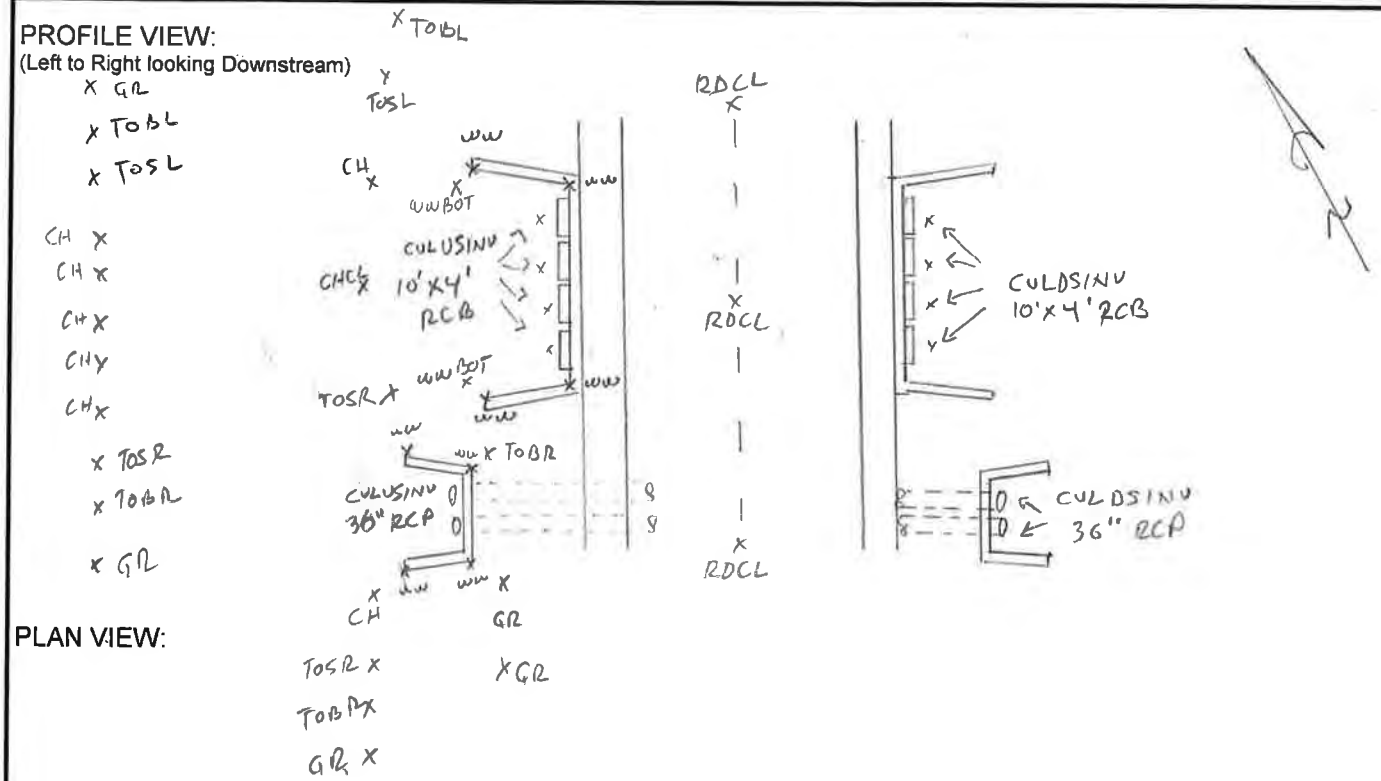
ERM Description: SPRTP Coordinate System: TXCENT.

Photo Numbers: DSCH: ✓ DSFACE ✓ OTXS: ✓ USFACE ✓ USCH: ✓

Additional Info:

File Name:

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

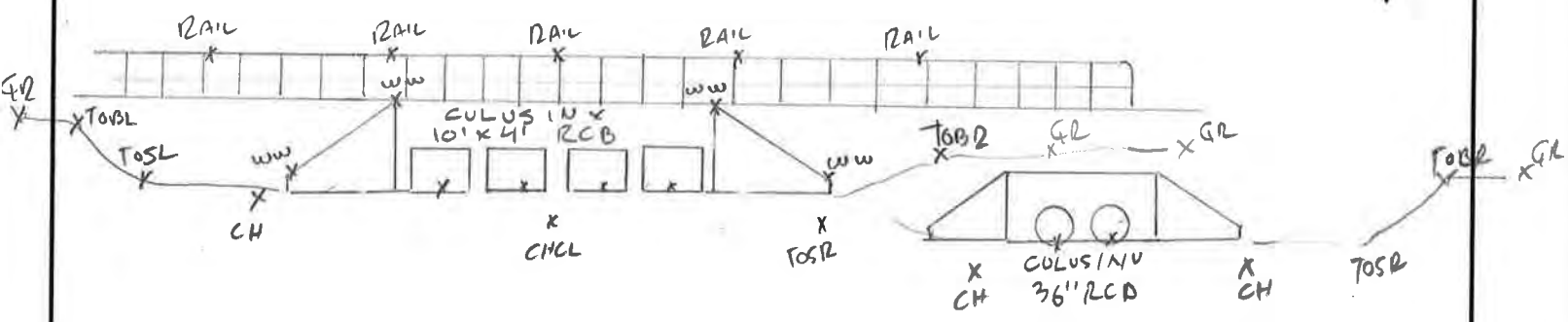


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	Photo ID: Coordinates: Description:	WC_STR_29000_DSFACE 30.473776, -97.62859 Downstream face

	Photo ID: Coordinates: Description:	WC_STR_29000_DSFACE1 30.473776, -97.62859 Downstream face

Survey Field Sheet

PROJECT: WILBARGER FLOOD STUDY SURVEY NAME: WC_T165_STR_1000

STREAM NAME: WILBARGER DATE: 7-9-20

LOCATION: RING RD & SKIMMER RUN CREW: LS, SH

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: 512.98 ERM ID: WCT1651001 GEOID: 12B

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):		@		Pier Shape:
CULVERT:	Number:	2	Shape:	RCB	Length:	123.93	Height:	5'	Width:	7'	Skew:
CULVERT:	I/O Type:	RCB			Material:	CONC	Wingwall Angle				
DAM:	Top Width:		Side Slope		Side Slope		US:		DS:		Outlet:

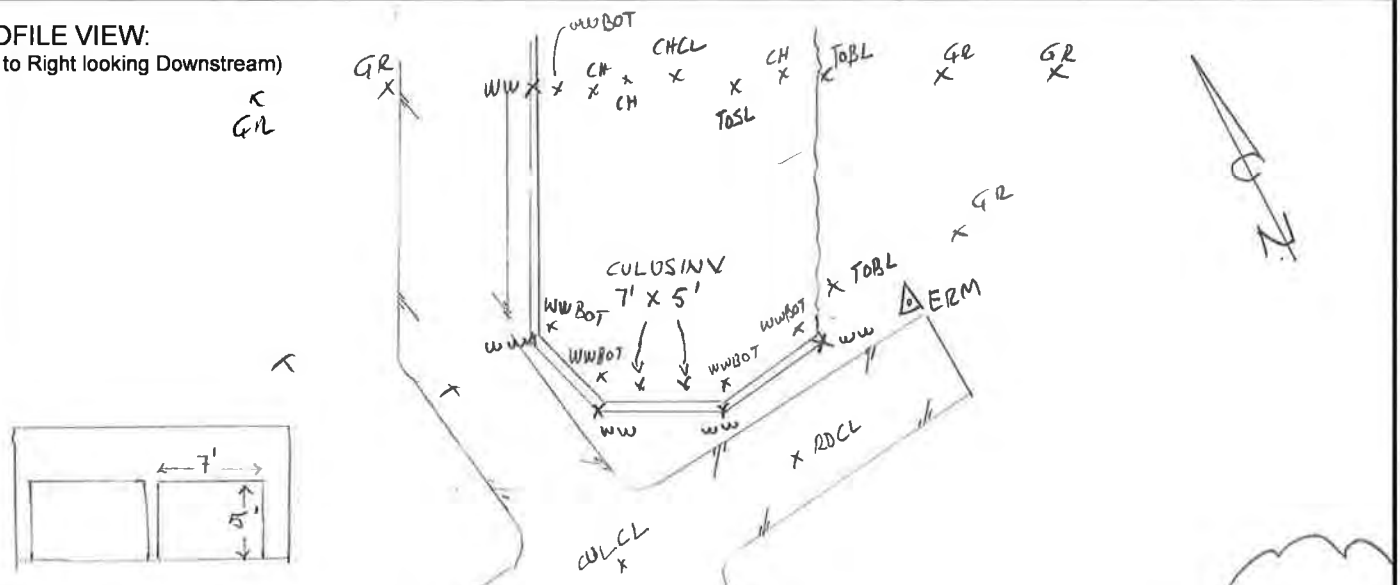
ERM Description: 1/2 IN I.R. W/ TRAV CAP Coordinate System: TX-C 4203

Photo Numbers: DSCH: DSFACE OTXS: USFACE USCH:

Additional Info:

File Name: 20070915H_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

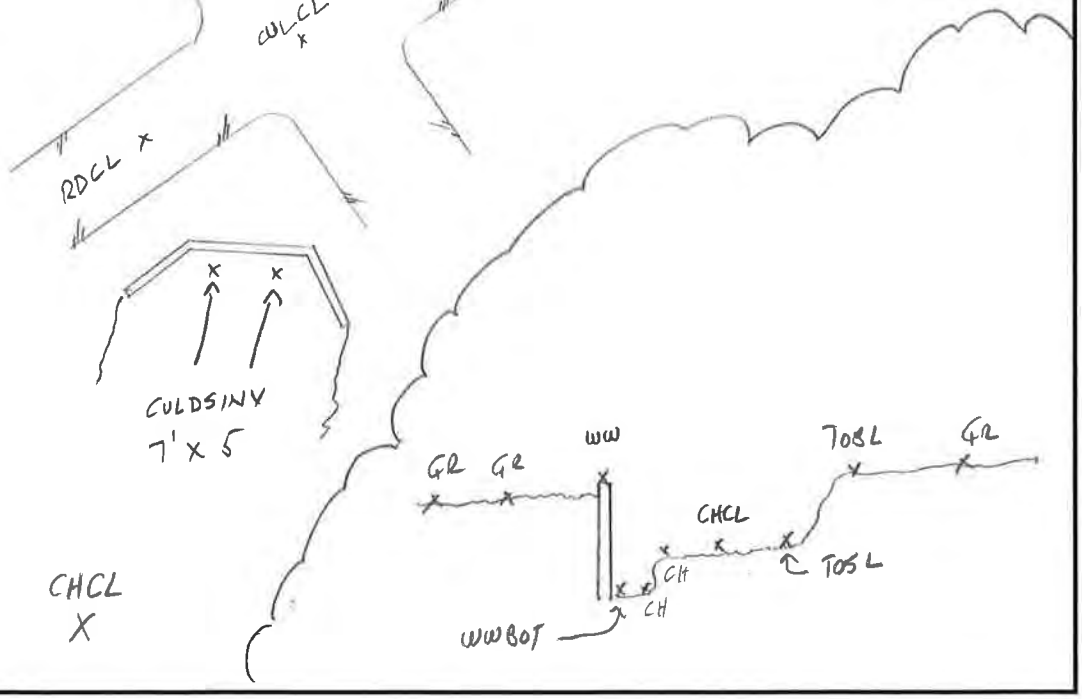


	Photo ID: Coordinates: Description:	WC_T165_STR_1000_USFACE 30.345085, -97.53578 Upstream face
	Photo ID: Coordinates: Description:	WC_T165_STR_1000_DSFACE 30.345085, -97.53578 Downstream face

Survey Field Sheet

PROJECT: FEMA Flood Study SURVEY NAME: WC-T167-STR-1000

STREAM NAME: W.L Barger DATE: 02/08/2020

LOCATION: old I20 CREW: W. Griffin, J. Johnson

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: 505 624 ERM ID: WC1671001 GEOID: 12B

BRIDGE: ~~Rail~~ Height: ____ Deck: 15.5 Width: 106' Pier(s): 30 @ 24 DIA Pier Shape: ROUND

~~CULVERT~~: Number: ____ Shape: ____ Length: ____ Height: ____ Width: ____ Skew: ____

~~CULVERT~~: I/O Type: ____ Material: ____ Wingwall Angle ____

~~DAM~~: Top Width: ____ Side Slope ____ Side Slope ____ US: ____ DS: ____ Outlet: ____

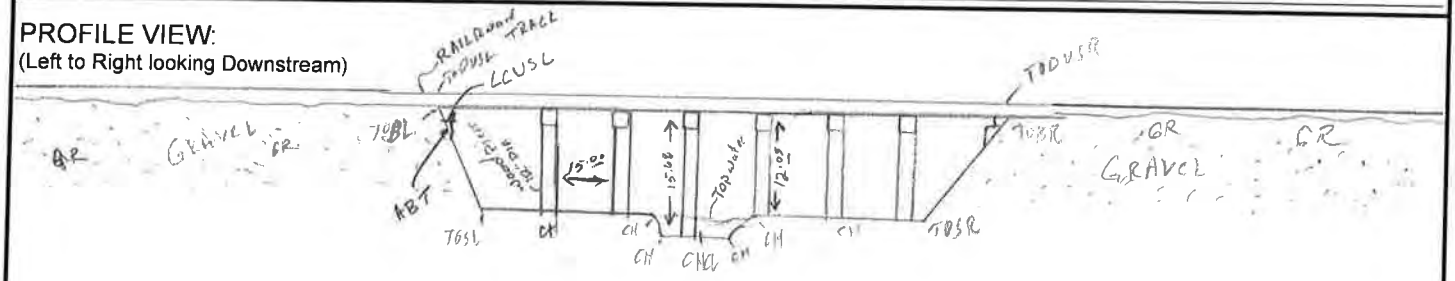
ERM Description: 1/2" IRON ROD W/ HALFF TRAV Coordinate System: TxC

Photo Numbers: DSCH: 1 DSFACE 2 OTXS: 3 USFACE 4 USCH: 5

Additional Info: ____

File Name: 20202BGG_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

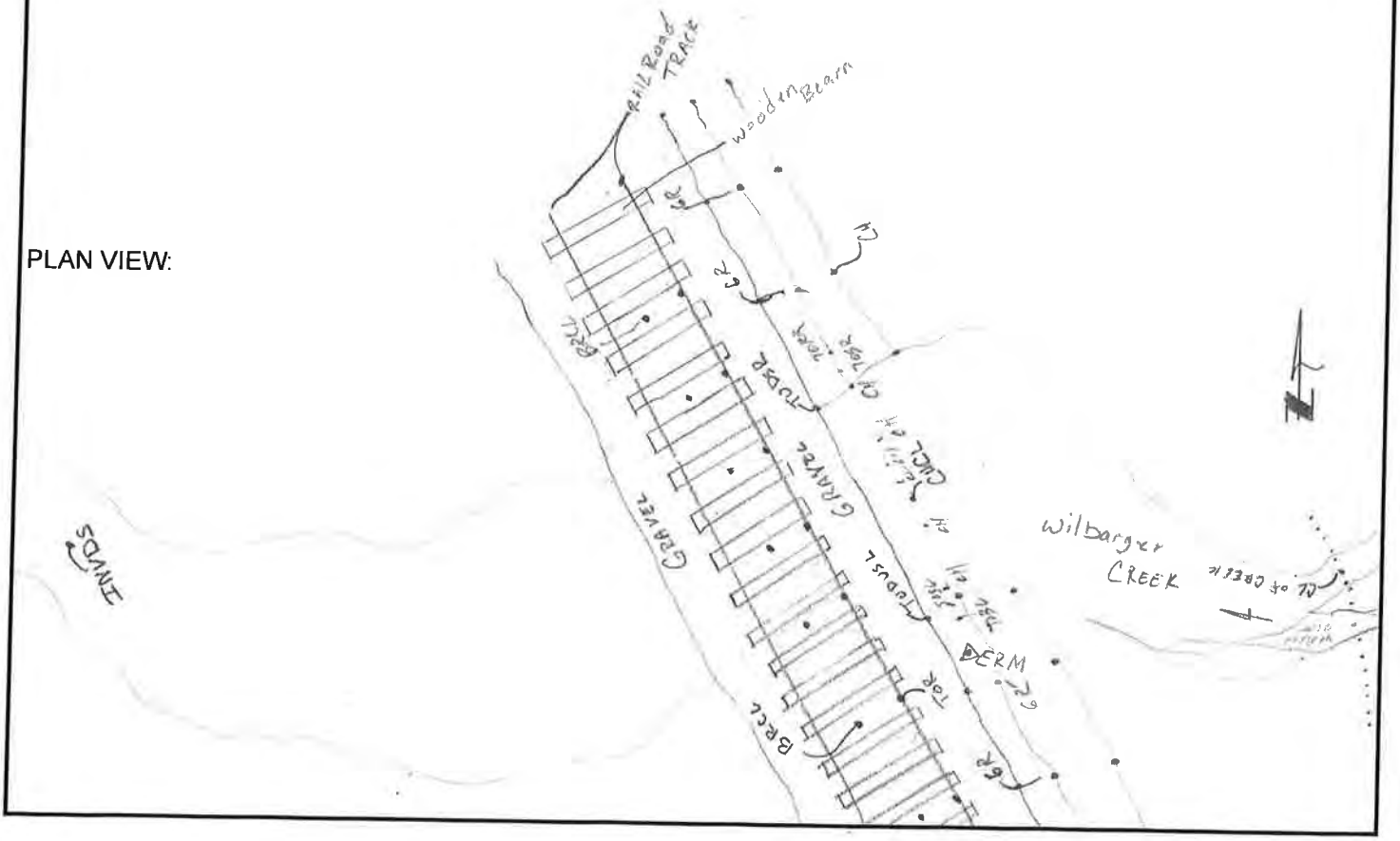


	Photo ID: Coordinates: Description:	WC_T167_STR_1000_USFACE1 30.342335, -97.538752 Upstream face
	Photo ID: Coordinates: Description:	WC_T167_STR_1000_USFACE2 30.342335, -97.538752 Upstream face

	Photo ID: Coordinates: Description:	WC_T167_STR_1000_DSFACE1 30.342335, -97.538752 Downstream face

Survey Field Sheet

PROJECT: TRAVIS COUNTY FEMA SURVEY NAME: WC_T167_STR_1000

STREAM NAME: WILLBARGER CREEK DATE: 11-23-2019

LOCATION: OLD HIGHWAY 20 CREW: JO, CL, CJL

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: 500.25FT ERM ID: WC4167STR1000 GEOID: 12B

BRIDGE: Rail Height: 2.13FT Deck: 21FT Width: 40FT Pier(s): 1 @ 2.2FT Pier Shape: Rect.

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope _____ Side Slope _____ US: _____ DS: _____ Outlet: _____

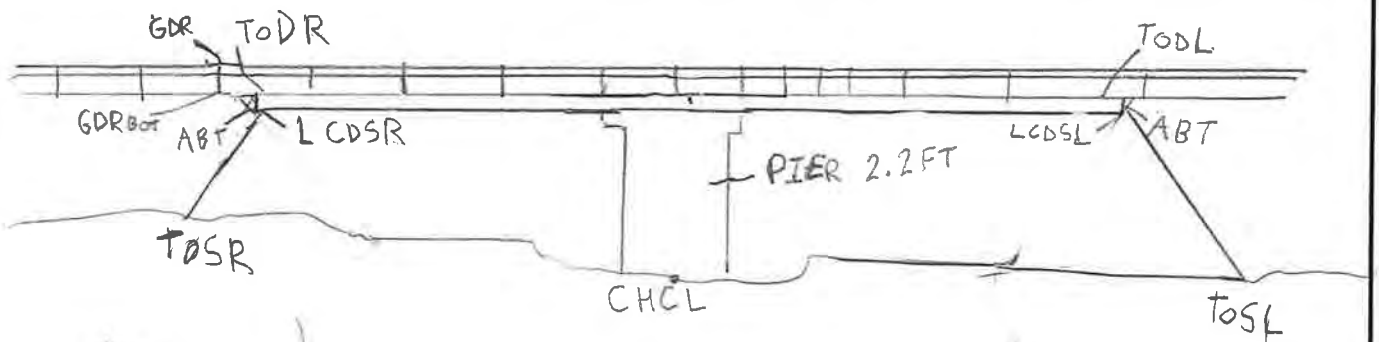
ERM Description: MAG NAIL Coordinate System: TXC

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: 191123JO_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

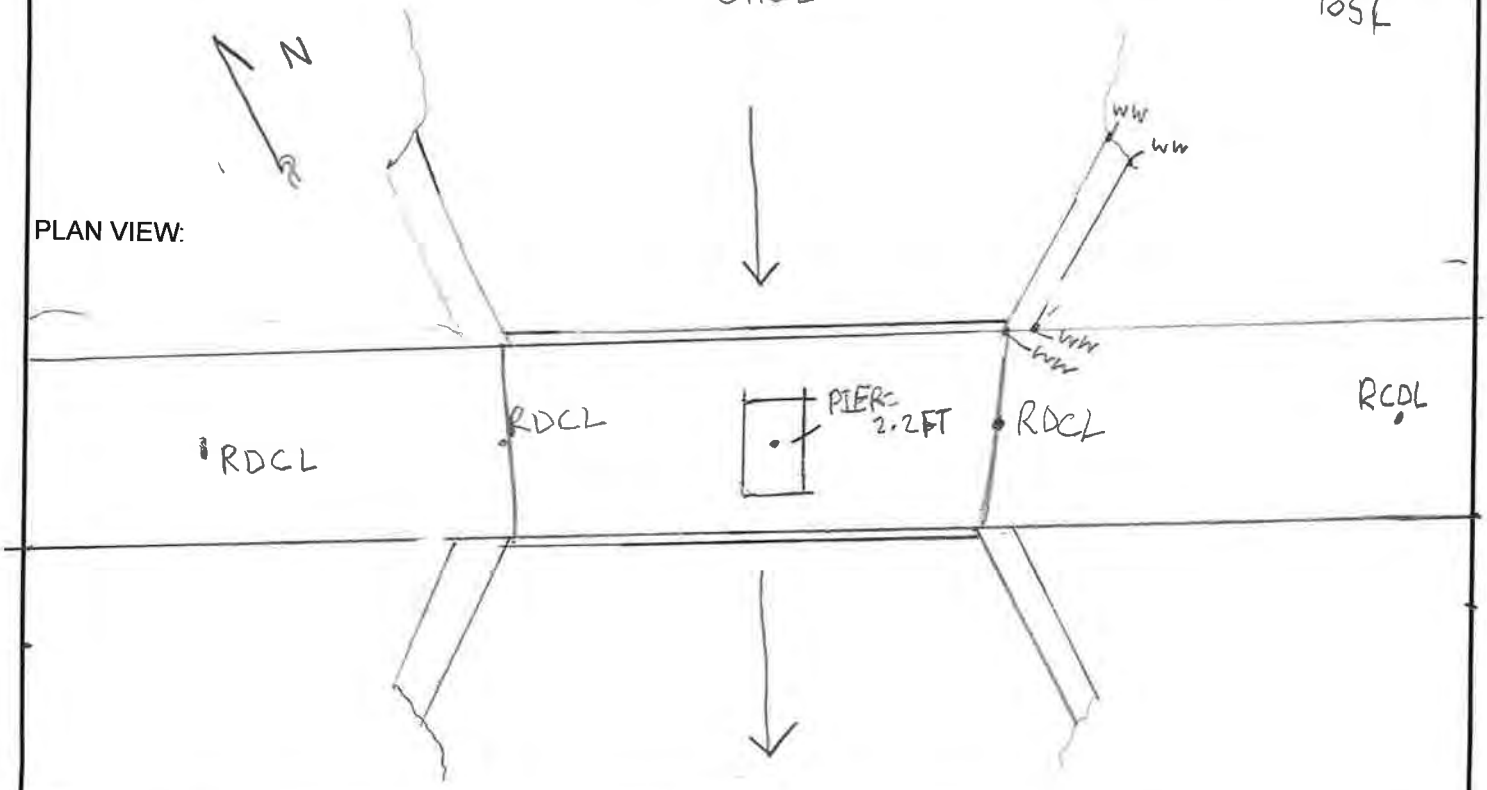


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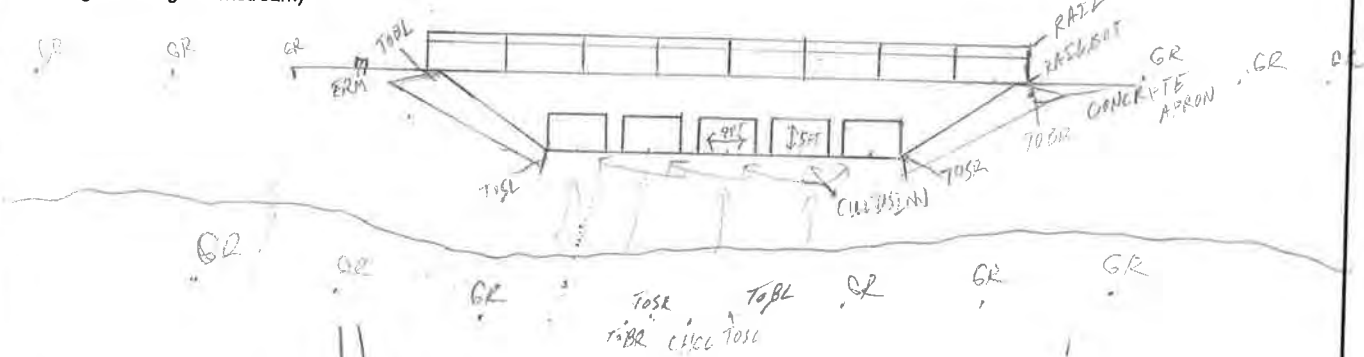
	Photo ID: Coordinates: Description:	WC_T167_STR_2000_DSF 30.34252, -97.538612 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY
SURVEY NAME: WC_T167_STR_2500
STREAM NAME: WILBARGER
DATE: 9-30-2019
LOCATION: RING RD. & FM 973
CREW: JJ, CT
TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: 503.791 ERM ID: WC1672501 GEOID: 12B

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@		Pier Shape:
CULVERT:	Number:	5	Shape:	RECTANGLE	Length:	62.3FT	Height:	5FT	Width:	9FT	Skew:	NO
CULVERT:	I/O Type:				Material:		Wingwall Angle			
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:		Outlet:
ERM Description:		1/2 IN IRON ROD W/ HALFF TRAY						Coordinate System:		TXC
Photo Numbers:			DSCH:		DSFACE		OTXS:	USFACE		USCH:
Additional Info:										
File Name:		190930JJ_35837								

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

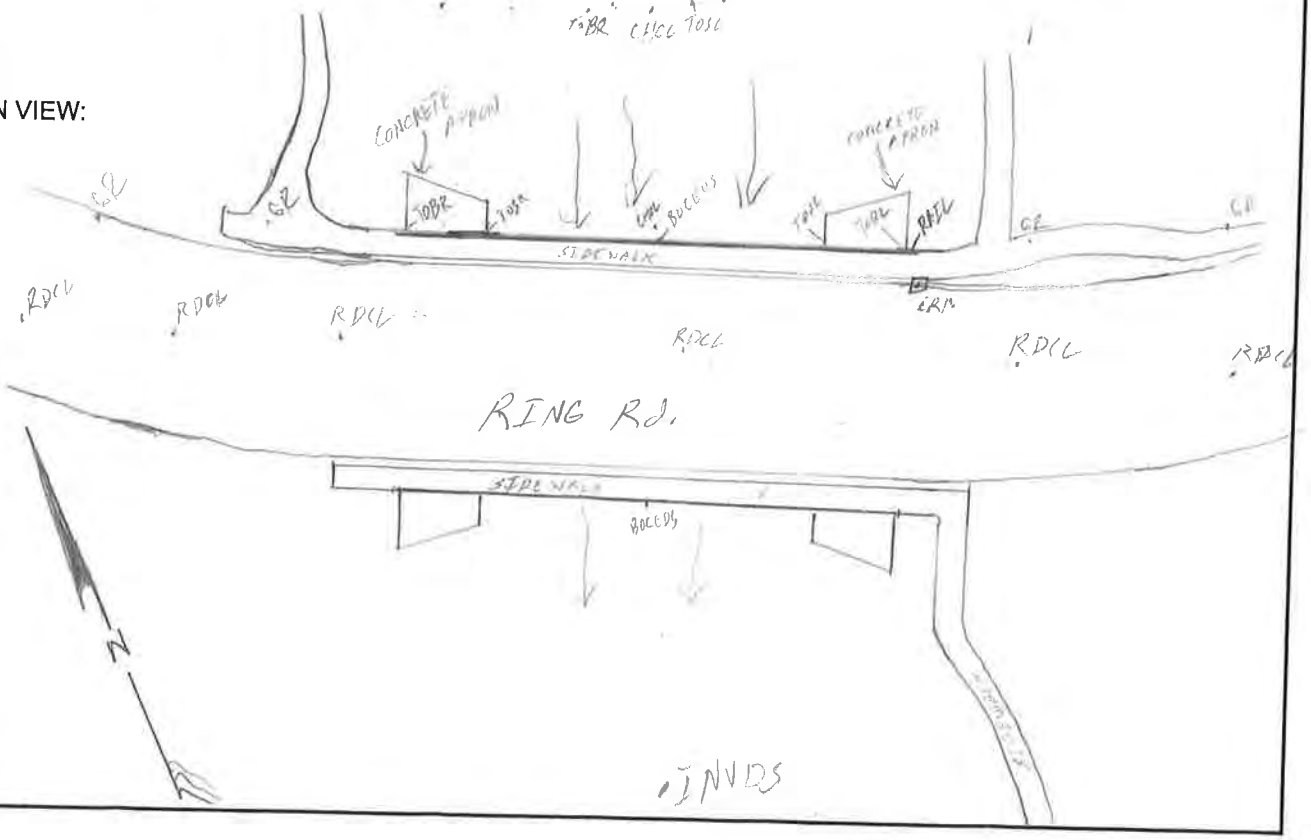


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	Photo ID: Coordinates: Description:	WC_T167_STR_2500_DSFACE 30.345569, -97.538315 Downstream face

Survey Field Sheet

PROJECT: Willberger — SURVEY NAME: WC_T176_STR3000

STREAM NAME: Willberger Creek — DATE: 11-21-19

LOCATION: Travis county — CREW: A. Vargas / A. Ramirez

TYPE: BR( ) CUL(X) DAM( ) XS( ) — ERM ELEV.: _____ — ERM ID: _____ — GEOID: G12AUS

BRIDGE: Rail Height: 3.1 — Deck: X — Width: X — Pier(s): X — @ X — Pier Shape: X

CULVERT: Number: _____ — Shape: RCB — Length: 218.0 — Height: 8' — Width: 7. — Skew: _____

CULVERT: I/O Type: RAB — Material: Concrete — Wingwall Angle: 45°

DAM: Top Width: _____ — Side Slope — Side Slope — US: _____ — DS: _____ — Outlet: _____

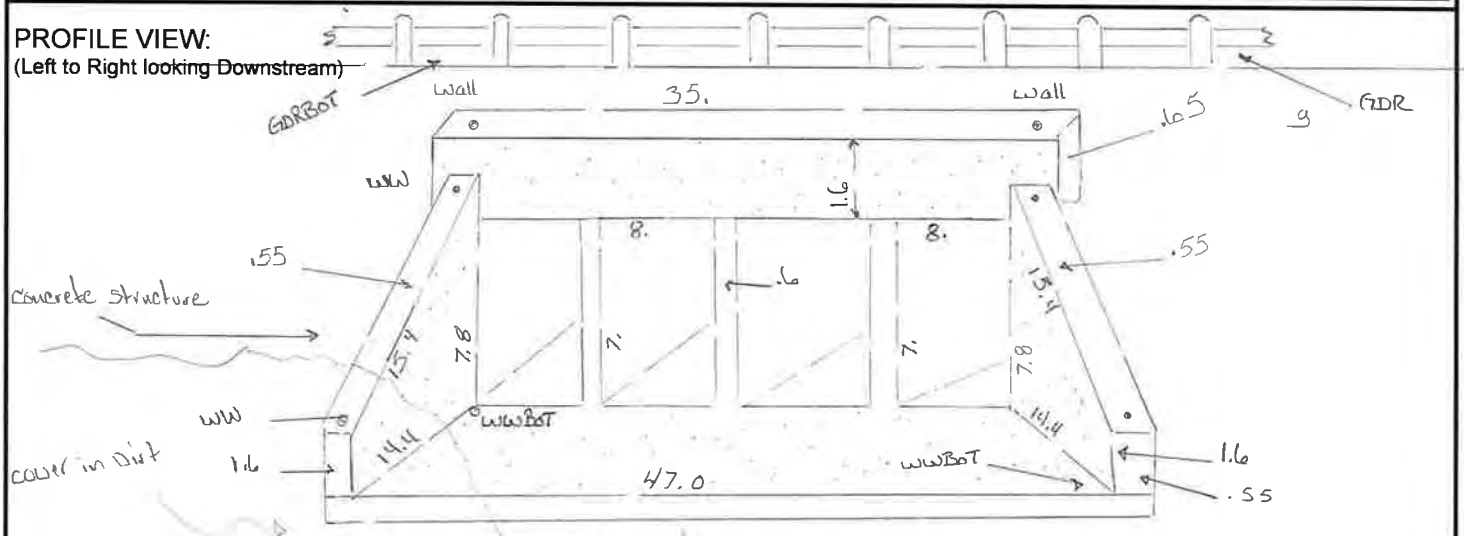
ERM Description: _____ — Coordinate System: TX Central 4203

Photo Numbers: 5 — DSCH: _____ — DSFACE _____ — OTXS: _____ — USFACE _____ — USCH: _____

Additional Info: _____

File Name: 191121AU2 - 35837

PROFILE VIEW:
(Left to Right looking ~~Downstream~~)



PLAN VIEW:

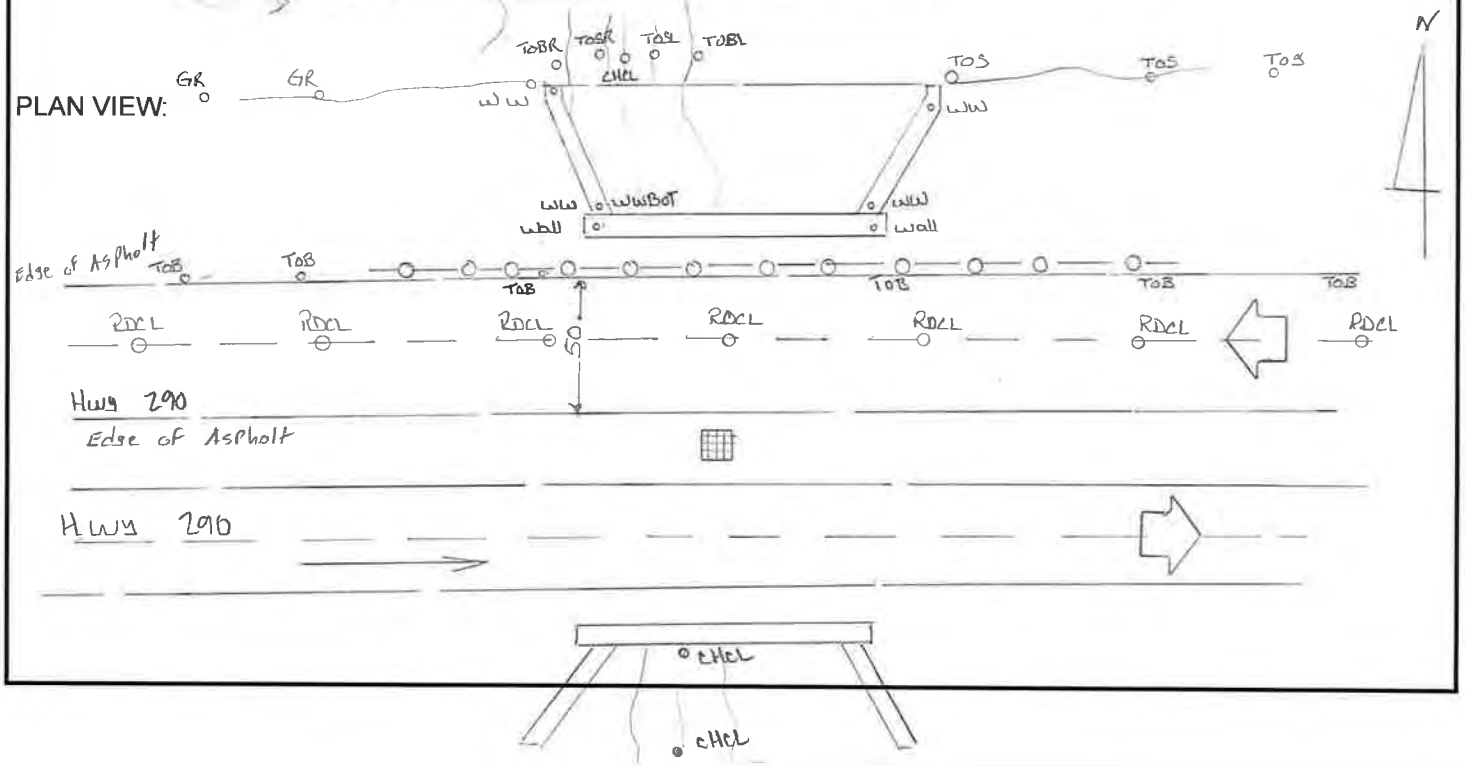


	Photo ID: Coordinates: Description:	WC_T167_STR_3000_USFACE 30.349299, -97.537586 Upstream face
	Photo ID: Coordinates: Description:	WC_T167_STR_3000_DSFACE 30.349299, -97.537586 Downstream face

Survey Field Sheet

PROJECT: WILLBARGER CREEK SURVEY NAME: AUG 35837

STREAM NAME: WC_T183_STR_1000 DATE: 6-11-19

LOCATION: HEATHERWILDE BLVD CREW: LS JJ

TYPE: BR( ) CUL(✓) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: WC1831000 GEOID: G12A

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 1000 Shape: ☐ Length: _____ Height: 4' Width: 7' Skew: 45°

CULVERT: I/O Type: RCB Material: CONC Wingwall Angle _____

DAM: Top Width: _____ Side Slope _____ Side Slope _____ US: _____ DS: _____ Outlet: _____

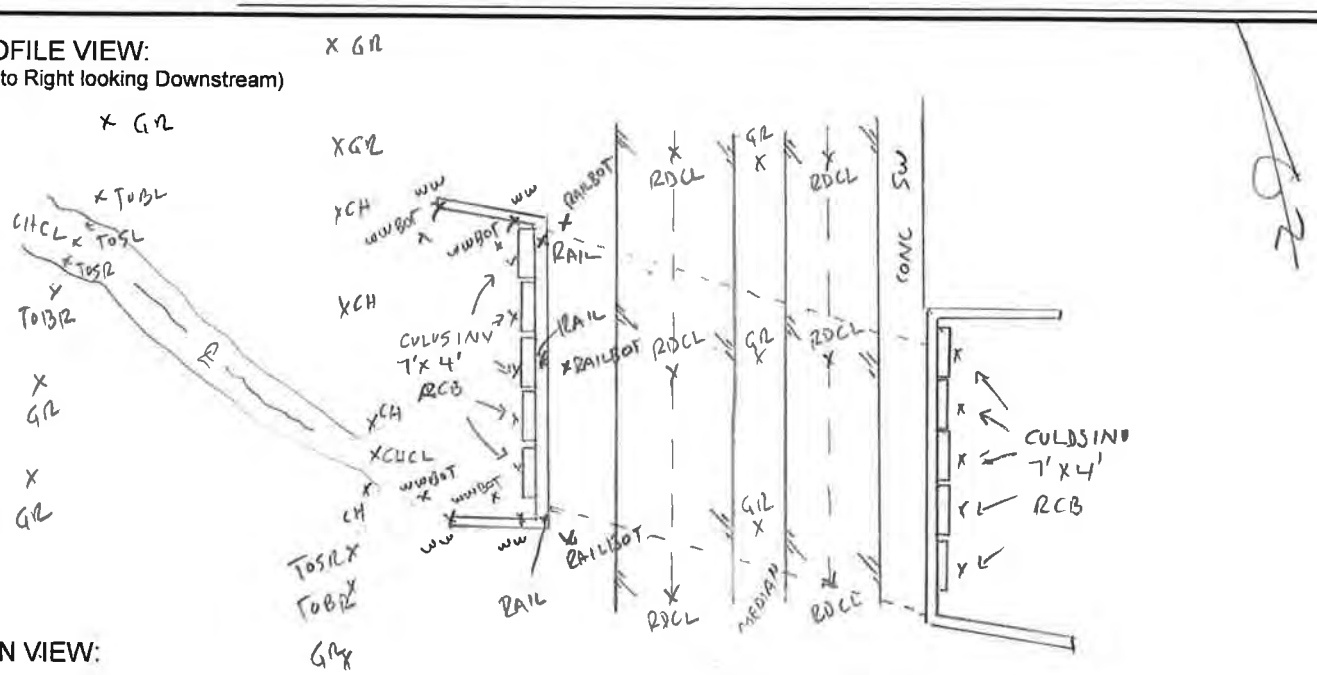
ERM Description: _____ Coordinate System: TX CENT.

Photo Numbers: DSCH: ✓ DSFACE ✓ OTXS: ✓ USFACE ✓ USCH: ✓

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

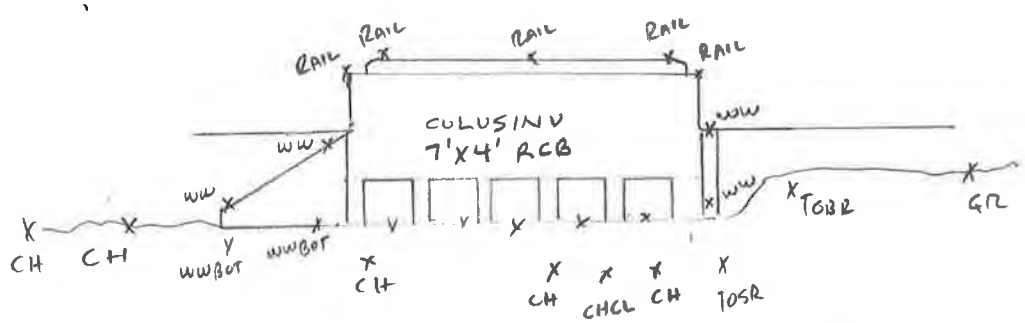


	Photo ID: Coordinates: Description:	WC_T183_STR_1000_USFACE 30.472056, -97.620942 Upstream face
	Photo ID: Coordinates: Description:	WC_T183_STR_1000_DSFACE 30.472056, -97.620942 Downstream face

Survey Field Sheet

PROJECT: CROSSINGS IN PFLUGERVILLE SURVEY NAME: AUD 35837

STREAM NAME: WILBARGER 0185 DATE: 6-12-19

LOCATION: WC_T185_STR_1000 CREW: LS JJ

TYPE: BR( ) CUL(✓) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: WC1851000 GEOID: G12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 1000 Shape: □ Length: _____ Height: 4' Width: 10' Skew: ✓

CULVERT: I/O Type: RCB Material: CONC Wingwall Angle ✓

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

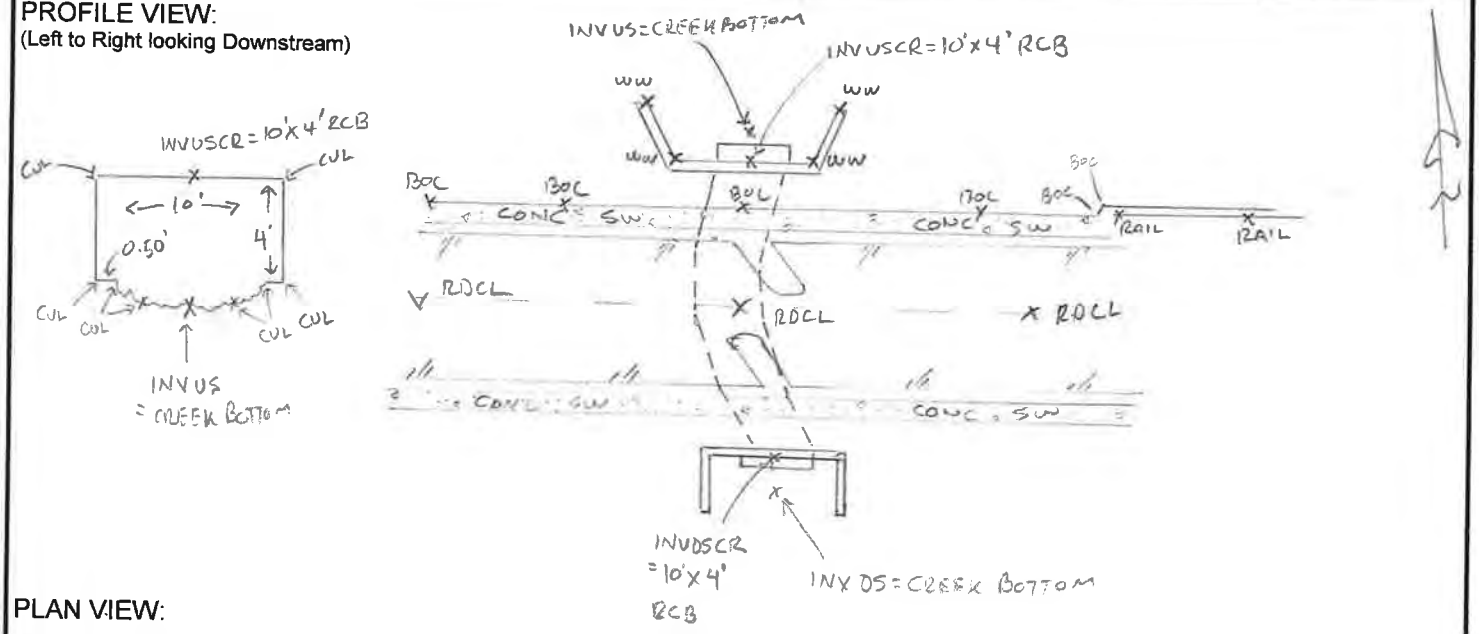
ERM Description: _____ Coordinate System: _____

Photo Numbers: DSCH: ✓ DSFACE ✓ OTXS: ✓ USFACE ✓ USCH: ✓

Additional Info: _____

File Name: 190612LS_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

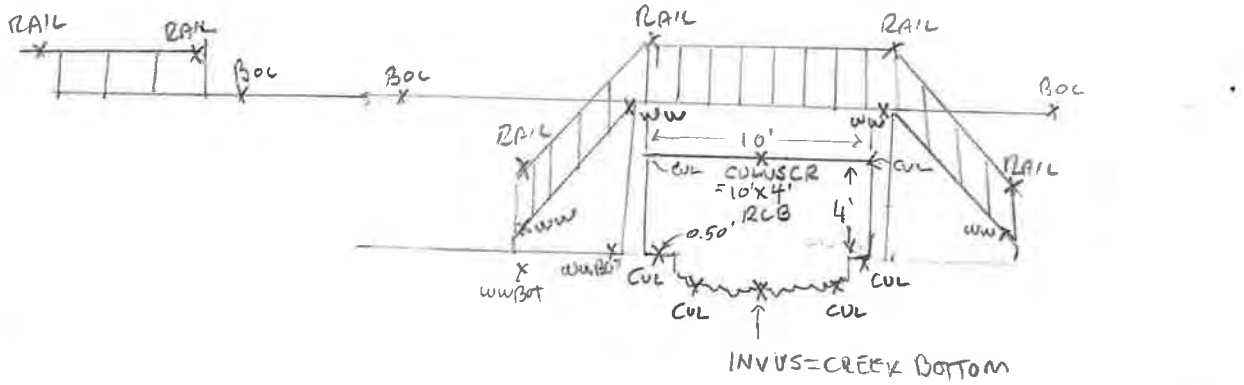


	Photo ID: Coordinates: Description:	WC_T185_STR_1000_USFACE 30.470526, -97.61582 Upstream face
	Photo ID: Coordinates: Description:	WC_T185_STR_1000_DSFACE 30.470526, -97.61582 Downstream face

Survey Field Sheet

PROJECT: CROSSINGS IN PFLUGERVILLE SURVEY NAME: AUO 35837

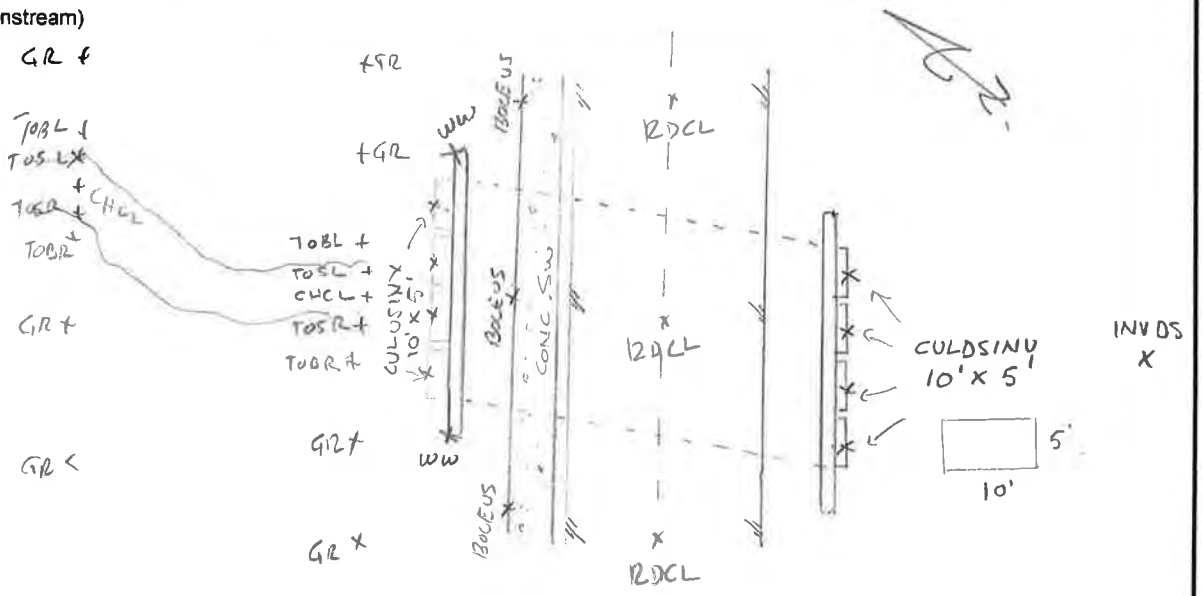
STREAM NAME: WILBERGER DATE: 6-17-19

LOCATION: WC-T186-STR-1000 CREW: LS

TYPE: BR( ) CUL(✓) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: WC186 1000 GEOID: G12B

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):		@		Pier Shape:
CULVERT:	Number:	1000	Shape:	☐	Length:		Height:	5'	Width:	10'	Skew: ✓
CULVERT:	I/O Type:	10'x5' RCB			Material:	CONC	Wingwall Angle			N/A	
DAM:	Top Width:		Side Slope		Side Slope		US:		DS:		Outlet:
ERM Description:		SIRTP4							Coordinate System:		
Photo Numbers:			DSCH: ✓		DSFACE ✓		OTXS: ✓		USFACE ✓		USCH: ✓
Additional Info:											
File Name:		190617LS-35837									

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

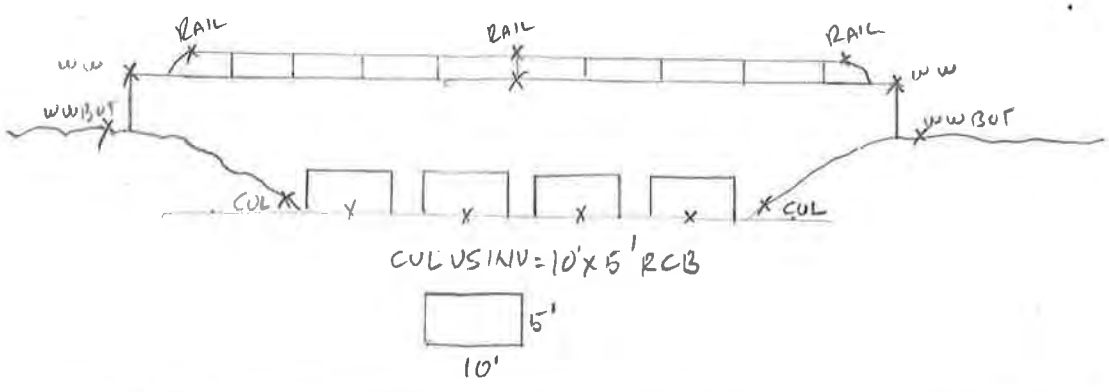


	Photo ID: Coordinates: Description:	WC_T186_STR_1000_USFACE 30.461274, -97.607683 Upstream face
	Photo ID: Coordinates: Description:	WC_T186_STR_1000_DSFACE 30.461274, -97.607683 Downstream face

Survey Field Sheet

PROJECT: WILLBARGER CREEK SURVEY NAME: AUD 35837

STREAM NAME: WC-TIB6-STR-2000 DATE: 6-11-19

LOCATION: TOWN CENTER DR. CREW: LS JS

TYPE: BR( ) CUL(✓) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: WC1B62000 GEOID: G12A

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 2000 Shape: ▭ Length: _____ Height: 3' Width: 5' Skew: N/A

CULVERT: I/O Type: RCB Material: CONC Wingwall Angle _____

DAM: Top Width: _____ Side Slope _____ Side Slope _____ US: _____ DS: _____ Outlet: _____

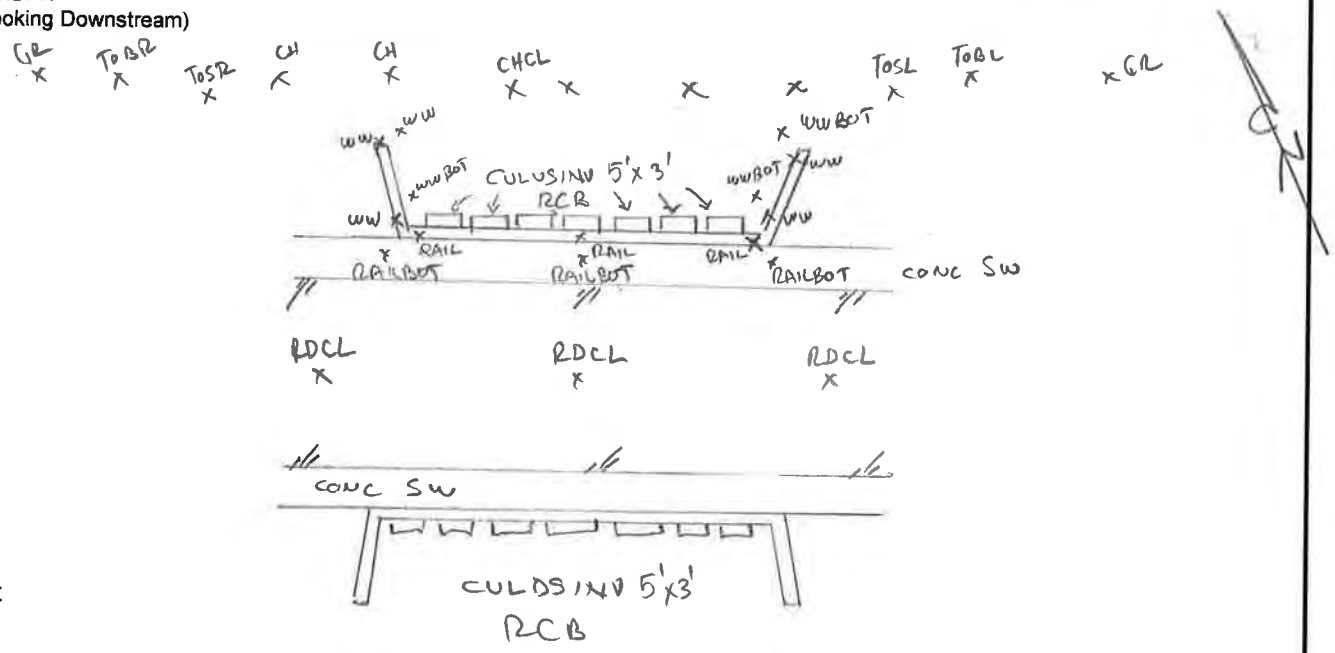
ERM Description: _____ Coordinate System: _____

Photo Numbers: DSCH: ✓ DSFACE ✓ OTXS: ✓ USFACE ✓ USCH: ✓

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

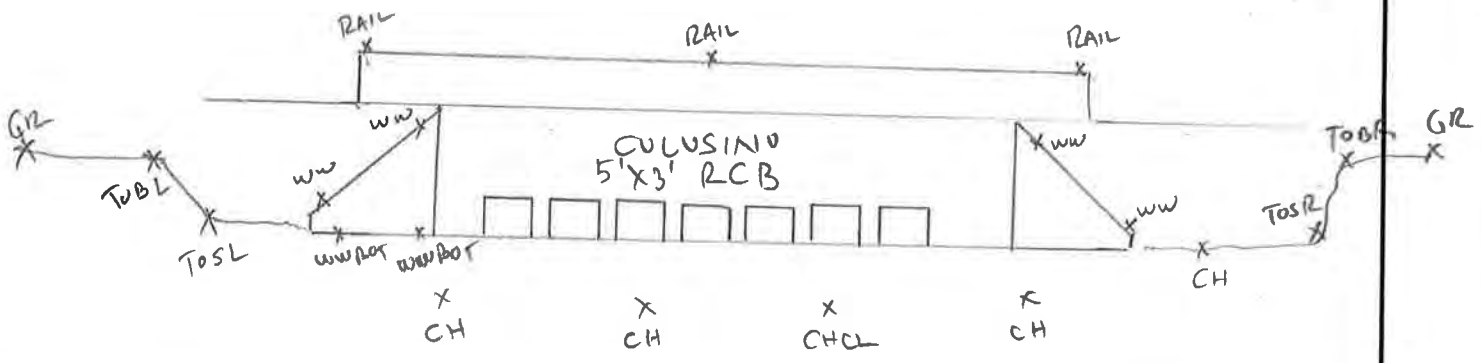


	Photo ID: Coordinates: Description:	WC_T186_STR_2000_USFACE 30.468146, -97.606602 Upstream face
	Photo ID: Coordinates: Description:	WC_T186_STR_2000_DSFACE 30.468146, -97.606602 Downstream face

Survey Field Sheet

PROJECT: 35837 WILBARGER | SURVEY NAME: WC_T196_DAM_1000

STREAM NAME: WILBARGER | DATE: 12-4-2019

LOCATION: LAKE PFLUGERVILLE | CREW: J. OGLE, C. TIPPIN, J. JOHNSON

TYPE: BR( ) CUL( ) DAM(X) XS( ) | ERM ELEV.: _____ | ERM ID: WC196 DAM 1000 | GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

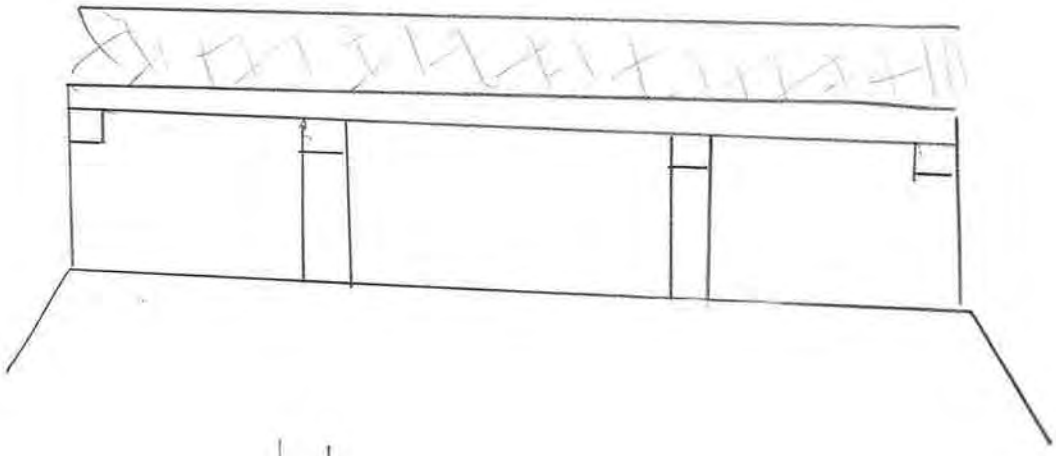
ERM Description: _____ Coordinate System: _____

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

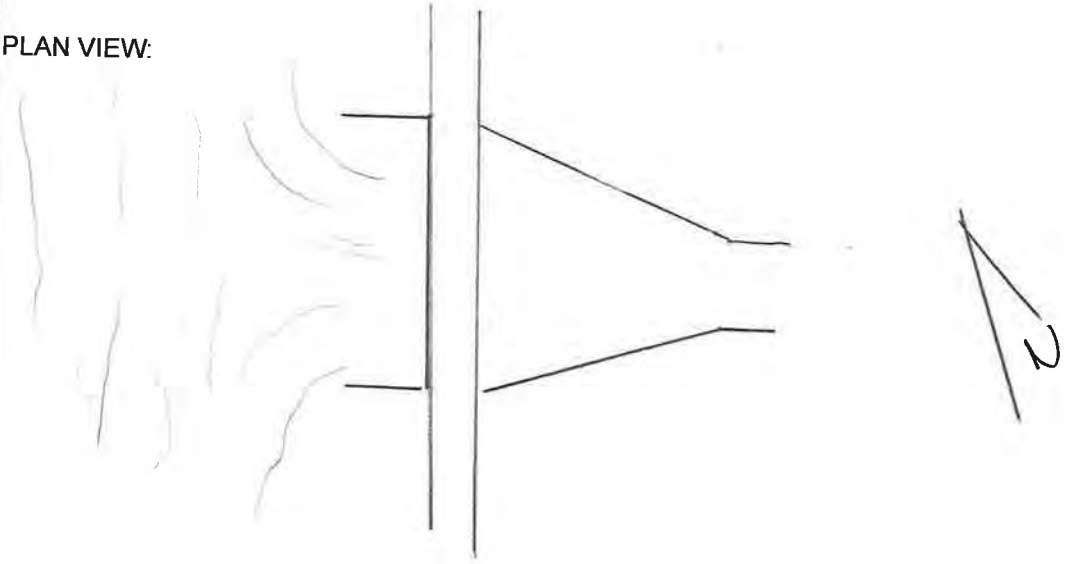
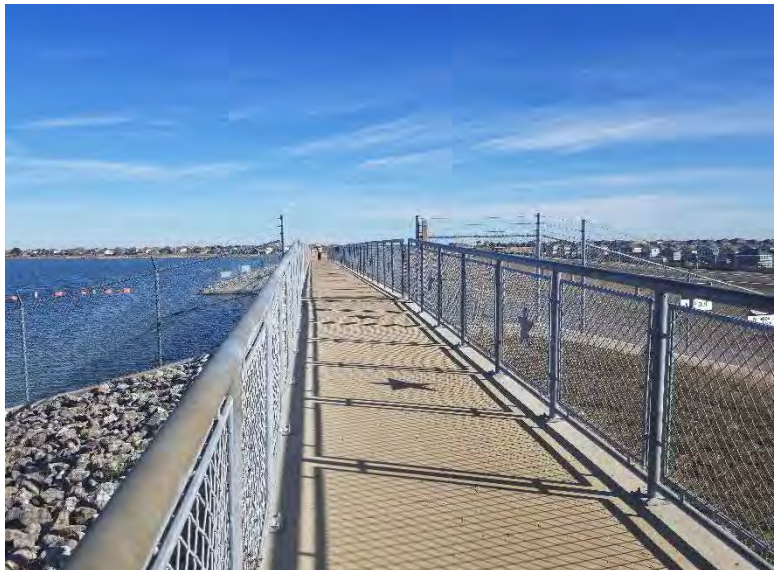


	Photo ID: Coordinates: Description:	WC_T196_DAM_1000_USF 30.438844, -97.568431 Upstream face
	Photo ID: Coordinates: Description:	WC_T196_DAM_1000_DSF 30.438844, -97.568431 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_T196_DAM-2000

STREAM NAME: WILBARGER CREEK DATE: 4/13/20

LOCATION: E PFLUGERVILLE PKWY CREW: JJ, CT

TYPE: BR( ) CUL( ) DAM(X) XS( ) ERM ELEV.: 646.848 ERM ID: WC196DAM2001 GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: UNDER-WATER

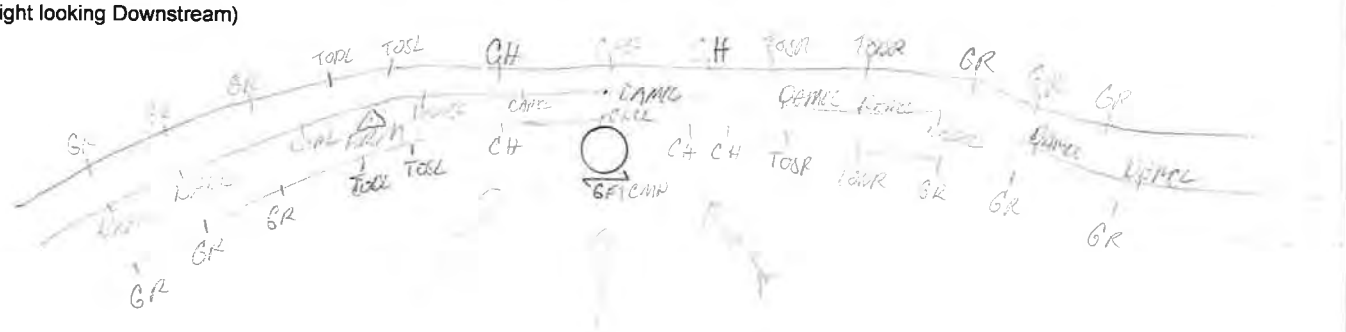
ERM Description: 1/2" IR w/ HALFF TRAV CAP Coordinate System: TX-C

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: 200413JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

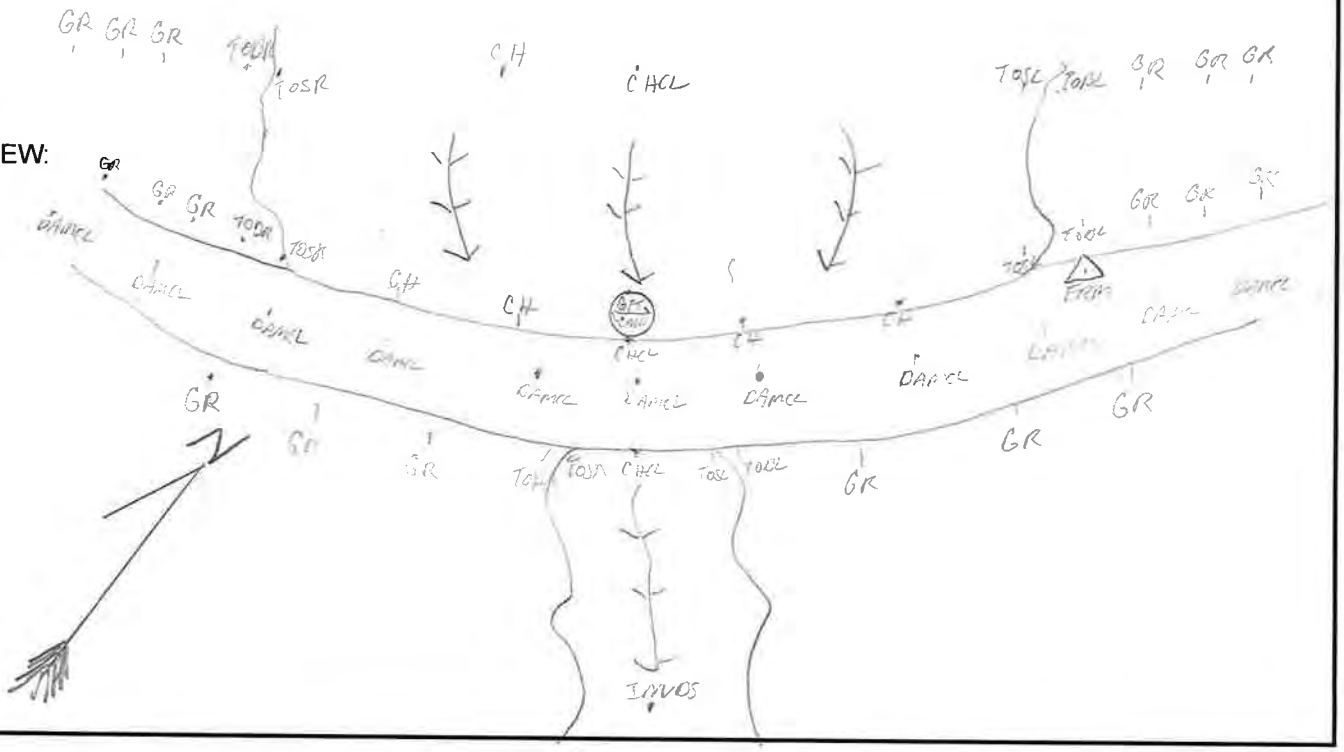


	Photo ID: Coordinates: Description:	WC_T196_DAM_2000_USFACE 30.446552, -97.578515 Upstream face
	Photo ID: Coordinates: Description:	WC_T196_DAM_2000_DSFACE 30.446552, -97.578515 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC-T196-STR-1000

STREAM NAME: UNKNOWN DATE: 6/27/2019

LOCATION: JESSE BOHL'S PFLUGERVILLE CREW: J. DODD & C. LAMB

TYPE: BR( ) CUL(✓) DAM( ) XS( ) ERM ELEV.: 583.580 ERM ID: WCT196001 GEOID: 12 A

BRIDGE:	Rail Height:	N/A	Deck:	N/A	Width:	N/A	Pier(s):	N/A	@		Pier Shape:	N/A
CULVERT:	Number:	1	Shape:	CYLINDER	Length:	19'90	Height:	16" CMP	Width:	16" CMP	Skew:	-11
CULVERT:	I/O Type:				Material:		Wingwall Angle					
DAM:	Top Width:		Side Slope		Side Slope		US:		DS:		Outlet:	
ERM Description:	RAILROAD SPIKE IN ROCK								Coordinate System:			
Photo Numbers:			DSCH:	✓	DSFACE	✓	OTXS:	✓	USFACE	✓	USCH:	✓
Additional Info:												
File Name:	190627JD_35837											

PROFILE VIEW:
(Left to Right looking Downstream)

PLAN VIEW:

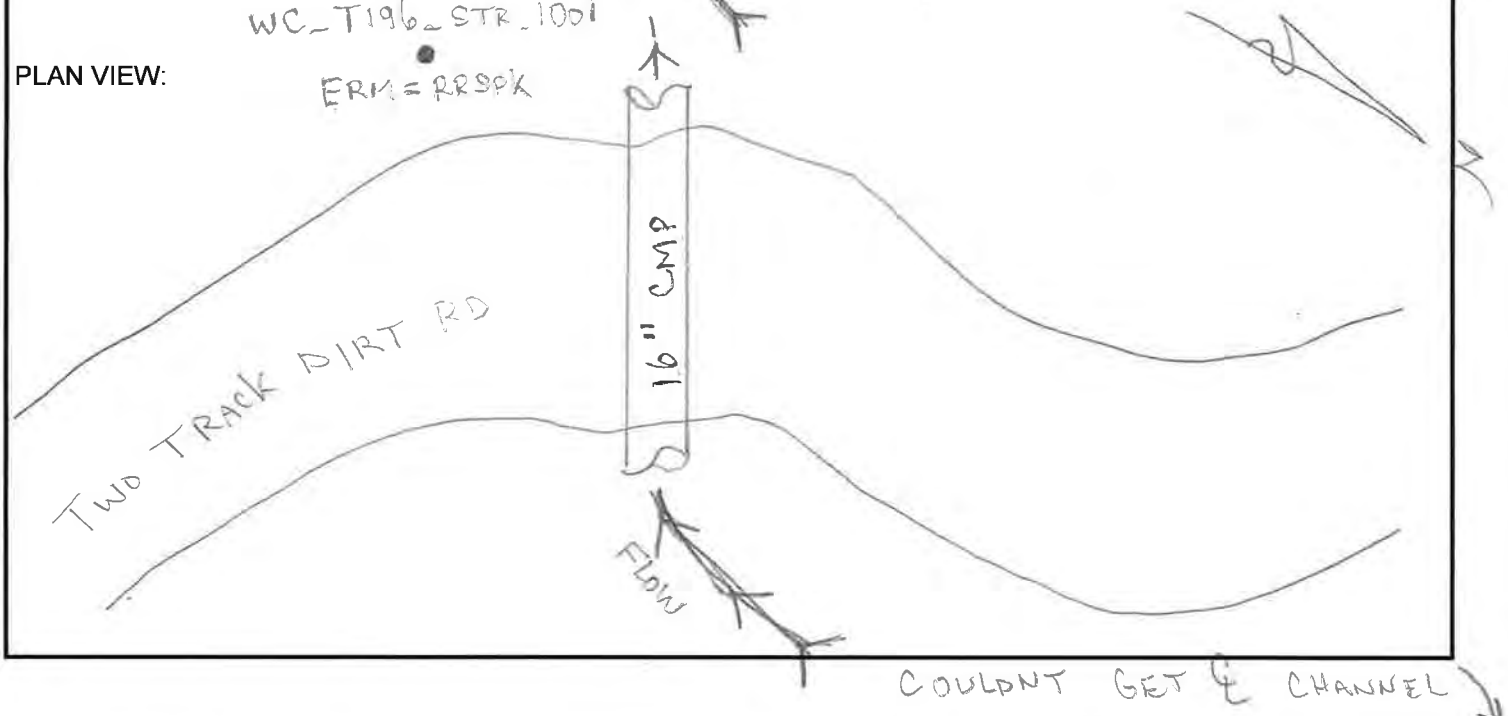


	Photo ID: Coordinates: Description:	WC_T196_STR_1000_USFACE 30.431801, -97.556931 Upstream face
	Photo ID: Coordinates: Description:	WC_T196_STR_1000_DSFACE 30.431801, -97.556931 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_196_STR_2000

STREAM NAME: UNKNOWN DATE: 2019-06-25

LOCATION: JESSE BOHLS DR PFLUGERVILLE CREW: JIMMY DODD CHRIS LAMB

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: 585.782 ERM ID: WC196 2001 GEOID: 12A

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):		@		Pier Shape:
CULVERT:	Number:	2	Shape:	RECTANG	Length:	28°	Height:	4°	Width:	8°	Skew: 3°44'32"29"
CULVERT:	I/O Type:				Material:		Wingwall Angle			N/A	
DAM:	Top Width:		Side Slope		Side Slope		US:		DS:		Outlet:

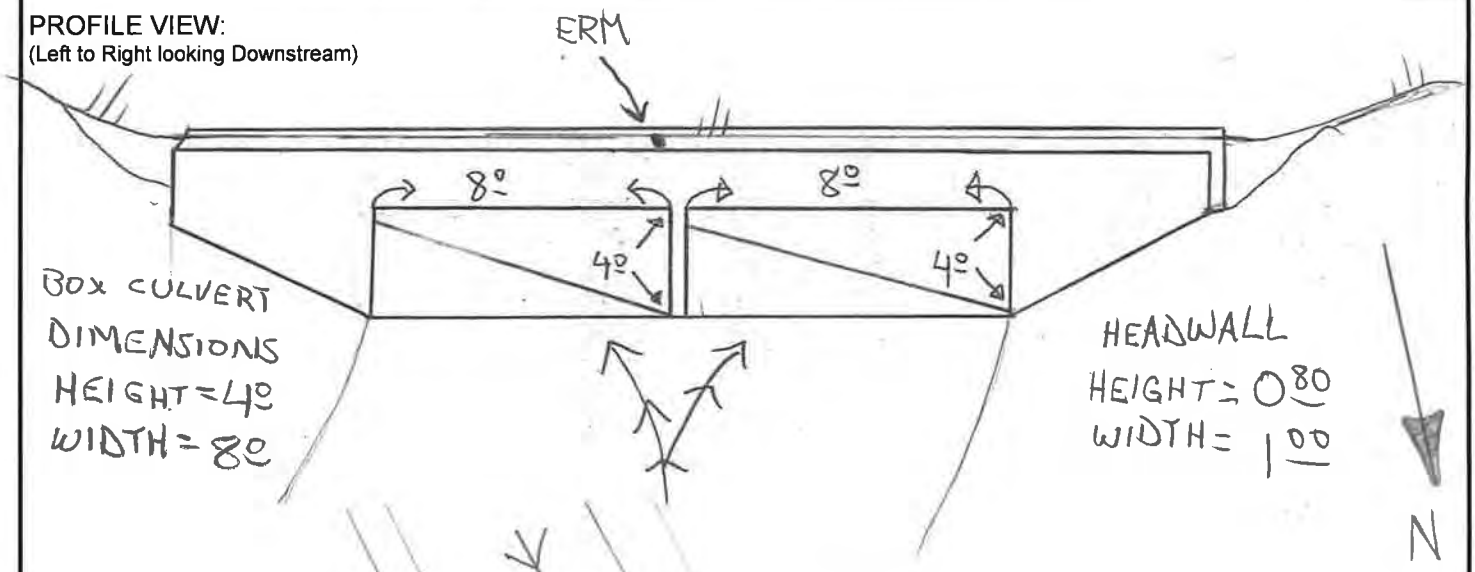
ERM Description: BRASS DISK ON U/S STREAM HEADWALL E Coordinate System: Tx CENTRAL

Photo Numbers: DSCH: 4 DSFACE 5 OTXS: 3 USFACE 1 USCH: 2

Additional Info:

File Name: 190626JD-35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

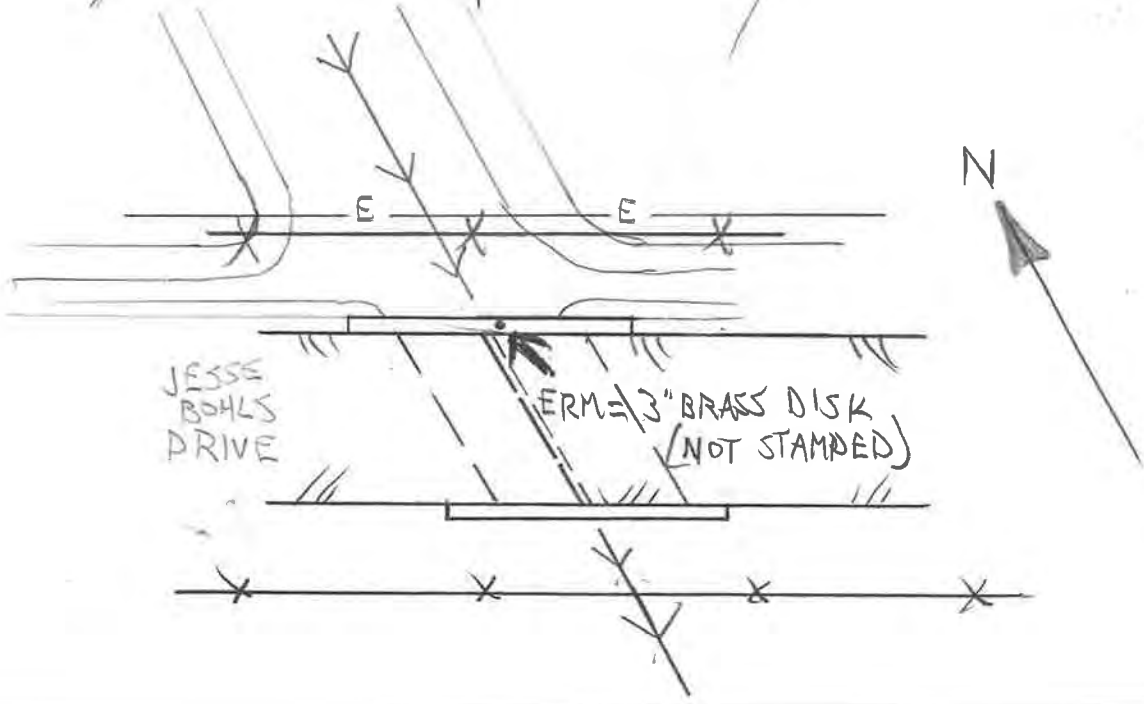


	Photo ID: Coordinates: Description:	WC_T196_STR_2000_USFACE 30.433589, -97.557966 Upstream face
	Photo ID: Coordinates: Description:	WC_T196_STR_2000_DSFACE 30.433589, -97.557966 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY PVILLE SURVEY NAME: WC_T196_STR_3000

STREAM NAME: UNKNOWN DATE: 2019-06-27

LOCATION: WEISS LN & JESSE BOHL'S PFLUGERVILLE CREW: JIMMY DODD CHRIS LAMB

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: 614.654 ERM ID: WCT196300 | GEOID: 12A

BRIDGE: Rail Height: 3.5' Deck: CONC. Width: 97' Pier(s): N/A @ N/A Pier Shape: N/A

CULVERT: Number: N/A Shape: N/A Length: N/A Height: N/A Width: N/A Skew: N/A

CULVERT: I/O Type: N/A Material: N/A Wingwall Angle N/A

DAM: N/A Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

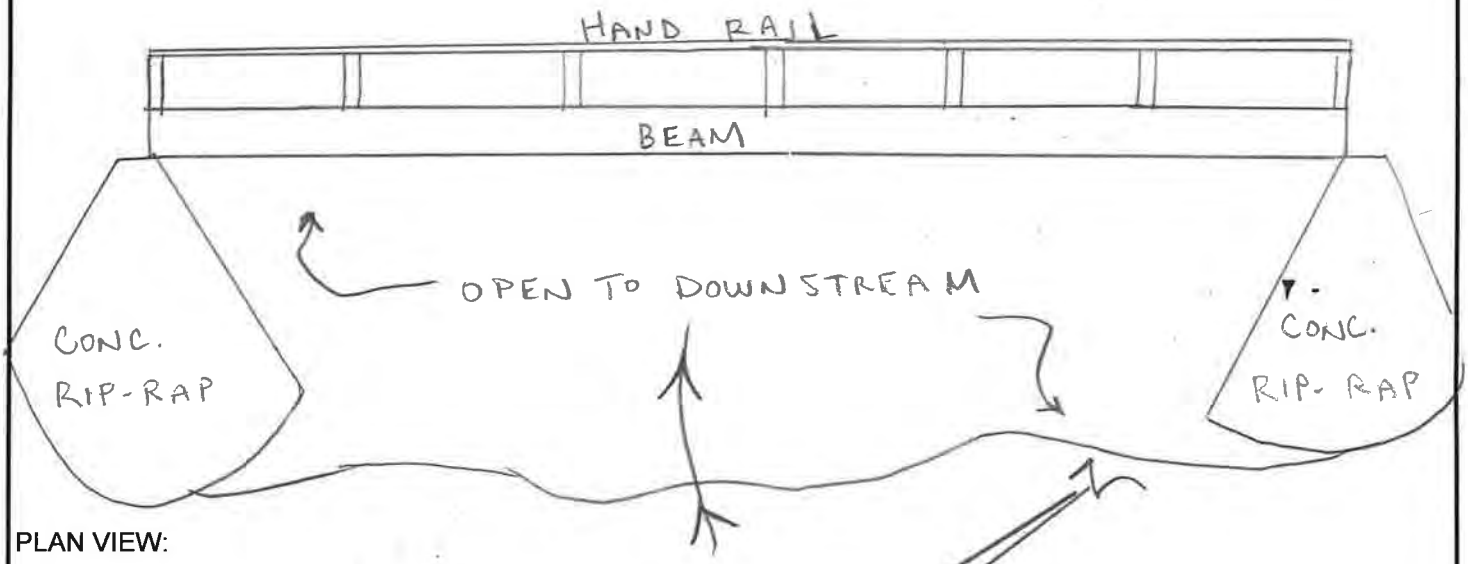
ERM Description: PK NAIL SET @ NW CNR OF BRIDGE Coordinate System: _____

Photo Numbers: DSCH: ✓ DSFACE ✓ OTXS: ✓ USFACE ✓ USCH: ✓

Additional Info: _____

File Name: 190627JD_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

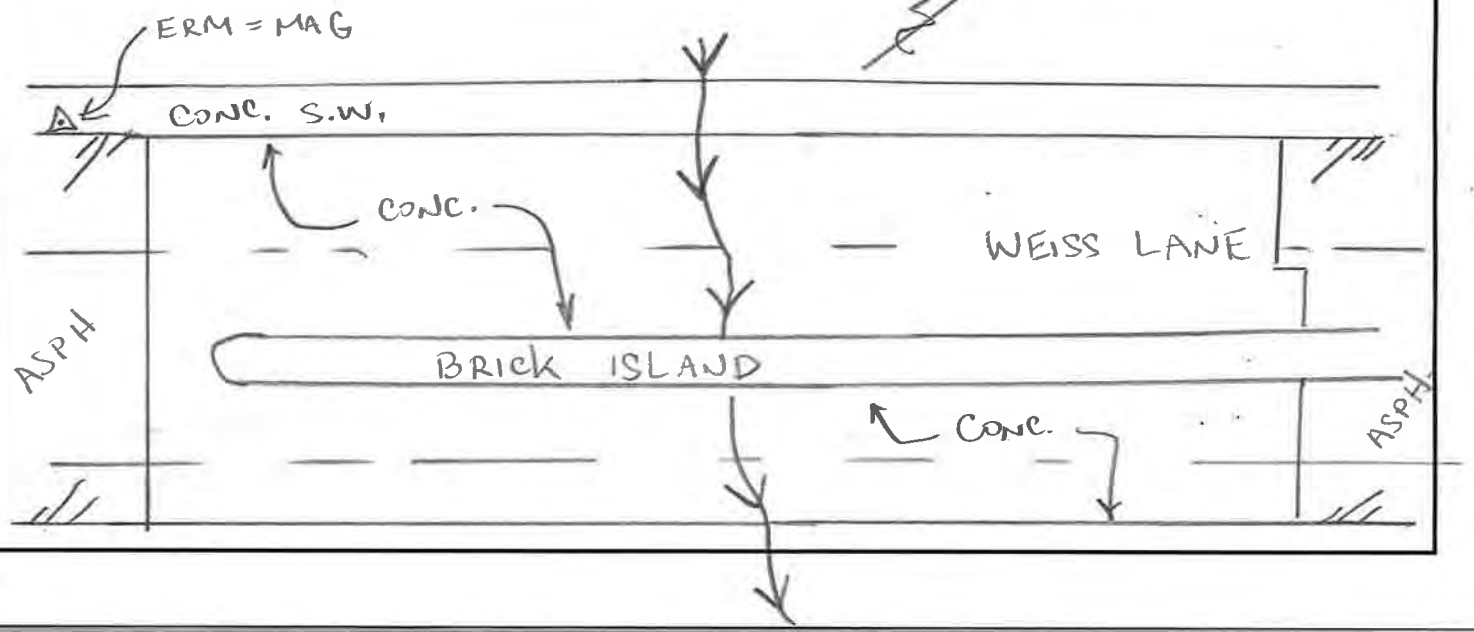


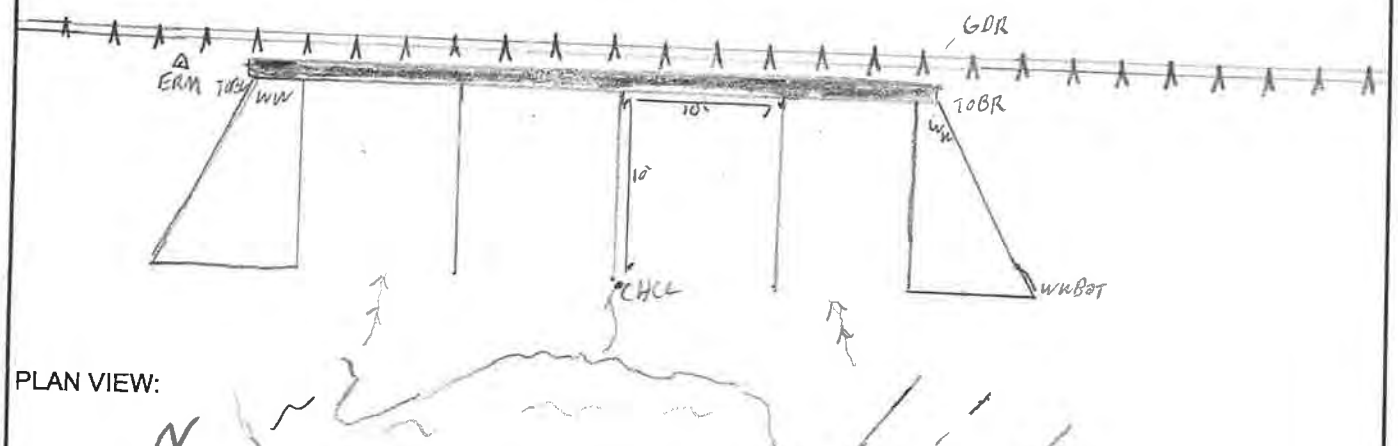
	Photo ID: Coordinates: Description:	WC_T196_STR_3000_USFACE 30.438289, -97.567228 Upstream face
	Photo ID: Coordinates: Description:	WC_T196_STR_3000_DSFACE 30.438289, -97.567228 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY
SURVEY NAME: WC_T196_STR-4000
STREAM NAME: WILBARGER CREEK
DATE: 7/11/19
LOCATION: PFLUGERVILLE, TX
CREW: JJ, CT
TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: 641.167 ERM ID: WC196001 GEOID: 12A

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:
CULVERT: Number: 4 Shape: SQUARE Length: 47.32 Height: 10' Width: 10' Skew:
CULVERT: I/O Type: Material: CONCRETE Wingwall Angle
DAM: Top Width: Side Slope Side Slope US: DS: Outlet:
ERM Description: MAG NAIL Coordinate System: TX-C
Photo Numbers: DSCH: 4 DSFACE 5 OTXS: 1 USFACE 3 USCH: 2
Additional Info:
File Name: 190711JJ_35937

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

	Photo ID: Coordinates: Description:	WC_T196_STR_4000_USFACE 30.443146, -97.577034 Upstream face
	Photo ID: Coordinates: Description:	WC_T196_STR_4000_DSFACE 30.443146, -97.577034 Downstream face

Survey Field Sheet

PROJECT: willbarger — SURVEY NAME: WC - T200 STR - 1000

STREAM NAME: willbarger Creek — DATE: 11-16-19

LOCATION: Pflugerville TX — CREW: Adolfo Vargas / A Ramirez

TYPE: BR(X) CUL( ) DAM( ) XS( ) — ERM ELEV.: _____ — ERM ID: _____ — GEOID: G12AUS

BRIDGE: Rail Height: 3.60 — Deck: .65 — Width: 29. — Pier(s): 3 @ 24" — Pier Shape: Round

CULVERT: Number: _____ — Shape: _____ — Length: _____ — Height: _____ — Width: _____ — Skew: _____

CULVERT: I/O Type: _____ — Material: _____ — Wingwall Angle _____

DAM: Top Width: _____ — Side Slope — Side Slope — US: _____ — DS: _____ — Outlet: _____

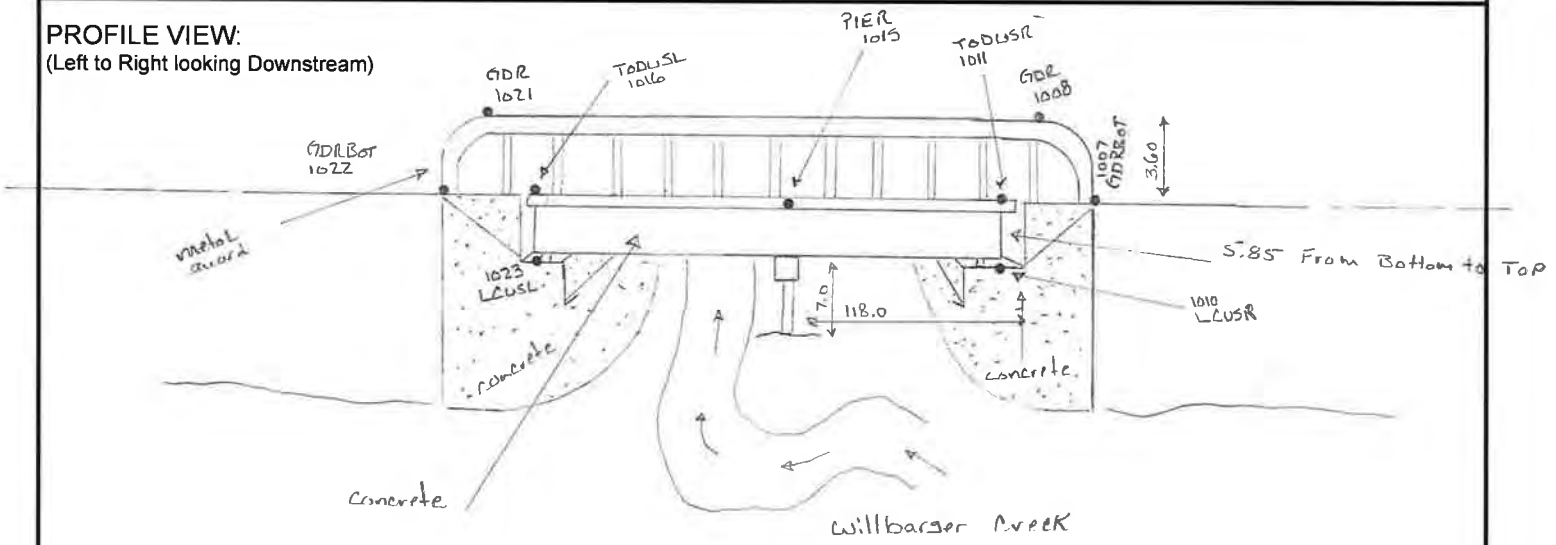
ERM Description: _____ — Coordinate System: TX Central 4203

Photo Numbers: 5 — DSCH: / — DSFACE / — OTXS: / — USFACE / — USCH: /

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

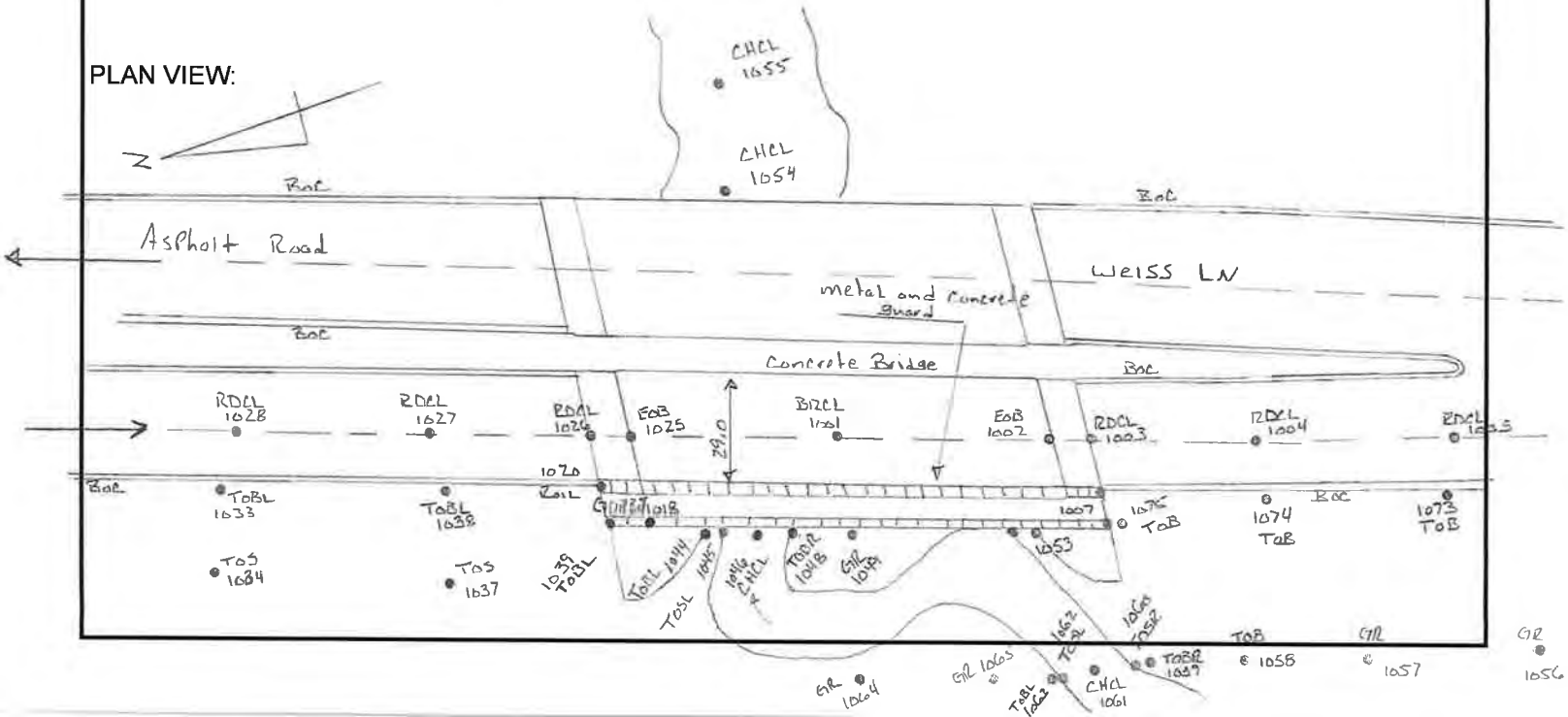


	Photo ID: Coordinates: Description:	WC_T200_STR_1000_USFACE 30.450802, -97.559286 Upstream face
	Photo ID: Coordinates: Description:	WC_T200_STR_1000_DSFACE 30.450802, -97.559286 Downstream face

35837_001

Survey Field Sheet

PROJECT: WILBARGER CREEK

SURVEY NAME: WC_T200_STR_2000

STREAM NAME: WILBARGER CREEK

DATE: 06-19-2019

LOCATION: HIDDEN LAKE DRIVE

CREW: JO, CT, JJ

TYPE: BR( ) CUL(✓) DAM( ) XS( ) ERM ELEV.: 641.30 ERM ID: WCT200STR201 GEOID: 12B

BRIDGE: Rail Height: | Deck: | Width: | Pier(s): | @ | Pier Shape:

CULVERT: Number: 14 | Shape: BOX | Length: 113.83 | Height: 5 | Width: 10 | Skew:

CULVERT: I/O Type: | Material: CONC. | Wingwall Angle:

DAM: Top Width: | Side Slope | Side Slope | US: | DS: | Outlet:

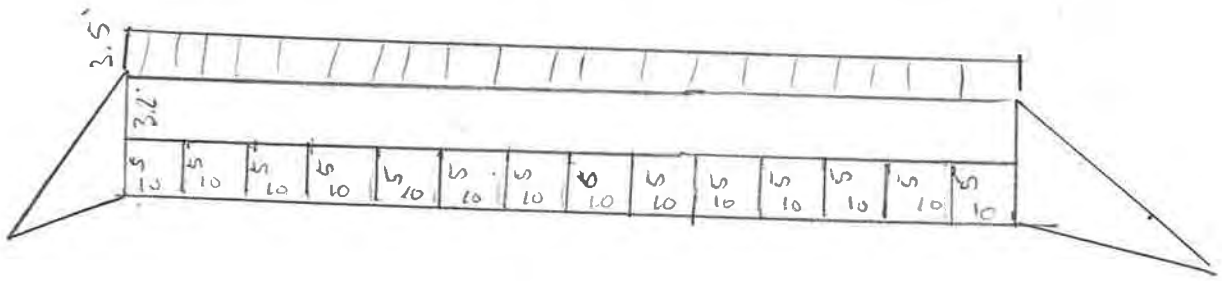
ERM Description: | Coordinate System:

Photo Numbers: | DSCH: | DSFACE | OTXS: | USFACE | USCH:

Additional Info:

File Name: 190619_10-35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

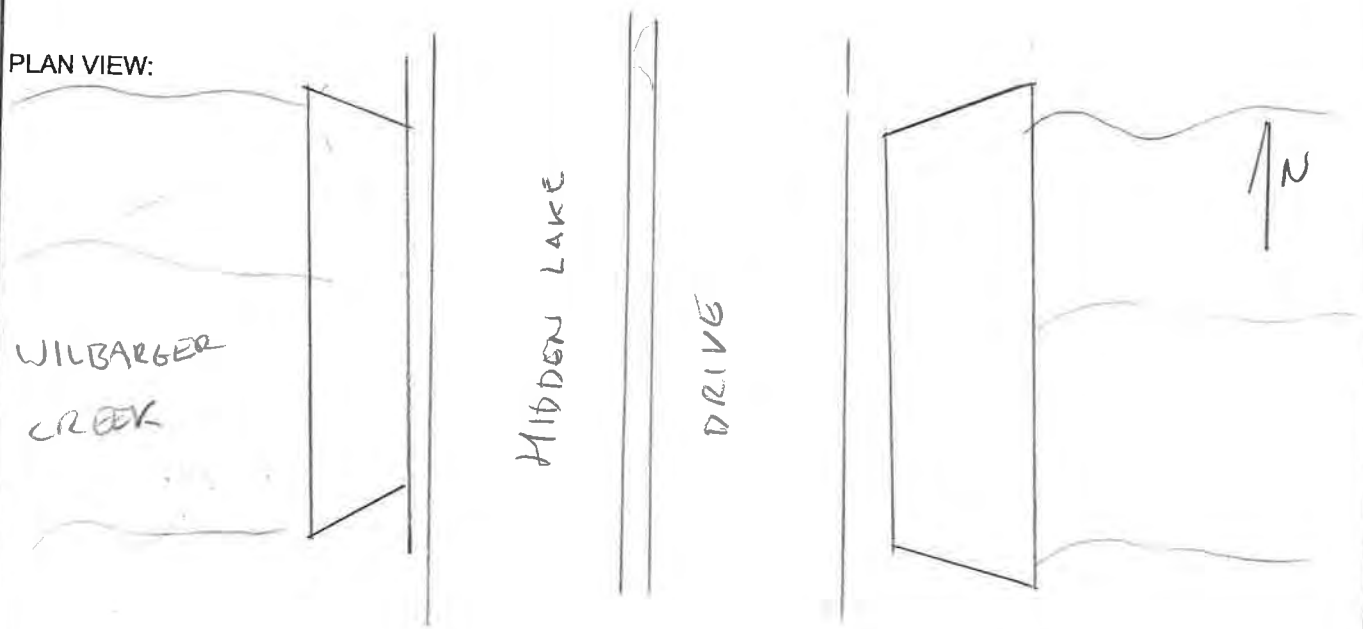


	Photo ID: Coordinates: Description:	WC_T200_STR_2000_USFACE 30.457016, -97.569147 Upstream face
	Photo ID: Coordinates: Description:	WC_T200_STR_2000_DSFACE 30.457016, -97.569147 Downstream face

Survey Field Sheet

PROJECT: Willbarger | SURVEY NAME: INC_T200_STR_3005

STREAM NAME: Willbarger Creek | DATE: 11-19-19

LOCATION: Pflugerville TX | CREW: Adolfo Vargas / A. Ramirez

TYPE: BR(X) CUL(X) DAM( ) XS( ) | ERM ELEV.: _____ | ERM ID: _____ | GEOID: G12AUS

BRIDGE: Rail Height: 0.40 | Deck: 0.50 | Width: 13.1 | Pier(s): X | @ X | Pier Shape: X

CULVERT: Number: wr3004 | Shape: Round | Length: 17.1 | Height: _____ | Width: 36" | Skew: _____

CULVERT: I/O Type: _____ | Material: _____ | Wingwall Angle _____

DAM: Top Width: _____ | Side Slope | Side Slope | US: _____ | DS: _____ | Outlet: _____

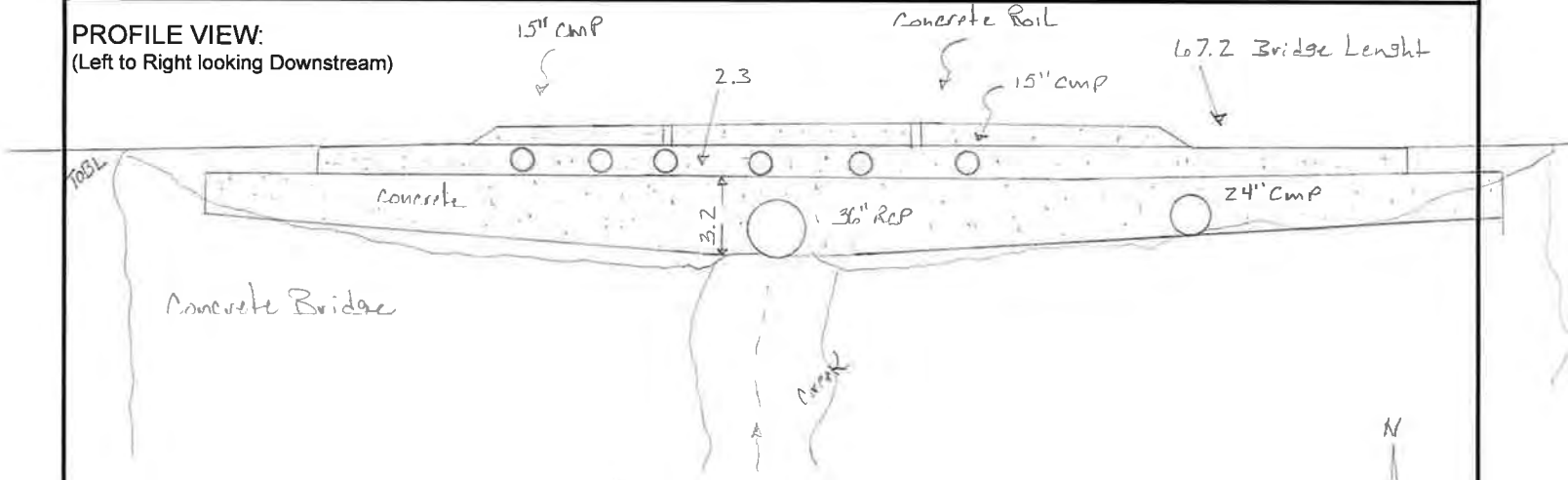
ERM Description: _____ | Coordinate System: TX Central 4203

Photo Numbers: 7 | DSCH: / | DSFACE - | OTXS: / | USFACE - | USCH: -

Additional Info: _____

File Name: 191119AV-35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

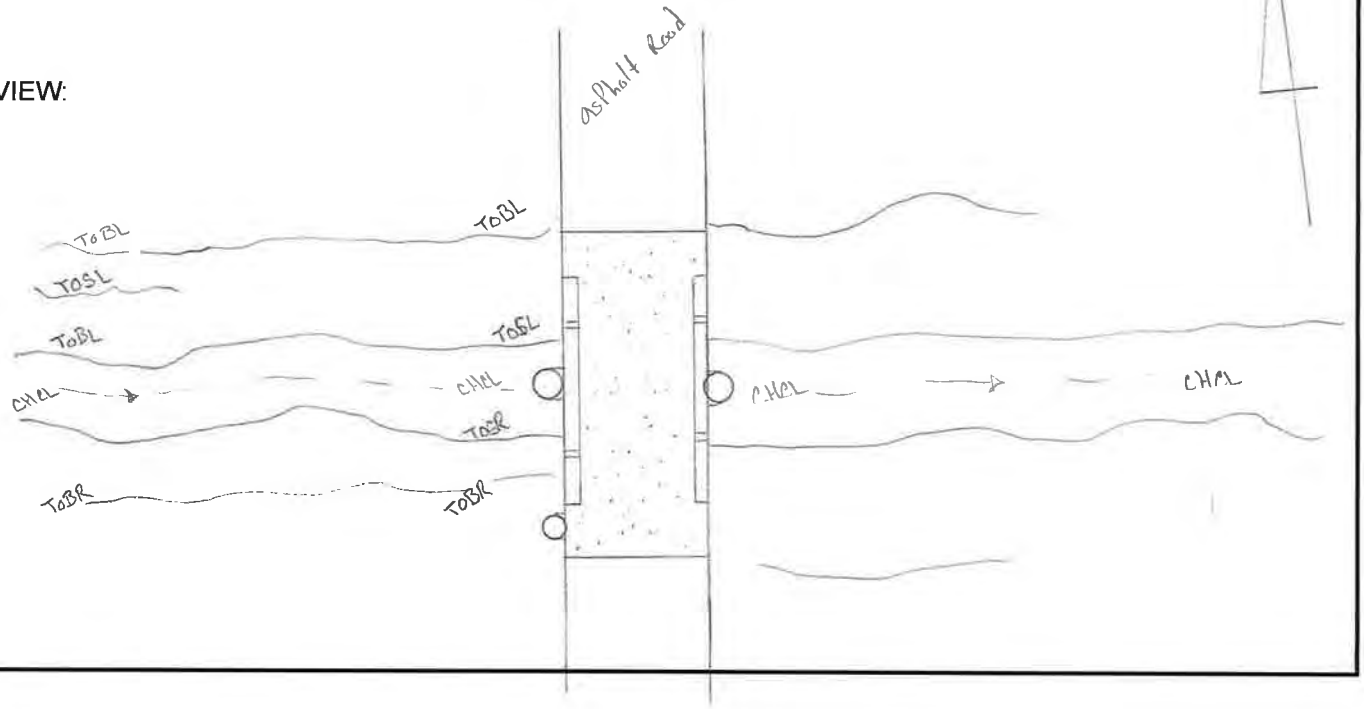


	Photo ID: Coordinates: Description:	WC_T200_STR_3000_USFACE 30.458272, -97.570463 Upstream face
	Photo ID: Coordinates: Description:	WC_T200_STR_3000_USFACE 30.458272, -97.570463 Upstream face

	Photo ID: Coordinates: Description:	WC_T200_STR_3000_DSFACE 30.458272, -97.570463 Downstream face
	Photo ID: Coordinates: Description:	WC_T200_STR_3000_DSFACE 30.458272, -97.570463 Downstream face

Survey Field Sheet

PROJECT: Willburger | SURVEY NAME: WC- T200 STR 4000

STREAM NAME: Willburger Creek | DATE: 11-17-19

LOCATION: Pflugerville, TX | CREW: Adolfo Vargas / A. Ramirez

TYPE: BR(✓) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: G12AUS

29.5'

BRIDGE: Rail Height: 0.85 Deck: .30 Width: 12' Pier(s): 6 @ 12"w Pier Shape: Round

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

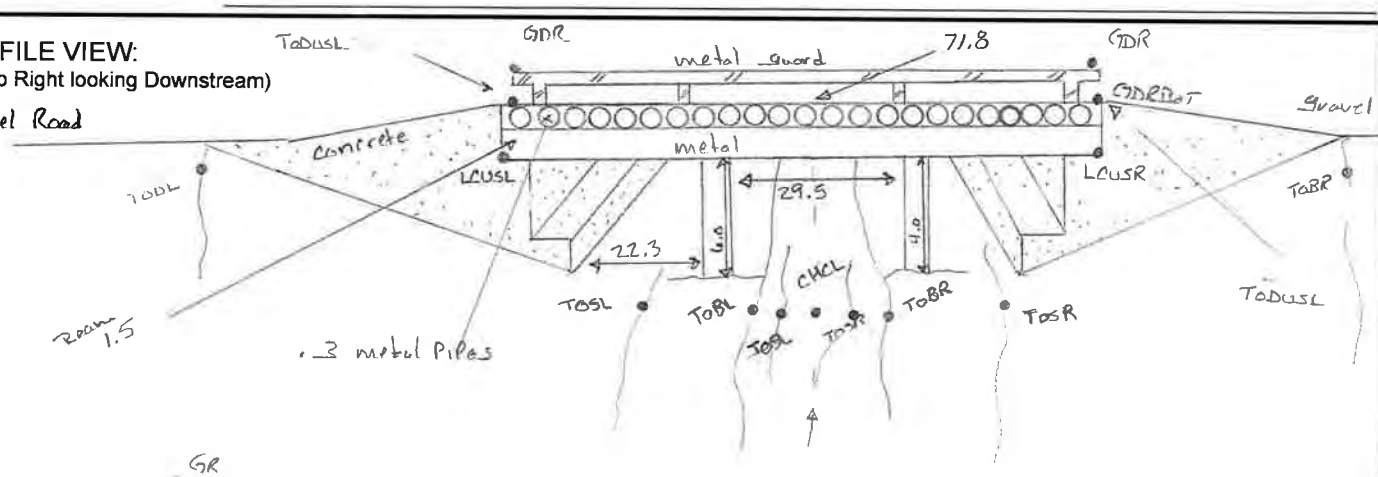
ERM Description: _____ Coordinate System: TX Central 4203

Photo Numbers: 5 DSCH: / DSFACE / OTXS: / USFACE / USCH: /

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

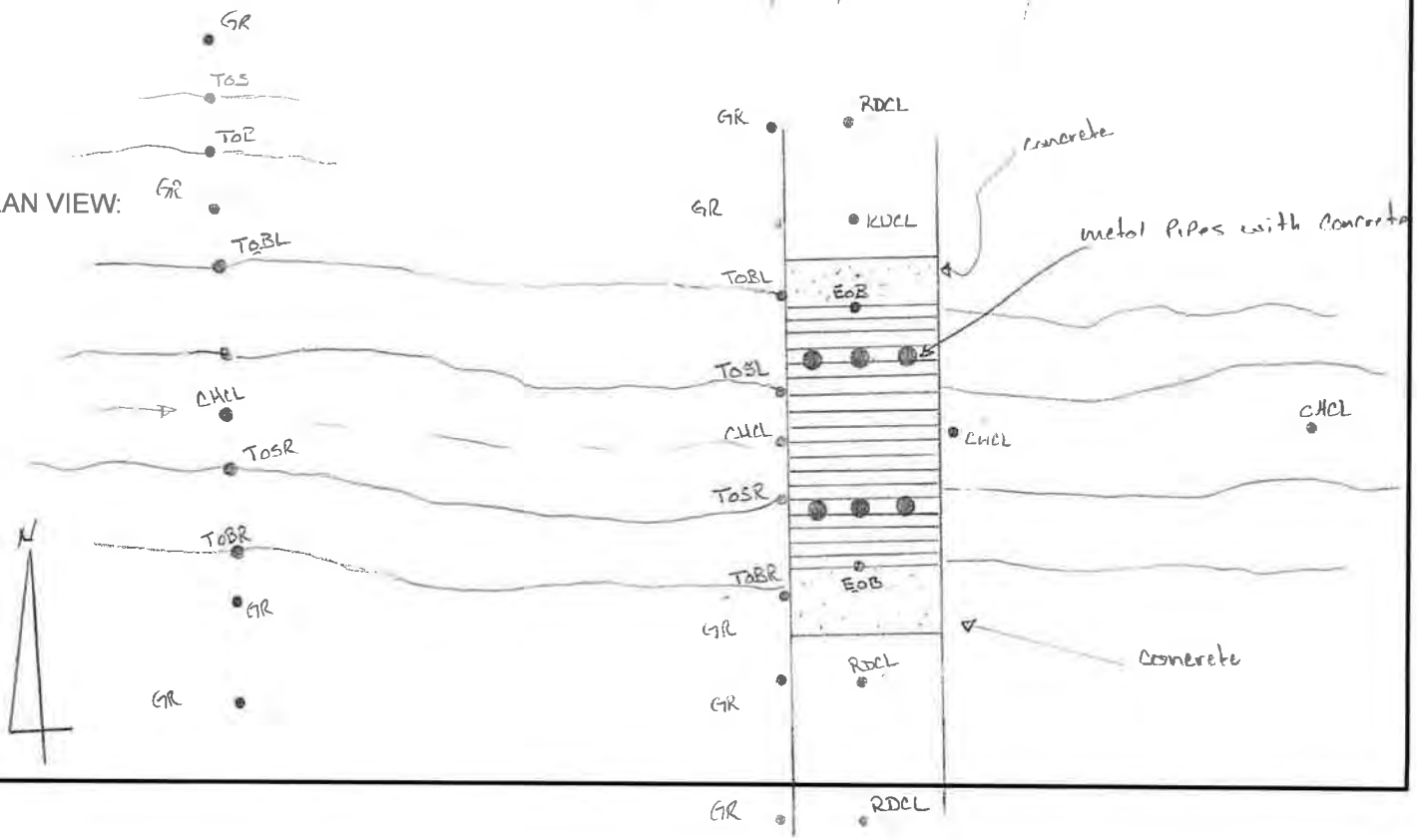


	Photo ID: Coordinates: Description:	WC_T200_STR_4000_USFACE 30.458922, -97.571178 Upstream face
	Photo ID: Coordinates: Description:	WC_T200_STR_4000_DSFACE 30.458922, -97.571178 Downstream face

Survey Field Sheet

PROJECT: WALBARGER CREEK

STREAM NAME: WALBARGER

LOCATION: KELLY LN

SURVEY NAME: WC-T200-STR-5000

DATE: 06-19-2019

CREW: JO, CT, JJ

TYPE: BR( ) CUL(✓) DAM( ) XS( ) ERM ELEV.: 649.73 ERM ID: WC200S001 GEOID: 12B

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:

CULVERT: Number: 3 Shape: BOX Length: 107.45 Height: 6 Width: 8 Skew:

CULVERT: I/O Type: Material: CONC Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

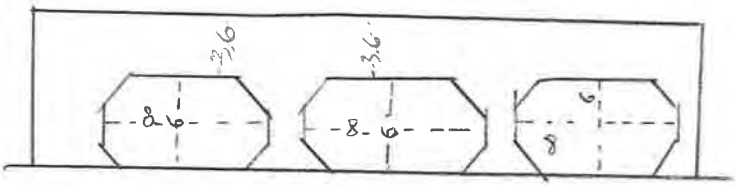
ERM Description: Coordinate System:

Photo Numbers: DSCH: DSFACE OTXS: USFACE USCH:

Additional Info:

File Name: 190619JO-35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

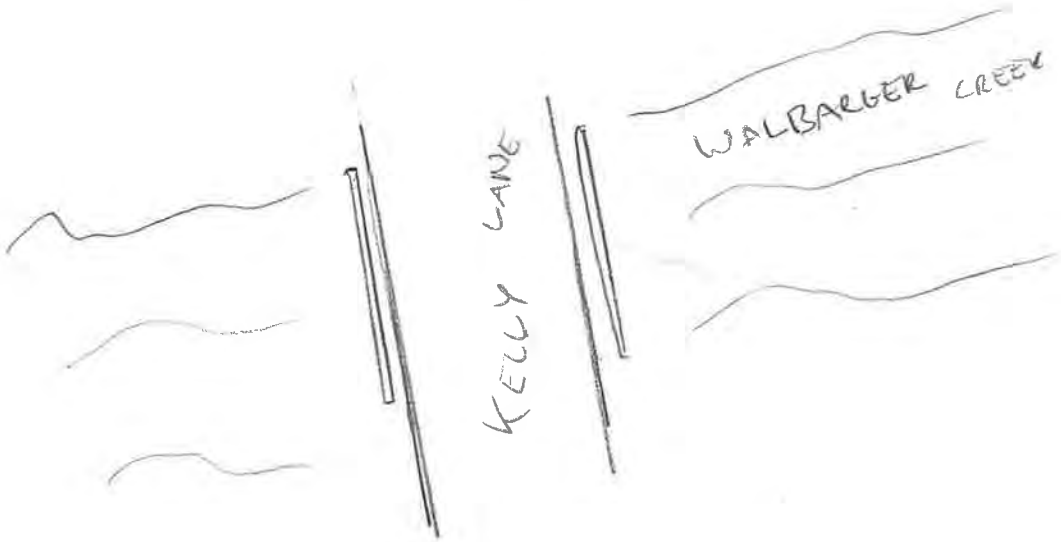


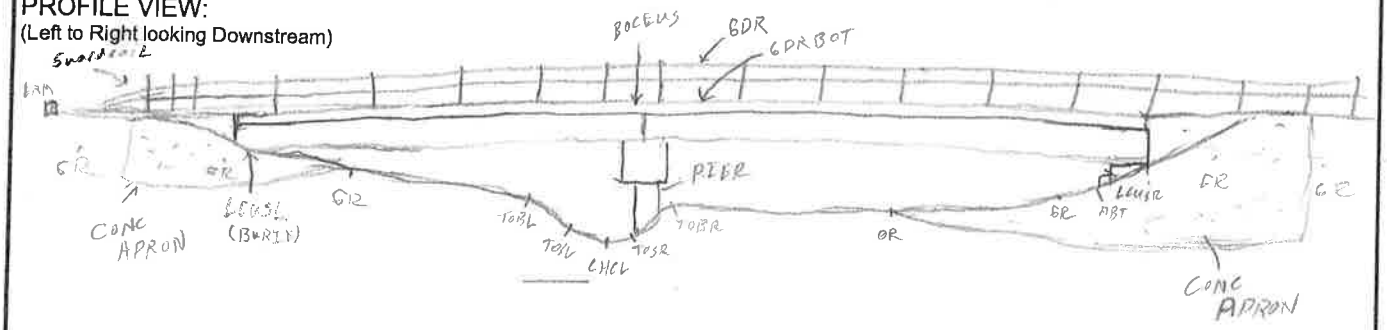
	Photo ID: Coordinates: Description:	WC_T200_STR_5000_USFACE 30.462417, -97.57366 Upstream face
	Photo ID: Coordinates: Description:	WC_T200_STR_5000_DSFACE 30.462417, -97.57366 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY
SURVEY NAME: WC_T200_STR_6000
STREAM NAME: WILBARGER
DATE: 7-30-2019
LOCATION: VILAMOURA St.
CREW: JJ CT
TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: 657.302 ERM ID: WC200600 GEOID: 12A

BRIDGE: Rail Height: 210' Deck: Width: Pier(s): 1 @ 24" Pier Shape:
CULVERT: Number: Shape: Length: Height: Width: Skew:
CULVERT: I/O Type: Material: Wingwall Angle
DAM: Top Width: Side Slope Side Slope US: DS: Outlet:
ERM Description: MAGNAIL IN ASPHALT Coordinate System: Tx C
Photo Numbers: DSCH: DSFACE OTXS: USFACE USCH:
Additional Info:
File Name: 190730JJ_38537

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

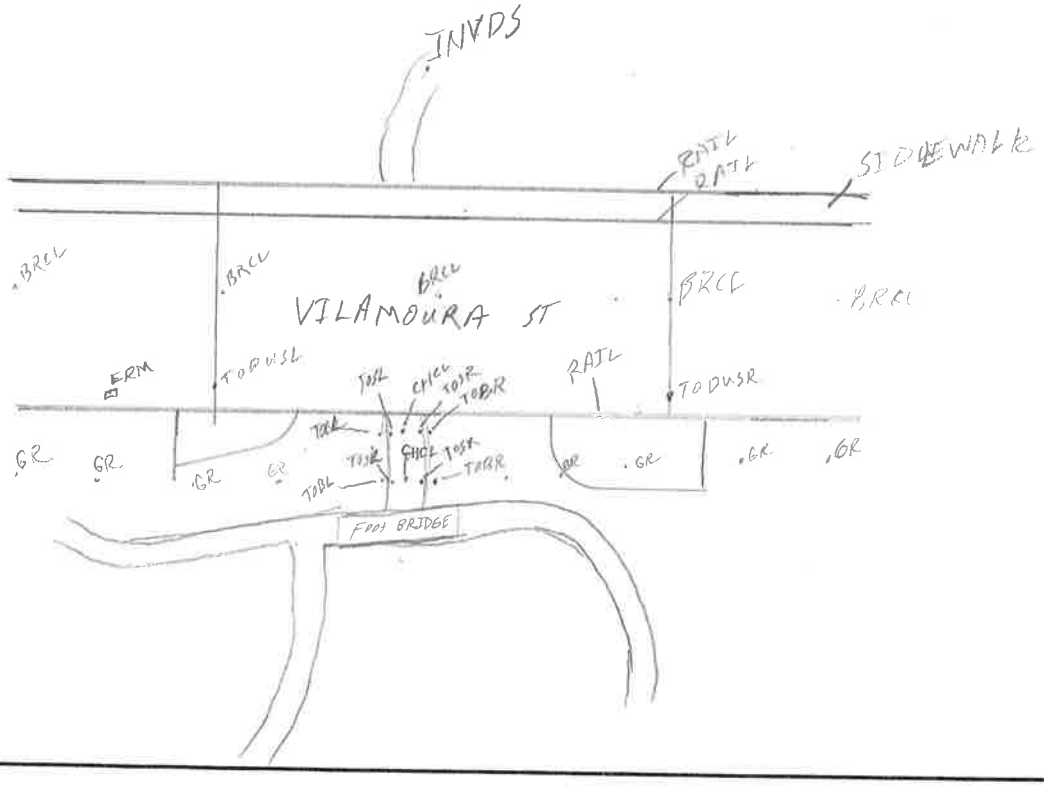


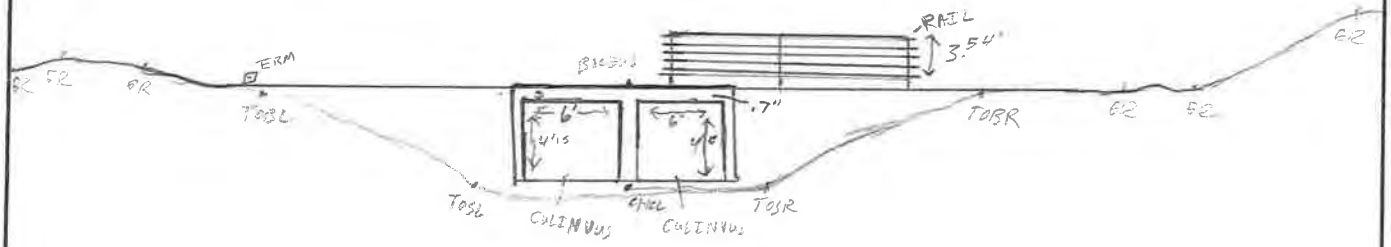
	Photo ID: Coordinates: Description:	WC_T200_STR_6000_USFACE 30.463779, -97.574139 Upstream face
	Photo ID: Coordinates: Description:	WC_T200_STR_6000_DSFACE 30.463779, -97.574139 Downstream face

Survey Field Sheet

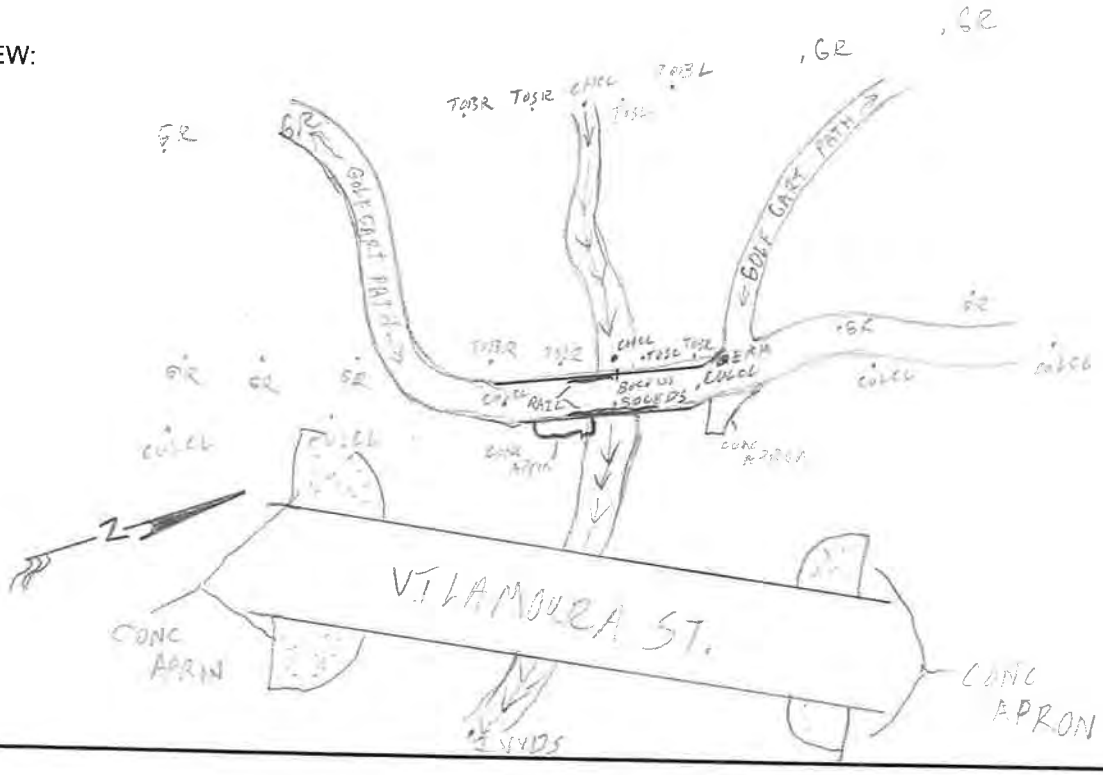
PROJECT: FEMA FLOOD STUDY
SURVEY NAME: WC_T200_STR_7000
STREAM NAME: WILBARGER
DATE: 7-29-2019
LOCATION: VILAMOURA ST.
CREW: JJ CT
TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: 650.685 ERM ID: WC2007001 GEOID: 12A

BRIDGE: Rail Height: 3.54" Deck: Width: Pier(s): @ Pier Shape:
CULVERT: Number: 2 Shape: SQUARE Length: 12' Height: 4.15' Width: 6' Skew: NO
CULVERT: I/O Type: Material: Wingwall Angle
DAM: Top Width: Side Slope Side Slope US: DS: Outlet:
ERM Description: MAG NAIL IN CONCRETE Coordinate System: Tx C
Photo Numbers: DSCH: DSFACE OTXS: USFACE USCH:
Additional Info: COMPLETE RESHOOT USED EXISTING ERM AS NEW ERM
File Name: 190729JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:



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Survey Field Sheet

PROJECT: FEMA FLOOD STUDY | SURVEY NAME: WC_TZOO_STR_8000

STREAM NAME: UNKNOWN | DATE: 2019-06-21

LOCATION: NE, +/- 300' OF CLUBHOUSE AT THE BLACKHAWK GOLF COURSE | CREW: JIMMY DODD

TYPE: BR(X) CUL( ) DAM( ) XS( ) | ERM ELEV.: 654.236 | ERM ID: WCTZOO8001 | GEOID: 12A

BRIDGE:	Rail Height:	170	Deck: CONC	Width:	70	Pier(s):	N/A	@	N/A	Pier Shape:	N/A
CULVERT:	Number:	1	Shape: CYLINDER	Length:	1650	Height:	18" RCP	Width:	18" RCP	Skew:	188 03'47"
CULVERT:	I/O Type:			Material:		Wingwall Angle					
DAM:	Top Width:	90	Side Slope	85	Side Slope	90	US:	30	DS:	25	Outlet:

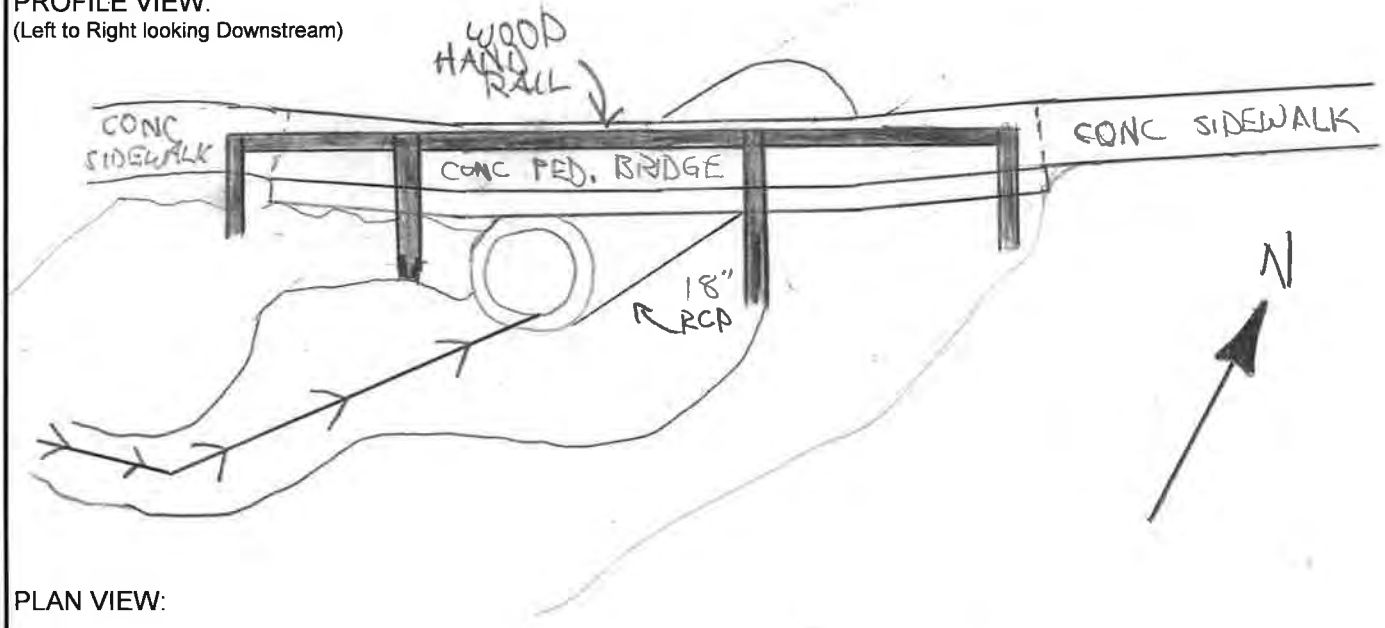
ERM Description: PK NAIL SET IN CONC SIDEWALK | Coordinate System: TX CENTRAL

Photo Numbers: DSCH: | DSFACE | OTXS: | USFACE | USCH:

Additional Info: CONCRETE OF BRIDGE BROKEN IN SEVERAL PLACES

File Name: 19062IJD-35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

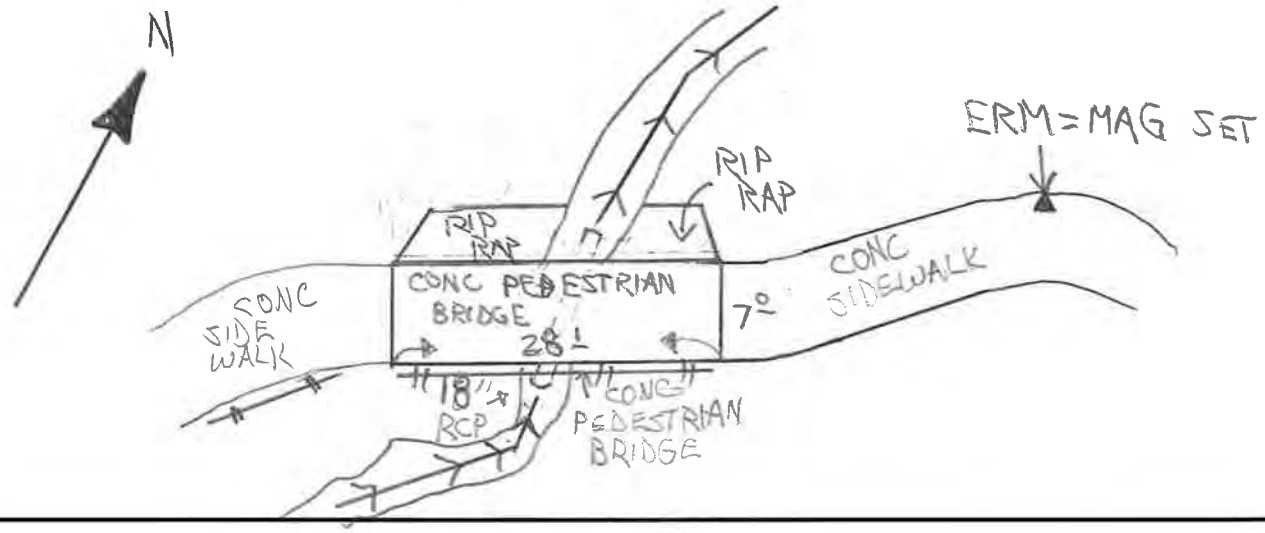


	Photo ID: Coordinates: Description:	WC_T200_STR_8000_USFACE 30.465719, -97.57698 Upstream face
	Photo ID: Coordinates: Description:	WC_T200_STR_8000_DSFACE 30.465719, -97.57698 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY
SURVEY NAME: WC_T200_STR_9000
STREAM NAME: WIBARGER CREEK
DATE: 7/30/2019
LOCATION: BLACKHAWK GOLF CLUB
CREW: JJ, CT
TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: 657.34' ERM ID: WC200 9001 GEOID: 12A

BRIDGE: Rail Height: .76" Deck: 15.25' Width: 6' Pier(s): 4 @ 3@4" 1@12" Pier Shape: Cylinder
CULVERT: Number: Shape: Length: Height: Width: Skew:
CULVERT: I/O Type: Material: Wingwall Angle
DAM: Top Width: Side Slope Side Slope US: DS: Outlet:
ERM Description: 60D NAIL Coordinate System: TX-C
Photo Numbers: DSCH: 3 DSFACE 5 OTXS: 1 USFACE 4 USCH: 2
Additional Info: COMPLETE RESHOOT
File Name: 190730JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)

PLAN VIEW:

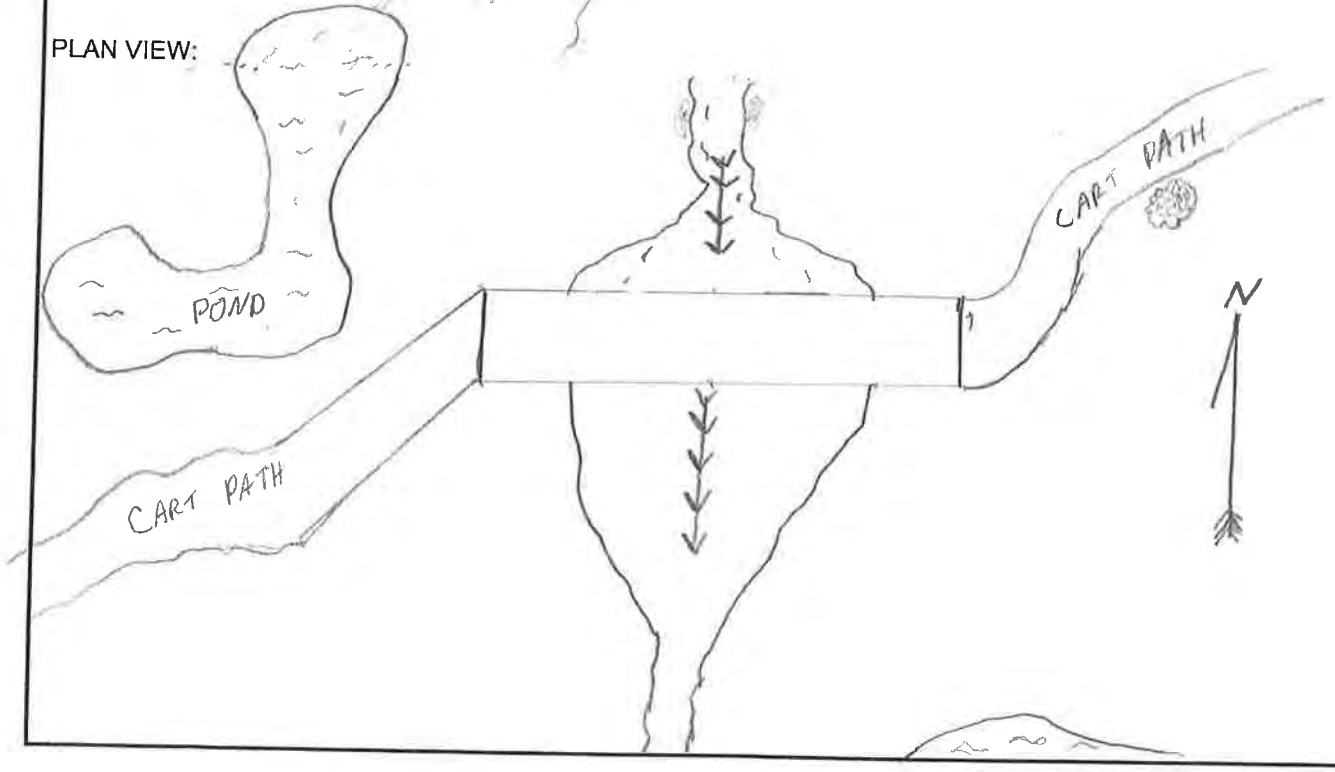


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	Photo ID: Coordinates: Description:	WC_T200_STR_9000_DSFACE 30.466734, -97.576634 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_T200_STR_10000

STREAM NAME: UNKNOWN DATE: 2019-06-20

LOCATION: BLACKHAWK GOLF COURSE CREW: JIMMY DODD CARTER TIPPIN

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: 657.12 ERM ID: WCT200|0001 GEOID: 12A

BRIDGE: Rail Height: 10 Deck: WOOD Width: 8.30 Pier(s): 4 WOOD @ 8" Pier Shape: CYLINDER

CULVERT: Number: Ø Shape: RECTAN Length: 60.1 Height: _____ Width: 8.3 Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

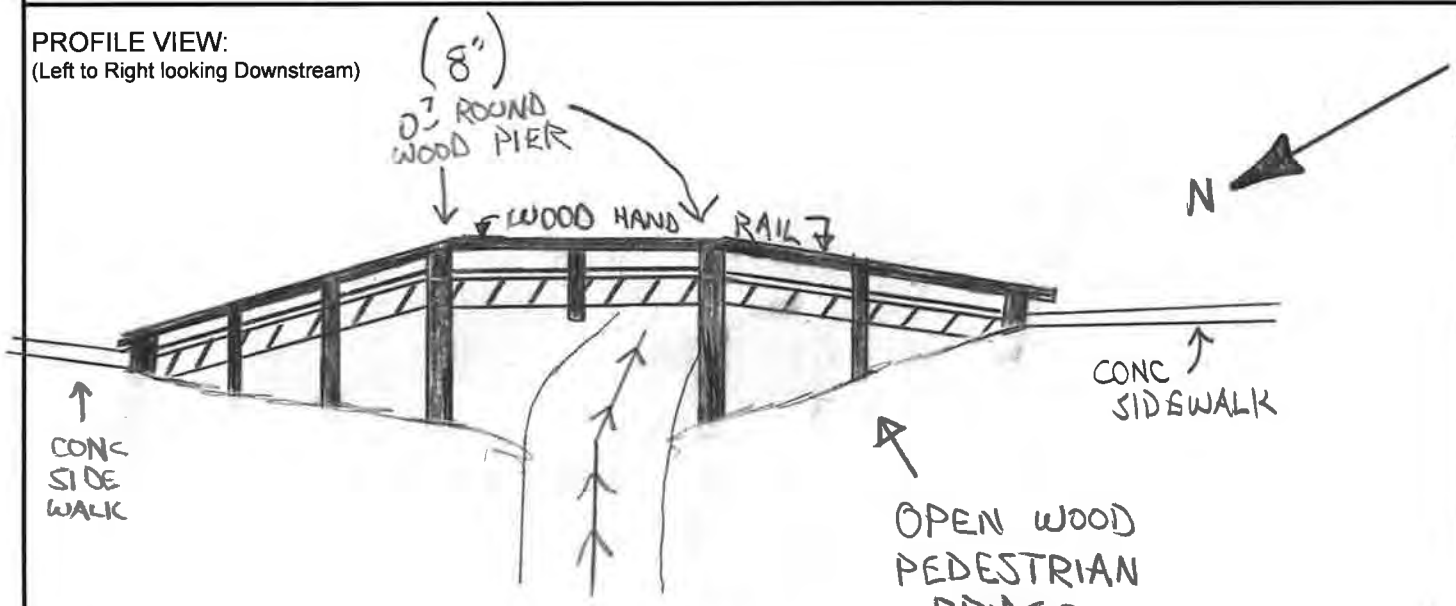
ERM Description: PK NAIL SET IN CONC Coordinate System: Tx CENTRAL 4203

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: 190620VD_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

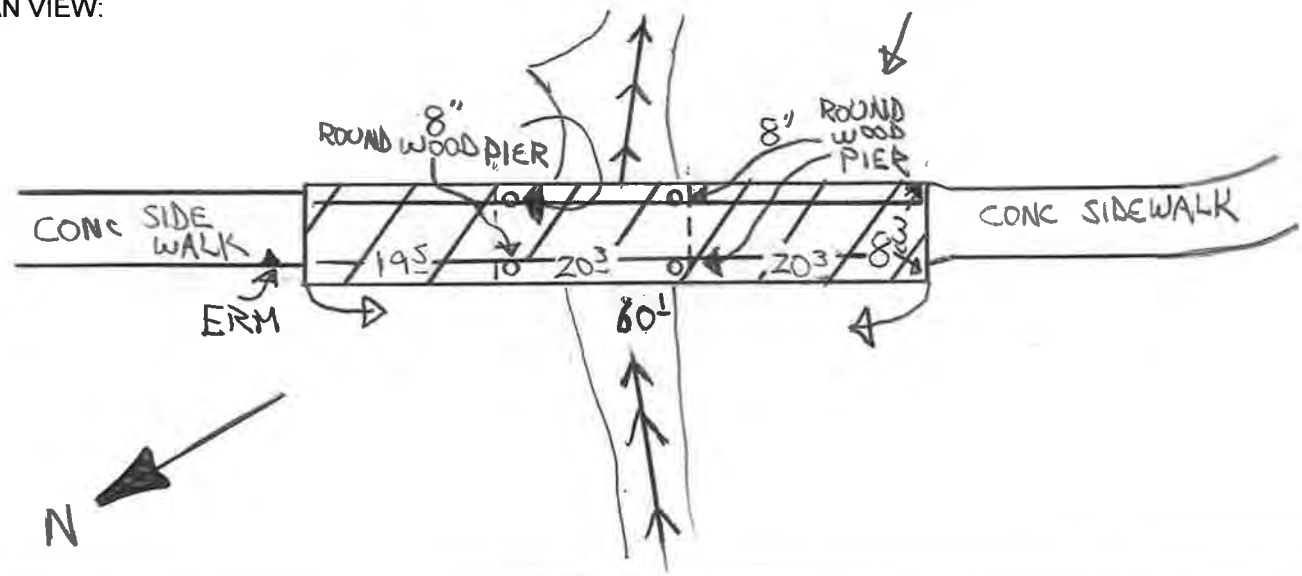


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	Photo ID: Coordinates: Description:	WC_T200_STR_10000_DSFACE 30.467528, -97.576789 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY PVILLE SURVEY NAME: WC_TZ00_STR_11000

STREAM NAME: UNKNOWN DATE: 2019-06-20

LOCATION: BLACKHAWK GOLF COURSE NEAR HOLE #3 CREW: JIMMY DODD CARTER TIPPIN

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: 622.911 ERM ID: WCTZ0011001 GEOID: 12A

BRIDGE: Rail Height: 1.0 Deck: WOOD Width: 8.0 Pier(s): 2 @ 0.45 Pier Shape: SQUARE / 0.55 Shape: CYLINDER

CULVERT: Number: ____ Shape: ____ Length: 38.4 Height: ____ Width: 8.0 Skew: ____

CULVERT: I/O Type: ____ Material: ____ Wingwall Angle ____

DAM: Top Width: ____ Side Slope ____ Side Slope ____ US: ____ DS: ____ Outlet: ____

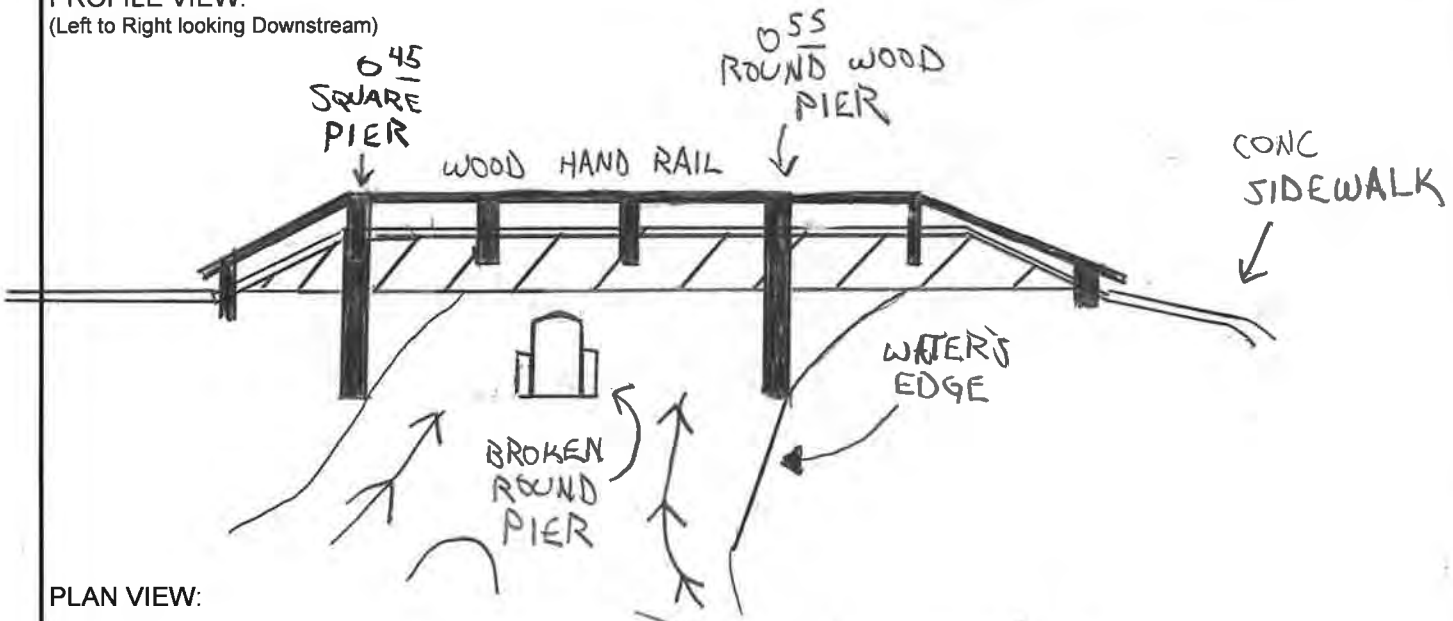
ERM Description: PK SET IN CONC SIDEWALK Coordinate System: TX CENTRAL 4203

Photo Numbers: DSCH: ____ DSFACE ____ OTXS: ____ USFACE ____ USCH: ____

Additional Info: ____

File Name: 190LZ0JD_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

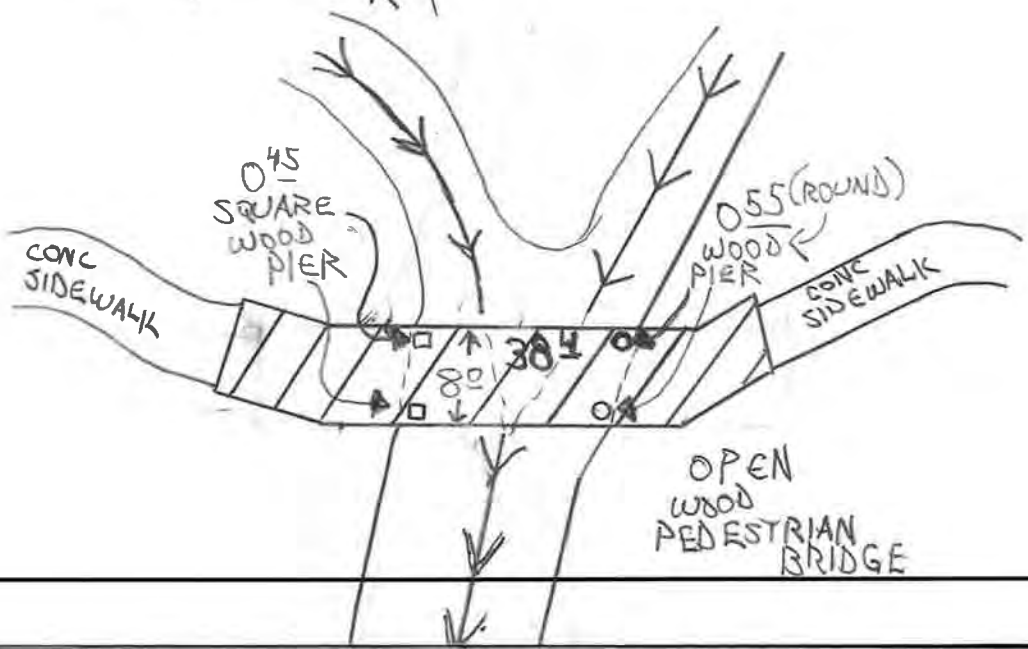


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	Photo ID: Coordinates: Description:	WC_T200_STR_11000_DSFACE 30.470191, -97.580948 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY PVILLE SURVEY NAME: WC_TZ00_STR_12000

STREAM NAME: UNKNOWN DATE: 2019-06-20

LOCATION: +/- 100' E. OF 19205 SEA ISLAND CREW: JIMMY DODD CARTER TIPPIN

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: 664 809 ERM ID: WCTZ00I2001 GEOID: IZA

BRIDGE: Rail Height: 150 Deck: CONC Width: 920 Pier(s): N/A @ N/A Pier Shape: N/A

CULVERT: Number: 3 Shape: CYLINDER Length: 920 Height: 18" RCP Width: 18" RCP Skew: Ø

CULVERT: I/O Type: Material: Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

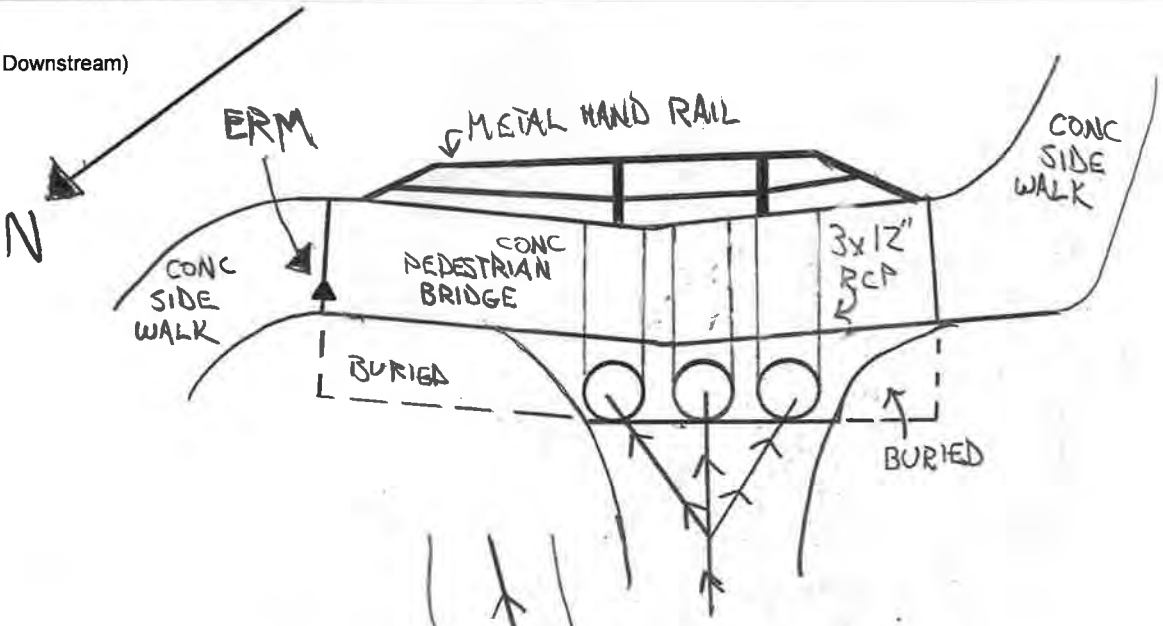
ERM Description: +/- 100' E. OF BR RT PROP CNR OF 19205 SEA ISLAND DR Coordinate System: Tx CENTRAL 4203

Photo Numbers: DSCH: DSFACE OTXS: USFACE USCH:

Additional Info:

File Name: 190620JD_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

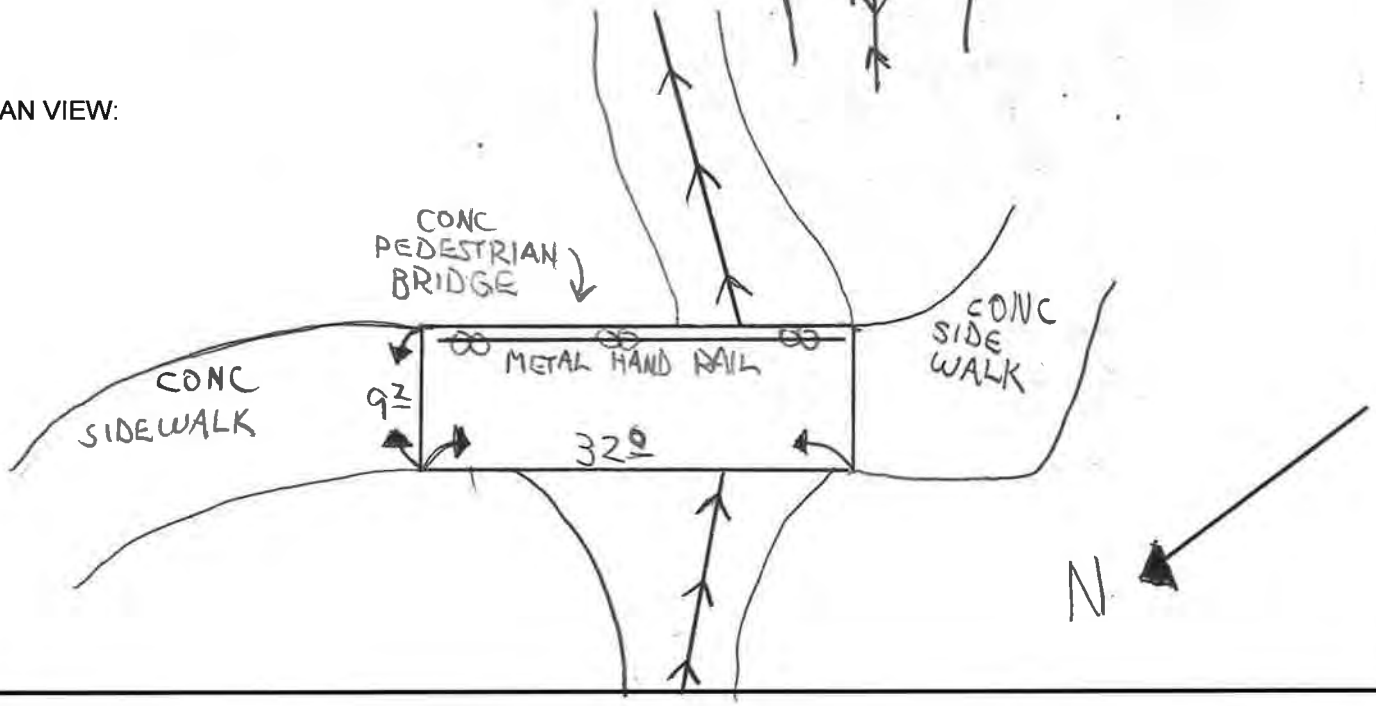


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	Photo ID: Coordinates: Description:	WC_T200_STR_12000_DSFACE 30.471329, -97.581086 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_TZ00_STR_13000

STREAM NAME: UNKNOWN DATE: 2019-06-19

LOCATION: BETWEEN 19601 MALLARD POND TRL & 2212 HAYFIELD SQUARE CREW: JIMMY DODD CHRIS LAMB

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: WCTZ00013001 GEOID: 12A

BRIDGE:	Rail Height:	2'06	Deck:		Width:		Pier(s):		@		Pier Shape:
CULVERT:	Number:	12	Shape:	RECTANGLE	Length:		Height:	6'0	Width:	8'0	Skew: 0
CULVERT:	I/O Type:				Material:		Wingwall Angle				
DAM:	Top Width:		Side Slope		Side Slope		US:		DS:		Outlet:

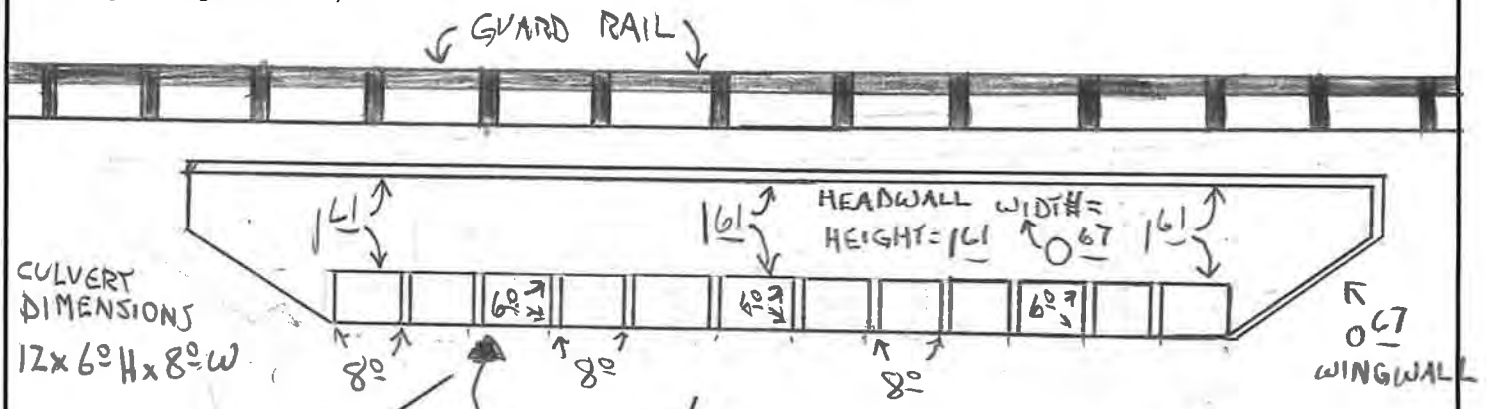
ERM Description: PK NAIL SET IN ASPH. NEAR N. END OF W. WALL Coordinate System: Tx CENTRAL

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info:

File Name: 190619JD-35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

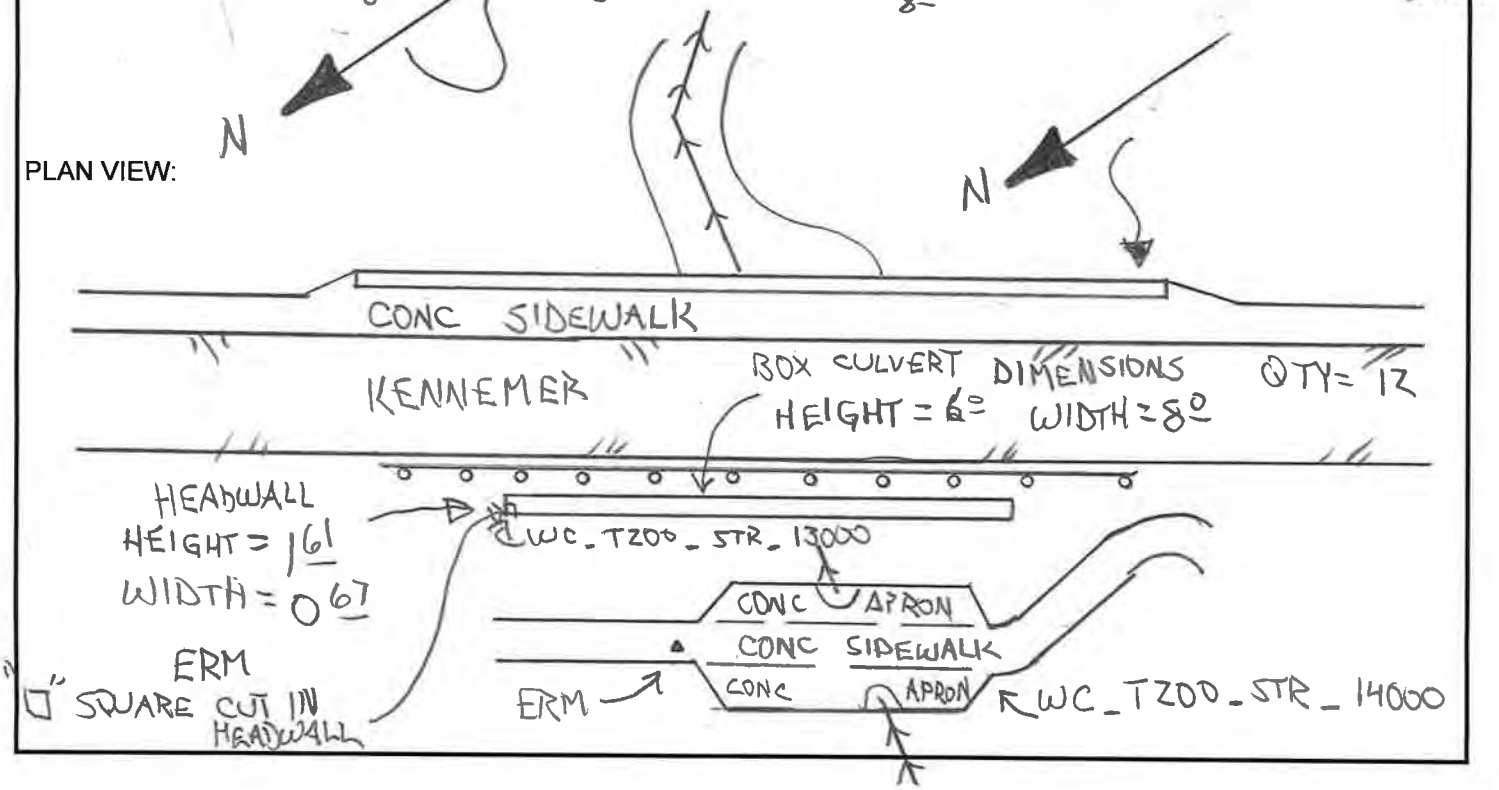


	Photo ID: Coordinates: Description:	WC_T200_STR_13000_USFACE 30.472614, -97.582041 Upstream face
	Photo ID: Coordinates: Description:	WC_T200_STR_13000_DSFACE 30.472614, -97.582041 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_TZOO_STR_14000

STREAM NAME: UNKNOWN DATE: 2019-06-19

LOCATION: KENNEMER DRIVE PFLUGERVILLE CREW: JIMMY DODD CARTER TIPPIN

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: 666.353 ERM ID: WCTZOO14001 GEOID: IZA

BRIDGE:	Rail Height:	N/A	Deck:	CONC	Width:	11°	Pier(s):	N/A	@	N/A	Pier Shape: N/A
CULVERT:	Number:	1	Shape:	CYLINDER	Length:		Height:	18" RCP	Width:	18" RCP	Skew: Ø
CULVERT:	I/O Type:				Material:				Wingwall Angle		
DAM:	Top Width:		Side Slope		Side Slope		US:		DS:		Outlet:

ERM Description: PK NAIL SET IN CONC Coordinate System: TX CENTRAL 4203

Photo Numbers: DSCH: DSFACE OTXS: USFACE USCH:

Additional Info:

File Name: 190619JD_35837

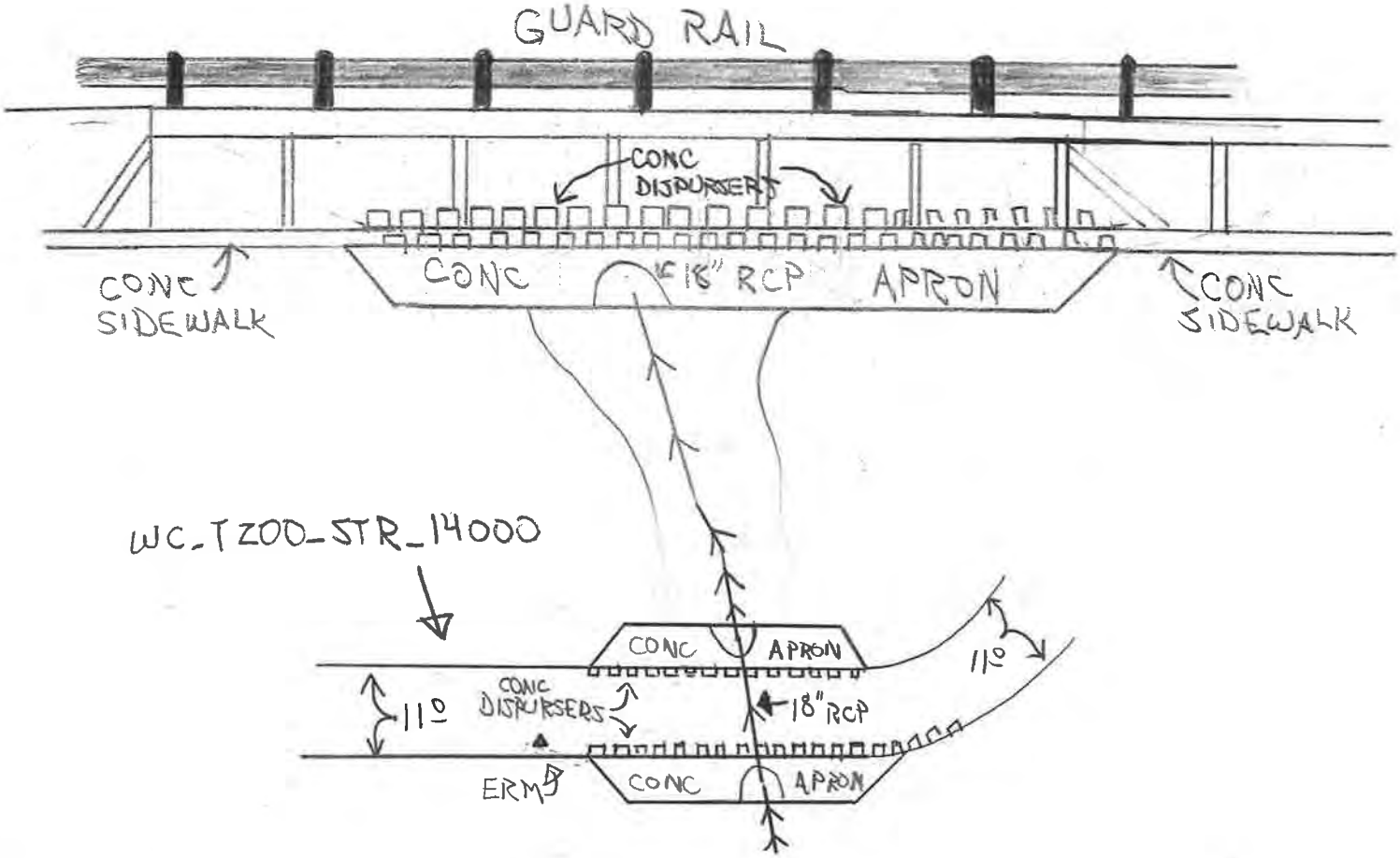


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	Photo ID: Coordinates: Description:	WC_T200_STR_14000_DSFACE 30.472804, -97.582291 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_T200_STR_15000

STREAM NAME: UNKNOWN DATE: 2019-06-20

LOCATION: KENNEMER DR PFLUGERVILLE CREW: JIMMY DODD CARTER TIPPIN

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: 663.73 ERM ID: WCT200(500) GEOID: 12A

BRIDGE: Rail Height: N/A Deck: CONC Width: 10.8 Pier(s): N/A @ N/A Pier Shape: N/A

CULVERT: Number: 8 Shape: CYLINDER Length: _____ Height: 18" RCP Width: 18" RCP Skew: 0

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope _____ Side Slope _____ US: _____ DS: _____ Outlet: _____

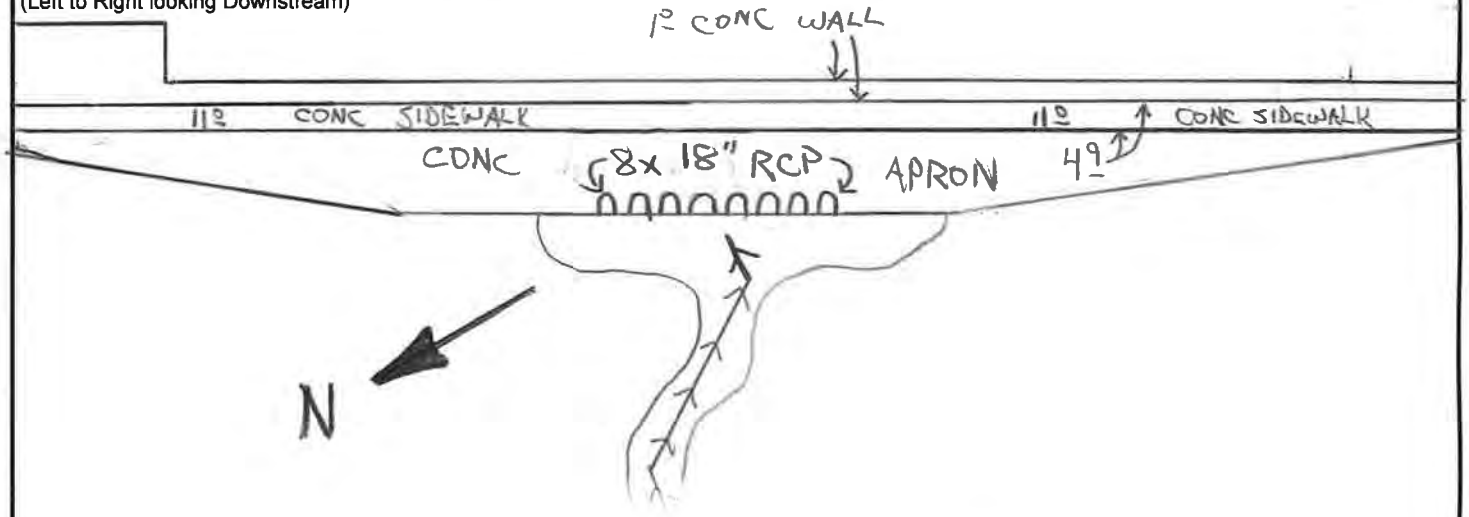
ERM Description: PK SET IN CONC SIDEWALK Coordinate System: TxCENTRAL 4203

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: 190620JD_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW: WC_T200_STR_14000

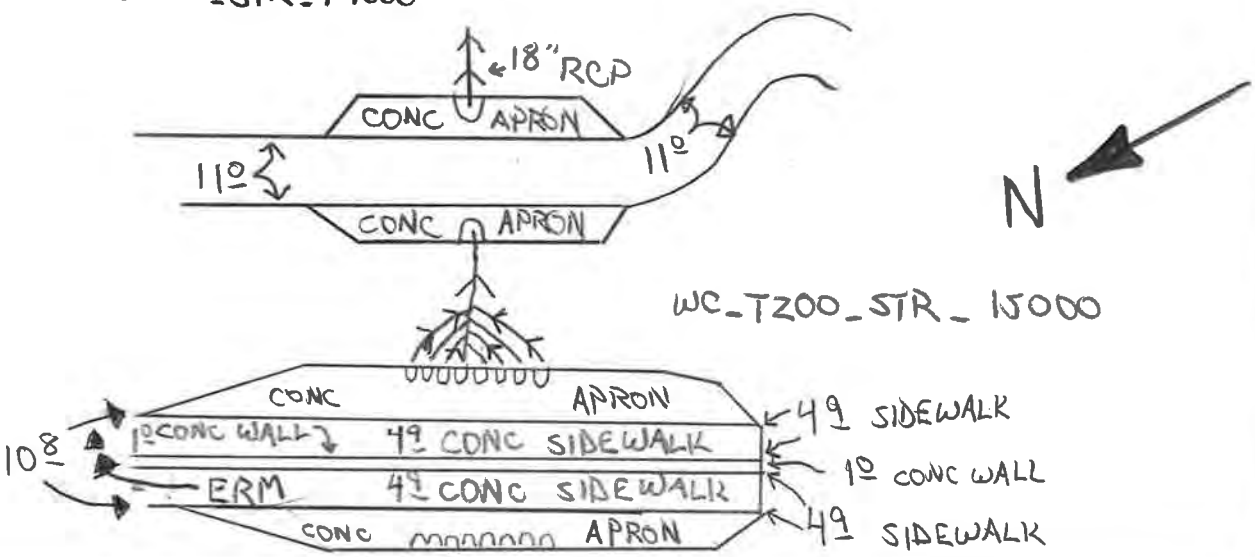


	Photo ID: Coordinates: Description:	WC_T200_STR_15000_USFACE 30.472919, -97.582396 Upstream face
	Photo ID: Coordinates: Description:	WC_T200_STR_15000_DSFACE 30.472919, -97.582396 Downstream face

Survey Field Sheet

PROJECT: 35837 SURVEY NAME: WC _ T200 _ STR _ 16mm

STREAM NAME: WILBARGER DATE: 12-04-2019

LOCATION: FLUGERVILLE CREW: J. OGLE, C. TIPPIN J JOHNSON

TYPE: BR( ) CUL(✓) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: 12B

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 3 Shape: ROUND Length: _____ Height: 15" Width: 15" Skew: _____

CULVERT: I/O Type: CONC PIPE Material: CONC Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

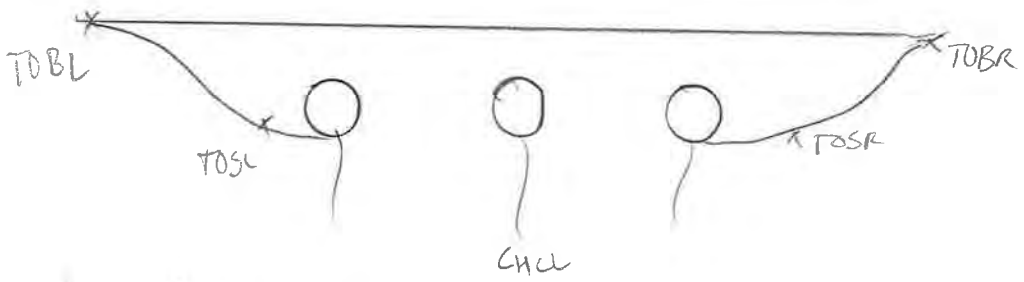
ERM Description: _____ Coordinate System: _____

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

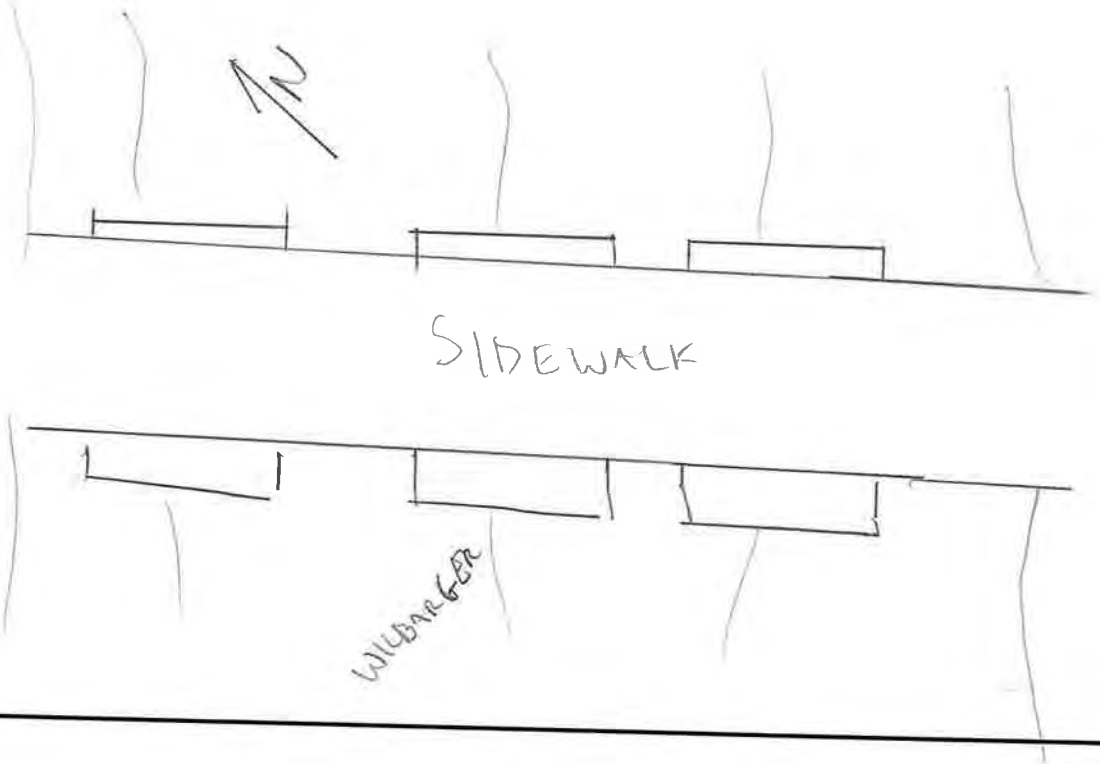
Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:



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Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_TZOO-STR-17000

STREAM NAME: UNKNOWN DATE: 2019-06-17

LOCATION: NW CNR OF ALGREG ST & DALSHANK ST. PFLUGERVILLE, TX CREW: JIMMY DODD

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: 691.026 ERM ID: WCZ0017001 GEOID: 12A

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):		@		Pier Shape:
CULVERT:	Number:	3	Shape:	CYLINDER	Length:	56.50	Height:	9.30	Width:	13.70	Skew: Ø
CULVERT:	I/O Type:				Material:		Wingwall Angle				
DAM:	Top Width:		Side Slope		Side Slope		US:		DS:		Outlet:

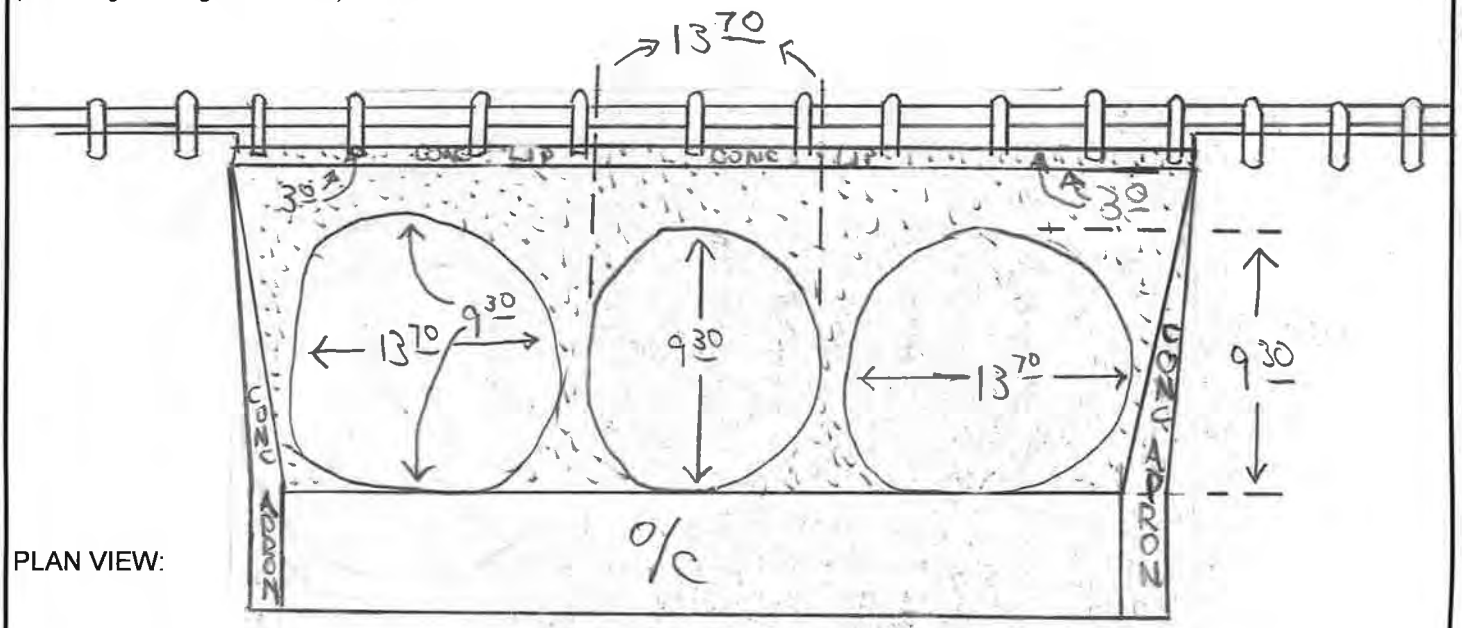
ERM Description: PK NAIL SET AT NE CNR OF CULVERT Coordinate System: TX CENTRAL 4203

Photo Numbers: DSCH: DSFACE OTXS: USFACE USCH:

Additional Info:

File Name: 190617JD-35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

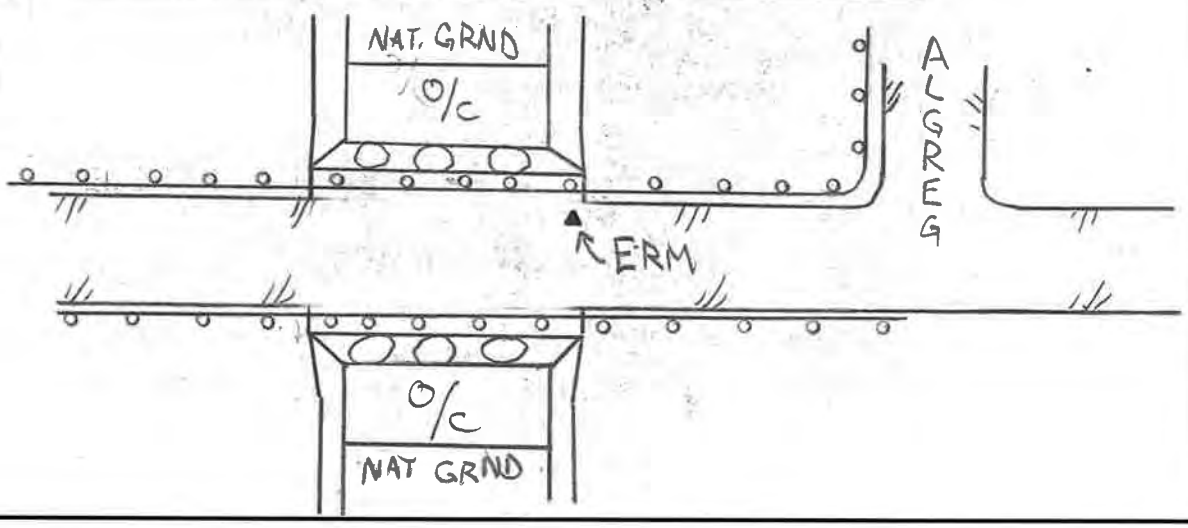


	Photo ID: Coordinates: Description:	WC_T200_STR_17000_USFACE 30.480729, -97.584834 Upstream face
	Photo ID: Coordinates: Description:	WC_T200_STR_17000_DSFACE 30.480729, -97.584834 Downstream face

No photo taken	Photo ID: Coordinates: Description:	WC_T200_STR_18000_USFACE 30.483255, -97.585744 Upstream face
No photo taken	Photo ID: Coordinates: Description:	WC_T200_STR_18000_DSFACE 30.483255, -97.585744 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_TZ06_STR_1000

STREAM NAME: UNKNOWN DATE: 2019-06-19

LOCATION: WC_TZ06_1000 CREW: JIMMY DODD CHRIS LAMB

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: 676.804 ERM ID: wkz06_1001 GEOID: 1ZA

BRIDGE: Rail Height: ____ Deck: ____ Width: ____ Pier(s): ____ @ ____ Pier Shape: ____

CULVERT: Number: 6 Shape: RECTANGLE Length: RECTANGLE Height: 6' Width: 10' Skew: 88°37'37"

CULVERT: I/O Type: ____ Material: ____ Wingwall Angle ____

DAM: Top Width: ____ Side Slope Side Slope US: ____ DS: ____ Outlet: ____

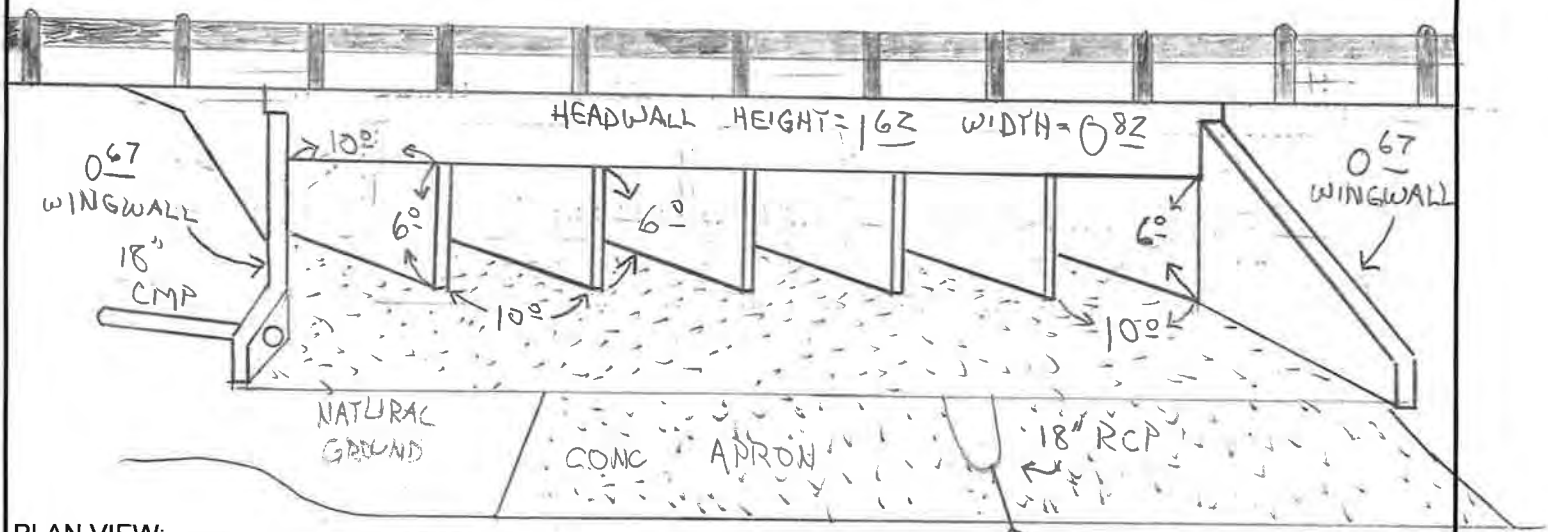
ERM Description: PK NAIL SET IN ASPHALT NEAR N. CNR OF W. WALL Coordinate System: Tx CENTRAL 4203

Photo Numbers: DSCH: ____ DSFACE ____ OTXS: ____ USFACE ____ USCH: ____

Additional Info: ____

File Name: 190619JD_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

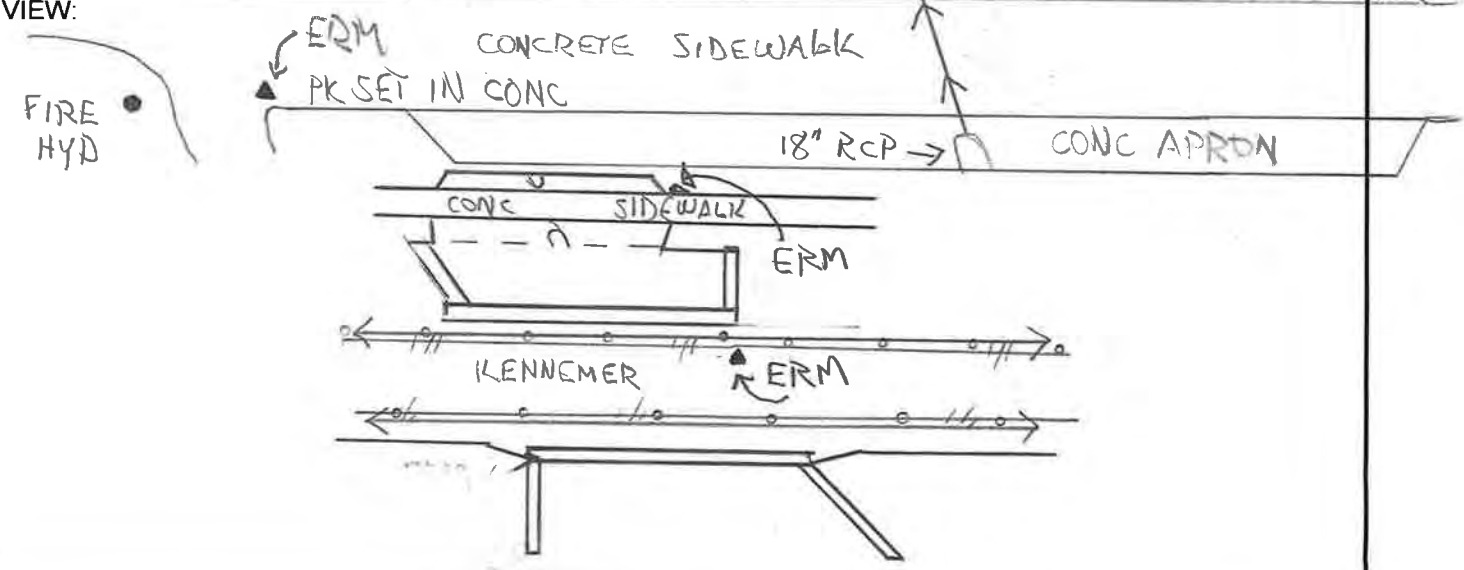


	Photo ID: Coordinates: Description:	WC_T206_STR_1000_USFACE 30.468992, -97.584283 Upstream face
	Photo ID: Coordinates: Description:	WC_T206_STR_1000_DSFACE 30.468992, -97.584283 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC-TZ00_STR_14000

STREAM NAME: UNKNOWN DATE: 2019-06-19

LOCATION: KENNEMER DRIVE PFLUGERVILLE CREW: JIMMY DODD CHRIS LAMB

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: WCTZ0014001 GEOID: IZA

BRIDGE: Rail Height: N/A Deck: CONC Width: _____ Pier(s): N/A @ N/A Pier Shape: N/A

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

ERM Description: _____ Coordinate System: _____

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: 190619UD_35837

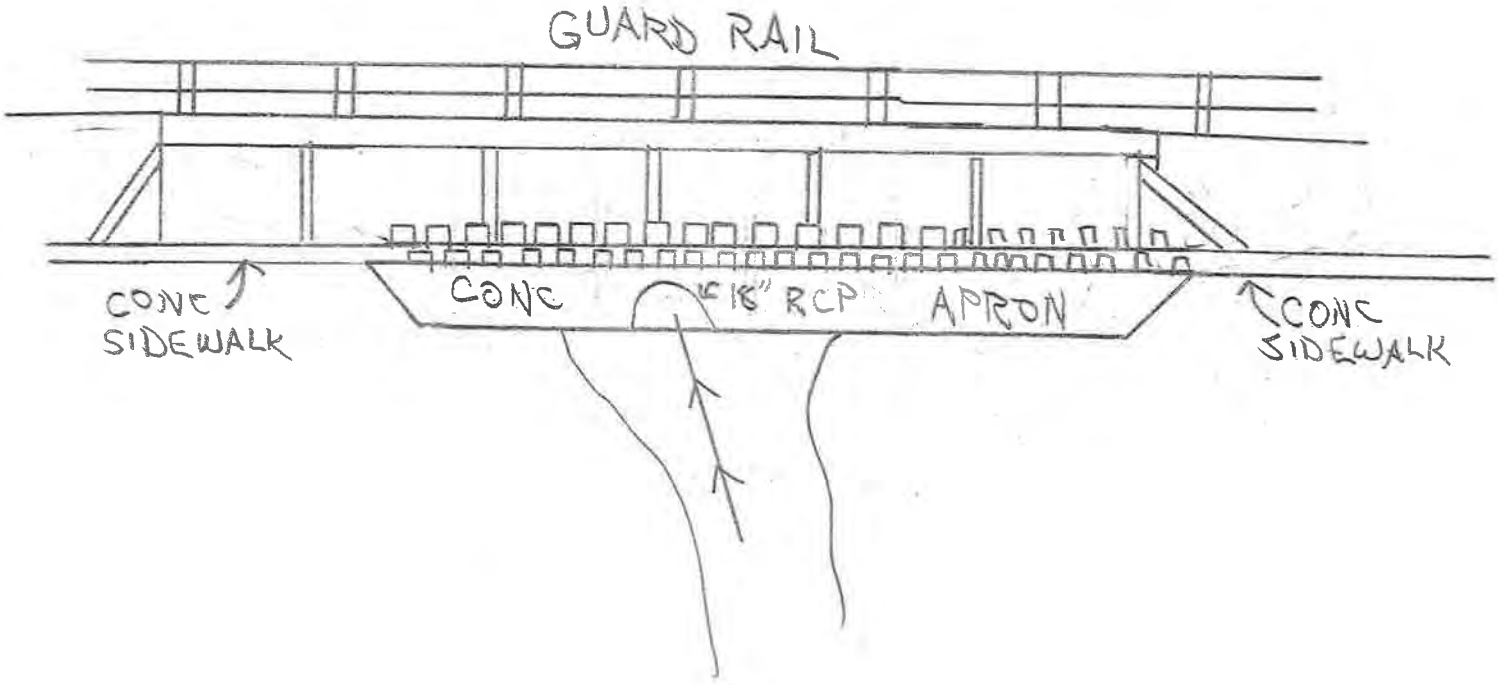


	Photo ID: Coordinates: Description:	WC_T206_STR_2000_USFACE 30.468998, -97.584475 Upstream face
	Photo ID: Coordinates: Description:	WC_T206_STR_2000_DSFACE 30.468998, -97.584475 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_TZ06_STR_3000

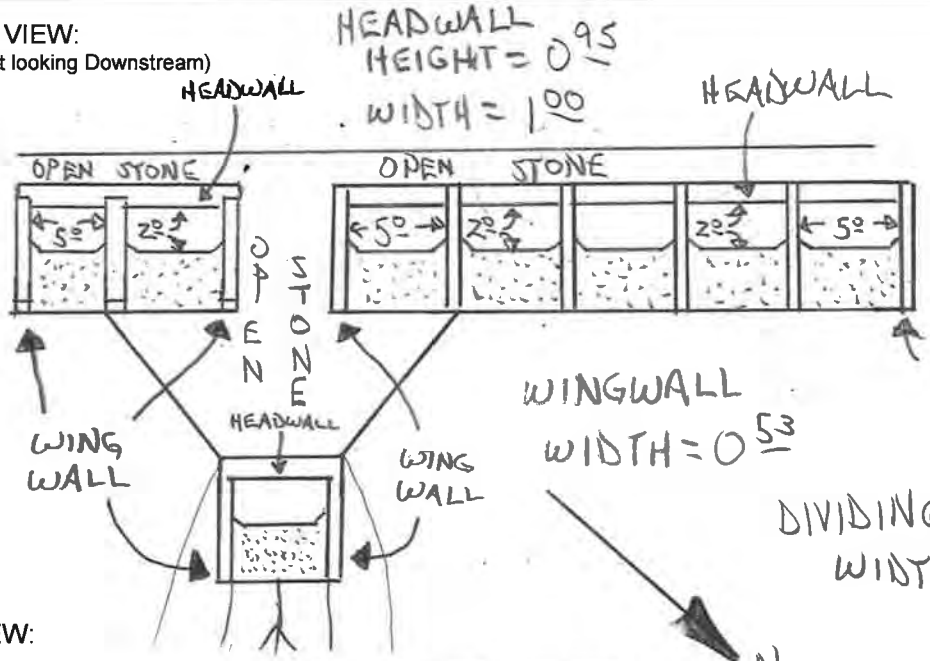
STREAM NAME: UNKNOWN DATE: 2019-07-02

LOCATION: MURCHISON RIDGE & SECLUDED WILLOW PFLUGERVILLE CREW: JIMMY DODD JERRY JOHNSON

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: 693.802 ERM ID: WC2063001 GEOID: 12A

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):		@		Pier Shape:
CULVERT:	Number:	8	Shape:	RECTANGLE	Length:		Height:	2°	Width:	5°	Skew: Ø
CULVERT:	I/O Type:	REINFORCED CONCRETE	Material:	CONC			Wingwall Angle	90° FROM HEADWALL			
DAM:	Top Width:		Side Slope		Side Slope		US:		DS:		Outlet:
ERM Description:	1/2" CAPPED IRON ROD SET @ SW CNR OF INTERSECTION						Coordinate System:	Tx CENTRAL 4203			
Photo Numbers:	DSCH: 2	DSFACE 1	OTXS: 3	USFACE 5	USCH: 4						
Additional Info:											
File Name:	190702JD_35837										

PROFILE VIEW:
(Left to Right looking Downstream)



BOX CULVERT DIMENSIONS
8 x 5°H x 2°W

PLAN VIEW:

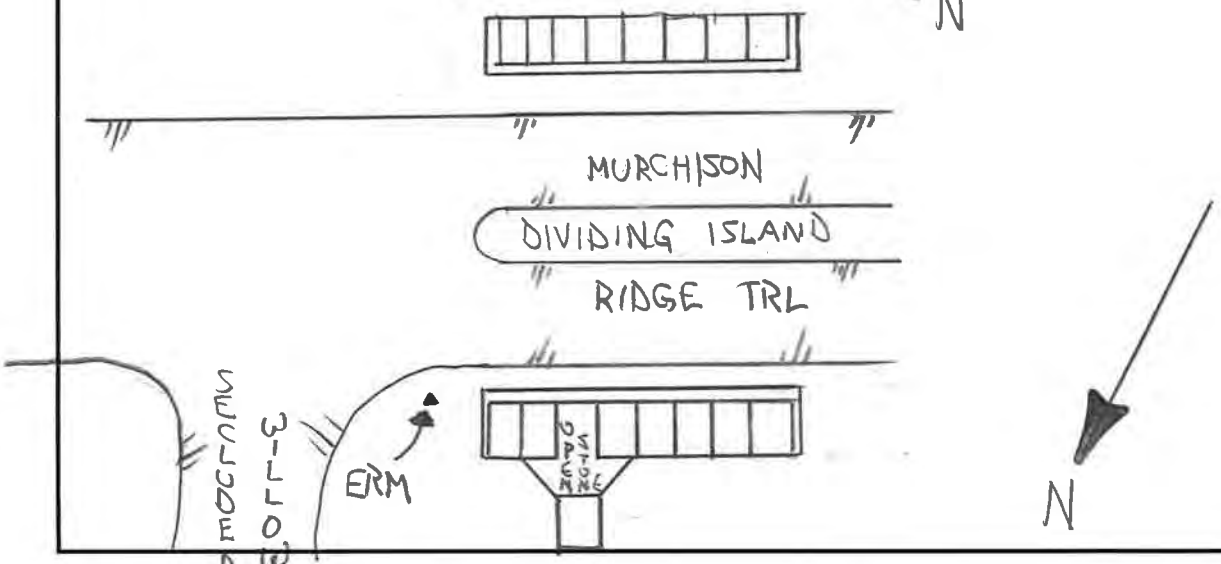


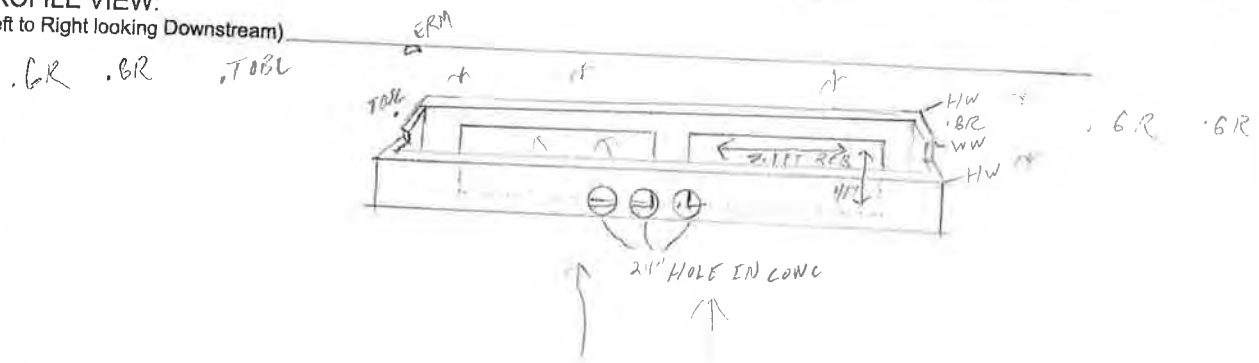
	Photo ID: Coordinates: Description:	WC_T206_STR_3000_USFACE 30.471148, -97.58746 Upstream face
	Photo ID: Coordinates: Description:	WC_T206_STR_3000_DSFACE 30.471148, -97.58746 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY
SURVEY NAME: WC_T207_STR_1000
STREAM NAME: WILBARGER
DATE: 10-04-2019
LOCATION: WEISS LN. & HIDDEN LAKE CROSSING
CREW: JJ
TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: 630.608 ERM ID: WC2071001 GEOID: 12B

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:
CULVERT: Number: Shape: Length: Height: Width: Skew:
CULVERT: I/O Type: Material: Wingwall Angle
DAM: Top Width: Side Slope Side Slope US: DS: Outlet:
ERM Description: 1/2 IN IR W/HALFF TRAV Coordinate System: TxC
Photo Numbers: DSCH: DSFACE OTXS: USFACE USCH:
Additional Info: 40 IN RCP ON DOWNSTREAM ONLY - ORIGIN UNKNOWN
File Name: 191004JJ_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

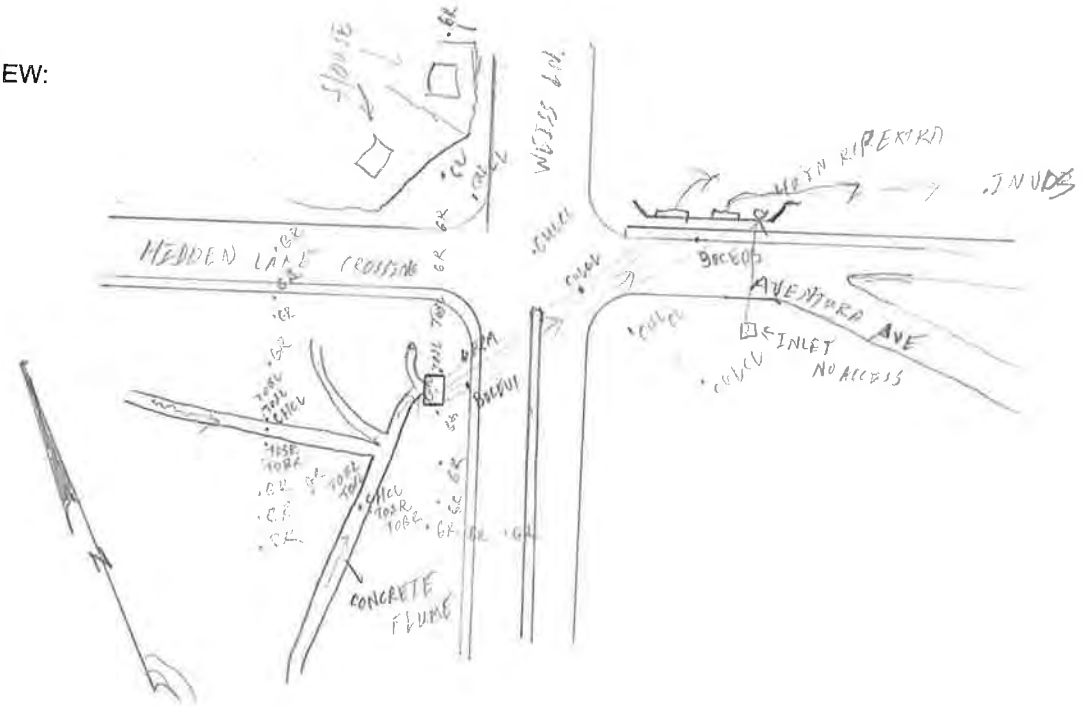


	Photo ID: Coordinates: Description:	WC_T207_STR_1000_USFACE 30.447238, -97.56151 Upstream face
	Photo ID: Coordinates: Description:	WC_T207_STR_1000_USFACE1 30.447238, -97.56151 Upstream face

	Photo ID: Coordinates: Description:	WC_T207_STR_1000_DSFACE 30.447238, -97.56151 Downstream face
	Photo ID: Coordinates: Description:	WC_T207_STR_1000_DSFACE1 30.447238, -97.56151 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY PVILLE SURVEY NAME: WC-TZ10-STR-1000

STREAM NAME: UNKNOWN DATE: 2019-06-26

LOCATION: JESSE BOHLS RD CREW: JIMMY DODD CHRIS LAMB

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: 588.359 ERM ID: WCTZ10 1001 GEOID: 12A

BRIDGE: Rail Height: 30 Deck: CONC Width: 41.80 Pier(s): 5 @ 36" Pier Shape: CYLINDER

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope _____ Side Slope _____ US: _____ DS: _____ Outlet: _____

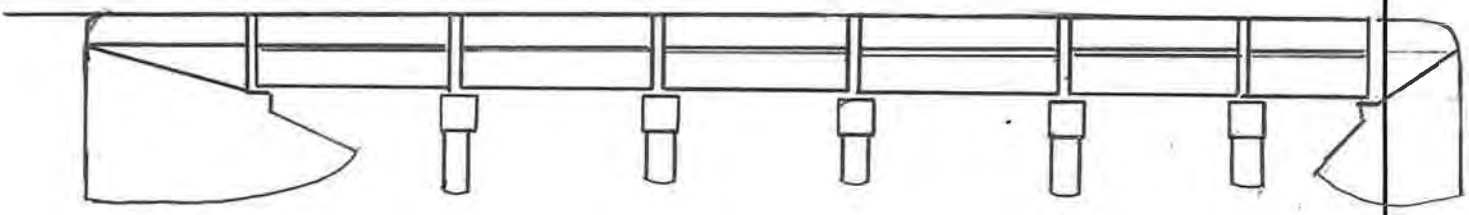
ERM Description: PK NAIL SET @ MOST NE CNR OF BRIDGE Coordinate System: TX CENTRAL 4203

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: 190626WD_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

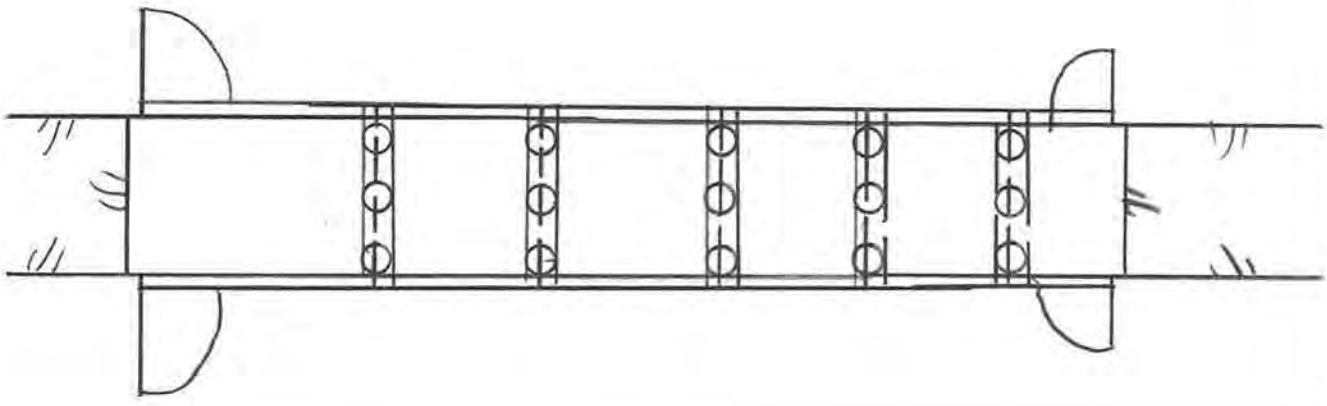


	Photo ID: Coordinates: Description:	WC_T210_STR_1000_USFACE 30.430844, -97.552239 Upstream face
	Photo ID: Coordinates: Description:	WC_T210_STR_1000_DSFACE 30.430844, -97.552239 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_TZ10_STR_2000

STREAM NAME: UNKNOWN DATE: 2019-07-02

LOCATION: WEISS LN @ CELE MIDDLE SCHOOL CREW: JIMMY DODD JERRY JOHNSON

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: 614.508 ERM ID: WC2102001 GEOID: 12A

BRIDGE: Rail Height: 2.30 Deck: CONC Width: 32' Pier(s): 1 @ 30" Pier Shape: CYLINDER

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope _____ Side Slope _____ US: _____ DS: _____ Outlet: _____

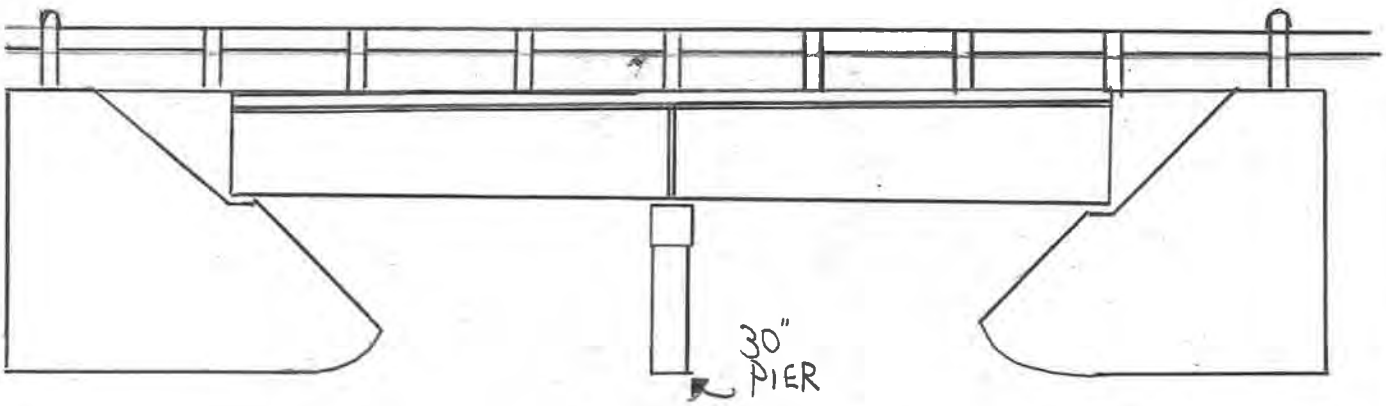
ERM Description: ½" IRON ROD SET @ NE CNR OF BRIDGE Coordinate System: TxCENTRAL 4203

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: 19070201_35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

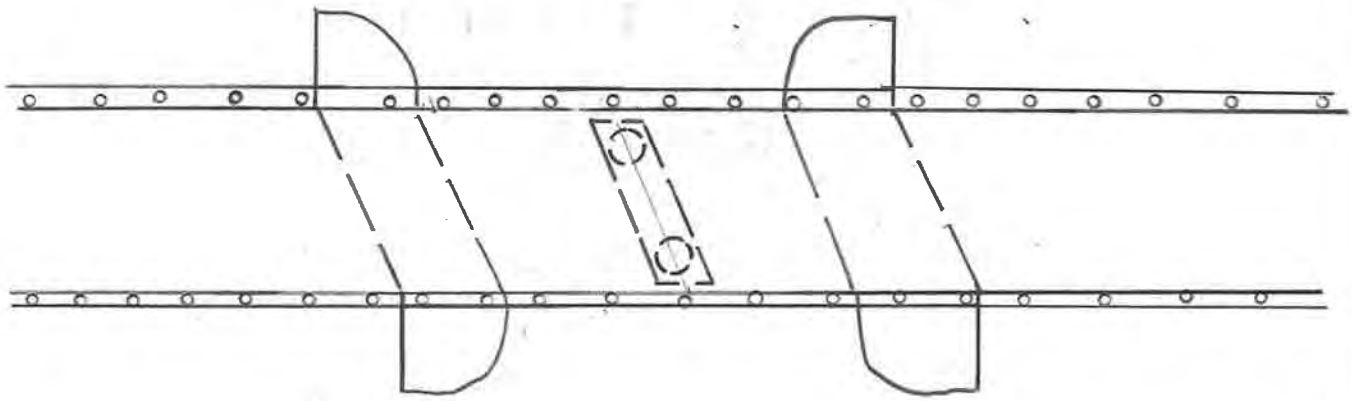


	Photo ID: Coordinates: Description:	WC_T210_STR_2000_USFACE 30.455681, -97.551393 Upstream face
	Photo ID: Coordinates: Description:	WC_T210_STR_2000_DSFACE 30.455681, -97.551393 Downstream face

Survey Field Sheet

PROJECT: Willbarger | SURVEY NAME: WC T210 STR 3000

STREAM NAME: Willbarger Creek | DATE: 11-17-19

LOCATION: Pflugerville, TX | CREW: Adolfo Jaramas / A. Ramirez

TYPE: BR(✓) CUL( ) DAM( ) XS( ) | ERM ELEV.: _____ | ERM ID: _____ | GEOID: G12AUS

BRIDGE: Rail Height: 2.4 | Deck: .67 | Width: 32. | Pier(s): 1 @ 18" | Pier Shape: Round

CULVERT: Number: _____ | Shape: _____ | Length: _____ | Height: _____ | Width: _____ | Skew: _____

CULVERT: I/O Type: _____ | Material: _____ | Wingwall Angle _____

DAM: Top Width: _____ | Side Slope | Side Slope | US: _____ | DS: _____ | Outlet: _____

ERM Description: _____ | Coordinate System: TX Central 4203

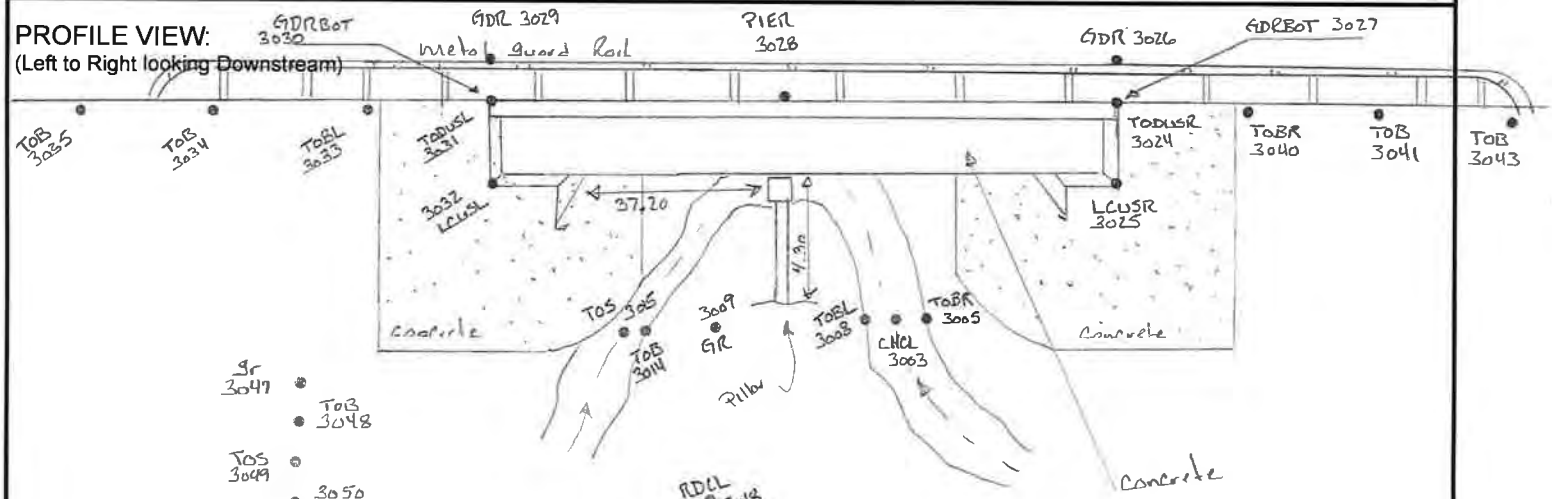
Photo Numbers: 5 | DSCH: 1 | DSFACE 1 | OTXS: 1 | USFACE 1 | USCH: 1

Additional Info: _____

File Name: _____

Deck 3.12

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

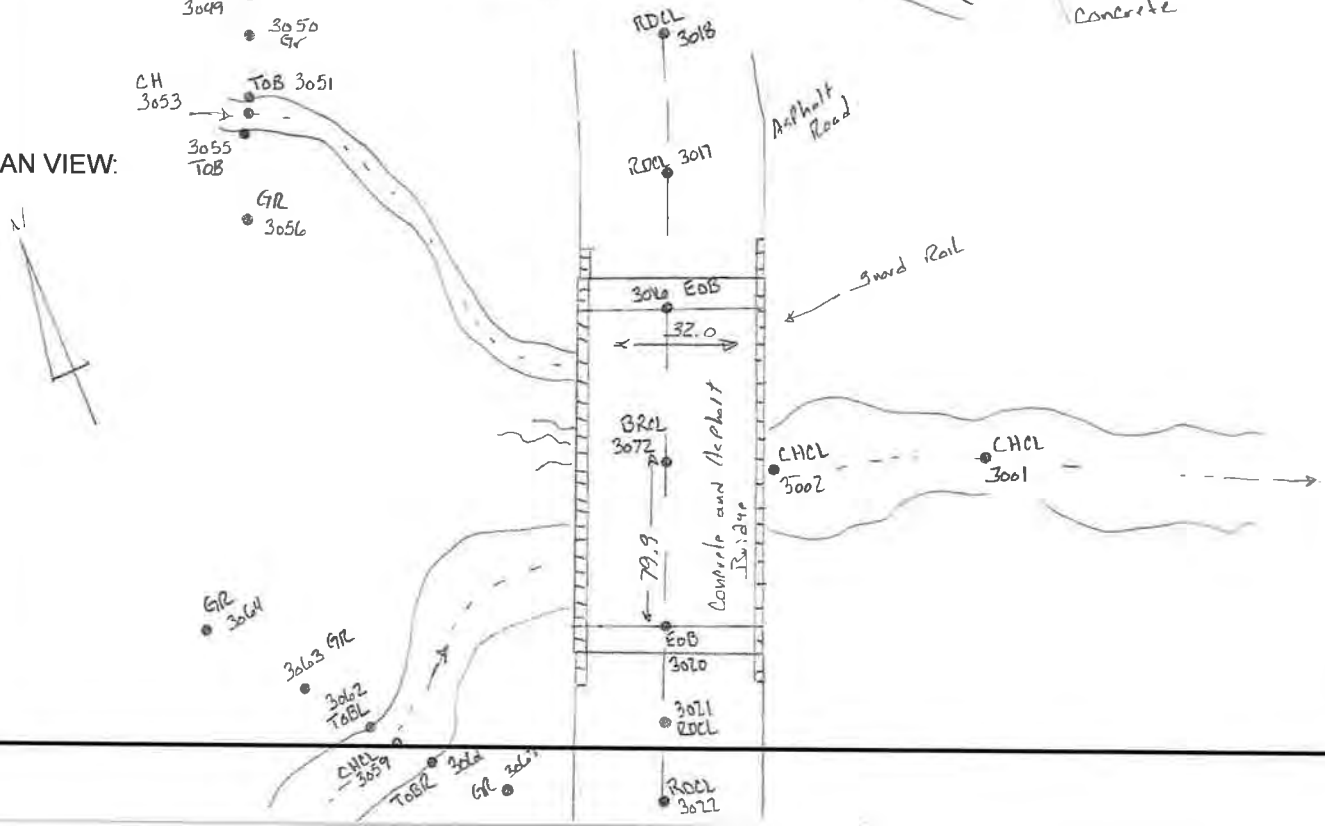


	Photo ID: Coordinates: Description:	WC_T210_STR_3000_USFACE 30.458735, -97.553967 Upstream face
	Photo ID: Coordinates: Description:	WC_T210_STR_3000_DSFACE 30.458735, -97.553967 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC 210 4000

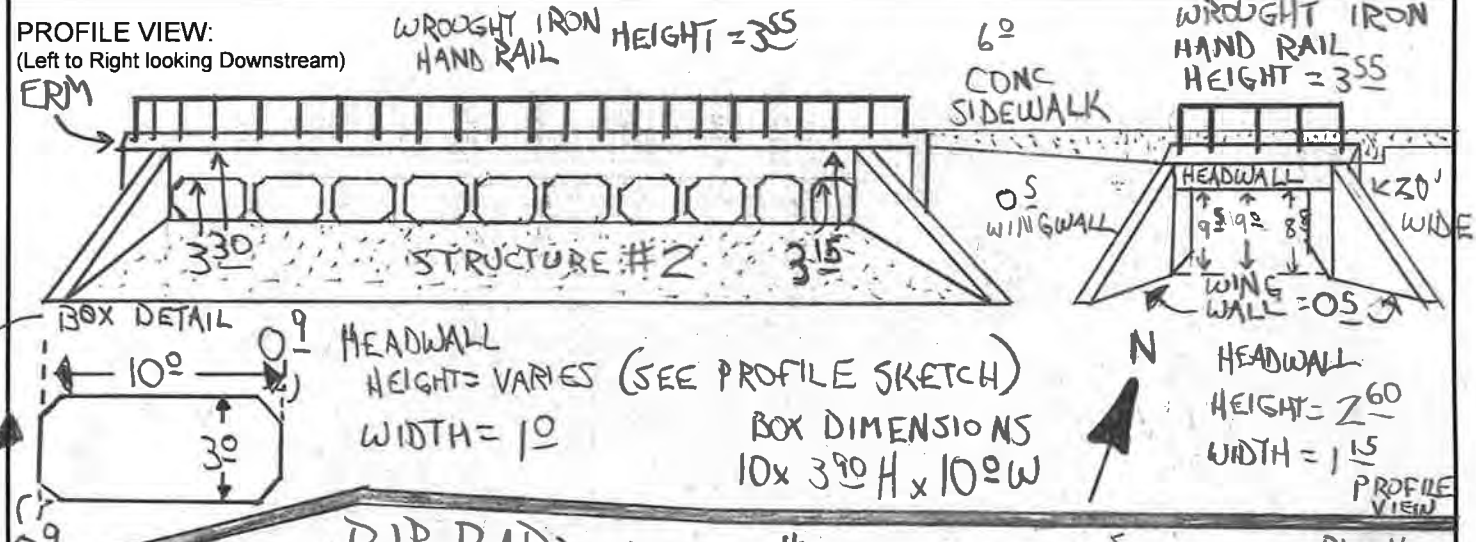
STREAM NAME: UNKNOWN DATE: 2019-06-13

LOCATION: NE CORNER OF JAKES HILL & CRISPIN HALL, PFLUGERVILLE, TX CREW: JIMMY DODD, CHRIS LAMB

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: WC2104001 GEOID: 12B

BRIDGE:	Rail Height: 3.55	Deck:	Width:	Pier(s):	@	Pier Shape:					
CULVERT:	Number: 10 x 1	Shape: RECTANGLE	Length:	Height: 3.90	Width: 10.0	Skew: Ø					
CULVERT:	I/O Type:	Material:	Wingwall Angle								
DAM:	Top Width:	Side Slope	Side Slope	US:	DS:	Outlet:					
ERM Description:	"X" SET IN MOST NE CORNER OF HEADWALL ON STRUCTURE #2					Coordinate System: Tx CENTRAL 4203					
Photo Numbers:	DSCH:	DSFACE	OTXS:	USFACE	USCH:						
Additional Info:											
File Name:	190613JD 35837										

PROFILE VIEW:
(Left to Right looking Downstream)



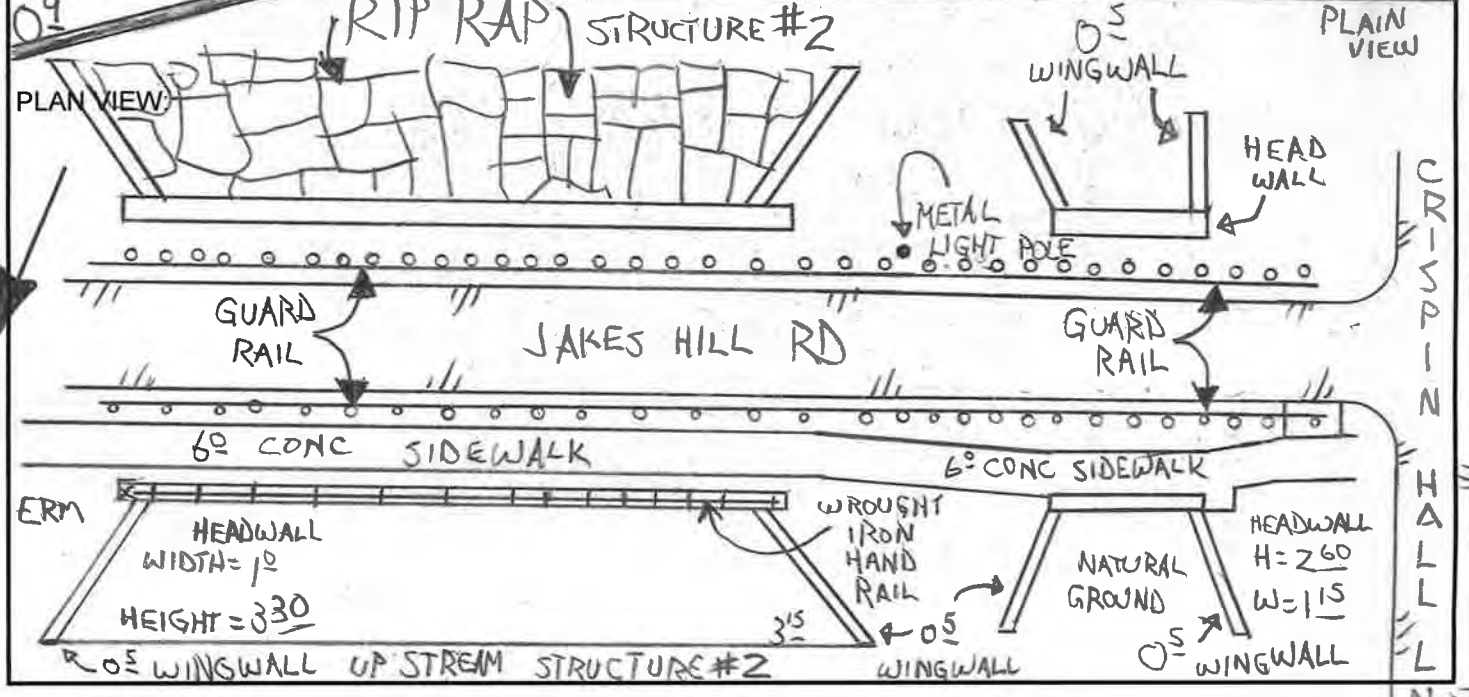


	Photo ID: Coordinates: Description:	WC_T210_STR_4000_USFACE 30.463867, -97.564214 Upstream face
	Photo ID: Coordinates: Description:	WC_T210_STR_4000_USFACE (CLOSE UP) 30.463867, -97.564214 Upstream face, Close up

	Photo ID: Coordinates: Description:	WC_T210_STR_4000_USFACE #2 30.463867, -97.564214 Upstream face of Structure #2
	Photo ID: Coordinates: Description:	WC_T210_STR_4000_USFACE #2 (CLOSE UP) 30.463867, -97.564214 Upstream face of Structure #2, Close up

	Photo ID: Coordinates: Description:	WC_T210_STR_4000_DSFACE 30.463867, -97.564214 Downstream face
	Photo ID: Coordinates: Description:	WC_T210_STR_4000_DSFACE (CLOSE UP) 30.463867, -97.564214 Downstream face, Close up

	Photo ID: Coordinates: Description:	WC_T210_STR_4000_DSFACE #2 30.463867, -97.564214 Downstream face of Structure #2
	Photo ID: Coordinates: Description:	WC_T210_STR_4000_DSFACE #2 (CLOSE UP) 30.463867, -97.564214 Downstream face of Structure #2, Close up

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC 210 5000

STREAM NAME: UNKNOWN DATE: 2019-06-13

LOCATION: WC 210 5000 PFLUGERVILLE, TX CREW: JIMMY DODD, CHRIS LAMB

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: 646.082 ERM ID: WC210S001 GEOID: 12B

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:

CULVERT: Number: 3 Shape: RECTANGLE Length: Height: 3.0 Width: 6.0 Skew: 0

CULVERT: I/O Type: Material: Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

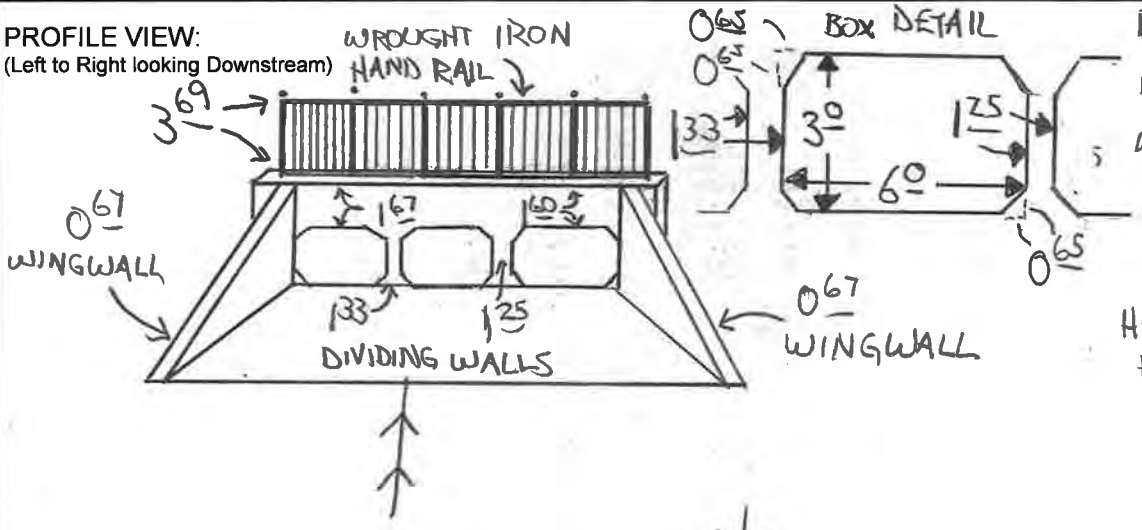
ERM Description: PK NAIL SET IN CONC SIDEWALK Coordinate System: TX CENTRAL 4203

Photo Numbers: DSCH: DSFACE OTXS: USFACE USCH:

Additional Info:

File Name: 190613JD 35837

PROFILE VIEW:
(Left to Right looking Downstream)



BOX DETAIL

BOX DIMENSIONS
HEIGHT = 3.0
WIDTH = 6.0

HEADWALL
HEIGHT = 1.35
WIDTH = 1.0

PLAN VIEW:

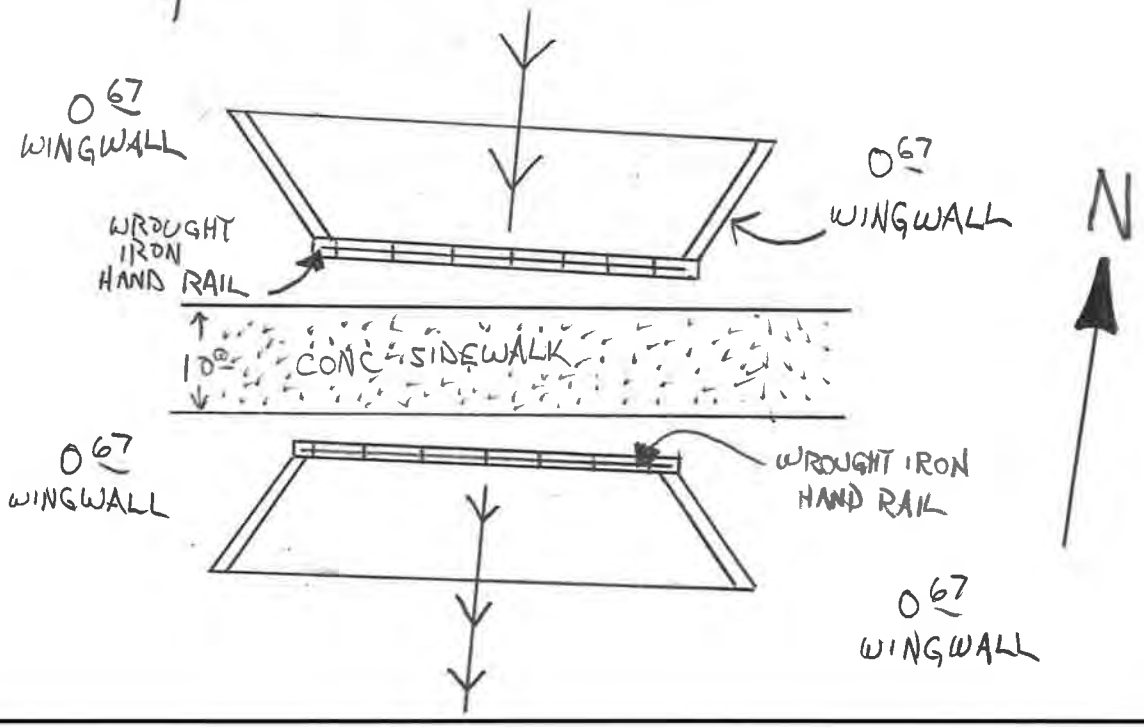


	Photo ID: Coordinates: Description:	WC_T210_STR_5000_USFACE 30.469002, -97.565868 Upstream face
	Photo ID: Coordinates: Description:	WC_T210_STR_5000_DSFACE 30.469002, -97.565868 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC Z10 6000

STREAM NAME: UNKNOWN DATE: 2019-06-13

LOCATION: WC Z10 6000 PFLUGERVILLE CREW: JIMMY DODD CHRIS LAMB

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: WCZ106001 GEOID: 12B

BRIDGE: Rail Height: 3.50 Deck: CONC Width: 10.70 Pier(s): N/A @ N/A Pier Shape: N/A

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

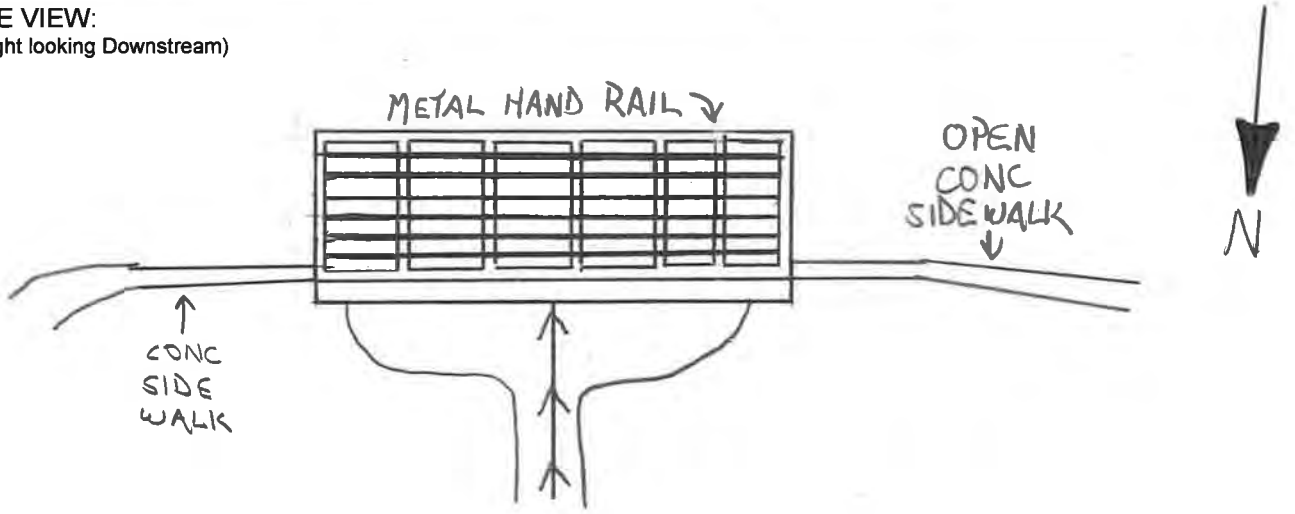
ERM Description: PK NAILSET IN CONC 25' EAST OF BRIDGE Coordinate System: Tx CENTRAL 4203

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: 19061RJD 35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

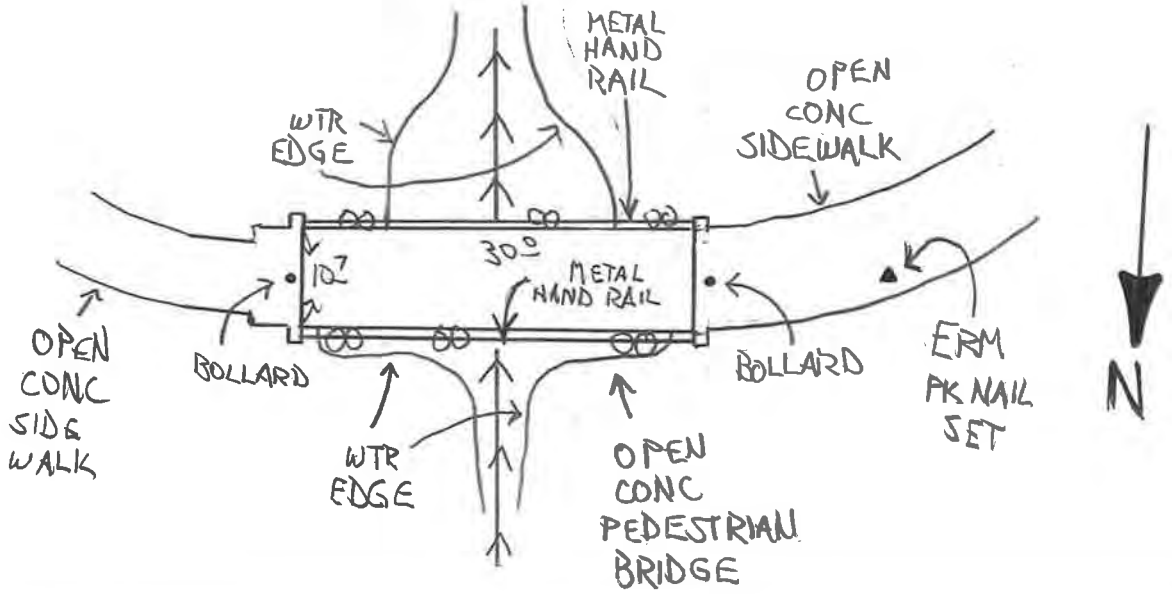


	Photo ID: Coordinates: Description:	WC_T210_STR_6000_USFACE 30.474059, -97.566127 Upstream face
	Photo ID: Coordinates: Description:	WC_T210_STR_6000_DSFACE 30.474059, -97.566127 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_ZIO_7000

STREAM NAME: UNKNOWN DATE: 2019-06-12

LOCATION: WC ZIO 7000 CREW: JIMMY DODD CHRIS LAMB

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: WCZ107001 GEOID: 12B

BRIDGE: Rail Height: 35' Deck: WOOD Width: 6.7 Pier(s): N/A @ N/A Pier Shape: N/A

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

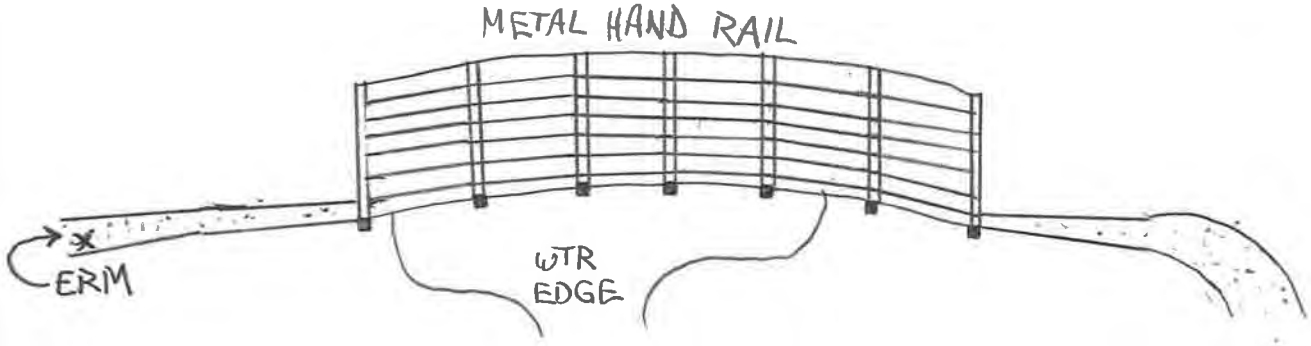
ERM Description: "X" SET IN CONC SIDEWALK 20' WEST OF BRIDGE Coordinate System: TX CENTRAL 4203

Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____

Additional Info: _____

File Name: 190612JD 35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

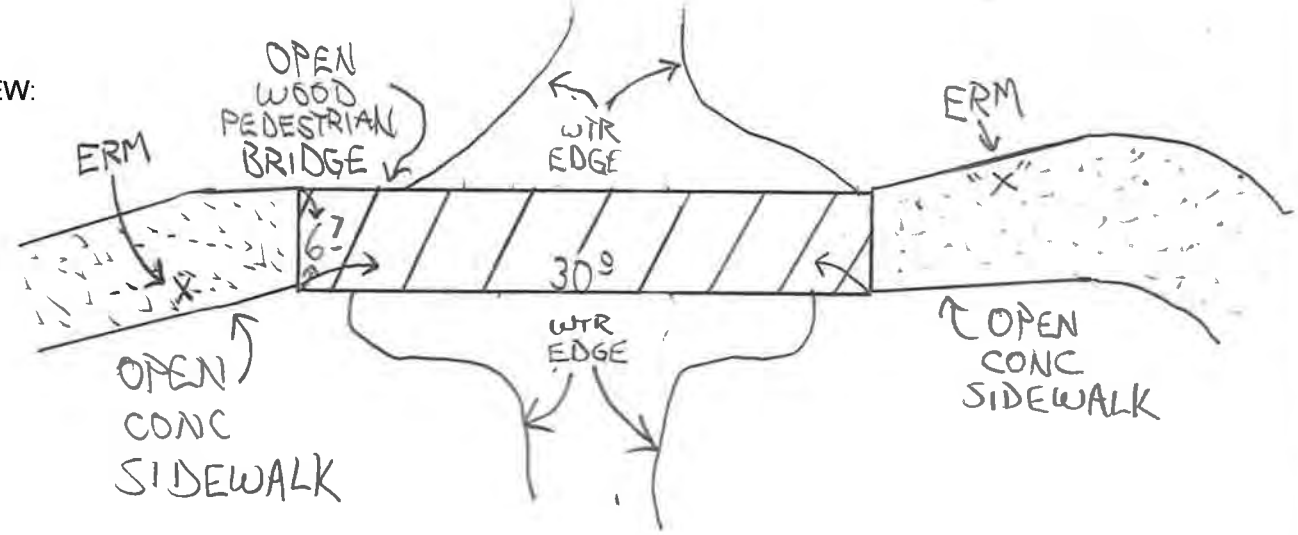


	Photo ID: Coordinates: Description:	WC_T210_STR_7000_USFACE 30.475397, -97.565671 Upstream face
	Photo ID: Coordinates: Description:	WC_T210_STR_7000_DSFACE 30.475397, -97.565671 Downstream face

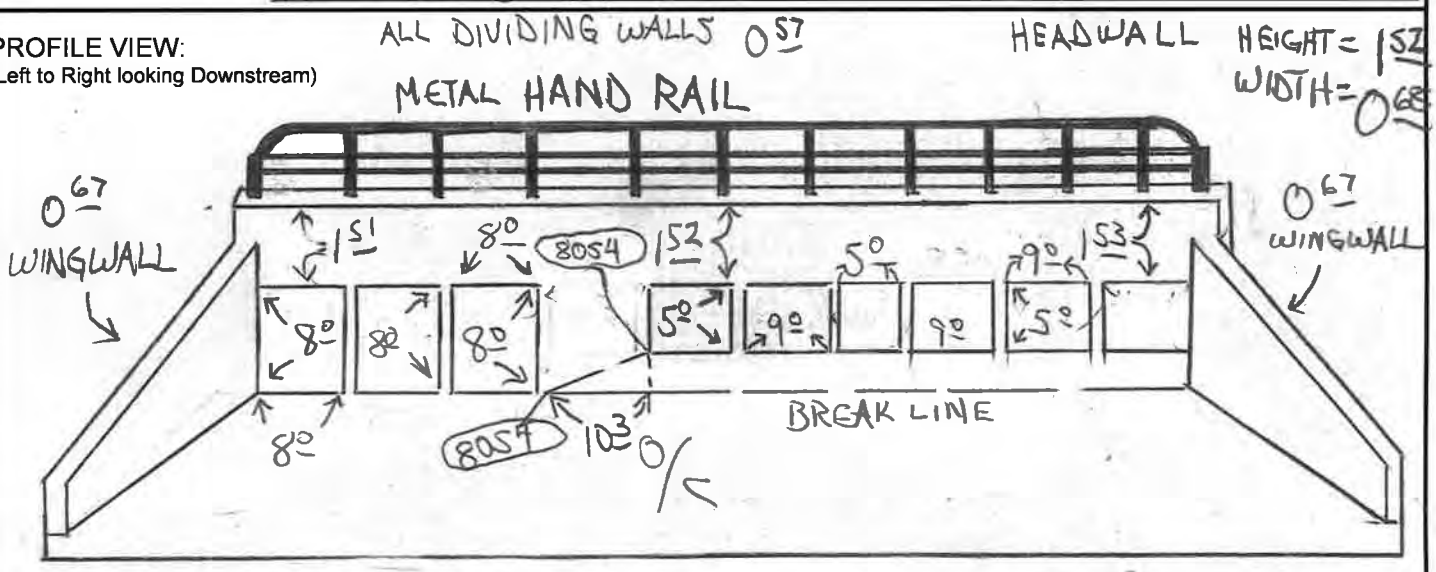
Survey Field Sheet

PROJECT: FEMA FLOOD STUDY
SURVEY NAME: WC 210 8000
STREAM NAME: UNKNOWN
DATE: 2019-06-12
LOCATION: WC 210 8000 (SPEIDEL DRIVE)
CREW: JIMMY DODD, CHRIS LAMB
TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: WC210B001 GEOID: 12B

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):		@		Pier Shape:
CULVERT:	Number:	6 x 3	Shape	RECTANGLE	Length:		Height:	5° & 8°	Width:	9° & 8°	Skew: Ø
CULVERT:	I/O Type:				Material:		Wingwall Angle				
DAM:	Top Width:		Side Slope		Side Slope		US:		DS:		Outlet:

ERM Description: "X" SET ON WEST END OF SOUTH HEADWALL
Coordinate System: TX CENTRAL 4203
Photo Numbers: DSCH: _____ DSFACE _____ OTXS: _____ USFACE _____ USCH: _____
Additional Info:
File Name: 19061ZJD 35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

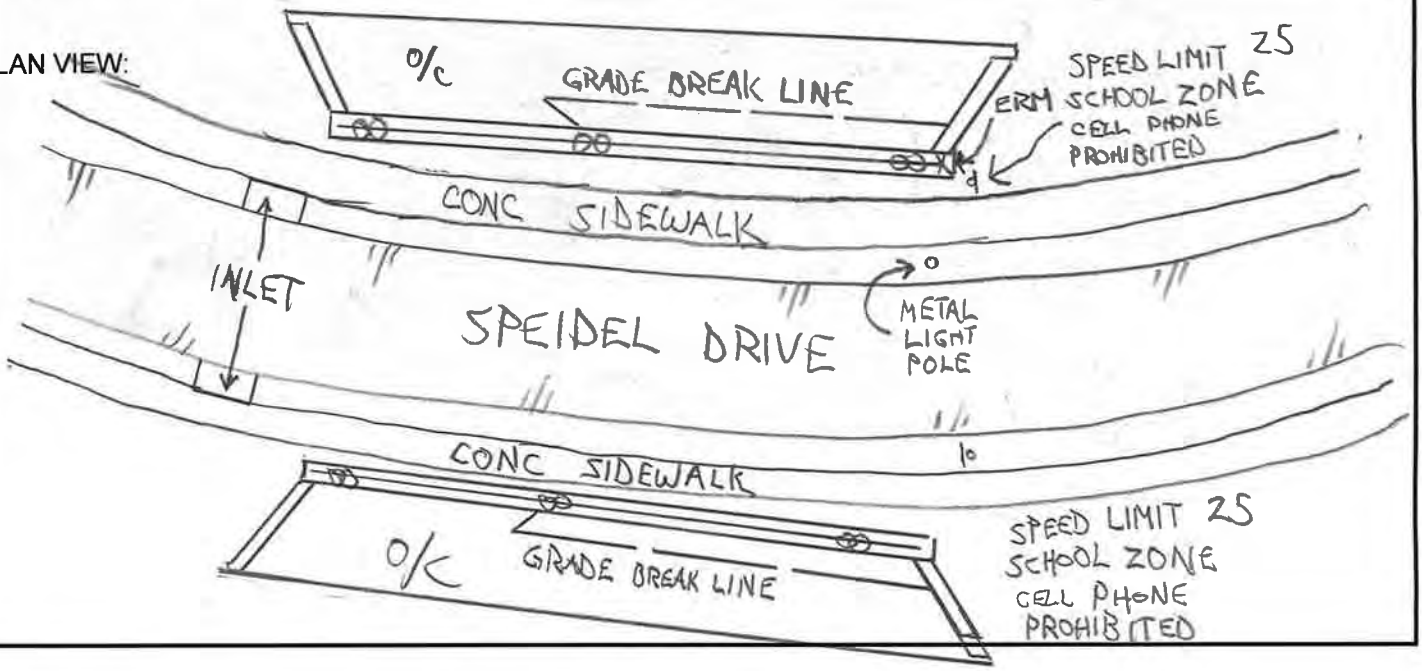


	Photo ID: Coordinates: Description:	WC_T210_STR_8000_USFACE 30.476814, -97.564405 Upstream face
	Photo ID: Coordinates: Description:	WC_T210_STR_8000_USFACE (CLOSE UP) 30.476814, -97.564405 Upstream face, Close up

	Photo ID: Coordinates: Description:	WC_T210_STR_8000_DSFACE 30.476814, -97.564405 Downstream face
	Photo ID: Coordinates: Description:	WC_T210_STR_8000_DSFACE (CLOSE UP) 30.476814, -97.564405 Downstream face, Close up

1-25 = 6.5 31-26 = 0.00

Survey Field Sheet

PROJECT: FEMA FLOOD SURVEY SURVEY NAME: WC Z10 9000

STREAM NAME: UNKNOWN DATE: 2019-06-12

LOCATION: WC Z10 9000 CREW: JIMMY DODD, CHRIS LAMB

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: 668.17 ERM ID: WCZ109001 GEOID: 12B

BRIDGE: Rail Height: ____ Deck: WOOD Width: ____ Pier(s): N/A @ N/A Pier Shape: N/A

CULVERT: Number: ____ Shape: ____ Length: ____ Height: ____ Width: ____ Skew: ____

CULVERT: I/O Type: ____ Material: ____ Wingwall Angle ____

DAM: Top Width: ____ Side Slope Side Slope US: ____ DS: ____ Outlet: ____

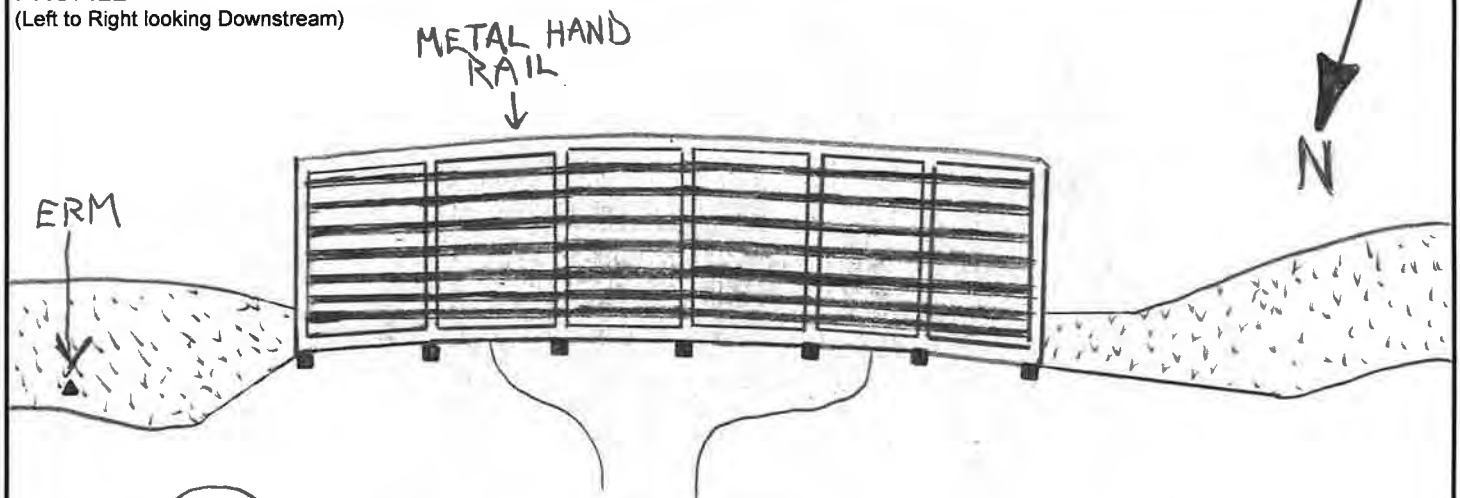
ERM Description: PK NAIL SET IN EXPANSION JOINT Coordinate System: ____

Photo Numbers: DSCH: ____ DSFACE ____ OTXS: ____ USFACE ____ USCH: ____

Additional Info: ____

File Name: ____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

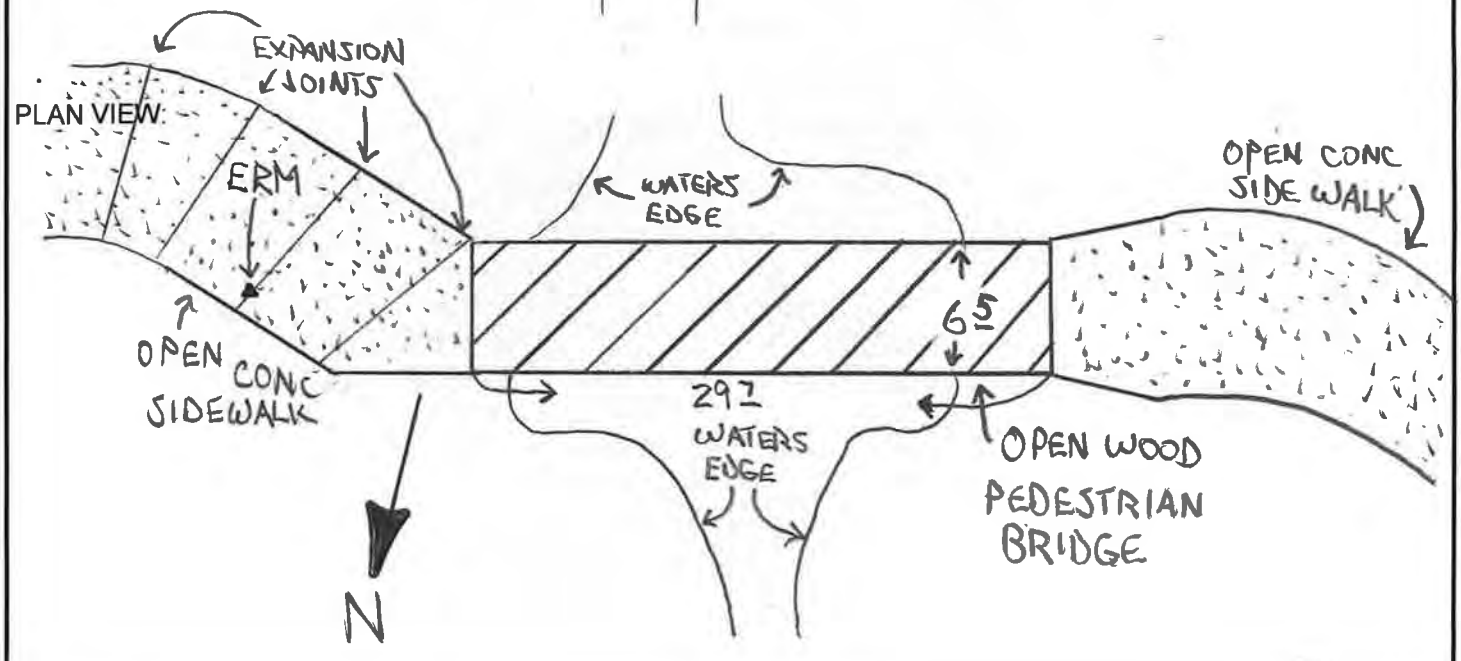


	Photo ID: Coordinates: Description:	WC_T210_STR_9000_USFACE 30.481307, -97.565356 Upstream face
	Photo ID: Coordinates: Description:	WC_T210_STR_9000_DSFACE 30.481307, -97.565356 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC 210 10000

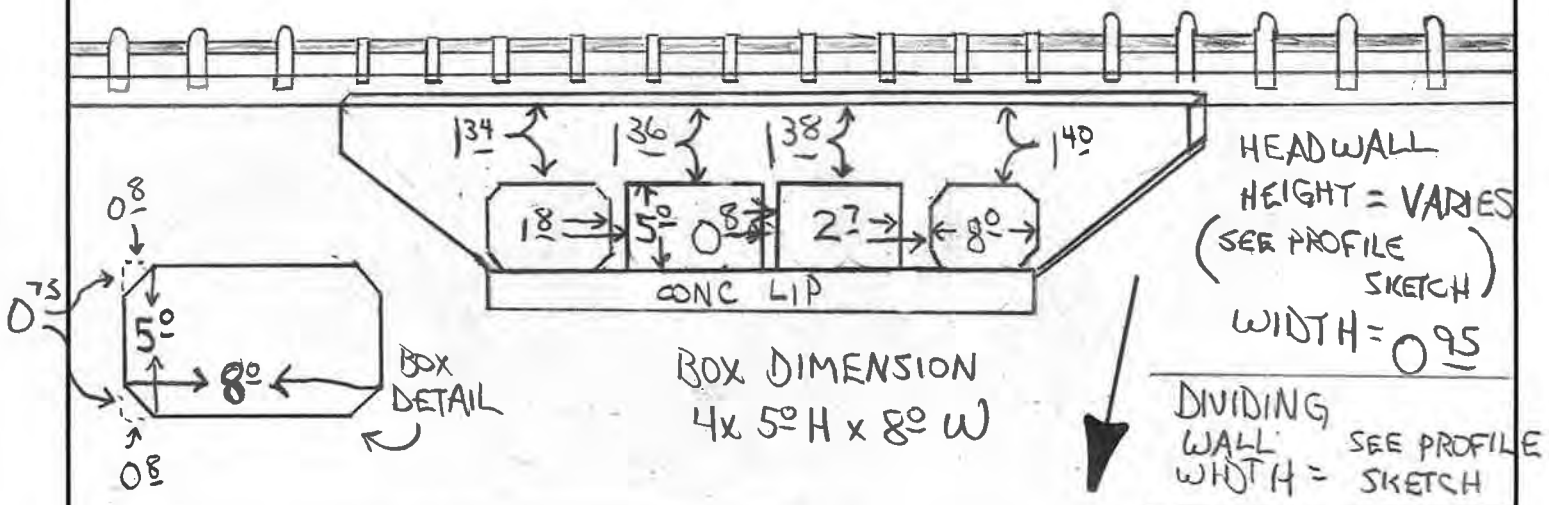
STREAM NAME: UNKNOWN DATE: 2019-06-12

LOCATION: WC 210 10000 ROWE LANE 200' EAST OF CASA NAVARRO DR CREW: JIMMY DODD, CHRIS LAMB

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: 677.93 ERM ID: WC210/1000/ GEOID: 12B

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):		@		Pier Shape:
CULVERT:	Number:	4	Shape:	RECTANGLE	Length:		Height:	5'	Width:	8'	Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle				
DAM:	Top Width:		Side Slope		Side Slope		US:		DS:		Outlet:
ERM Description:	PK NAIL SET IN CONC NEAR SE CNR OF N. HEADWALL								Coordinate System:		
Photo Numbers:			DSCH:		DSFACE		OTXS:		USFACE		USCH:
Additional Info:											
File Name:	190612JD 35837										

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

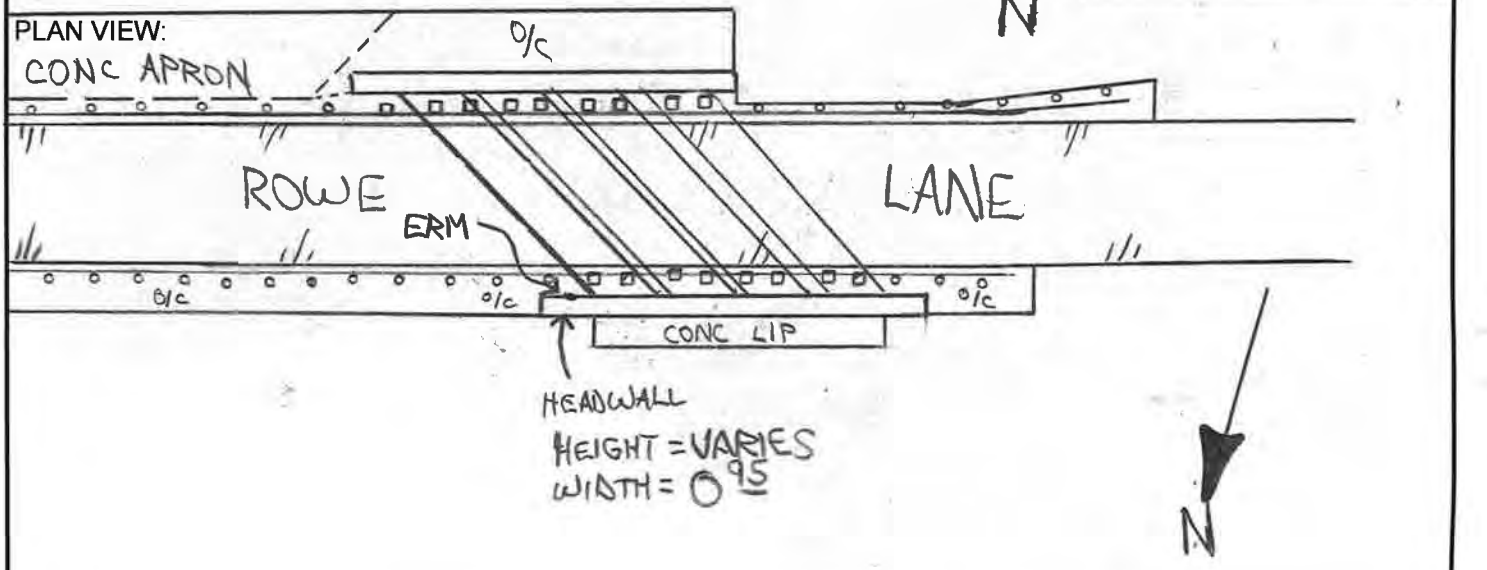


	Photo ID: Coordinates: Description:	WC_T210_STR_10000_USFACE 30.482742, -97.568161 Upstream face
	Photo ID: Coordinates: Description:	WC_T210_STR_10000_USFACE (CLOSE UP) 30.482742, -97.568161 Upstream face

	Photo ID: Coordinates: Description:	WC_T210_STR_10000_DSFACE 30.482742, -97.568161 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME:

STREAM NAME: UNKNOWN DATE: 2019-06-11

LOCATION: WC 210 11000 CREW: JIMMY DODD, CHRIS LAMB

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: 680.151 ERM ID: WC210 11001 GEOID: 12B

BRIDGE: Rail Height: 3.40 Deck: WOOD Width: 7.0 Pier(s): Ø @ N/A Pier Shape: N/A

CULVERT: Number: Shape: Length: Height: Width: Skew:

CULVERT: I/O Type: Material: Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

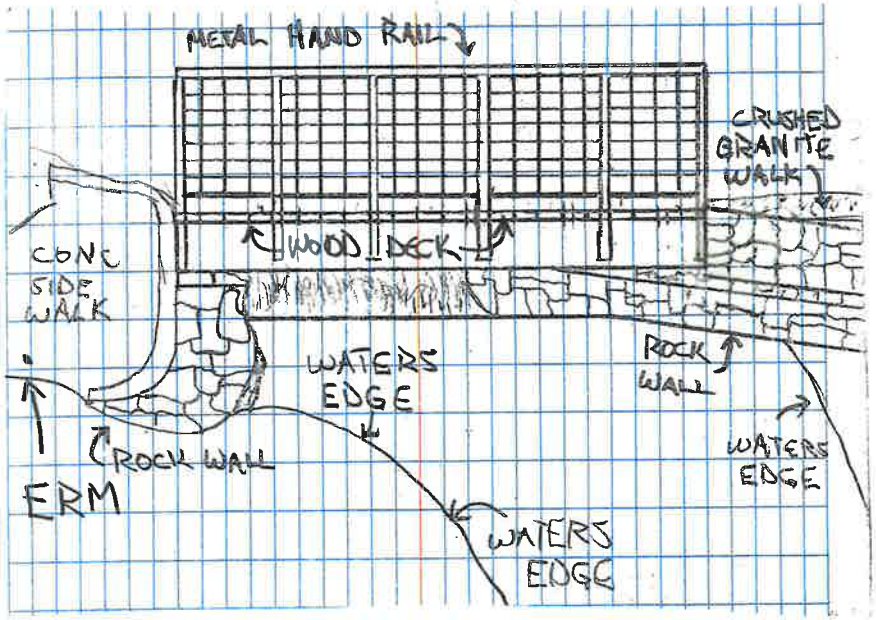
ERM Description: MAG NAIL SET IN CONC +/- 10' E. OF BRIDGE Coordinate System: TX CENTRAL 4203

Photo Numbers: DSCH: DSFACE OTXS: USFACE USCH:

Additional Info:

File Name: 190611JD 35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

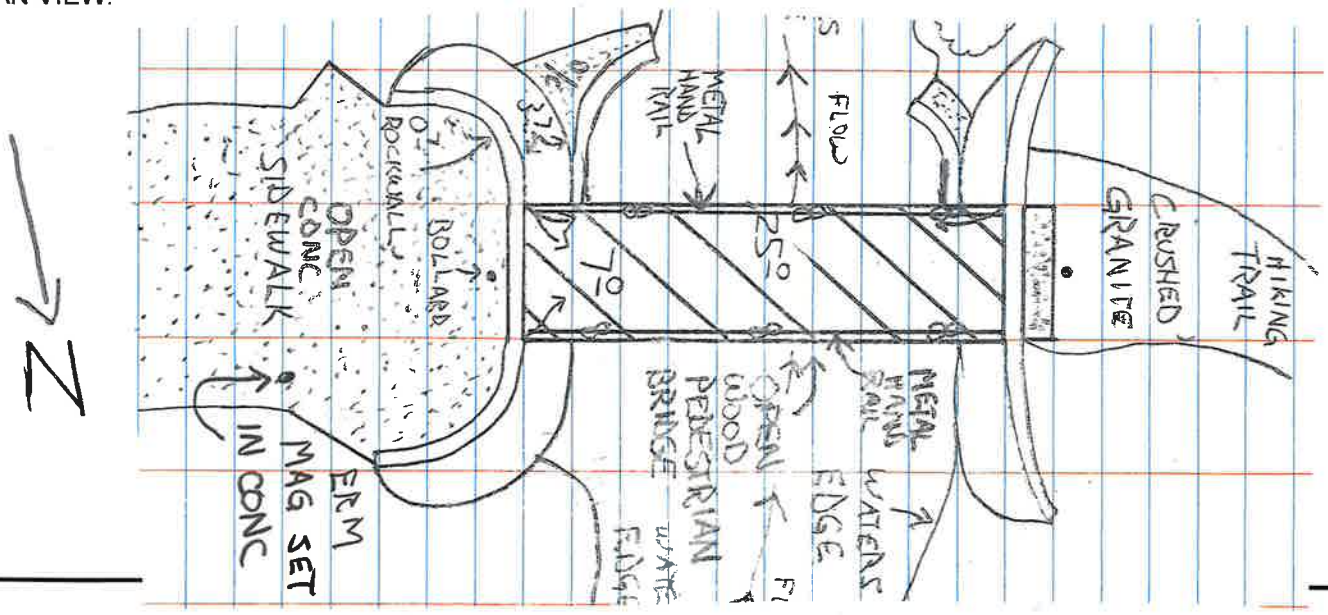


	Photo ID: Coordinates: Description:	WC_T210_STR_11000_USFACE 30.483501, -97.569092 Upstream face
	Photo ID: Coordinates: Description:	WC_T210_STR_11000_DSFACE 30.483501, -97.569092 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC 210 12000

STREAM NAME: UNKNOWN DATE: 2019-06-11

LOCATION: WC 210 12000 CREW: JIMMY DODD CHRIS LAMB

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: 687.535 ERM ID: WC21012001 GEOID: 12B

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):		@		Pier Shape:
CULVERT:	Number:	7	Shape:	RECTANGLE	Length:	61.35	Height:	6.0	Width:	10.0	Skew: Ø
CULVERT:	I/O Type:				Material:		Wingwall Angle				
DAM:	Top Width:		Side Slope		Side Slope		US:		DS:		Outlet:

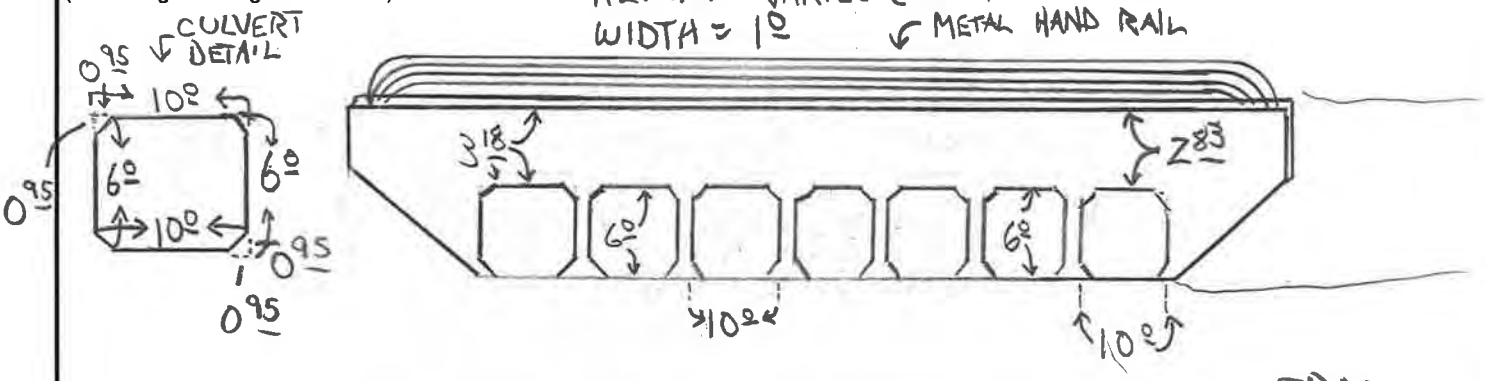
ERM Description: 'X' SET IN NW CORNER OF WEST HEADWALL Coordinate System: TX CENTRAL 4203

Photo Numbers: DSCH: DSFACE OTXS: USFACE USCH:

Additional Info:

File Name: 19061IND 35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

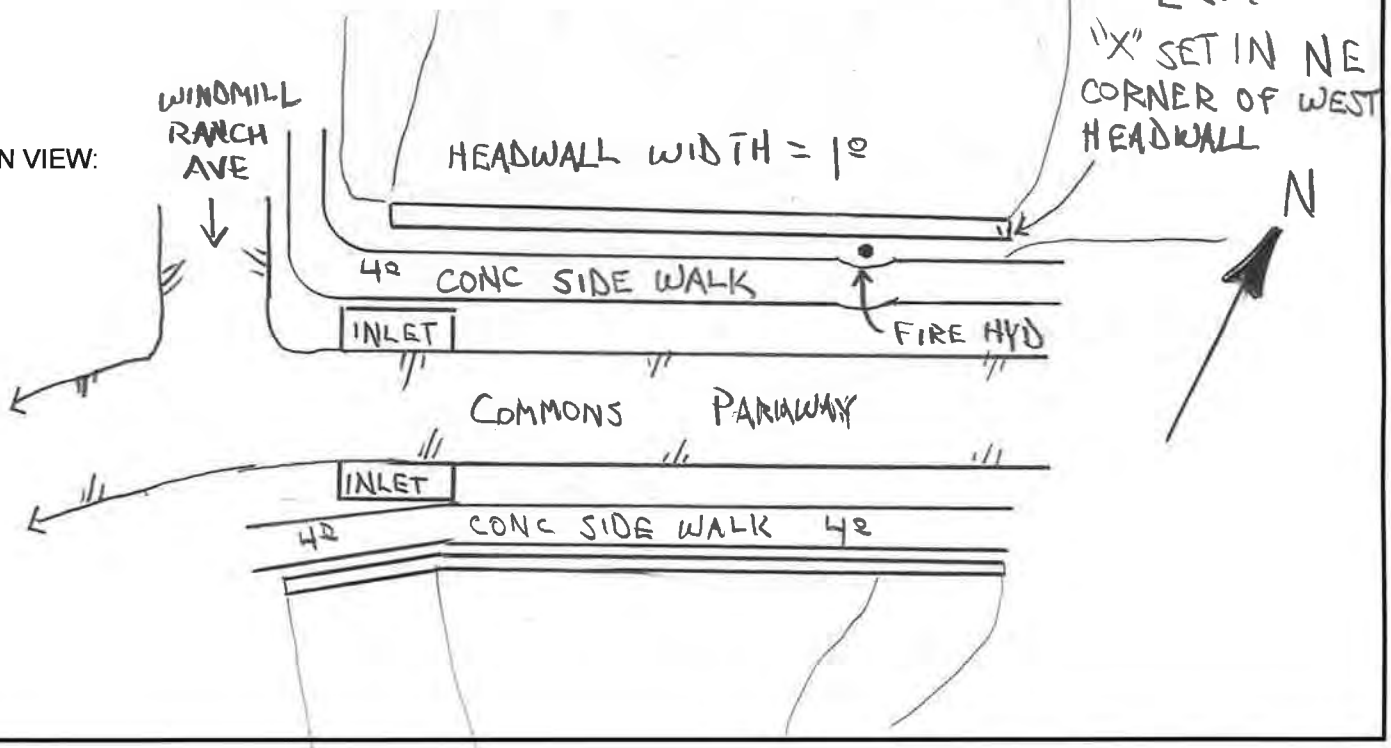


	Photo ID: Coordinates: Description:	WC_T210_STR_12000_USFACE 30.349173, -97.549688 Upstream face
	Photo ID: Coordinates: Description:	WC_T210_STR_12000_DSFACE 30.349173, -97.549688 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC 210 13000

STREAM NAME: UNKNOWN DATE: 2019-06-11

LOCATION: WC 200 13000 CREW: JIMMY DODD, CHRIS LAMB

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: 696.26 ERM ID: WC20013001 GEOID: IZB

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):		@		Pier Shape:
CULVERT:	Number:	6 BOXES	Shape:	RECTANGLE	Length:	60'	Height:	4'	Width:	8'	Skew: Ø
CULVERT:	I/O Type:				Material:		Wingwall Angle				
DAM:	Top Width:		Side Slope		Side Slope		US:		DS:		Outlet:

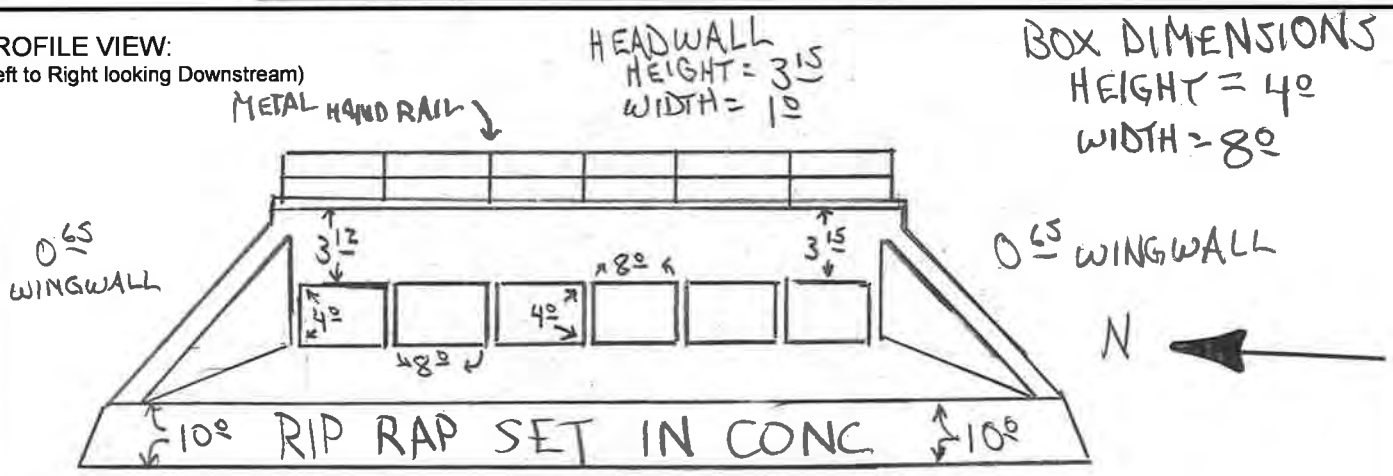
ERM Description: 3" BRASS DISK IN SW CORNER OF WEST HEADWALL Coordinate System: TX CENTRAL 4203

Photo Numbers: DSCH: DSFACE OTXS: USFACE USCH:

Additional Info:

File Name: 190611JD 35837

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

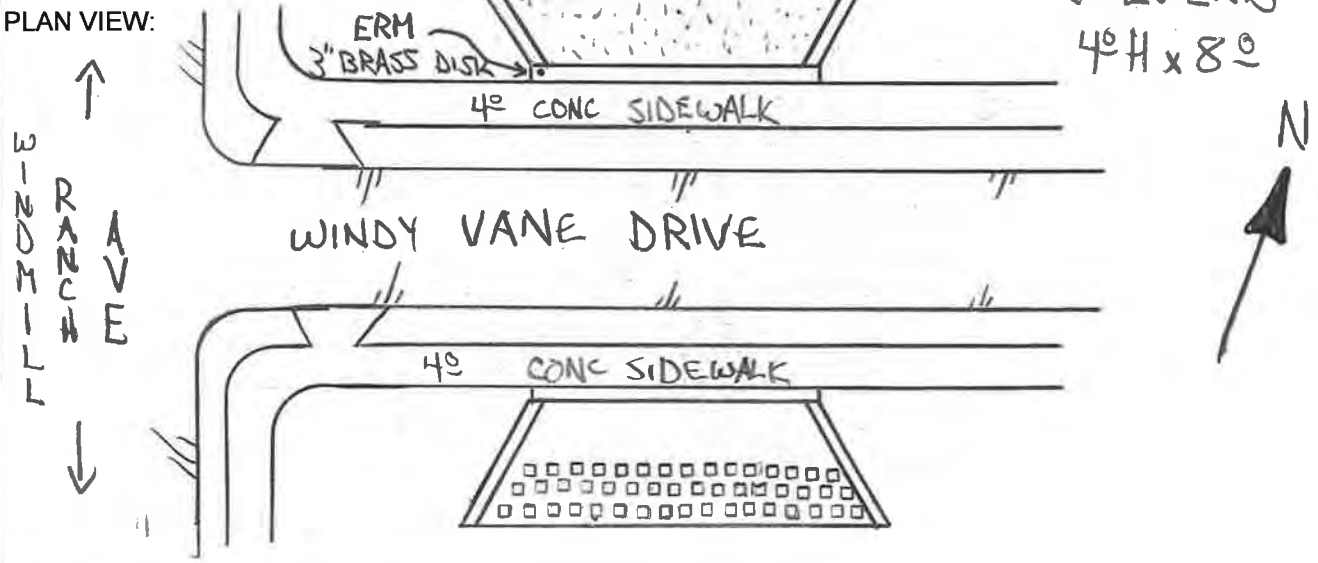


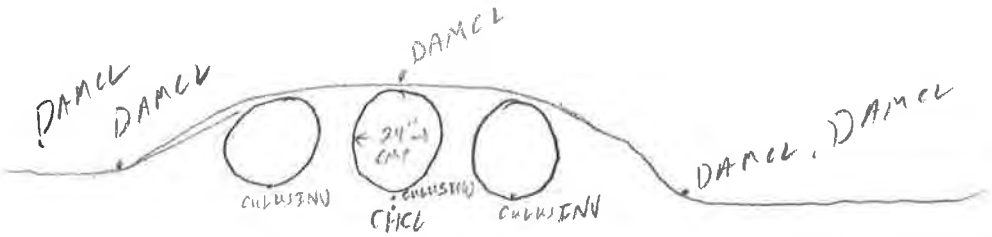
	Photo ID: Coordinates: Description:	WC_T210_STR_13000_USFACE 30.490115, -97.571104 Upstream face
	Photo ID: Coordinates: Description:	WC_T210_STR_13000_DSFACE 30.490115, -97.571104 Downstream face

Survey Field Sheet

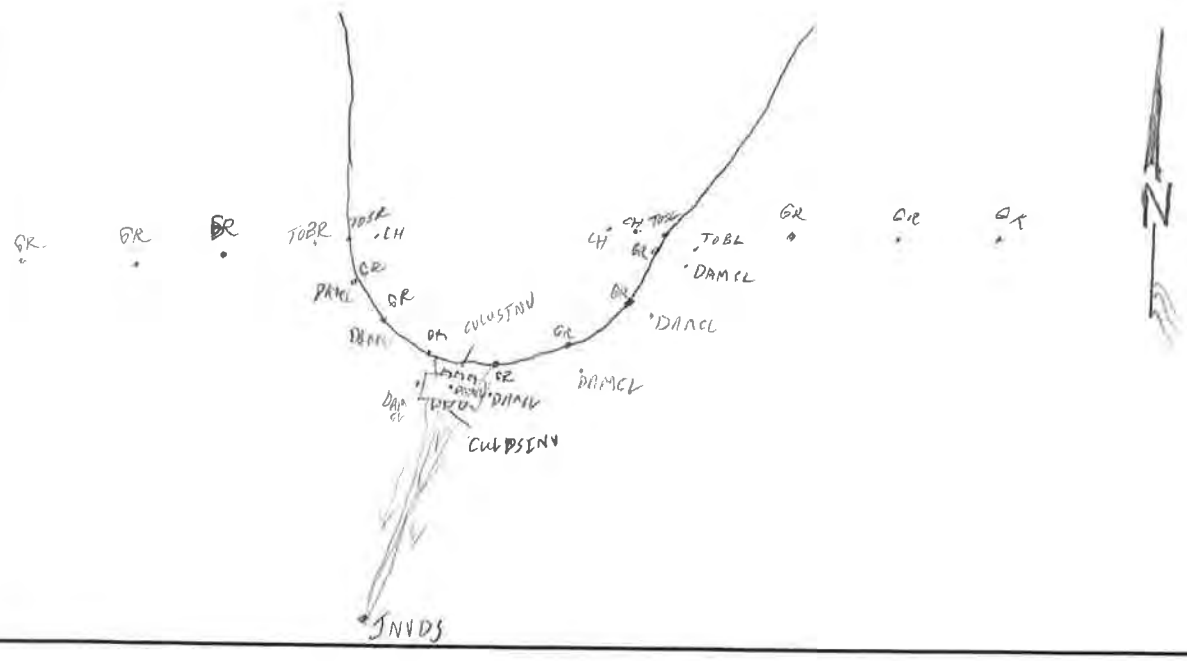
PROJECT: FEMA FLOOD STUDY
SURVEY NAME: WC_T216_DAM_1000
STREAM NAME: WILBARGER
DATE: 7-31-2018
LOCATION:
CREW: JJ CT
TYPE: BR( ) CUL( ) DAM(X) XS( ) ERM ELEV.: 627.049' ERM ID: WC216D1000 GEOID: Geoid 12A

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:	3	Shape:	circle	Length:		Height:	Width:	Skew:
CULVERT:	I/O Type:				Material:		Wingwall Angle		
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:
ERM Description:		1/2 IN IR W/HALF TRV						Coordinate System:	Tx C
Photo Numbers:			DSCH:		DSFACE		OTXS:	USFACE	USCH:
Additional Info:									
File Name:		190731JJ_35837							

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:



No photo taken	Photo ID: Coordinates: Description:	WC_T216_DAM_1000_USFACE 30.473036, -97.555665 Upstream face
	Photo ID: Coordinates: Description:	WC_T216_DAM_1000_DSFACE 30.473036, -97.555665 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_TX16_STR_1000

STREAM NAME: UNKNOWN DATE: 2019-06-17

LOCATION: WC_TX16_STR_1000 150' E. OF ABIGAIL WAY ON ISLE OF GLASS CREW: JIMMY DODD

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: 624.375 ERM ID: WCX161001 GEOID: 12A

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):		@		Pier Shape:
CULVERT:	Number:	6	Shape:	RECTANGLE	Length:	74.06	Height:	5.0	Width:	9.0	Skew: 0
CULVERT:	I/O Type:				Material:		Wingwall Angle				
DAM:	Top Width:		Side Slope		Side Slope		US:		DS:		Outlet:

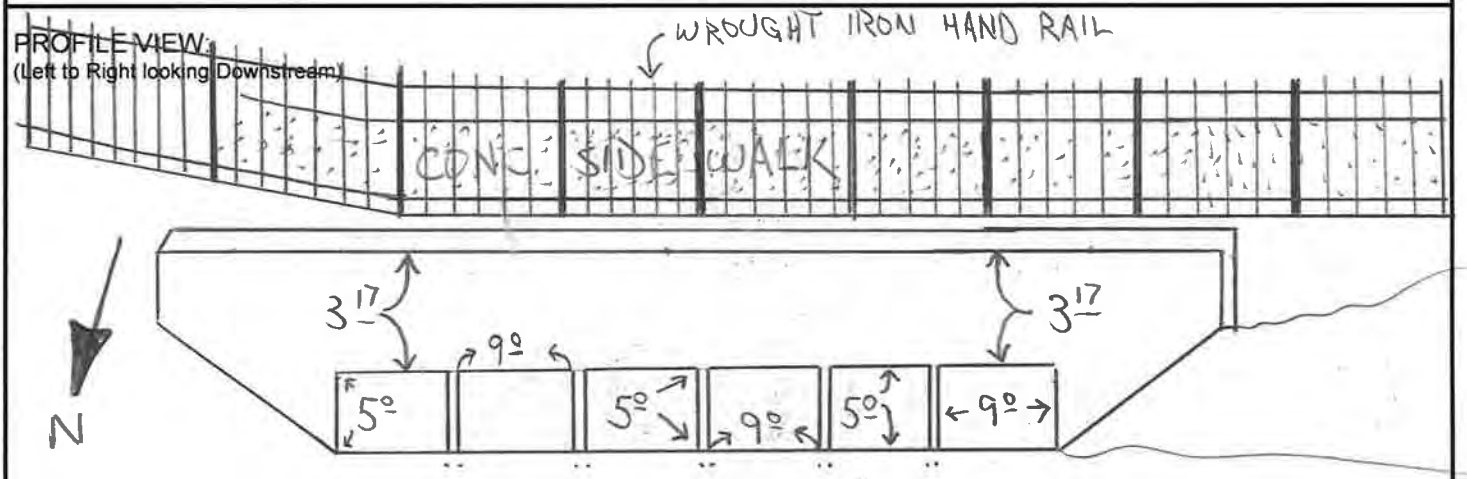
ERM Description: PK NAIL SET IN ASPHALT NEAR E. SIDE OF N. WALL Coordinate System: TX CENTRAL 4203

Photo Numbers: DSCH: DSFACE OTXS: USFACE USCH:

Additional Info:

File Name: 190617JD-35837

PROFILE VIEW:
(Left to Right looking Downstream)



BOX CULVERT DIMENSIONS
HEIGHT = 5.0
WIDTH = 9.0

HEADWALL
HEIGHT = 3.17
WIDTH = 1.0

PLAN VIEW:

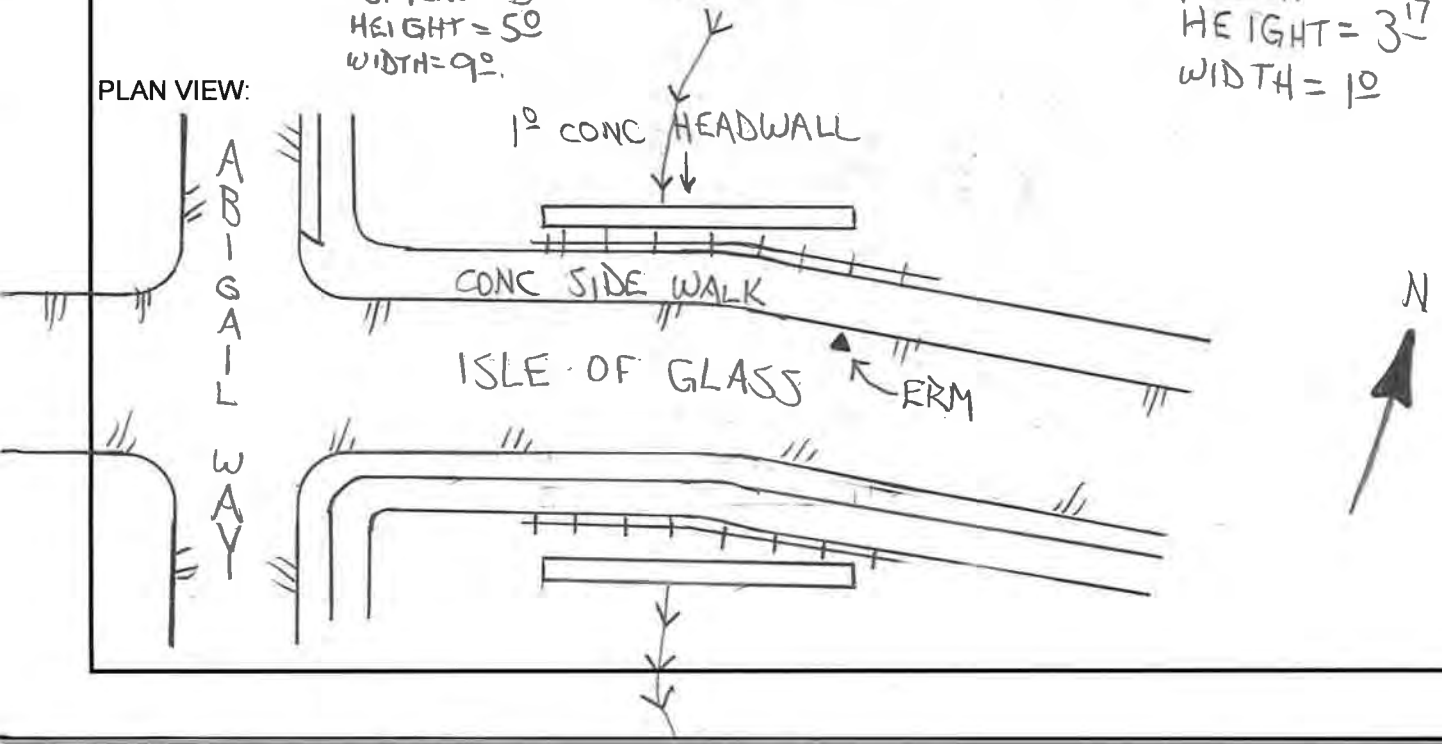


	Photo ID: Coordinates: Description:	WC_T216_STR_1000_USFACE 30.464044, -97.556327 Upstream face
	Photo ID: Coordinates: Description:	WC_T216_STR_1000_USFACE (close up) 30.464044, -97.556327 Upstream face

	Photo ID: Coordinates: Description:	WC_T216_STR_1000_DSFACE 30.464044, -97.556327 Downstream face

Survey Field Sheet

PROJECT: FEMA FLOOD STUDY SURVEY NAME: WC_T216_STR_2000

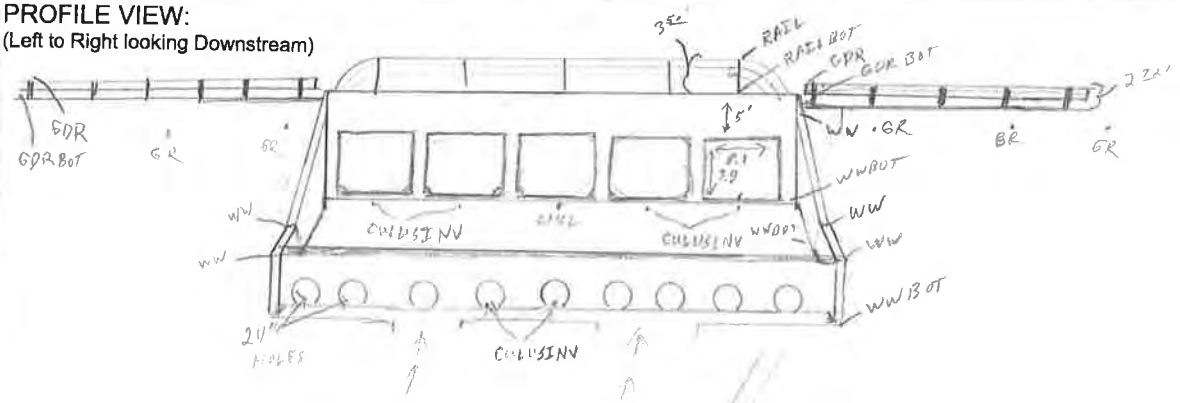
STREAM NAME: DATE: 7-31-2019

LOCATION: SPEIDAL DR. & HARRIER FLIGHT CREW: JJ CT

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: 642.128 ERM ID: WC2162001 GEOID: 12A

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):	@	Pier Shape:
CULVERT:	Number:	5	Shape:	RECTANGLE	Length:	70'	Height: 3'	Width: 8'	Skew: NO
CULVERT:	I/O Type:				Material:		Wingwall Angle		
DAM:	Top Width:		Side Slope		Side Slope		US:	DS:	Outlet:
ERM Description:		MAG NAIL IN ASPHALT						Coordinate System:	Tx C
Photo Numbers:			DSCH:		DSFACE		OTXS:	USFACE	USCH:
Additional Info:		COMPLETE RESHOOT							
File Name:		190731JJ_38537							

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

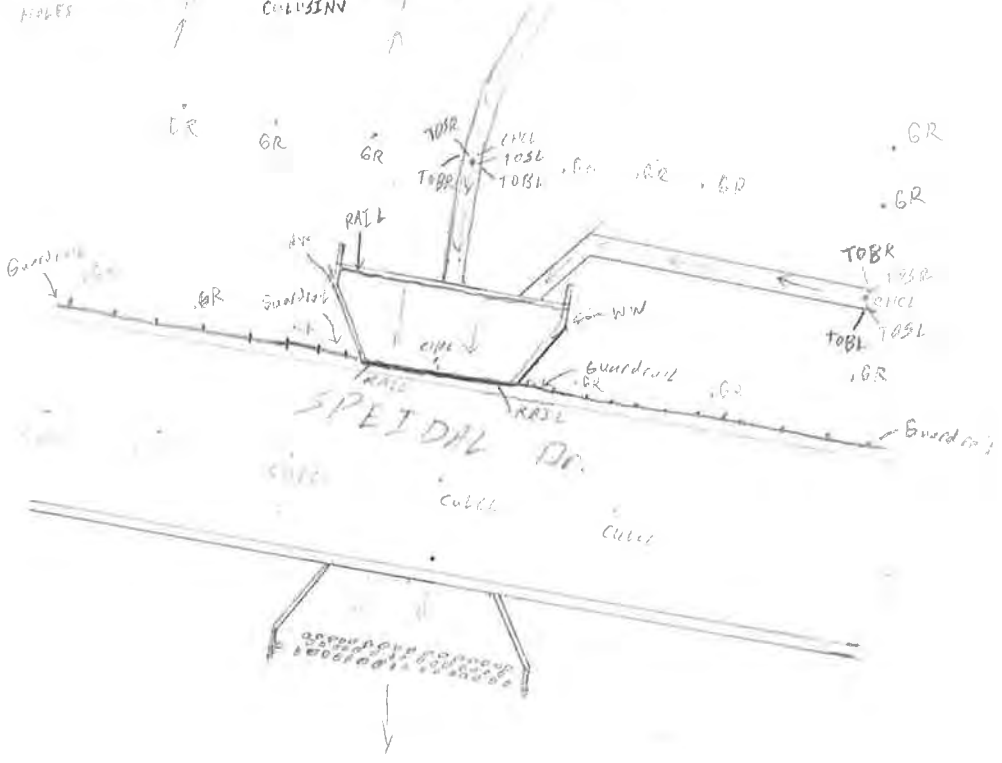


	Photo ID: Coordinates: Description:	WC_T216_STR_2000_USFACE 30.473036, -97.555665 Upstream face
	Photo ID: Coordinates: Description:	WC_T216_STR_2000_DSFACE 30.473036, -97.555665 Downstream face

	Photo ID: Coordinates: Description:	WC_T216_STR_2000_DSFACE2 30.473036, -97.555665 Downstream face

Appendix C-3: Field Reconnaissance – Bastrop County

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: DCW_STR_100, Railroad Bridge CREW: ML + JZ

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: ~~20.5~~ Deck: 3' Width: 15.5' Pier(s): _____ @ _____ Pier Shape: circular & square

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____

DAM: Top Width: _____ Side Slope _____ Side Slope _____ Wingwall Angle _____

ERM Description: _____ US: _____ DS: _____ Outlet: _____

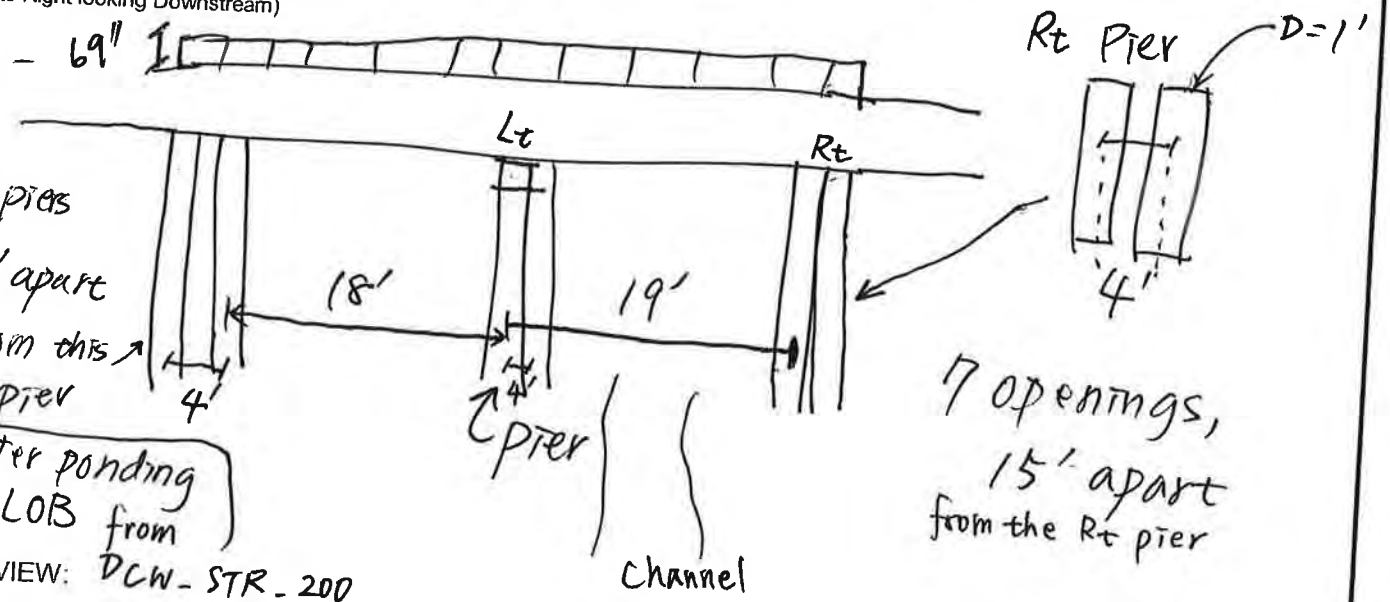
Photo Numbers: _____ Coordinate System: _____

USC: 2 USF: 3,4,5 (Lt Rt) DSF: 6,7,8 DSC: 1 Foundation 9

Additional Info: Photos: LOB US 10 11, LOB 12, ROB 13, Overview 14

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

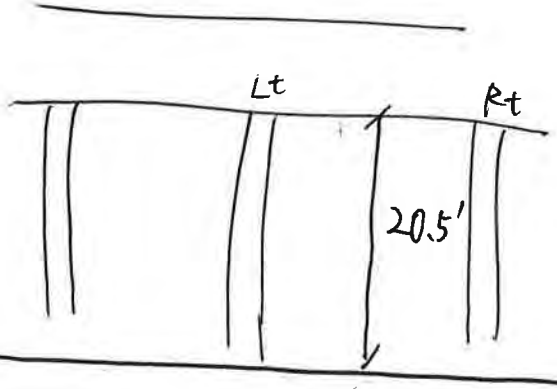


	Photo ID: Coordinates: Description:	DCW_STR_100_USC 30.321436, -97.456868 Upstream channel
	Photo ID: Coordinates: Description:	DCW_STR_100_USF_1 30.321436, -97.456868 Left upstream face, looking downstream

	Photo ID: Coordinates: Description:	DCW_STR_100_USF_2 30.321436, -97.456868 Upstream face
	Photo ID: Coordinates: Description:	DCW_STR_100_USF_3 30.321436, -97.456868 Right upstream face, looking downstream

	Photo ID: Coordinates: Description:	DCW_STR_100_DSF_1 30.321436, -97.456868 Left (looking downstream) downstream face
	Photo ID: Coordinates: Description:	DCW_STR_100_DSF_2 30.321436, -97.456868 Downstream face

	Photo ID: Coordinates: Description:	DCW_STR_100_DSF_3 30.321436, -97.456868 Right (looking downstream) downstream face
	Photo ID: Coordinates: Description:	DCW_STR_100_DSC 30.321436, -97.456868 Downstream channel

	Photo ID: Coordinates: Description:	DCW_STR_100_Foundation 30.321436, -97.456868 Foundation of the bridge
	Photo ID: Coordinates: Description:	DCW_STR_100_LOB_US_1 30.321181, -97.456333 Upstream face of water flowing from DCW_STR_200_B culverts. Located left of the bridge crossing

	Photo ID: Coordinates: Description:	DCW_STR_100_LOB_US_2 30.321181, -97.456333 Upstream face of water flowing from DCW_STR_200_B culverts. Located left of the bridge crossing
	Photo ID: Coordinates: Description:	DCW_STR_100_LOB 30.321436, -97.456868 Left overbank

	Photo ID: Coordinates: Description:	DCW_STR_100_ROB 30.321436, -97.456868 Right overbank
	Photo ID: Coordinates: Description:	DCW_STR_100_OVERVIEW 30.321436, -97.456868 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: DCW_STR_200 A CREW: _____

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 2'4"-0.5' Deck: 1' Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

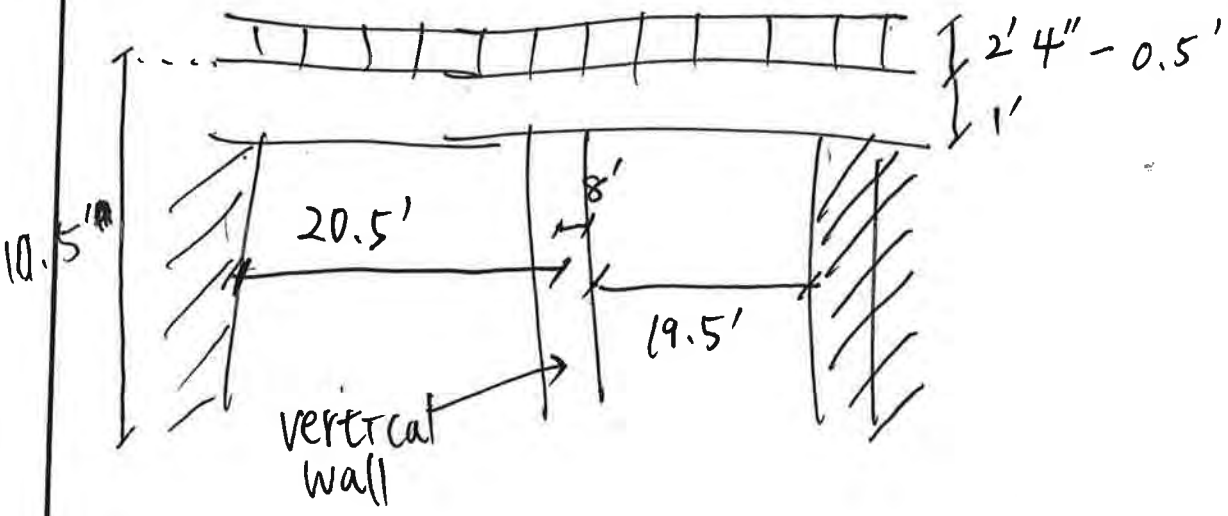
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 4, 8 DSC: 3 LOB 5 ROB 7 6

Additional Info: OVERVIEW: after USC of DCW-STR-200 A

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

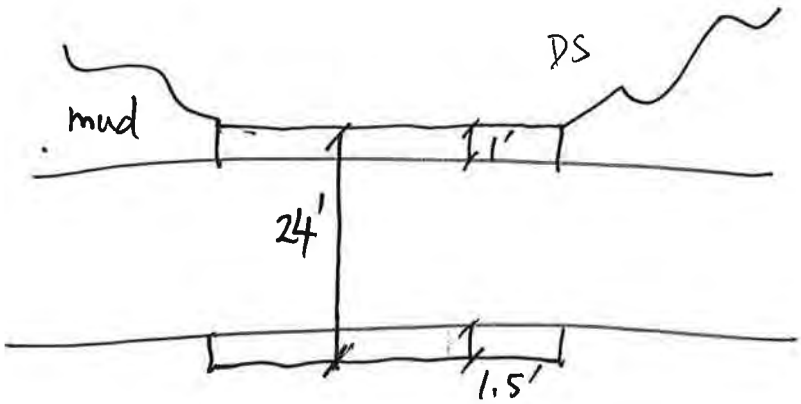


	Photo ID: Coordinates: Description:	DCW_STR_200_A_USC 30.32161, -97.456752 Upstream channel
	Photo ID: Coordinates: Description:	DCW_STR_200_A_USF 30.32161, -97.456752 Upstream face

	Photo ID: Coordinates: Description:	DCW_STR_200_A_DSF 30.32161, -97.456752 Downstream face
	Photo ID: Coordinates: Description:	DCW_STR_200_A_DSC 30.32161, -97.456752 Downstream channel

	Photo ID: Coordinates: Description:	DCW_STR_200_A_LOB 30.32161, -97.456752 Left overbank
	Photo ID: Coordinates: Description:	DCW_STR_200_A_ROB 30.32161, -97.456752 Right overbank

	Photo ID: Coordinates: Description:	DCW_STR_200_A_OVERVIEW 30.32161, -97.456752 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: DCW-STR-200, Little Rd B CREW: ML + JZ

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 2 Shape: circular Length: 30" Height: 30" Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: CMP Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

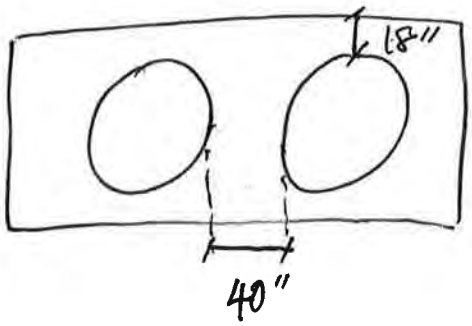
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 COB: 5 ROB: 6 OVERVIEW: 7

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

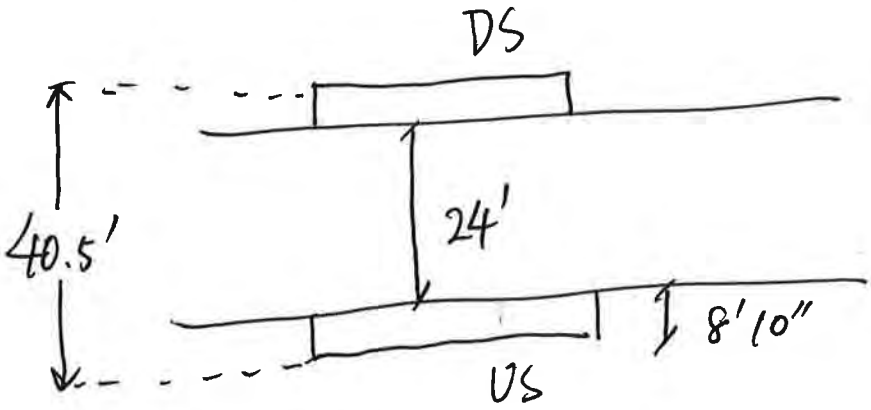


		Photo ID: Coordinates: Description:	DCW_STR_200_B_USC 30.321357, -97.456224 Upstream channel
		Photo ID: Coordinates: Description:	DCW_STR_200_B_USF 30.321357, -97.456224 Upstream face

		Photo ID: Coordinates: Description:	DCW_STR_200_B_DSF 30.321357, -97.456224 Downstream face
		Photo ID: Coordinates: Description:	DCW_STR_200_B_DSC 30.321357, -97.456224 Downstream channel

		Photo ID: Coordinates: Description:	DCW_STR_200_B_LOB 30.321357, -97.456224 Left overbank
		Photo ID: Coordinates: Description:	DCW_STR_200_B_ROB 30.321357, -97.456224 Right overbank

		Photo ID: Coordinates: Description:	DCW_STR_200_B_OVERVIEW 30.321357, -97.456224 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: DCW-STR-300, Albert Voelker Rd CREW: _____

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: no rail Deck: 18" Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOB 5 ROB 6

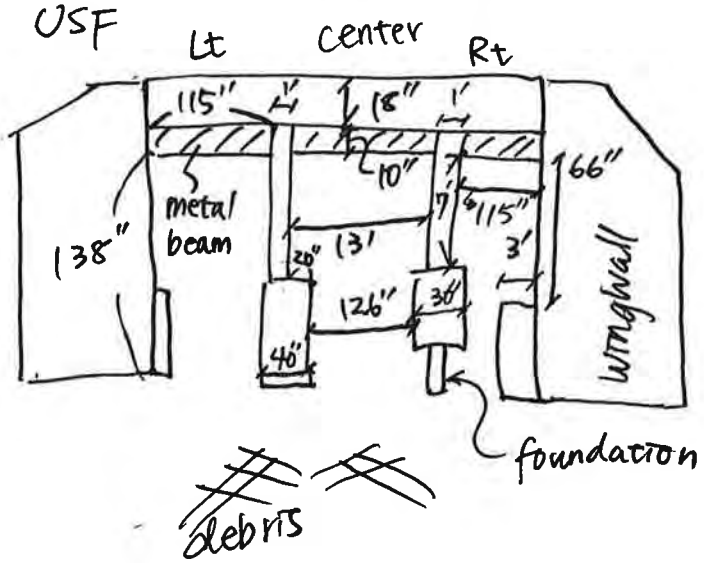
Additional Info: A lot of debris, built in 1956

File Name: center 7 Foundation on Rt 8 Lt 9 center 10 sign 11 LOB DS debris 12 overview 13

PROFILE VIEW:
(Left to Right looking Downstream)

▭ ... concrete

▨ ... metal



PLAN VIEW:

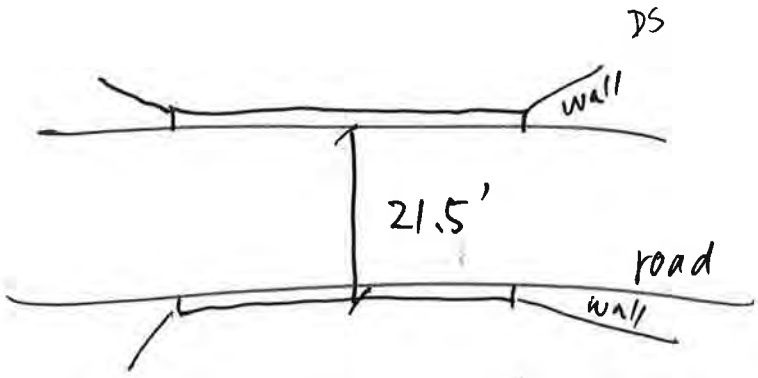


	Photo ID: Coordinates: Description:	DCW_STR_300_USC 30.335559, -97.439998 Upstream channel
	Photo ID: Coordinates: Description:	DCW_STR_300_USF 30.335559, -97.439998 Upstream face

	Photo ID: Coordinates: Description:	DCW_STR_300_DSF 30.335559, -97.439998 Downstream face
	Photo ID: Coordinates: Description:	DCW_STR_300_DSC 30.335559, -97.439998 Downstream channel

	Photo ID: Coordinates: Description:	DCW_STR_300_LOB 30.335559, -97.439998 Left overbank
	Photo ID: Coordinates: Description:	DCW_STR_300_ROB 30.335559, -97.439998 Right overbank

	Photo ID: Coordinates: Description:	DCW_STR_300_Center_1 30.335559, -97.439998 Center opening of the bridge
	Photo ID: Coordinates: Description:	DCW_STR_300_Center_2 30.335559, -97.439998 Center opening of the bridge

	Photo ID: Coordinates: Description:	DCW_STR_300_LOB_DS_Debris 30.335559, -97.439998 Debris downstream of left overbank
	Photo ID: Coordinates: Description:	DCW_STR_300_Right_Foundation 30.335559, -97.439998 Foundation of the bridge, right opening of the bridge

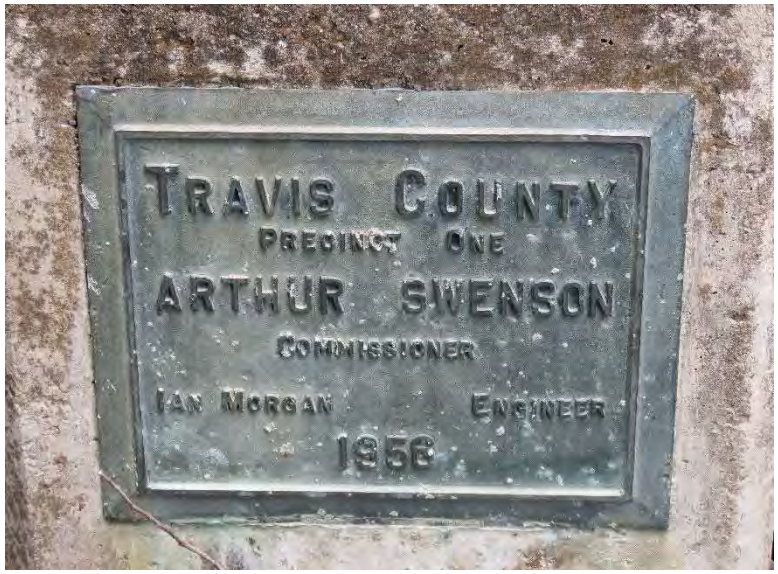
	Photo ID: Coordinates: Description:	DCW_STR_300_Left 30.335559, -97.439998 Left opening of the bridge
	Photo ID: Coordinates: Description:	DCW_STR_300_Sign 30.335559, -97.439998 Sign of the bridge

	Photo ID: Coordinates: Description:	DCW_STR_300_OVERVIEW 30.335559, -97.439998 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: DCW-STR-420 [redacted] CREW: _____

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 33" Deck: 20" Width: 56' Pier(s): 4 @ 1' Pier Shape: outside H-pile 1-side octagon

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: 8 piers/set

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1, 3 USF: 2, 4 DSF: 9-10 DSC: 8, 11

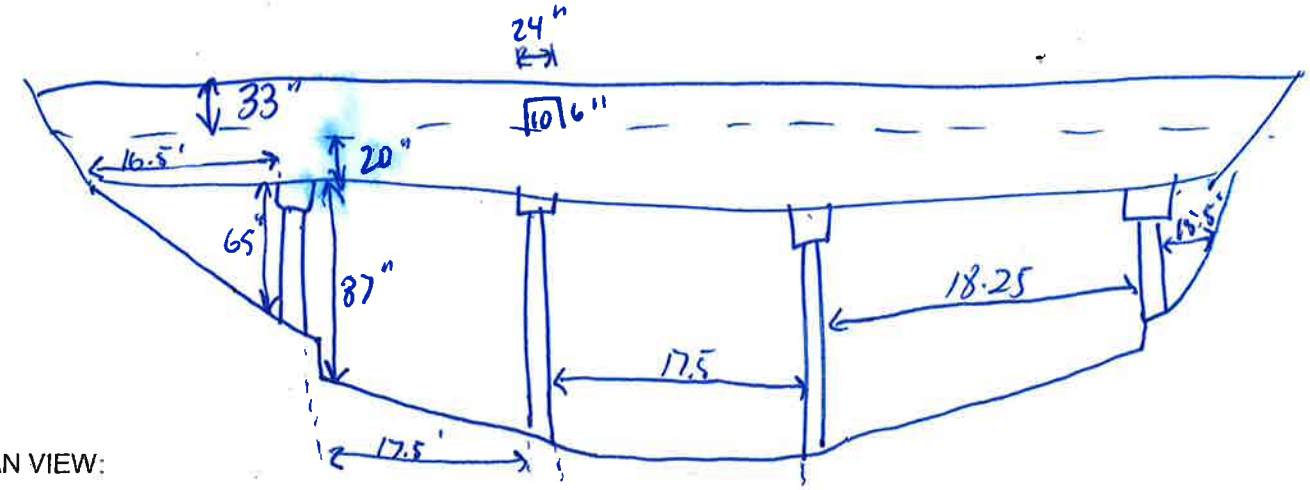
Additional Info: Pics 5-7 usc from under bridge, 12-14 DSC from under bridge

File Name: 15-16 LOB eROB from under bridge

17-19 us to DS of Left abutment

PROFILE VIEW: 20-22 " " Right "

(Left to Right looking Downstream)



PLAN VIEW:

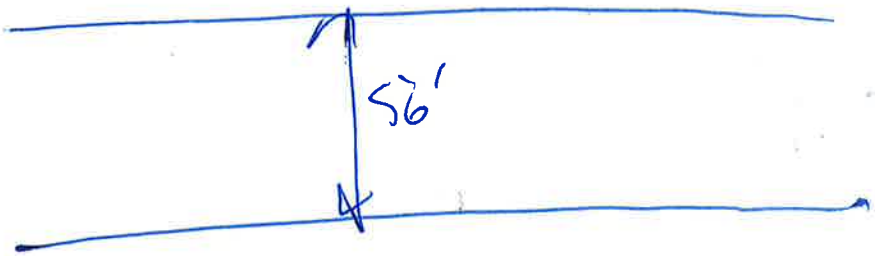


	Photo ID: Coordinates: Description:	DCW_STR_400_USC_1 30.351613, -97.43749 Upstream channel
	Photo ID: Coordinates: Description:	DCW_STR_400_USC_2 30.351613, -97.43749 Upstream channel

	Photo ID: Coordinates: Description:	DCW_STR_400_USC_3 30.351613, -97.43749 Upstream channel, taken under the bridge
	Photo ID: Coordinates: Description:	DCW_STR_400_USC_4 30.351613, -97.43749 Upstream channel, taken under the bridge

	Photo ID: Coordinates: Description:	DCW_STR_400_USC_5 30.351613, -97.43749 Upstream channel, taken under the bridge
	Photo ID: Coordinates: Description:	DCW_STR_400_USF_1 30.351613, -97.43749 Upstream face

	Photo ID: Coordinates: Description:	DCW_STR_400_USF_2 30.351613, -97.43749 Upstream face
	Photo ID: Coordinates: Description:	DCW_STR_400_DSF_1 30.351613, -97.43749 Downstream face

	Photo ID: Coordinates: Description:	DCW_STR_400_DSF_2 30.351613, -97.43749 Downstream face
	Photo ID: Coordinates: Description:	DCW_STR_400_DSC_1 30.351613, -97.43749 Downstream channel

	Photo ID: Coordinates: Description:	DCW_STR_400_DSC_2 30.351613, -97.43749 Downstream channel
	Photo ID: Coordinates: Description:	DCW_STR_400_DSC_3 30.351613, -97.43749 Downstream channel, taken under the bridge

	Photo ID: Coordinates: Description:	DCW_STR_400_DSC_4 30.351613, -97.43749 Downstream channel, taken under the bridge
	Photo ID: Coordinates: Description:	DCW_STR_400_DSC_5 30.351613, -97.43749 Downstream channel, taken under the bridge

	Photo ID: Coordinates: Description:	DCW_STR_400_LOB 30.351613, -97.43749 Left overbank, taken under the bridge
	Photo ID: Coordinates: Description:	DCW_STR_400_ROB 30.351613, -97.43749 Right overbank, taken under the bridge

	Photo ID: Coordinates: Description:	DCW_STR_400_LtAbutment_1 30.351613, -97.43749 Left abutment, looking upstream
	Photo ID: Coordinates: Description:	DCW_STR_400_LtAbutment_2 30.351613, -97.43749 Left abutment

	Photo ID: Coordinates: Description:	DCW_STR_400_LtAbutment_3 30.351613, -97.43749 Left abutment, looking downstream
	Photo ID: Coordinates: Description:	DCW_STR_400_RtAbutment_1 30.351613, -97.43749 Right abutment, looking upstream

	Photo ID: Coordinates: Description:	DCW_STR_400_RtAbutment_2 30.351613, -97.43749 Right abutment
	Photo ID: Coordinates: Description:	DCW_STR_400_RtAbutment_3 30.351613, -97.43749 Tight abutment, looking downstream

	Photo ID: Coordinates: Description:	DCW_STR_400_BridgeID 30.351613, -97.43749 TxDOT Bridge ID

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: [redacted] DCW-STR-503 CREW: _____

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 30" Deck: 12' Width: _____ Pier(s): 1 @ 30" Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

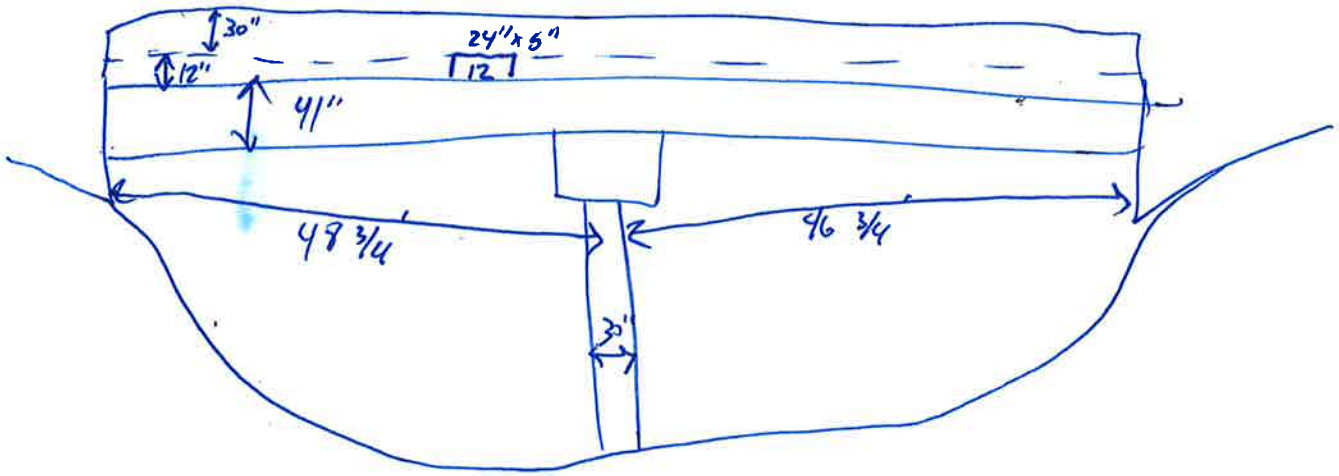
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1-4 USF: 5-7 DSF: 8, 10 DSC: 9, 11-12

Additional Info: pic 13 of TxDOT Bridge ID

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

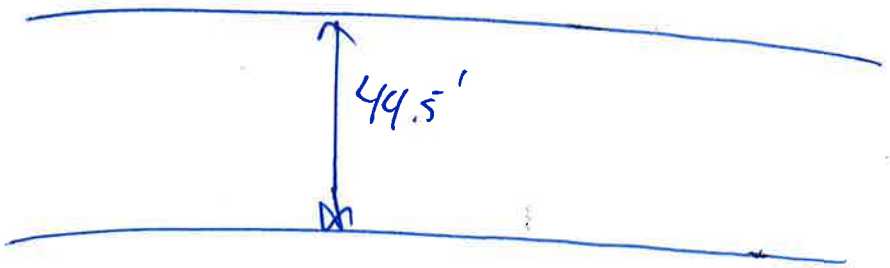


	Photo ID: Coordinates: Description:	DCW_STR_500_USC_1 30.351906, -97.437739 Upstream channel
	Photo ID: Coordinates: Description:	DCW_STR_500_USC_2 30.351906, -97.437739 Upstream channel

	Photo ID: Coordinates: Description:	DCW_STR_500_USC_3 30.351906, -97.437739 Upstream channel
	Photo ID: Coordinates: Description:	DCW_STR_500_USC_4 30.351906, -97.437739 Upstream channel

	Photo ID: Coordinates: Description:	DCW_STR_500_USF_1 30.351906, -97.437739 Upstream face
	Photo ID: Coordinates: Description:	DCW_STR_500_USF_2 30.351906, -97.437739 Upstream face

	Photo ID: Coordinates: Description:	DCW_STR_500_USF_3 30.351906, -97.437739 Upstream face
	Photo ID: Coordinates: Description:	DCW_STR_500_DSF_1 30.351906, -97.437739 Downstream face

	Photo ID: Coordinates: Description:	DCW_STR_500_DSF_2 30.351906, -97.437739 Downstream face
	Photo ID: Coordinates: Description:	DCW_STR_500_DSC_1 30.351906, -97.437739 Downstream channel

	Photo ID: Coordinates: Description:	DCW_STR_500_DSC_2 30.351906, -97.437739 Downstream channel
	Photo ID: Coordinates: Description:	DCW_STR_500_DSC_3 30.351906, -97.437739 Downstream channel

	Photo ID: Coordinates: Description:	DCW_STR_500_BridgeID 30.351906, -97.437739 TxDOT Bridge ID

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: DCW-STR-600, FM 1100 CREW: _____

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 22" Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

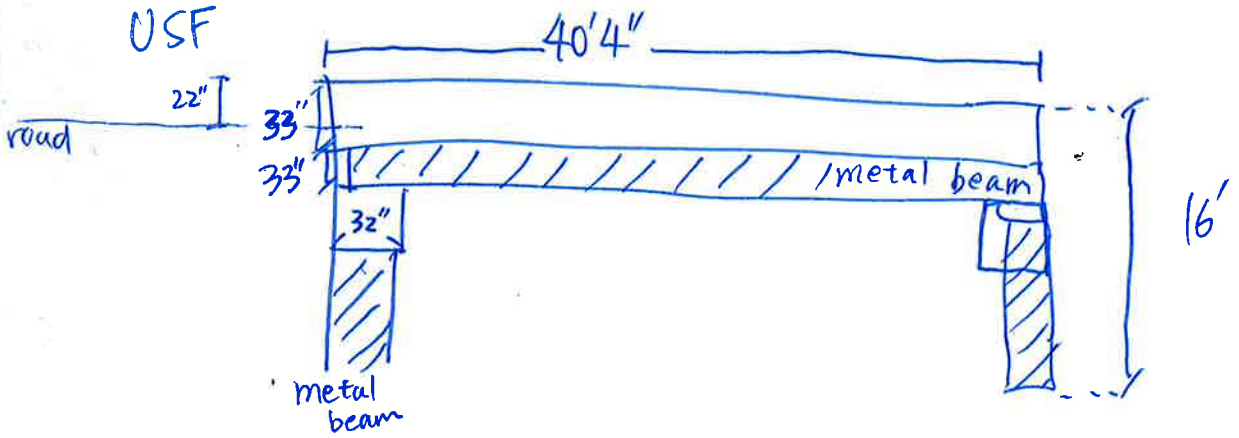
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 4 USF: 5 DSF: 2, 3 DSC: 1 LOB 6 ROB 7 OVERVIEW 8

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

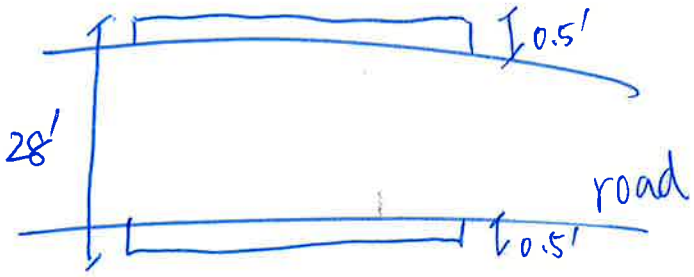


	Photo ID: Coordinates: Description:	DCW_STR_600_USC 30.371918, -97.429115 Upstream channel
	Photo ID: Coordinates: Description:	DCW_STR_600_USF 30.371918, -97.429115 Upstream face

	Photo ID: Coordinates: Description:	DCW_STR_600_DSF_1 30.371918, -97.429115 Downstream face
	Photo ID: Coordinates: Description:	DCW_STR_600_DSF_2 30.371918, -97.429115 Downstream face

	Photo ID: Coordinates: Description:	DCW_STR_600_DSC 30.371918, -97.429115 Downstream channel
	Photo ID: Coordinates: Description:	DCW_STR_600_LOB 30.371918, -97.429115 Left overbank

	Photo ID: Coordinates: Description:	DCW_STR_600_ROB 30.371918, -97.429115 Right overbank
	Photo ID: Coordinates: Description:	DCW_STR_600_OVERVIEW 30.371918, -97.429115 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: DCW-STR-700, Carlson Rd CREW: _____

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: 20.5' Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 1 Shape: box Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: Concrete Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

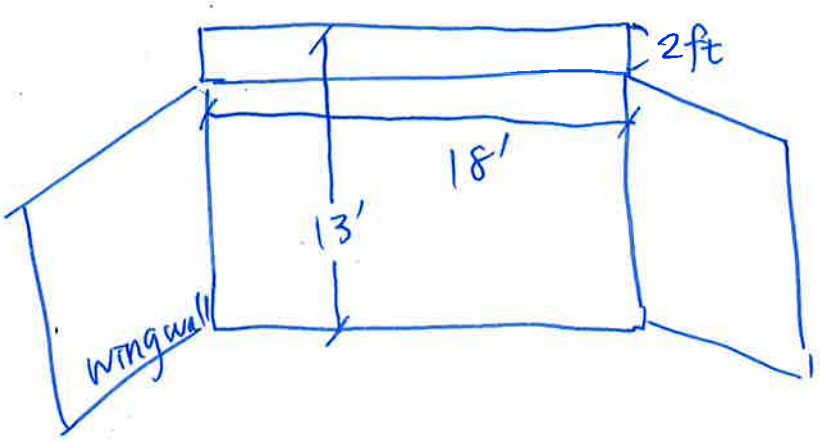
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOB 5 ROB 6 sign 7 OVERVIEW 8

Additional Info: _____

File.Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

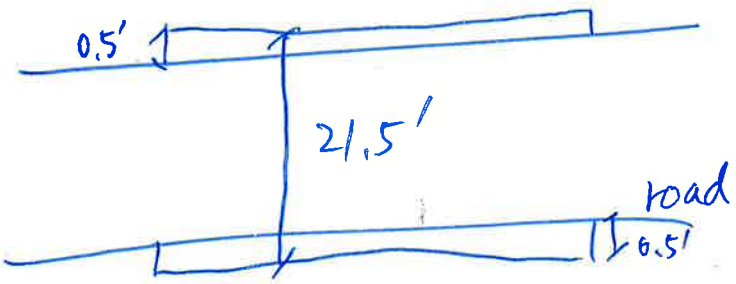


	Photo ID: Coordinates: Description:	DCW_STR_700_USC 30.38231, -97.415932 Upstream channel
	Photo ID: Coordinates: Description:	DCW_STR_700_USF 30.38231, -97.415932 Upstream face

	Photo ID: Coordinates: Description:	DCW_STR_700_DSF 30.38231, -97.415932 Downstream face
	Photo ID: Coordinates: Description:	DCW_STR_700_DSC 30.38231, -97.415932 Downstream channel

	Photo ID: Coordinates: Description:	DCW_STR_700_Sign 30.38231, -97.415932 Structure sign
	Photo ID: Coordinates: Description:	DCW_STR_700_LOB 30.38231, -97.415932 Left overbank

	Photo ID: Coordinates: Description:	DCW_STR_700_ROB 30.38231, -97.415932 Right overbank
	Photo ID: Coordinates: Description:	DCW_STR_700_OVERVIEW 30.38231, -97.415932 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: DCW_STR_800, Carlson Rd CREW: _____

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: 2' Width: 23.5' Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 1 Shape: O Length: 26.5' Height: 18" Width: 18" Skew: _____

CULVERT: I/O Type: _____ Material: CMP Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

ERM Description: _____ Coordinate System: _____

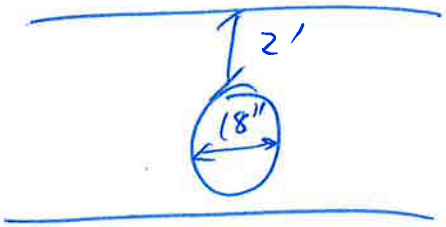
Photo Numbers: USC: 1 USF: 2 DSF: 4 DSC: 3 LOB 5 ROB 6 OVERVIEW 7

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)

mitered to slope



PLAN VIEW:

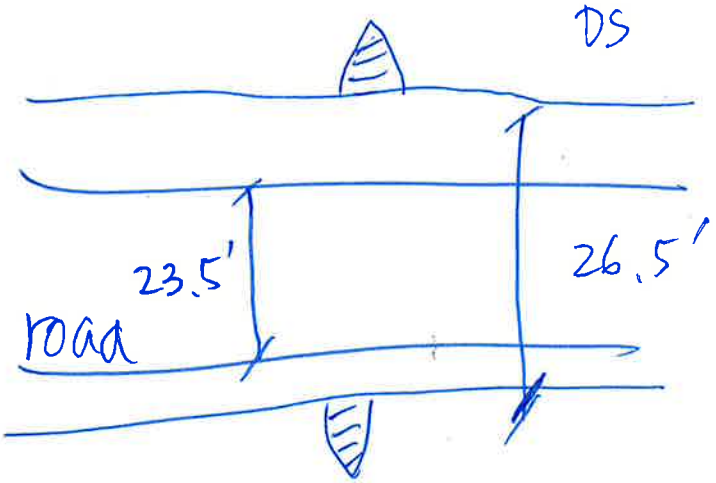


	Photo ID: Coordinates: Description:	DCW_STR_800_USC 30.390753, -97.410555 Upstream channel
	Photo ID: Coordinates: Description:	DCW_STR_800_USF 30.390753, -97.410555 Upstream face

	Photo ID: Coordinates: Description:	DCW_STR_800_DSF 30.390753, -97.410555 Downstream face
	Photo ID: Coordinates: Description:	DCW_STR_800_DSC 30.390753, -97.410555 Downstream channel

	Photo ID: Coordinates: Description:	DCW_STR_800_LOB 30.390753, -97.410555 Left overbank
	Photo ID: Coordinates: Description:	DCW_STR_800_ROB 30.390753, -97.410555 Right overbank

	Photo ID: Coordinates: Description:	DCW_STR_800_OVERVIEW 30.390753, -97.410555 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: DCW_STR_900, County Line Rd CREW: _____

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 3 Shape: □ Length: 24' Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: concrete Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

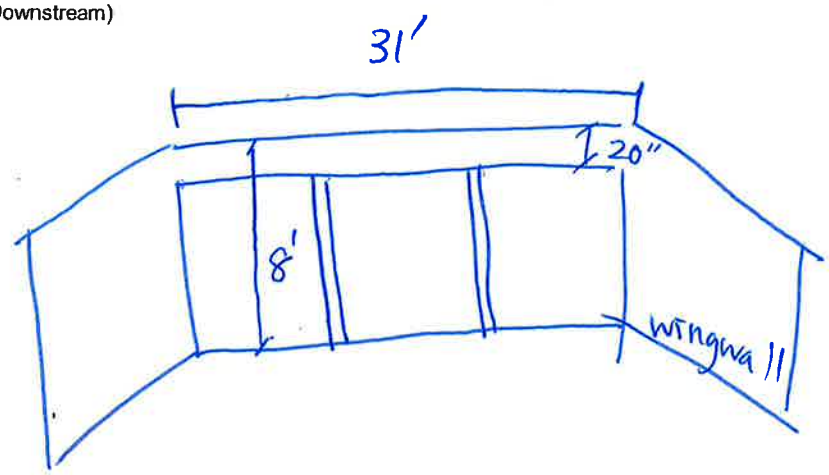
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: ~~4~~ 4 LOB 5 ROB 6

Additional Info: _____

File Name: sign 3,

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

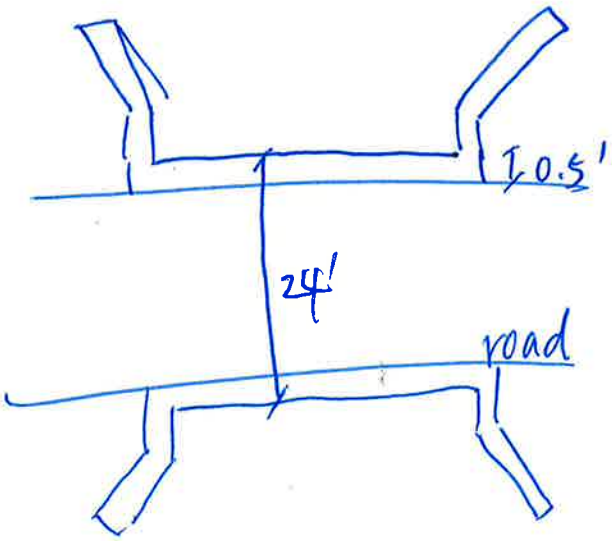


	Photo ID: Coordinates: Description:	DCW_STR_900_USC 30.390154. -97.38806 Upstream channel
	Photo ID: Coordinates: Description:	DCW_STR_900_USF 30.390154. -97.38806 Upstream face

	Photo ID: Coordinates: Description:	DCW_STR_900_DSF 30.390154. -97.38806 Downstream face
	Photo ID: Coordinates: Description:	DCW_STR_900_DSC 30.390154. -97.38806 Downstream channel

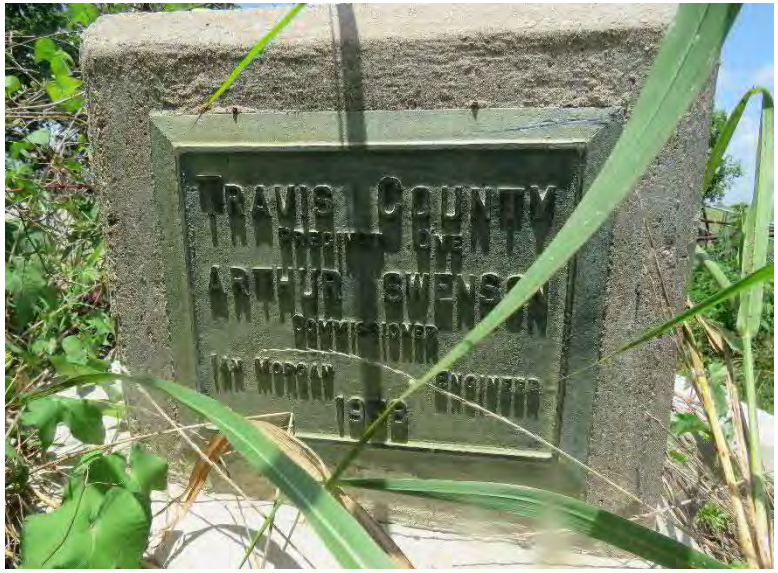
	Photo ID: Coordinates: Description:	DCW_STR_900_Sign 30.390154. -97.38806 Structure sign
	Photo ID: Coordinates: Description:	DCW_STR_900_LOB 30.390154. -97.38806 Left overbank

	Photo ID: Coordinates: Description:	DCW_STR_900_ROB 30.390154. -97.38806 Right overbank
	Photo ID: Coordinates: Description:	DCW_STR_900_OVERVIEW 30.390154. -97.38806 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: EC_STR-600, TX-95 CREW: ML + JZ

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: 32" Width: ~~GIS~~ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

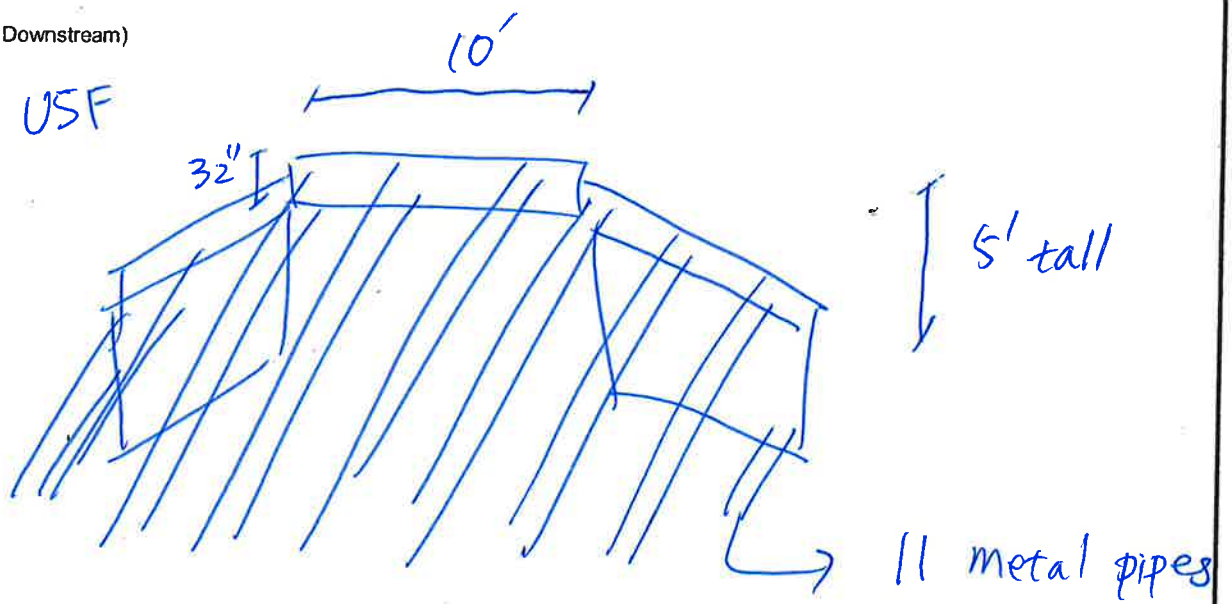
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 4 DSC: 3, 5

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

	Photo ID: Coordinates: Description:	EC_STR_600_USC 30.386831, -97.370167 Upstream channel
	Photo ID: Coordinates: Description:	EC_STR_600_USF 30.386831, -97.370167 Upstream face

	Photo ID: Coordinates: Description:	EC_STR_600_DSF 30.386831, -97.370167 Downstream face
	Photo ID: Coordinates: Description:	EC_STR_600_DSC_1 30.386831, -97.370167 Downstream channel

	Photo ID: Coordinates: Description:	EC_STR_600_DSC_2 30.386831, -97.370167 Downstream channel

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: EC_STR_700, TX-95 CREW: _____

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: 20" Width: 56' Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 2 Shape: O Length: _____ Height: 82" Width: 82" Skew: _____

CULVERT: I/O Type: _____ Material: metal, not CMP Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

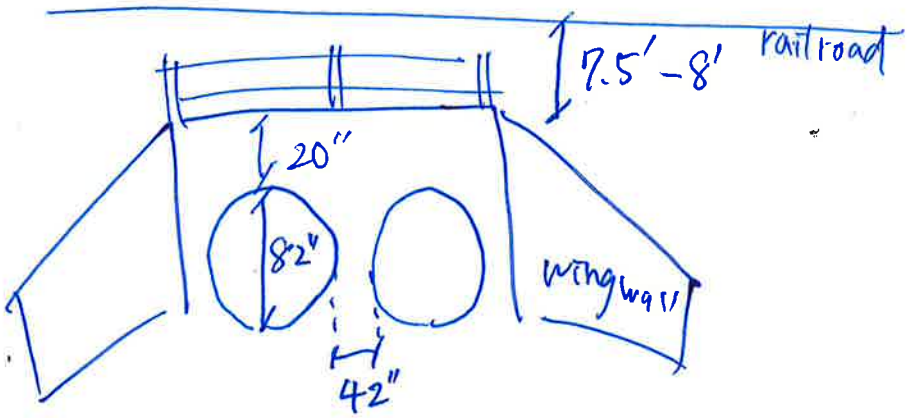
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 3 USF: 4 DSF: 1 DSC: 2

Additional Info: under railroad

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

	Photo ID: Coordinates: Description:	EC_STR_700_USC 30.38674, -97.369827 Upstream channel
	Photo ID: Coordinates: Description:	EC_STR_700_USF 30.38674, -97.369827 Upstream face

	Photo ID: Coordinates: Description:	EC_STR_700_DSF 30.38674, -97.369827 Downstream face
	Photo ID: Coordinates: Description:	EC_STR_700_DSC 30.38674, -97.369827 Downstream channel

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: HBS_STR_100 CREW: _____

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 6 Shape: ROUND Length: 64' Height: 10' Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: CMP Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

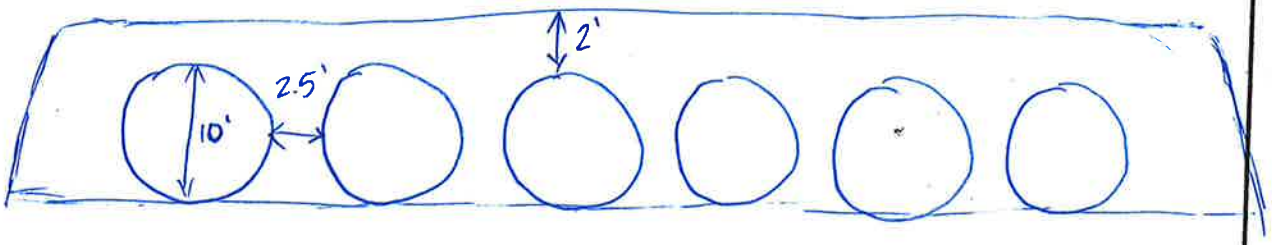
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1-4 USF: 5-7 DSF: 8-10 DSC: 11-14 LOB: 15

Additional Info: HIGH PLANT GROWTH/TREES (in and around culvert) OVERVIEW: 17 ROB: 16

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

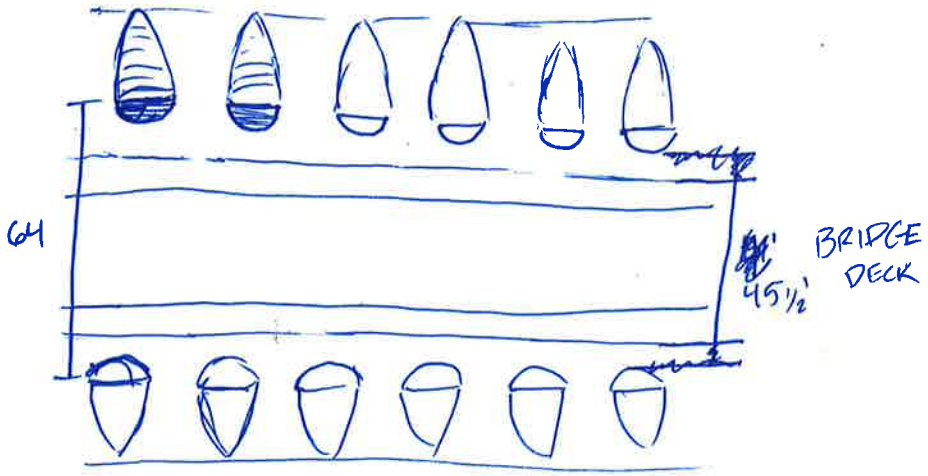


	Photo ID: Coordinates: Description:	HBS_STR_100_USC_1 30.28422, -97.461197 Upstream channel
	Photo ID: Coordinates: Description:	HBS_STR_100_USC_2 30.28422, -97.461197 Upstream channel

	Photo ID: Coordinates: Description:	HBS_STR_100_USC_3 30.28422, -97.461197 Upstream channel
	Photo ID: Coordinates: Description:	HBS_STR_100_USC_4 30.28422, -97.461197 Upstream channel

	Photo ID: Coordinates: Description:	HBS_STR_100_USF_1 30.28422, -97.461197 Upstream face
	Photo ID: Coordinates: Description:	HBS_STR_100_USF_2 30.28422, -97.461197 Upstream face

	Photo ID: Coordinates: Description:	HBS_STR_100_USF_3 30.28422, -97.461197 Upstream face
	Photo ID: Coordinates: Description:	HBS_STR_100_DSC_1 30.28422, -97.461197 Downstream channel

	Photo ID: Coordinates: Description:	HBS_STR_100_DSC_2 30.28422, -97.461197 Downstream channel
	Photo ID: Coordinates: Description:	HBS_STR_100_DSC_3 30.28422, -97.461197 Downstream channel

	Photo ID: Coordinates: Description:	HBS_STR_100_DSC_4 30.28422, -97.461197 Downstream channel
	Photo ID: Coordinates: Description:	HBS_STR_100_DSF_1 30.28422, -97.461197 Downstream face

	Photo ID: Coordinates: Description:	HBS_STR_100_DSF_2 30.28422, -97.461197 Downstream face
	Photo ID: Coordinates: Description:	HBS_STR_100_DSF_3 30.28422, -97.461197 Downstream face

	Photo ID: Coordinates: Description:	HBS_STR_100_LOB 30.28422, -97.461197 Left overbank
	Photo ID: Coordinates: Description:	HBS_STR_100_ROB 30.28422, -97.461197 Right overbank

	Photo ID: Coordinates: Description:	HBS_STR_100_OVERVIEW 30.28422, -97.461197 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: LC_STR-100, Upper Elgin Rd. CREW: _____

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 34'' Deck: _____ Width: 26' Pier(s): 0 @ _____ Pier Shape: NA

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

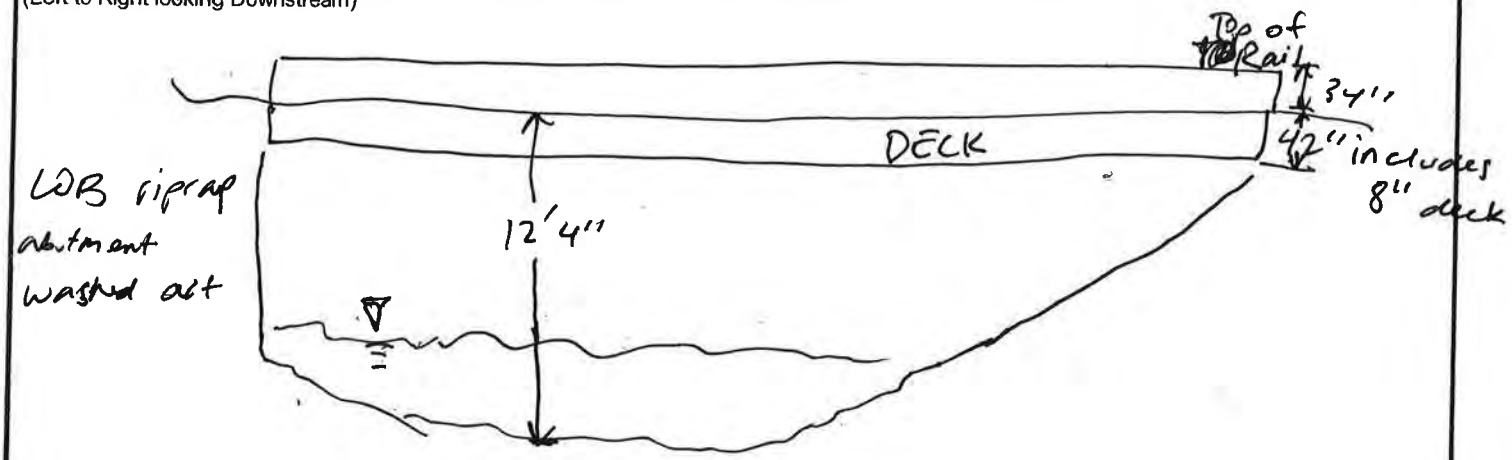
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2, 3 DSF: 4, 5, 6 DSC: 7 LOB: 8 ROB: 9 Overview: 14

Additional Info: ROB Debris USF: 10 ROB Debris Deck: 11

File Name: LOB Wash at USF: 12, 13

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

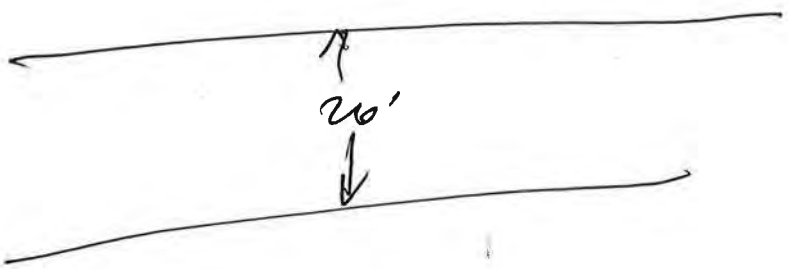


	Photo ID: Coordinates: Description:	LC_STR_100_USC 30.256854, -97.442034 Upstream channel
	Photo ID: Coordinates: Description:	LC_STR_100_USF_1 30.256854, -97.442034 Upstream face

	Photo ID: Coordinates: Description:	LC_STR_100_USF_2 30.256854, -97.442034 Upstream face
	Photo ID: Coordinates: Description:	LC_STR_100_USF_3 30.256854, -97.442034 Upstream face

	Photo ID: Coordinates: Description:	LC_STR_100_DSC 30.256854, -97.442034 Downstream channel
	Photo ID: Coordinates: Description:	LC_STR_100_DSF_1 30.256854, -97.442034 Downstream face

	Photo ID: Coordinates: Description:	LC_STR_100_DSF_2 30.256854, -97.442034 Downstream face
	Photo ID: Coordinates: Description:	LC_STR_100_DSF_3 30.256854, -97.442034 Downstream face

	Photo ID: Coordinates: Description:	LC_STR_100_LOB 30.256854, -97.442034 Left overbank
	Photo ID: Coordinates: Description:	LC_STR_100_LOB_USF_Washout_1 30.256854, -97.442034 Washout on left overbank upstream face

	Photo ID: Coordinates: Description:	LC_STR_100_LOB_USF_Washout_2 30.256854, -97.442034 Washout on left overbank upstream face
	Photo ID: Coordinates: Description:	LC_STR_100_OVERVIEW 30.256854, -97.442034 Structure Overview

	Photo ID: Coordinates: Description:	LC_STR_100_ROB 30.256854, -97.442034 Right overbank
	Photo ID: Coordinates: Description:	LC_STR_100_ROB_Deck_Debris 30.256854, -97.442034 Debris on deck

	Photo ID: Coordinates: Description:	LC_STR_100_ROB_USF_Debris 30.256854, -97.442034 Debris on right overbank on upstream face

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: LC_STR_200 CREW: _____

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 1.5' Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 12 Shape: round Length: 32' Height: 10' Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: CMP Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

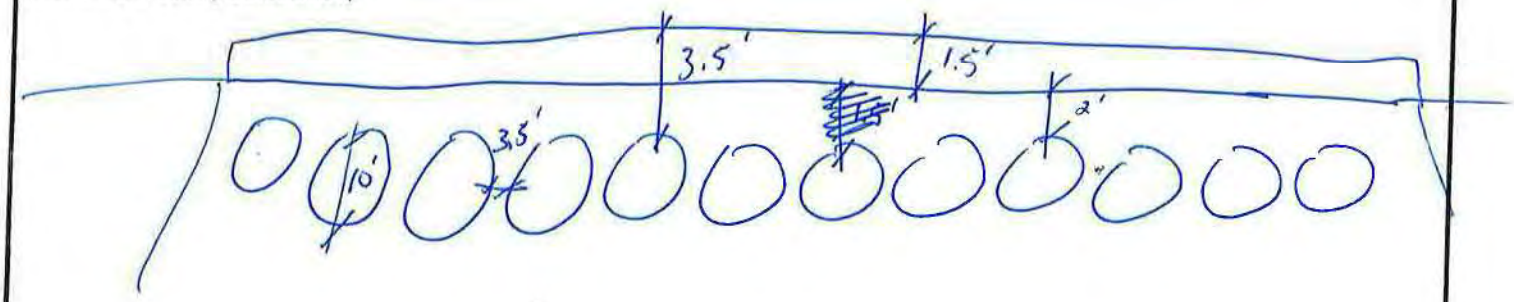
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1-2 USF: 3-6 DSF: 7-~~8~~ 9, 11 DSC: 10, 12 LOB: 13 ROB: 14

Additional Info: wide, lots of growth in channel, debris in channel & culverts overview: 15

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

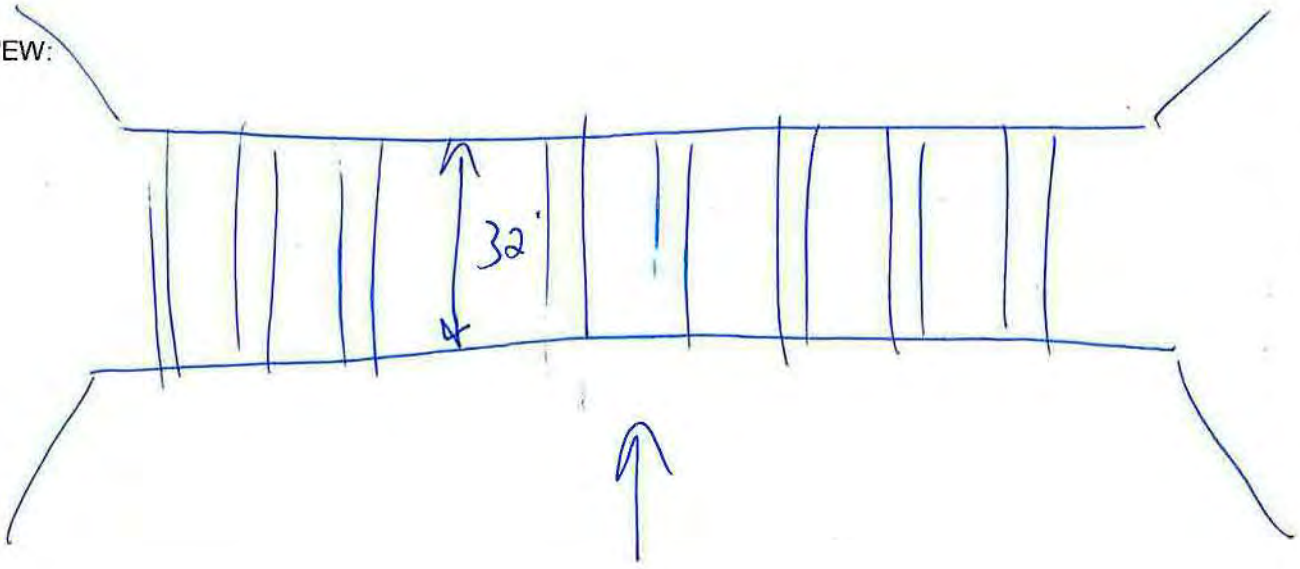


	Photo ID: Coordinates: Description:	LC_STR_200_USC_1 30.274208, -97.462544 Upstream channel
	Photo ID: Coordinates: Description:	LC_STR_200_USC_2 30.274208, -97.462544 Upstream channel

	Photo ID: Coordinates: Description:	LC_STR_200_USF_1 30.274208, -97.462544 Upstream face
	Photo ID: Coordinates: Description:	LC_STR_200_USF_2 30.274208, -97.462544 Upstream face

	Photo ID: Coordinates: Description:	LC_STR_200_USF_3 30.274208, -97.462544 Upstream face
	Photo ID: Coordinates: Description:	LC_STR_200_USF_4 30.274208, -97.462544 Upstream face

	Photo ID: Coordinates: Description:	LC_STR_200_DSC_1 30.274208, -97.462544 Downstream channel
	Photo ID: Coordinates: Description:	LC_STR_200_DSC_2 30.274208, -97.462544 Downstream channel

	Photo ID: Coordinates: Description:	LC_STR_200_DSF_1 30.274208, -97.462544 Downstream face
	Photo ID: Coordinates: Description:	LC_STR_200_DSF_2 30.274208, -97.462544 Downstream face

	Photo ID: Coordinates: Description:	LC_STR_200_DSF_3 30.274208, -97.462544 Downstream face
	Photo ID: Coordinates: Description:	LC_STR_200_DSF_4 30.274208, -97.462544 Downstream face

	Photo ID: Coordinates: Description:	LC_STR_200_LOB 30.274208, -97.462544 Left overbank
	Photo ID: Coordinates: Description:	LC_STR_200_ROB 30.274208, -97.462544 Right overbank

	Photo ID: Coordinates: Description:	LC_STR_200_OVERVIEW 30.274208, -97.462544 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: LC_STR_300 CREW: ML + JR

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 21" Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 7 Shape: ROUND Length: 32' Height: 10' Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

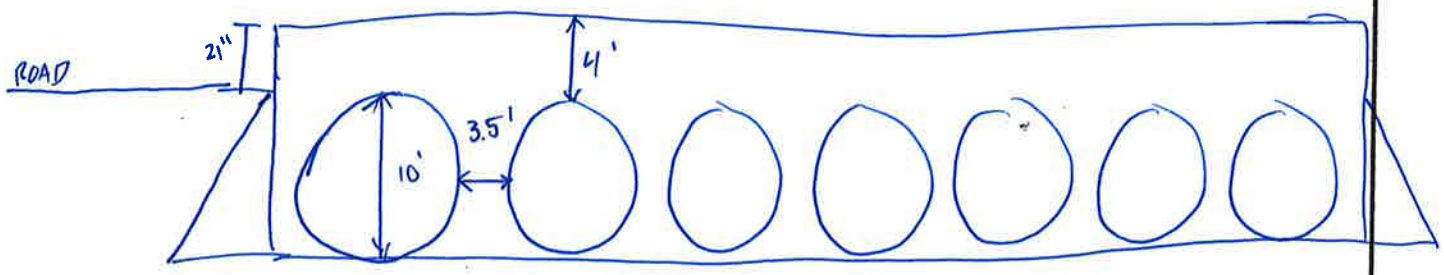
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1-4 USF: 5-7 DSF: 8 DSC: 9-12 LOB:13 ROB:14

Additional Info: OVERVIEW

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

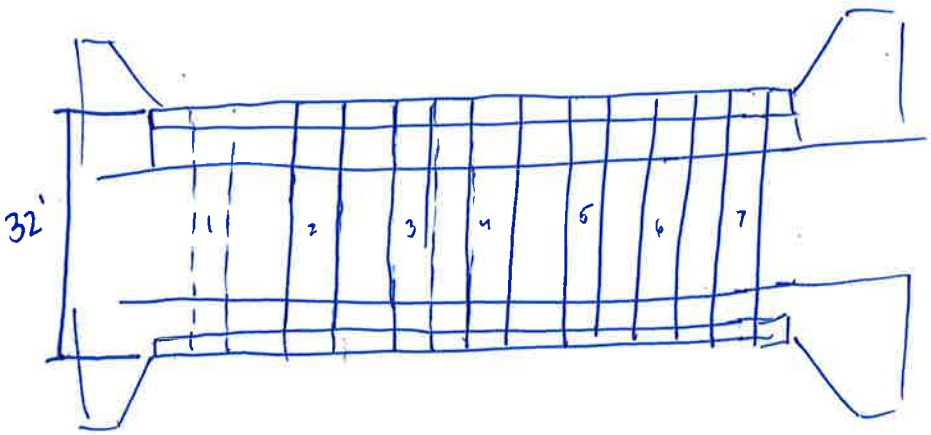


	Photo ID: Coordinates: Description:	LC_STR_300_USC_1 30.279704, -97.476055 Upstream channel
	Photo ID: Coordinates: Description:	LC_STR_300_USC_2 30.279704, -97.476055 Upstream channel

	Photo ID: Coordinates: Description:	LC_STR_300_USC_3 30.279704, -97.476055 Upstream channel
	Photo ID: Coordinates: Description:	LC_STR_300_USC_4 30.279704, -97.476055 Upstream channel

	Photo ID: Coordinates: Description:	LC_STR_300_USF_1 30.279704, -97.476055 Upstream face
	Photo ID: Coordinates: Description:	LC_STR_300_USF_2 30.279704, -97.476055 Upstream face

	Photo ID: Coordinates: Description:	LC_STR_300_USF_3 30.279704, -97.476055 Upstream face
	Photo ID: Coordinates: Description:	LC_STR_300_DSC_1 30.279704, -97.476055 Downstream channel

	Photo ID: Coordinates: Description:	LC_STR_300_DSC_2 30.279704, -97.476055 Downstream channel
	Photo ID: Coordinates: Description:	LC_STR_300_DSC_3 30.279704, -97.476055 Downstream channel

	Photo ID: Coordinates: Description:	LC_STR_300_DSC_4 30.279704, -97.476055 Downstream channel
	Photo ID: Coordinates: Description:	LC_STR_300_DSF 30.279704, -97.476055 Downstream face

	Photo ID: Coordinates: Description:	LC_STR_300_LOB 30.279704, -97.476055 Left overbank
	Photo ID: Coordinates: Description:	LC_STR_300_ROB 30.279704, -97.476055 Right overbank

	Photo ID: Coordinates: Description:	LC_STR_300_OVERVIEW 30.279704, -97.476055 Overview

HALFF

Survey Field Sheet

PROJECT: Willbarger

SURVEY NAME:

STREAM NAME: willbarger Creek

DATE: 6/14/19

LOCATION: WC-STR-100

CREW:

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: 3' Deck: 1' thick Width: 12' Pier(s): 2-30" @ Pier Shape: round

CULVERT: Number: Shape: Length: Height: Width: Skew:

CULVERT: I/O Type: Material: Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

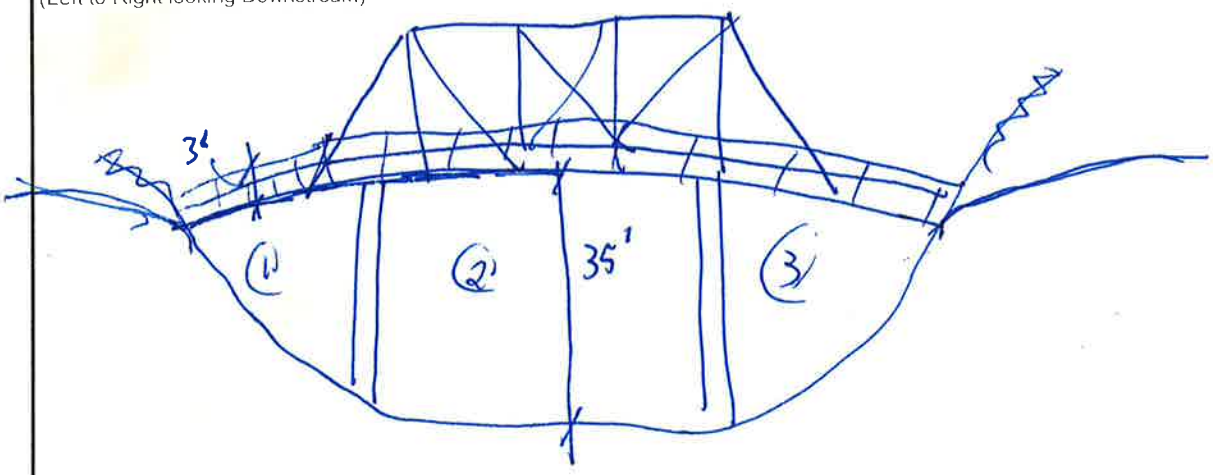
ERM Description: Coordinate System:

Photo Numbers: USC: 1-3 USF: DSF: DSC: 4

Additional Info: span 1: 68' span 2: 100' span 3: 83'

File Name: 15' between 2 bridges

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

	Photo ID: Coordinates: Description:	WC_STR_100_USC_1 30.2225274, -97.4094066 Upstream channel
	Photo ID: Coordinates: Description:	WC_STR_100_USC_2 30.2225274, -97.4094066 Upstream channel

	Photo ID: Coordinates: Description:	WC_STR_100_USC_3 30.2225274, -97.4094066 Upstream channel
	Photo ID: Coordinates: Description:	WC_STR_100_DSC 30.2225274, -97.4094066 Downstream channel

HALFF

Survey Field Sheet

PROJECT: Will Barger SURVEY NAME:

STREAM NAME: Will Barger Creek DATE: 6/4/14

LOCATION: WC-STR-207 Lower Elgin Rd CREW:

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: 27" Deck: 1' thickness Width: 25' Pier(s): 2-30" @ Pier Shape: round

CULVERT: Number: Shape: Length: Height: Width: Skew:

CULVERT: I/O Type: Material: Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

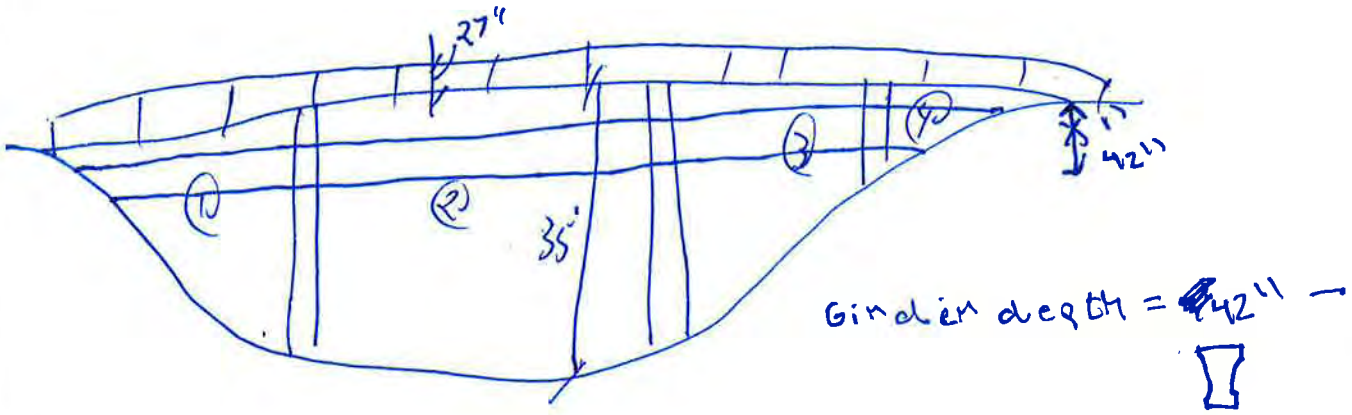
ERM Description: Coordinate System:

Photo Numbers: USC: 6 USF: DSF: DSC: 2-3 LOB: 4 ROB: 5

Additional Info: span ① : 79' span ② 85' span ③ : 65.5' span ④ : 63.5'

File Name:

PROFILE VIEW:
(Left to Right looking Downstream)



Girder depth = 42"

PLAN VIEW:

	Photo ID: Coordinates: Description:	WC_STR_200_USC 30.2225274, -97.4094066 Upstream channel
	Photo ID: Coordinates: Description:	WC_STR_200_DSC_1 30.2225274, -97.4094066 Downstream channel

	Photo ID: Coordinates: Description:	WC_STR_200_DSC_2 30.2225274, -97.4094066 Downstream channel
	Photo ID: Coordinates: Description:	WC_STR_200_LOB 30.2225274, -97.4094066 Left overbank, looking downstream

	Photo ID: Coordinates: Description:	WC_STR_200_ROB 30.2225274, -97.4094066 Right overbank, looking downstream

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: Wilbarger Creek, main stem DATE: _____

LOCATION: WC – STR – 300, 1704 CREW: JG & MC

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 33" Deck: 240" Width: 28ft. Pier(s): 6 @ 2' Pier Shape: circ.

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

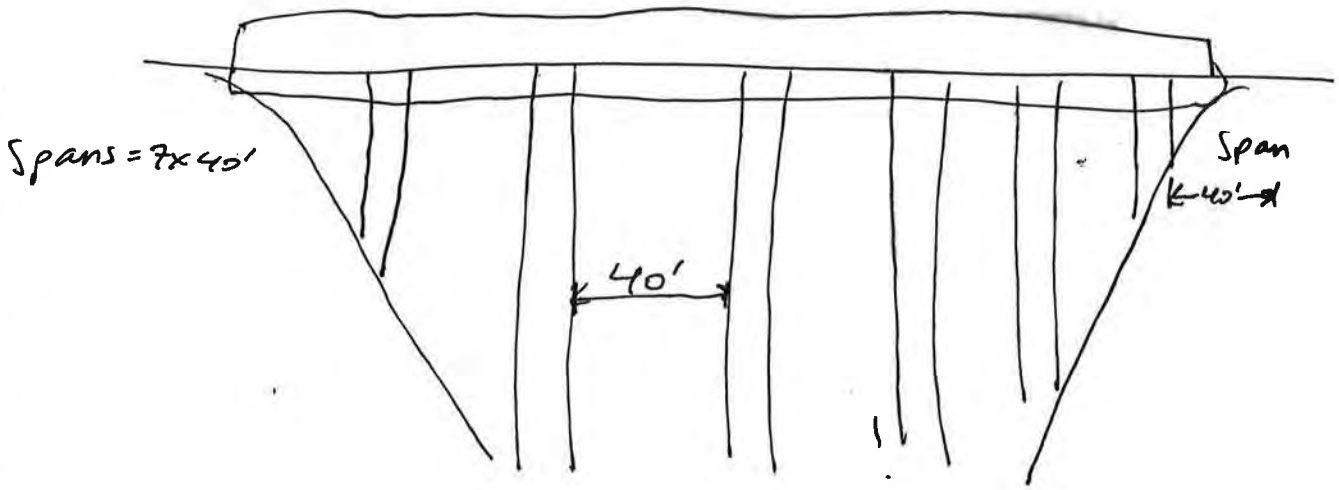
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 6 of 7 DSF: 2 DSC: 3 LOB

Additional Info: Log: 4 Gage: 5 Spans: 8, 9

File Name: (ROS to LOS)

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

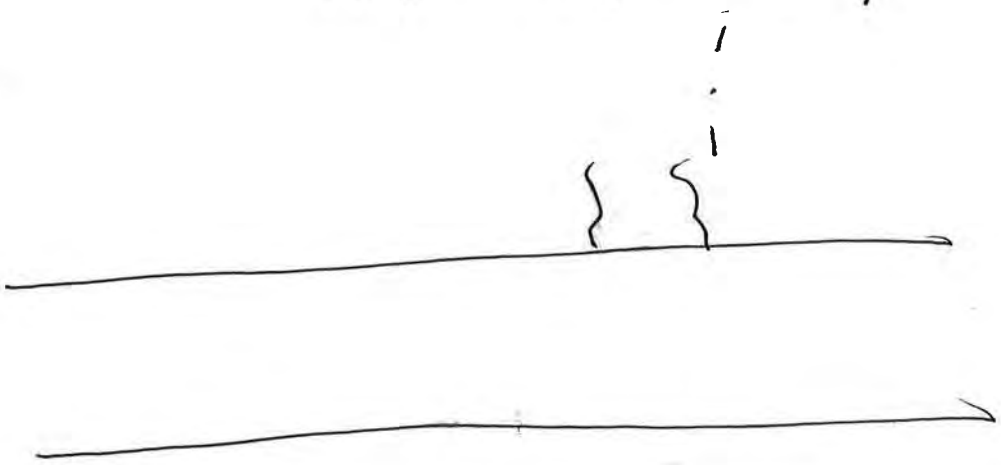


	Photo ID: Coordinates: Description:	WC_STR_300_USC 30.23206, -97.43257 Upstream channel
	Photo ID: Coordinates: Description:	WC_STR_300_USF_1 30.23206, -97.43257 Upstream face

	Photo ID: Coordinates: Description:	WC_STR_300_USF_2 30.23206, -97.43257 Upstream face
	Photo ID: Coordinates: Description:	WC_STR_300_DSC 30.23206, -97.43257 Downstream channel

	Photo ID: Coordinates: Description:	WC_STR_300_DSF 30.23206, -97.43257 Downstream face
	Photo ID: Coordinates: Description:	WC_STR_300_LOB_Spans 30.23206, -97.43257 Bridge spans on the left overbank

	Photo ID: Coordinates: Description:	WC_STR_300_ROB_Spans 30.23206, -97.43257 Bridge spans on the right overbank

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: WC_STR_400 CREW: _____

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 27" Deck: 49" (THICKNESS) Width: 26' Pier(s): 2 @ 3' Pier Shape: ROUND

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

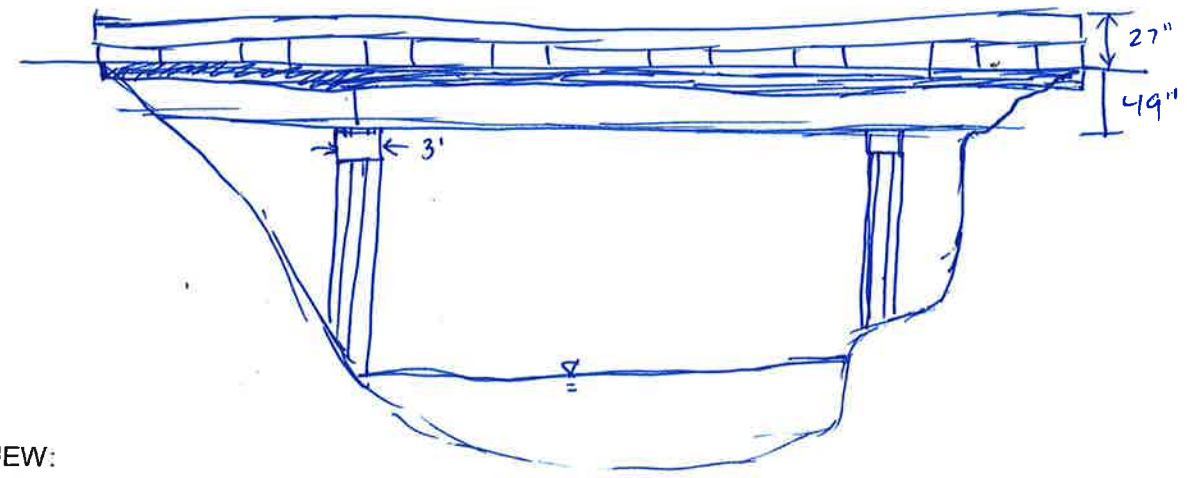
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOB: 7 ROB: 8

Additional Info: CENT FOUNDATION: 5-6 OVERVIEW: 9

File Name: _____

PROFILE VIEW: 39' 9" 60' 50'
(Left to Right looking Downstream)



PLAN VIEW:

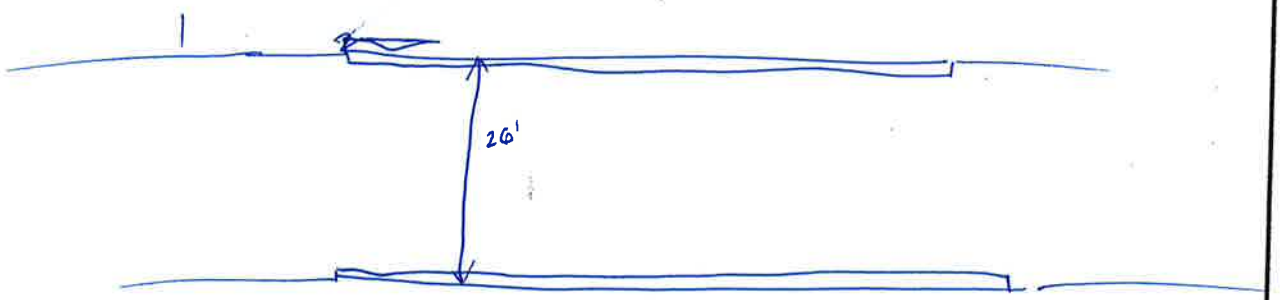


	Photo ID: Coordinates: Description:	WC_STR_400_USC 30.283081, -97.440238 Upstream channel
	Photo ID: Coordinates: Description:	WC_STR_400_USF 30.283081, -97.440238 Upstream face

	Photo ID: Coordinates: Description:	WC_STR_400_DSC 30.283081, -97.440238 Downstream channel
	Photo ID: Coordinates: Description:	WC_STR_400_DSF 30.283081, -97.440238 Downstream face

	Photo ID: Coordinates: Description:	WC_STR_400_BentFoundation_1 30.283081, -97.440238 Bent bridge foundation
	Photo ID: Coordinates: Description:	WC_STR_400_ BentFoundation_2 30.283081, -97.440238 Bent bridge foundation

	Photo ID: Coordinates: Description:	WC_STR_400_ Debris 30.283081, -97.440238 Debris
	Photo ID: Coordinates: Description:	WC_STR_400_LOB 30.283081, -97.440238 Left overbank

	Photo ID: Coordinates: Description:	WC_STR_400_ROB 30.283081, -97.440238 Right overbank
	Photo ID: Coordinates: Description:	WC_STR_400_OVERVIEW 30.283081, -97.440238 Overview

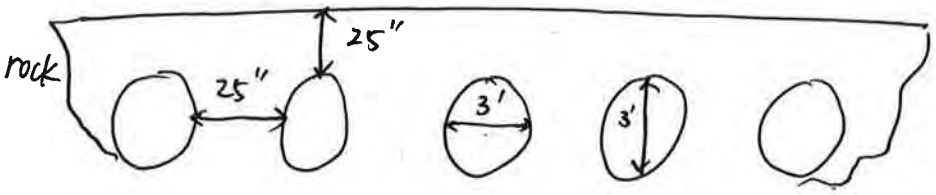
HALFF

Survey Field Sheet

PROJECT: Wilbanger Creek - SURVEY NAME: WC-STR-450
STREAM NAME: WC DATE: 12/21/2020
LOCATION: Upper Elgin Rd CREW: JB
TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

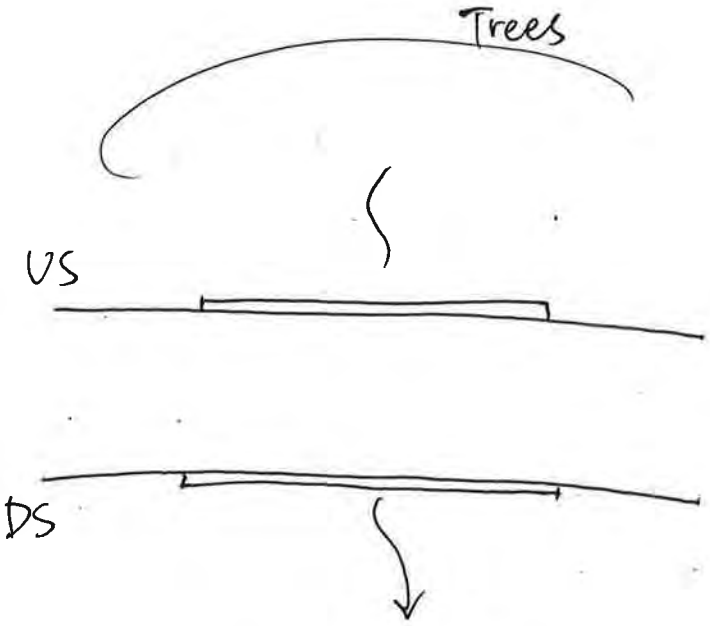
BRIDGE: Rail Ht: N/A Deck: 25" Width: GIS Pier(s): _____ @ _____ Shape: _____
CULVERT: Number: 5 Shape: circular Length: GIS Height: 3' Width: 3' Skew: —
CULVERT: I/O Type: _____ Material: CMP Wingwall Angle No wingwall
DAM: Top Width: _____ Side Slope US: _____ DS: _____ Outlet: _____
ERM Description: _____ Coordinate System: _____
Photo Numbers: _____ USC: 4 USF: 3 OTXS: _____ DSF: 1, 2 DSC: 5
Additional Info: _____ OV: 6
File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



US deck is smaller

PLAN VIEW:



No wingwall

	Photo ID: Coordinates: Description:	WC_STR_450_USC 30.286317, -97.439534 Upstream channel
	Photo ID: Coordinates: Description:	WC_STR_450_USF 30.286317, -97.439534 Upstream face

	Photo ID: Coordinates: Description:	WC_STR_450_DSC 30.286317, -97.439534 Downstream channel
	Photo ID: Coordinates: Description:	WC_STR_450_DSF_1 30.286317, -97.439534 Downstream channel

	Photo ID: Coordinates: Description:	WC_STR_450_DSF_2 30.286317, -97.439534 Downstream face
	Photo ID: Coordinates: Description:	WC_STR_450_OVERVIEW 30.286317, -97.439534 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: WC_STR-500 CREW: _____

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 105" Deck: 9" (THICKNESS) Width: 14' Pier(s): 2 @ 3' Pier Shape: ROUND

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

ERM Description: _____ Coordinate System: _____

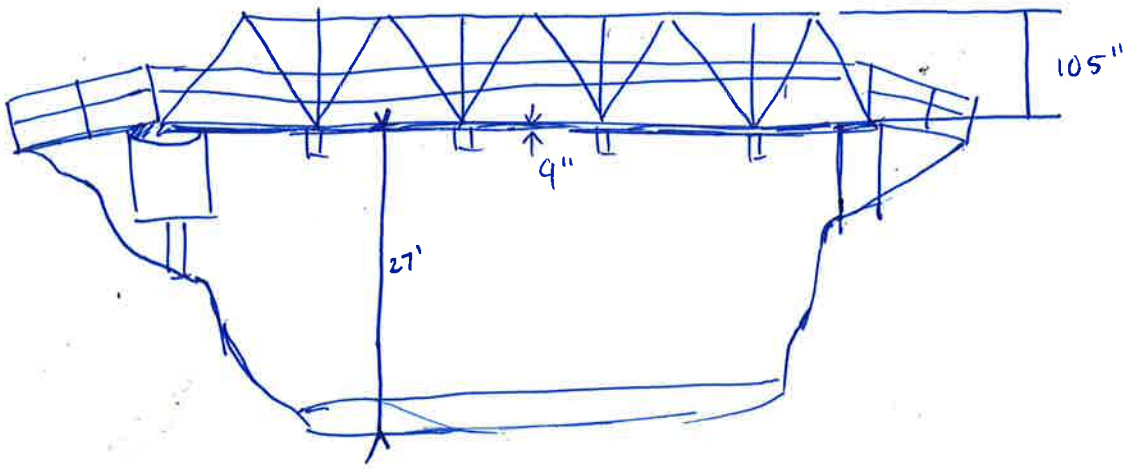
Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOB 5 ROB 6

Additional Info: SPACE B/W STR 400 & STR 500 : 10' VC-STR-400 DEBRIS 7 OVERVIEW 8

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)

14'½ 89'½' 16'



PLAN VIEW:

LOB

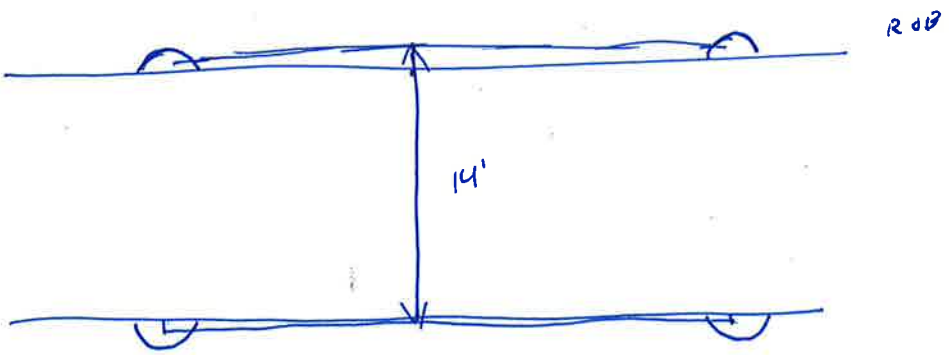


	Photo ID: Coordinates: Description:	WC_STR_500_USC 30.28311, -97.440317 Upstream channel
	Photo ID: Coordinates: Description:	WC_STR_500_USF 30.28311, -97.440317 Upstream face

	Photo ID: Coordinates: Description:	WC_STR_500_DSC 30.28311, -97.440317 Downstream channel
	Photo ID: Coordinates: Description:	WC_STR_500_DSF 30.28311, -97.440317 Downstream face

	Photo ID: Coordinates: Description:	WC_STR_500_LOB 30.28311, -97.440317 Left overbank
	Photo ID: Coordinates: Description:	WC_STR_500_ROB 30.28311, -97.440317 Right overbank

	Photo ID: Coordinates: Description:	WC_STR_500_OVERVIEW 30.28311, -97.440317 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: 6/28/19

LOCATION: WC_T3_STR-100, Forest Ridge Dr. CREW: JG & ML

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 1 + 5 Shape: circ. Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: CMP Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

ERM Description: _____ Coordinate System: _____

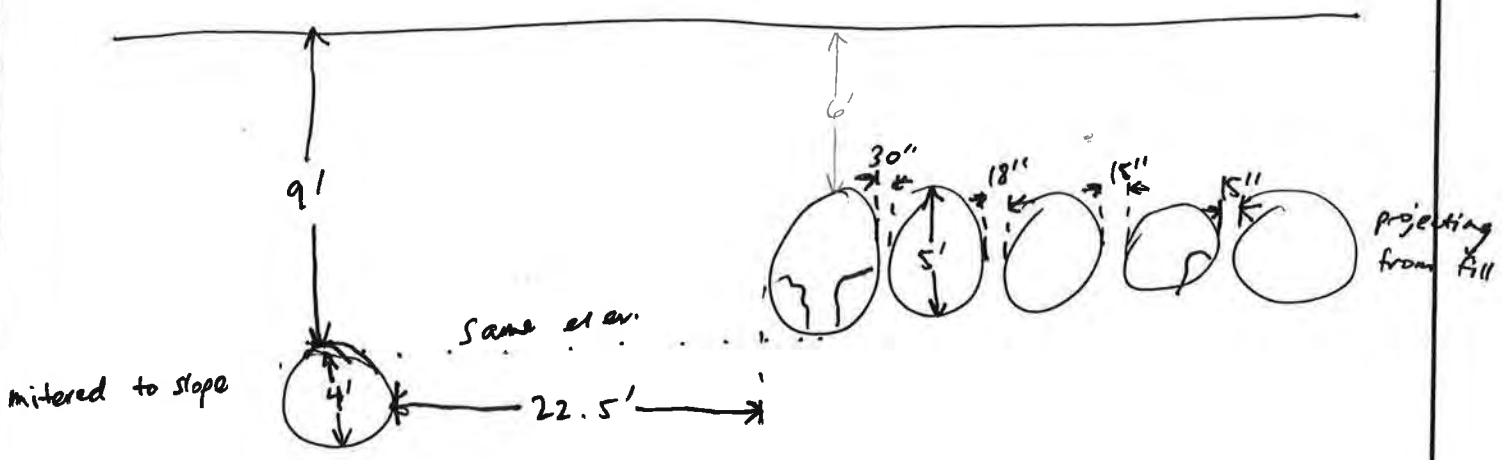
Photo Numbers: USC: -6 USF: -5--1 DSF: 1,2,3 DSC: 4 LOB: 5 ROB: 6 Overview: 7

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)

All CMP



PLAN VIEW:

Pool

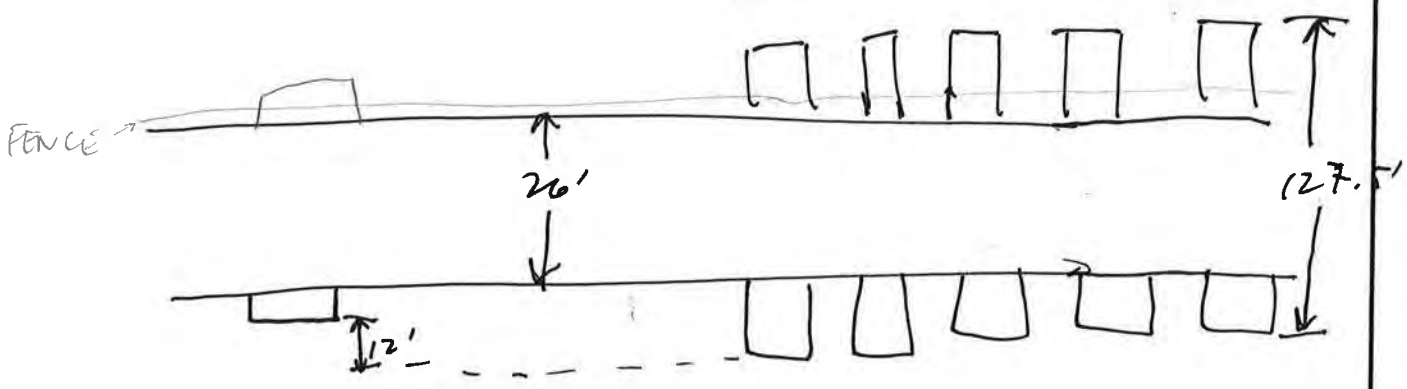


	Photo ID: Coordinates: Description:	WC_T3_STR_100_DSC 30.226424, -97.402082 Downstream channel
	Photo ID: Coordinates: Description:	WC_T3_STR_100_DSF_1 30.226424, -97.402082 Downstream face

	Photo ID: Coordinates: Description:	WC_T3_STR_100_DSF_2 30.226424, -97.402082 Downstream face
	Photo ID: Coordinates: Description:	WC_T3_STR_100_DSF_3 30.226424, -97.402082 Downstream face

	Photo ID: Coordinates: Description:	WC_T3_STR_100_LOB 30.226424, -97.402082 Left overbank
	Photo ID: Coordinates: Description:	WC_T3_STR_100_ROB 30.226424, -97.402082 Right overbank

	Photo ID: Coordinates: Description:	WC_T3_STR_100_OVERVIEW 30.226424, -97.402082 Overview of crossing
	Photo ID: Coordinates: Description:	WC_T3_STR_100_USC 30.226424, -97.402082 Upstream channel

	Photo ID: Coordinates: Description:	WC_T3_STR_100_USF 30.226424, -97.402082 Upstream face
	Photo ID: Coordinates: Description:	WC_T3_STR_100_USF_Culv1 30.226424, -97.402082 First culvert on upstream face

	Photo ID: Coordinates: Description:	WC_T3_STR_100_USF_Culv2_1 30.226424, -97.402082 Second culvert on upstream face
	Photo ID: Coordinates: Description:	WC_T3_STR_100_USF_Culv2_2 30.226424, -97.402082 Second culvert on upstream face

	Photo ID: Coordinates: Description:	WC_T3_STR_100_USF_Culv2_3 30.226424, -97.402082 Second culvert on upstream face

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: Wilbarger Creek Trib. 4 DATE: _____

LOCATION: NC_T4_STR_100, Wilbarger Creek Dr. CREW: JG & MC

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 3 Shape: circ. Length: 29.5' Height: 3' Width: _____ Skew: _____

CULVERT: I/O Type: Proj. from fill Material: CMP Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

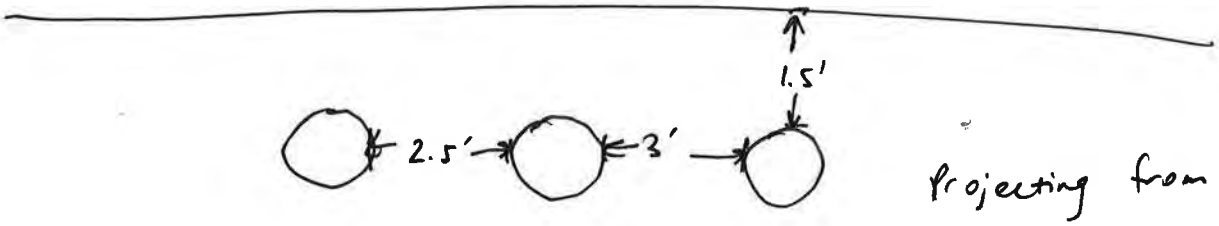
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOB: 5 ROB: 6 overview: 7

Additional Info: _____

File Name: DS LOB Erosion: 8, 9 US LOB Power Line: 10

PROFILE VIEW:
(Left to Right looking Downstream)



Projecting from fill

PLAN VIEW:

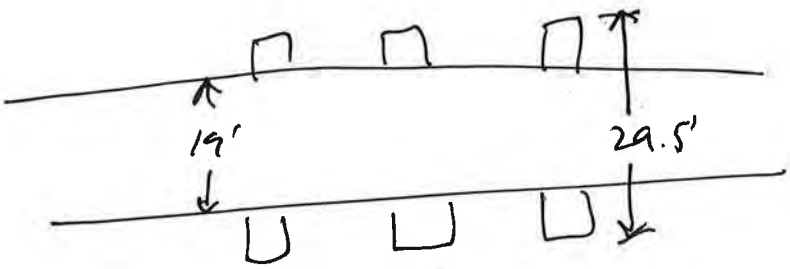


	Photo ID: Coordinates: Description:	WC_T4_STR_100_DSC 30.228596, -97.415373 Downstream channel
	Photo ID: Coordinates: Description:	WC_T4_STR_100_DSF 30.228596, -97.415373 Downstream face

	Photo ID: Coordinates: Description:	WC_T4_STR_100_USC 30.228596, -97.415373 Upstream channel
	Photo ID: Coordinates: Description:	WC_T4_STR_100_USF 30.228596, -97.415373 Upstream face

	Photo ID: Coordinates: Description:	WC_T4_STR_100_LOB 30.228596, -97.415373 Left overbank
	Photo ID: Coordinates: Description:	WC_T4_STR_100_LOB_DS_Erosion_1 30.228596, -97.415373 Erosion on downstream side of left overbank

	Photo ID: Coordinates: Description:	WC_T4_STR_100_LOB_DS_Erosion_2 30.228596, -97.415373 Erosion on downstream side of left overbank
	Photo ID: Coordinates: Description:	WC_T4_STR_100_LOB_US_PowerLine 30.228596, -97.415373 Falling down powerline on upstream overbank

	Photo ID: Coordinates: Description:	WC_T4_STR_100_ROB 30.228596, -97.415373 Right overbank
	Photo ID: Coordinates: Description:	WC_T4_STR_100_OVERVIEW 30.228596, -97.415373 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: WC_T6_STR_100 CREW: _____

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: ~~28"~~ 28" Deck: 27" (THICKNESS) Width: 16' DECK LENGTH: 41' ~~Pier(s):~~ _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

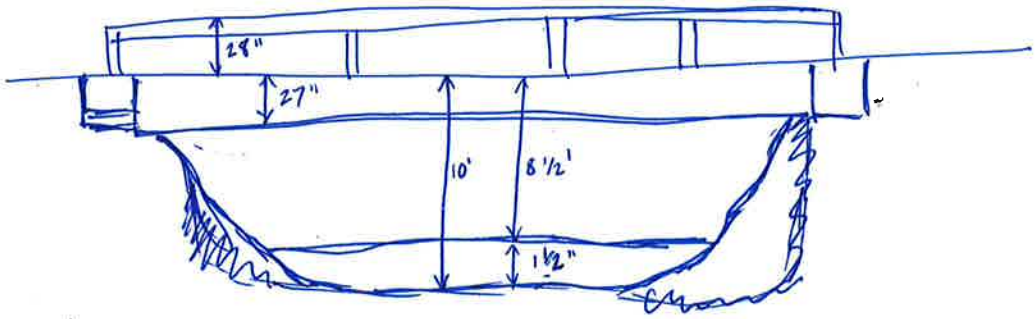
ERM Description: _____ Coordinate System: _____

Photo Numbers: SPIDER PIC: 0 USC: 1 USF: 2 DSF: 3 DSC: 4 LOB: 5 ROB: 6 OVERVIEW: 7

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

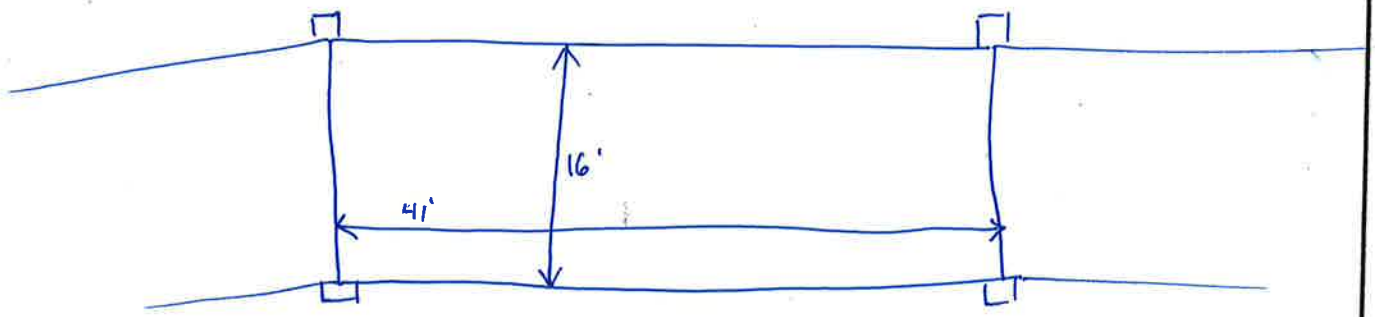


	Photo ID: Coordinates: Description:	WC_T6_STR_100_USC 30.286845, -97.429887 Upstream channel
	Photo ID: Coordinates: Description:	WC_T6_STR_100_USF 30.286845, -97.429887 Upstream face

	Photo ID: Coordinates: Description:	WC_T6_STR_100_DSC 30.286845, -97.429887 Downstream channel
	Photo ID: Coordinates: Description:	WC_T6_STR_100_DSF 30.286845, -97.429887 Downstream face

	Photo ID: Coordinates: Description:	WC_T6_STR_100_LOB 30.286845, -97.429887 Left overbank
	Photo ID: Coordinates: Description:	WC_T6_STR_100_ROB 30.286845, -97.429887 Right overbank

	Photo ID: Coordinates: Description:	WC_T6_STR_100_OVERVIEW 30.286845, -97.429887 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: WC_T6_STR_200 CREW: _____

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 2'4" Deck: [illegible]" Width: 16'11" Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 2 Shape: ROUND Length: _____ Height: 4' Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: CMP Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

ERM Description: _____ Coordinate System: _____

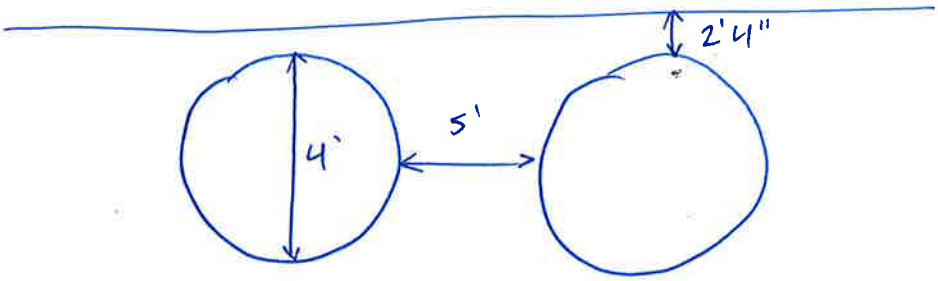
Photo Numbers: USC: 1 USF: 2 DSF: 3-4 DSC: _____ LOB ROB OVERVIEW

Additional Info: _____

File Name: _____

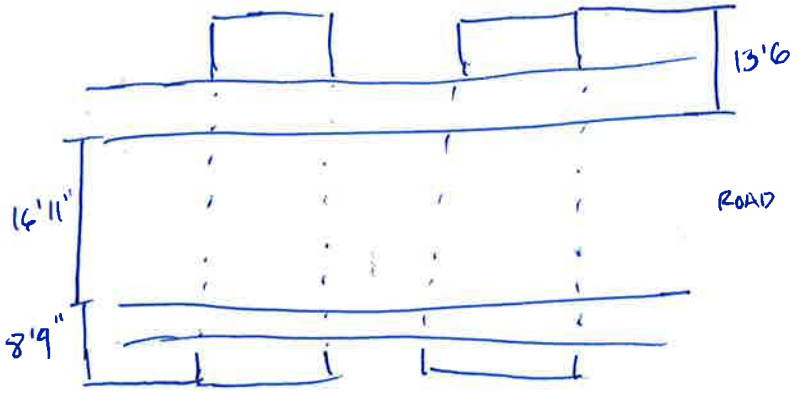
PROFILE VIEW:
(Left to Right looking Downstream)

8'9 16'11 13'6



PLAN VIEW:

DS



US

	Photo ID: Coordinates: Description:	WC_T6_STR_200_USC 30.299181, -97.416825 Upstream channel
	Photo ID: Coordinates: Description:	WC_T6_STR_200_USF 30.299181, -97.416825 Upstream face

	Photo ID: Coordinates: Description:	WC_T6_STR_200_DSC 30.299181, -97.416825 Downstream channel
	Photo ID: Coordinates: Description:	WC_T6_STR_200_DSF_1 30.299181, -97.416825 Downstream face

	Photo ID: Coordinates: Description:	WC_T6_STR_200_DSF_2 30.299181, -97.416825 Downstream face
	Photo ID: Coordinates: Description:	WC_T6_STR_200_LOB 30.299181, -97.416825 Left overbank

	Photo ID: Coordinates: Description:	WC_T6_STR_200_ROB 30.299181, -97.416825 Right overbank
	Photo ID: Coordinates: Description:	WC_T6_STR_200_OVERVIEW 30.299181, -97.416825 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: WC-T9-STR-100 A CREW: _____

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 2½' Deck: 16" THICKNESS Width: 24' Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

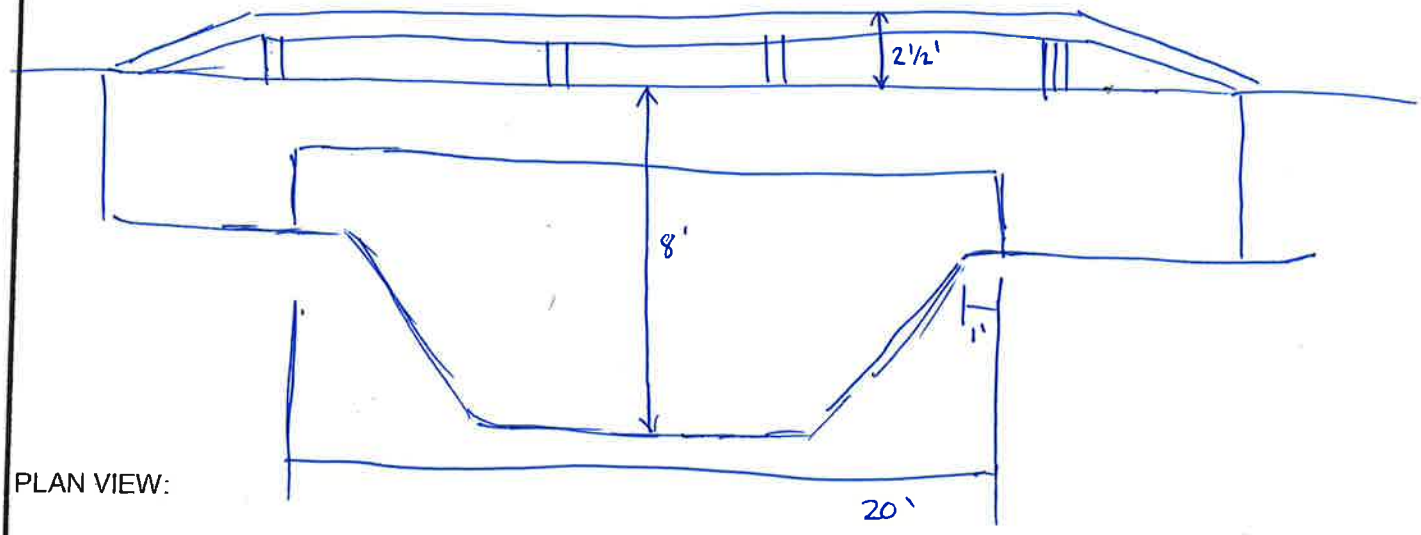
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1,2,4 USF: 3 DSF: 5 DSC: 6 LOB: 7 ROB: 8

Additional Info: CLOSER TO LITTLE ROAD

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

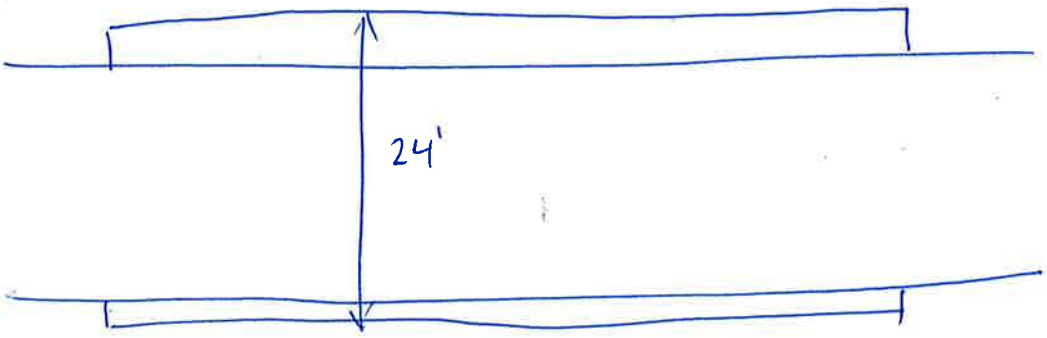


	Photo ID: Coordinates: Description:	WC_T9_STR_100_A_USC_1 30.326141, -97.417288 Upstream channel
	Photo ID: Coordinates: Description:	WC_T9_STR_100_A_USC_2 30.326141, -97.417288 Upstream channel

	Photo ID: Coordinates: Description:	WC_T9_STR_100_A_USC_3 30.326141, -97.417288 Upstream channel
	Photo ID: Coordinates: Description:	WC_T9_STR_100_A_USF 30.326141, -97.417288 Upstream face

	Photo ID: Coordinates: Description:	WC_T9_STR_100_A_DSC 30.326141, -97.417288 Downstream channel
	Photo ID: Coordinates: Description:	WC_T9_STR_100_A_DSF 30.326141, -97.417288 Downstream face

	Photo ID: Coordinates: Description:	WC_T9_STR_100_A_LOB 30.326141, -97.417288 Left overbank
	Photo ID: Coordinates: Description:	WC_T9_STR_100_A_ROB 30.326141, -97.417288 Right overbank

	Photo ID: Coordinates: Description:	WC_T9_STR_100_A_OVERVIEW 30.326141, -97.417288 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: WC_I9STR_100 B CREW: _____

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 32" Deck: 1' Width: 24' Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 2 Shape: Rect. (THICKNESS) Length: 8' Height: 4' Width: 24' Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

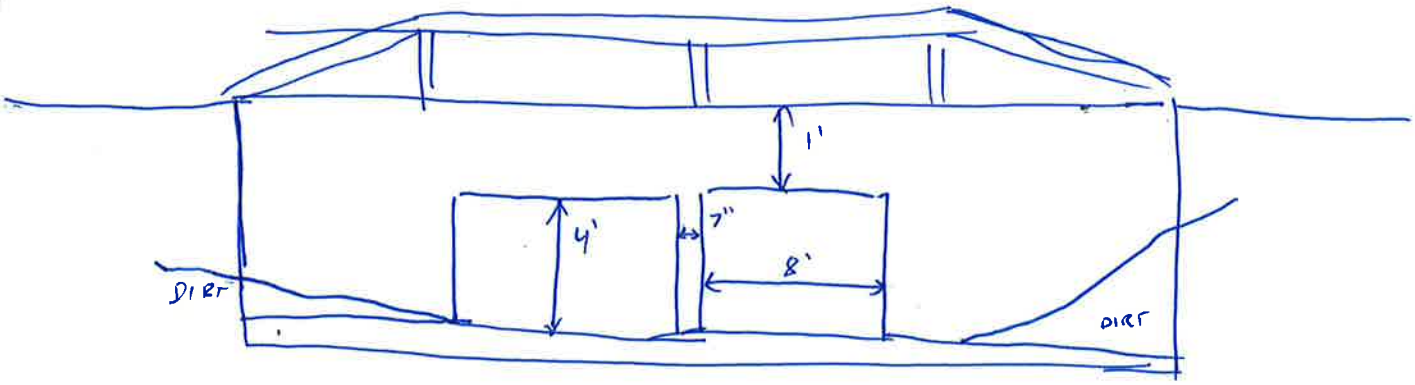
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1,2 USF: 3 DSF: 4 DSC: 5 COB:6 ROB:7

Additional Info: FURTHER FROM LITTIG - FENCING ON US & DS sides (collects debris) OVERVIEW:

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

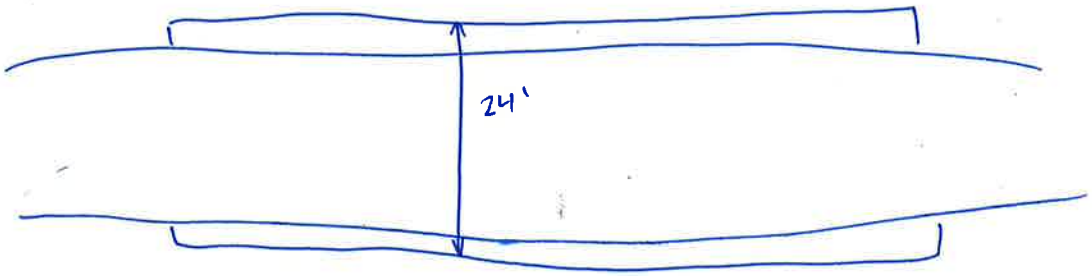


	Photo ID: Coordinates: Description:	WC_T9_STR_100_B_USC_1 30.325984, -97.416965 Upstream channel
	Photo ID: Coordinates: Description:	WC_T9_STR_100_B_USC_2 30.325984, -97.416965 Upstream channel

	Photo ID: Coordinates: Description:	WC_T9_STR_100_B_USF 30.325984, -97.416965 Upstream face
	Photo ID: Coordinates: Description:	WC_T9_STR_100_B_DSC 30.325984, -97.416965 Downstream channel

	Photo ID: Coordinates: Description:	WC_T9_STR_100_B_DSF 30.325984, -97.416965 Downstream face
	Photo ID: Coordinates: Description:	WC_T9_STR_100_B_LOB 30.325984, -97.416965 Left overbank

	Photo ID: Coordinates: Description:	WC_T9_STR_100_B_ROB 30.325984, -97.416965 Right overbank
	Photo ID: Coordinates: Description:	WC_T9_STR_100_B_OVERVIEW 30.325984, -97.416965 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: WC-T9-STR-300, Little Rd CREW: _____

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: 13" Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 2 Shape: O Length: _____ Height: 5' Width: 5' Skew: _____

CULVERT: I/O Type: _____ Material: CMP Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1,2 (POB) USF: 4 DSF: _____ DSC: 3

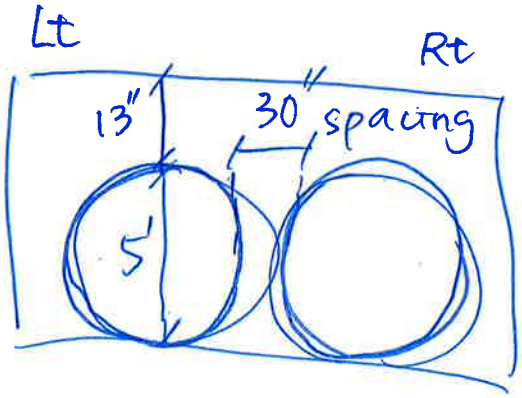
Additional Info: USF Rt culvert 5 LOB 6 ROB 7 overview 8

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)

USF

culverts not projecting



PLAN VIEW:

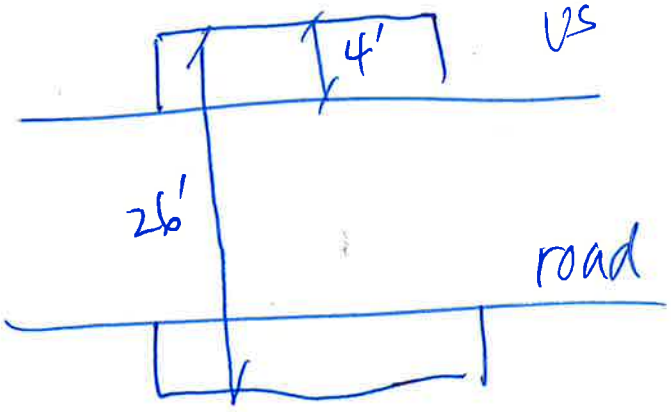


	Photo ID: Coordinates: Description:	WC_T9_STR_300_USC_1 30.342481, -97.390899 Upstream channel
	Photo ID: Coordinates: Description:	WC_T9_STR_300_USC_2 30.342481, -97.390899 Upstream channel

	Photo ID: Coordinates: Description:	WC_T9_STR_300_USF 30.342481, -97.390899 Upstream face
	Photo ID: Coordinates: Description:	WC_T9_STR_300_USF_Rt_Culvert 30.342481, -97.390899 Upstream face of the right culvert, looking downstream

	Photo ID: Coordinates: Description:	WC_T9_STR_300_DSC 30.342481, -97.390899 Downstream channel
	Photo ID: Coordinates: Description:	WC_T9_STR_300_LOB 30.342481, -97.390899 Left overbank

	Photo ID: Coordinates: Description:	WC_T9_STR_300_ROB 30.342481, -97.390899 Right overbank
	Photo ID: Coordinates: Description:	WC_T9_STR_300_ROB_USC 30.342481, -97.390899 Upstream channel of another channel located on the right overbank of the WC_T9_STR_300 channel

	Photo ID: Coordinates: Description:	WC_T9_STR_300_OVERVIEW 30.342481, -97.390899 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: NC-T9-STR-400, Upper Eighth Rd CREW: ML + JZ

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: 7" Width: 19' Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 2 Shape: ○ Length: 29' Height: 2' Width: 2' Skew: _____

CULVERT: I/O Type: _____ Material: CMP Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

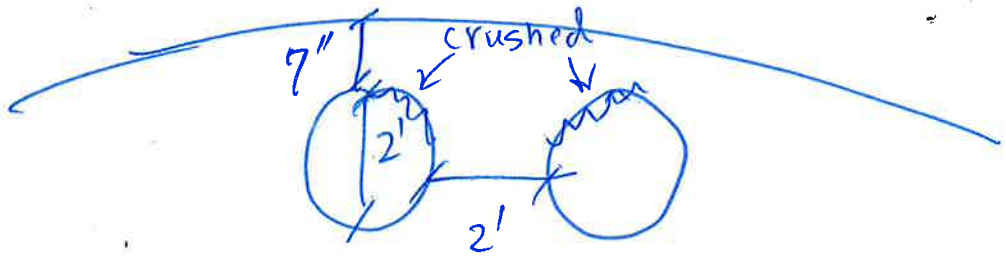
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 4 DSC: 3 LOB 5 ROB 6 OVERVIEW 7

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

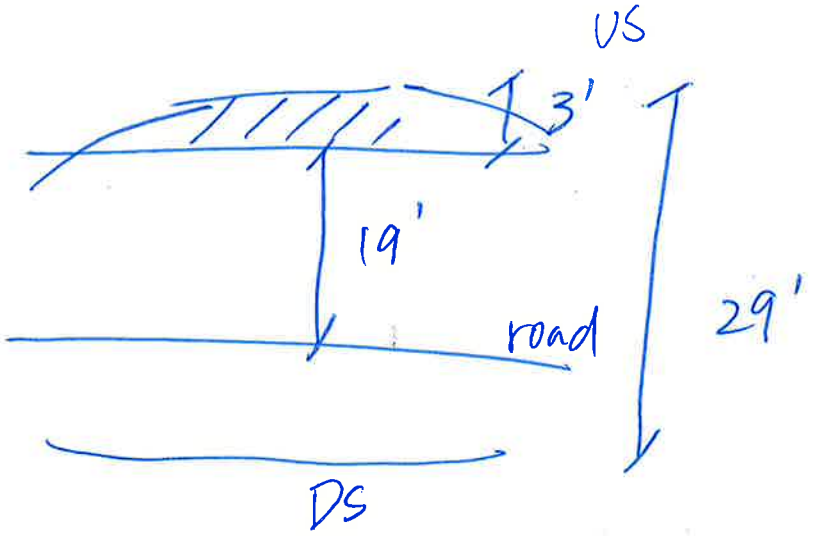


	Photo ID: Coordinates: Description:	WC_T9_STR_400_USC 30.343083, -97.38869 Upstream channel
	Photo ID: Coordinates: Description:	WC_T9_STR_400_USF 30.343083, -97.38869 Upstream face

	Photo ID: Coordinates: Description:	WC_T9_STR_400_DSC 30.343083, -97.38869 Downstream channel
	Photo ID: Coordinates: Description:	WC_T9_STR_400_DSF 30.343083, -97.38869 Downstream face

	Photo ID: Coordinates: Description:	WC_T9_STR_400_LOB 30.343083, -97.38869 Left overbank
	Photo ID: Coordinates: Description:	WC_T9_STR_400_ROB 30.343083, -97.38869 Right overbank

	Photo ID: Coordinates: Description:	WC_T9_STR_400_OVERVIEW 30.343083, -97.38869 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: WC_ TO20 _ STR-100 CREW: JG + ML

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 1 Shape: circ. Length: 32.5' Height: 3' Width: _____ Skew: _____

CULVERT: I/O Type: Proj. from fill Material: RCP Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

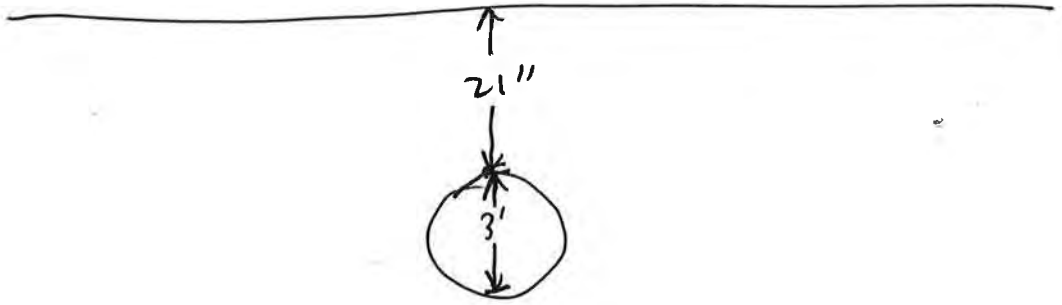
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOB: 5 ROB: 6 Overview: 7

Additional Info: culvert @ orange tag

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

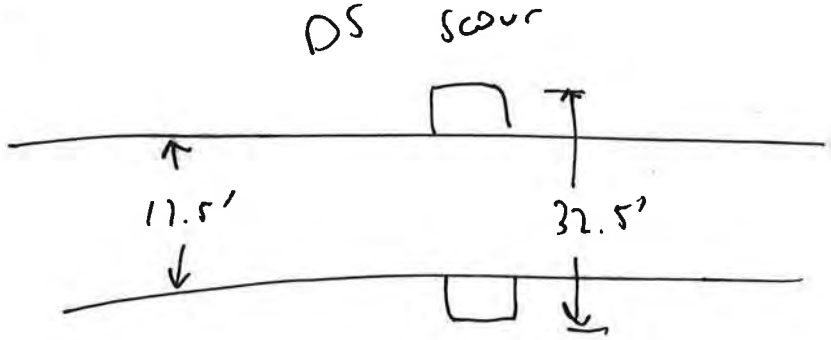


	Photo ID: Coordinates: Description:	WC_T020_STR_100_DSC 30.232417, -97.412928 Downstream channel
	Photo ID: Coordinates: Description:	WC_T020_STR_100_DSF 30.232417, -97.412928 Downstream face

	Photo ID: Coordinates: Description:	WC_T020_STR_100_USC 30.232417, -97.412928 Upstream channel
	Photo ID: Coordinates: Description:	WC_T020_STR_100_USF 30.232417, -97.412928 Upstream face

	Photo ID: Coordinates: Description:	WC_T020_STR_100_LOB 30.232417, -97.412928 Left overbank
	Photo ID: Coordinates: Description:	WC_T020_STR_100_ROB 30.232417, -97.412928 Right overbank

	Photo ID: Coordinates: Description:	WC_T020_STR_100_OVERVIEW 30.232417, -97.412928 Left overbank

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: A _____ DATE: _____

LOCATION: WC_TO24_STR_100, Upper Elgin River Rd CREW: JCa + MC

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 4 Shape: circ. Length: 27' Height: 30" Width: _____ Skew: _____

CULVERT: I/O Type: flush (not projecting) Material: RCP Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

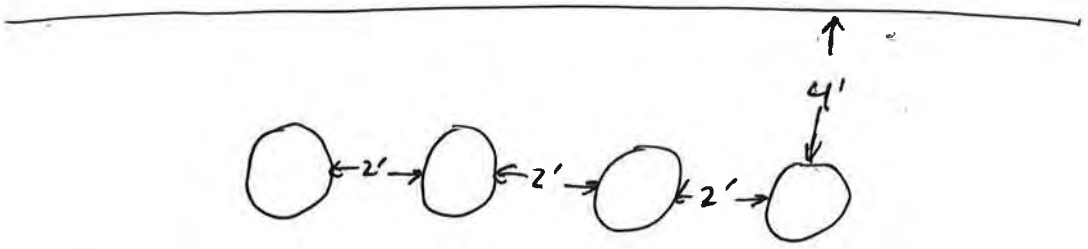
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4-6 LOB: 7 ROB: 8

Additional Info: Overview: 9

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

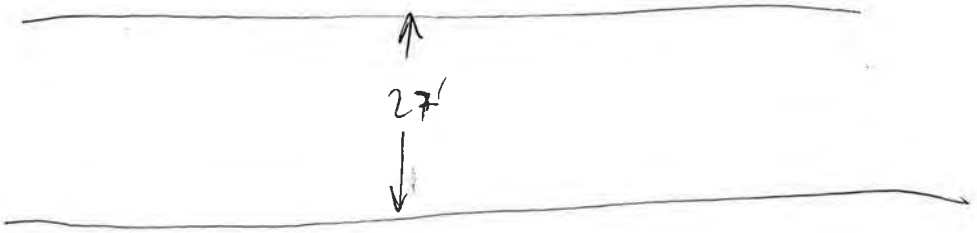


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	Photo ID: Coordinates: Description:	WC_T024_STR_100_A_DSC_2 30.247573, -97.447926 Downstream channel

	Photo ID: Coordinates: Description:	WC_T024_STR_100_A_DSC_3 30.247573, -97.447926 Downstream channel
	Photo ID: Coordinates: Description:	WC_T024_STR_100_A_DSF 30.247573, -97.447926 Downstream face

	Photo ID: Coordinates: Description:	WC_T024_STR_100_A_LOB 30.247573, -97.447926 Left overbank
	Photo ID: Coordinates: Description:	WC_T024_STR_100_A_OVERVIEW 30.247573, -97.447926 Overview of structure

	Photo ID: Coordinates: Description:	WC_T024_STR_100_A_ROB 30.247573, -97.447926 Right overbank
	Photo ID: Coordinates: Description:	WC_T024_STR_100_A_USC 30.247573, -97.447926 Upstream channel

	Photo ID: Coordinates: Description:	WC_T024_STR_100_A_USF 30.247573, -97.447926 Upstream face

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: WC_TO24_STR_100, Upper Elgin River Rd. B CREW: JG & ML

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 1 Shape: circ. Length: 33' Height: 3' Width: _____ Skew: _____

CULVERT: I/O Type: flush (not projecting) Material: CMP Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

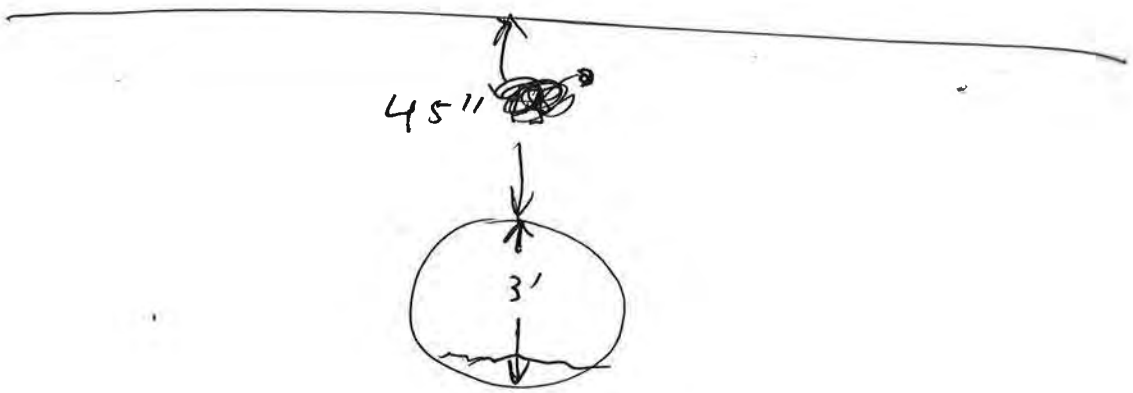
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1,2 USF: 3 DSF: 4 DSC: 5-8 LOR: 9 ROR: 10 Overview: 11

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

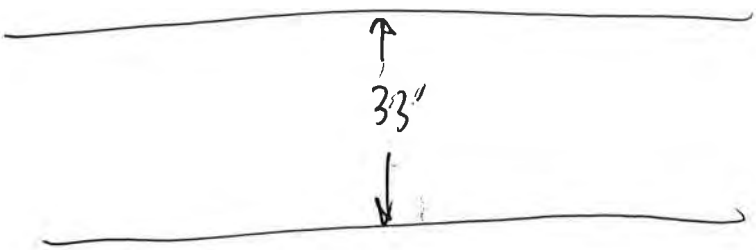


	Photo ID: Coordinates: Description:	WC_T024_STR_100_B_DSC_1 30.247953, -97.447692 Downstream channel
	Photo ID: Coordinates: Description:	WC_T024_STR_100_B_DSC_2 30.247953, -97.447692 Downstream channel

	Photo ID: Coordinates: Description:	WC_T024_STR_100_B_DSC_3 30.247953, -97.447692 Downstream channel
	Photo ID: Coordinates: Description:	WC_T024_STR_100_B_DSC_4 30.247953, -97.447692 Downstream channel

	Photo ID: Coordinates: Description:	WC_T024_STR_100_B_DSF 30.247953, -97.447692 Downstream face
	Photo ID: Coordinates: Description:	WC_T024_STR_100_B_LOB 30.247953, -97.447692 Left overbank

	Photo ID: Coordinates: Description:	WC_T024_STR_100_B_OVERVIEW 30.247953, -97.447692 Overview of structure
	Photo ID: Coordinates: Description:	WC_T024_STR_100_B_ROB 30.247953, -97.447692 Right overbank

	Photo ID: Coordinates: Description:	WC_T024_STR_100_B_USC_1 30.247953, -97.447692 Upstream channel
	Photo ID: Coordinates: Description:	WC_T024_STR_100_B_USC_2 30.247953, -97.447692 Upstream channel

	Photo ID: Coordinates: Description:	WC_T024_STR_100_B_USF 30.247953, -97.447692 Upstream face

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: WC_TD24_STR_200, Dry Willow Rd. CREW: JG & ML

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: ~~X~~ 3 Shape: Circ. Length: _____ Height: 3' Width: _____ Skew: _____

CULVERT: I/O Type: Proj. from fill Material: CMP Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

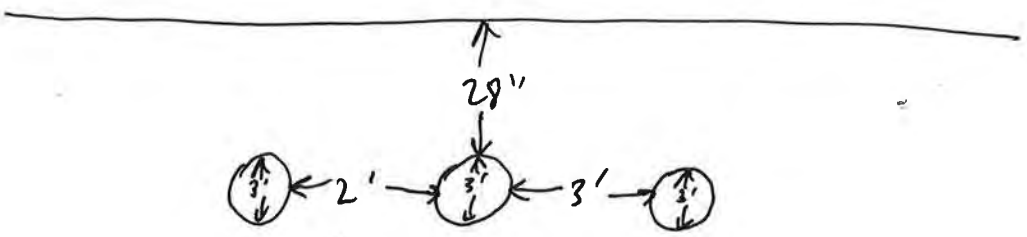
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOR: 5 ROR: 6 Overview: 7

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

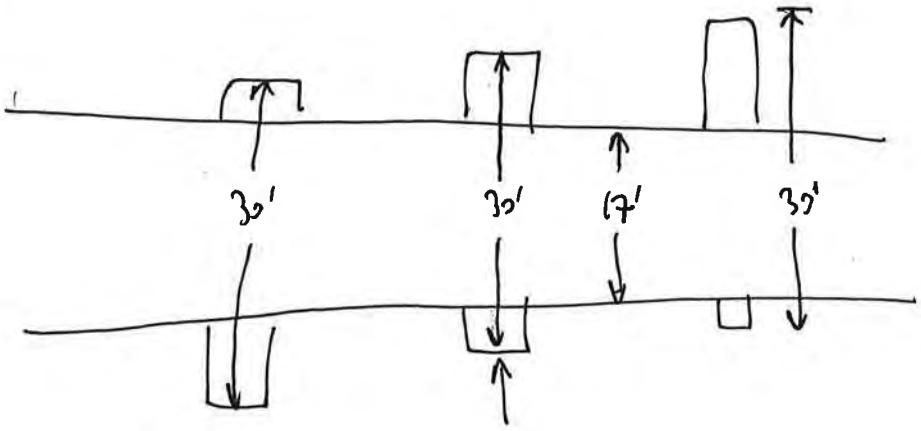


	Photo ID: Coordinates: Description:	WC_T024_STR_200_DSC 30.247013, -97.443854 Downstream channel
	Photo ID: Coordinates: Description:	WC_T024_STR_200_DSF 30.247013, -97.443854 Downstream face

	Photo ID: Coordinates: Description:	WC_T024_STR_200_LOB 30.247013, -97.443854 Left overbank
	Photo ID: Coordinates: Description:	WC_T024_STR_200_OVERVIEW 30.247013, -97.443854 Overview of structure

	Photo ID: Coordinates: Description:	WC_T024_STR_200_ROB 30.247013, -97.443854 Right overbank
	Photo ID: Coordinates: Description:	WC_T024_STR_200_USC 30.247013, -97.443854 Upstream channel

	Photo ID: Coordinates: Description:	WC_T024_STR_200_USF 30.247013, -97.443854 Upstream face

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: WC_T030_STR_100 CREW: _____

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 1 Shape: round Length: 35.5' Height: 6' Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: CMP Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

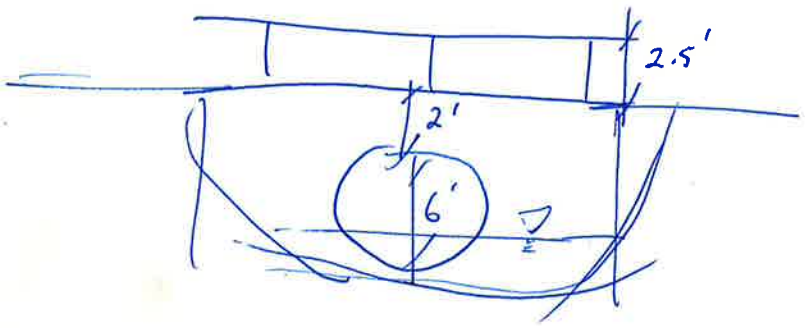
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOB: 5 ROB: 6 overview

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

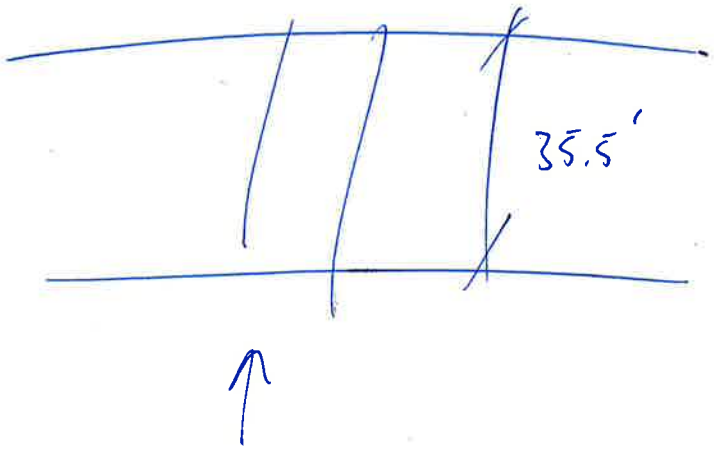


	Photo ID: Coordinates: Description:	WC_T030_STR_100_USC 30.284168, -97.42435 Upstream channel
	Photo ID: Coordinates: Description:	WC_T030_STR_100_USF 30.284168, -97.42435 Upstream face

	Photo ID: Coordinates: Description:	WC_T030_STR_100_DSC 30.284168, -97.42435 Downstream channel
	Photo ID: Coordinates: Description:	WC_T030_STR_100_DSF 30.284168, -97.42435 Downstream face

	Photo ID: Coordinates: Description:	WC_T030_STR_100_LOB 30.284168, -97.42435 Left overbank
	Photo ID: Coordinates: Description:	WC_T030_STR_100_ROB 30.284168, -97.42435 Right overbank

	Photo ID: Coordinates: Description:	WC_T030_STR_100_OVERVIEW 30.284168, -97.42435 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: WC-T260-STR-100, 296 CREW: _____

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: 32+21" Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 2 Shape: BOX Length: 9' Height: 9' Width: _____ Skew: no

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

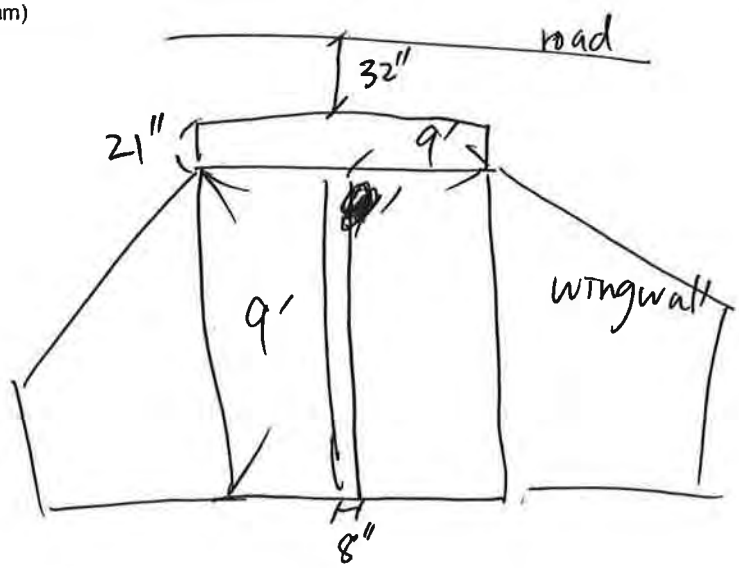
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 3 USF: 4 DSF: 2 DSC: 1

Additional Info: standing water

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

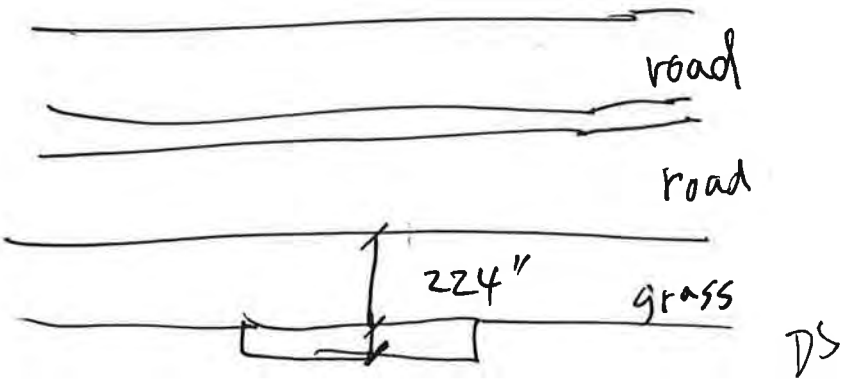


	Photo ID: Coordinates: Description:	WC_T260_STR_100_USC 30.352028, -97.416546 Upstream channel
	Photo ID: Coordinates: Description:	WC_T260_STR_100_USF 30.352028, -97.416546 Upstream face

	Photo ID: Coordinates: Description:	WC_T260_STR_100_DSF 30.352028, -97.416546 Downstream face
	Photo ID: Coordinates: Description:	WC_T260_STR_100_DSC 30.352028, -97.416546 Downstream channel

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: WC_T307_STR_100 CREW: _____

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 3.5' Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 6 Shape: ROUND Length: 32' Height: 8' Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

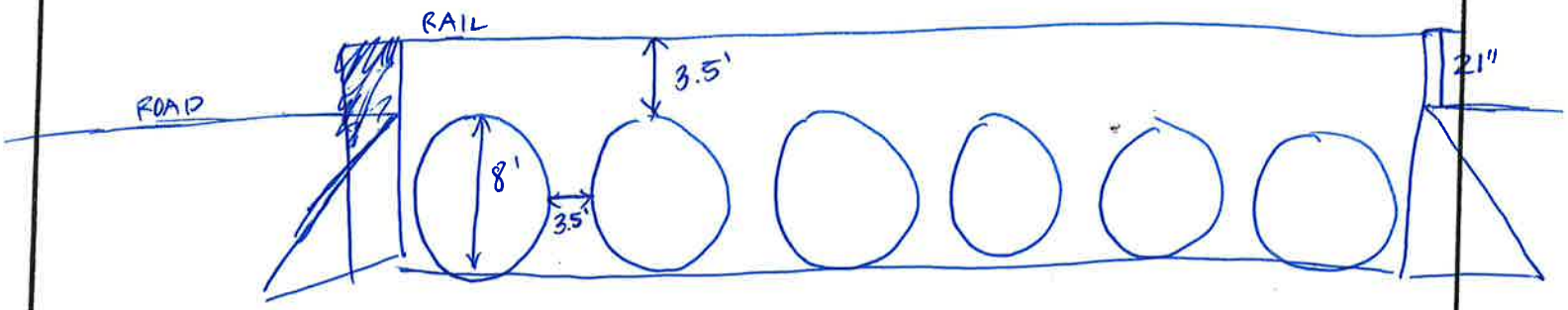
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1-3 USF: 4-5 DSF: 6,7 DSC: 8,9,10 LOB 11 ROB 12

Additional Info: HIGH Debris (dead trees / pallets in culvert)

File Name: DS EROSION: 13/14

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

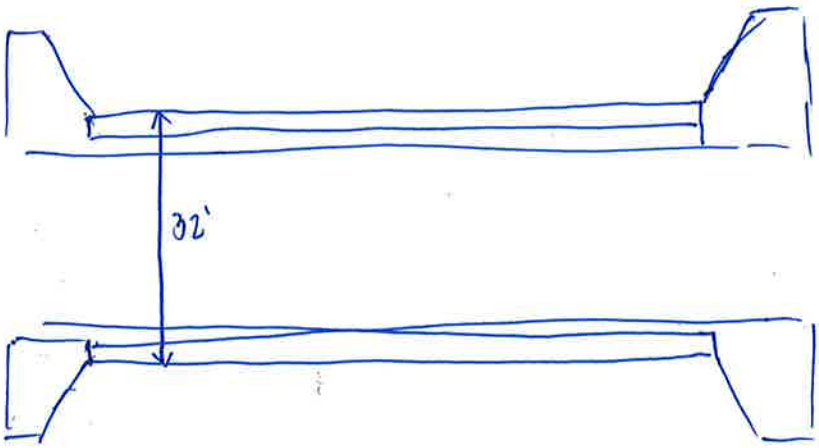


	Photo ID: Coordinates: Description:	WC_T307_STR_100_USC_1 30.268157, -97.462716 Upstream channel
	Photo ID: Coordinates: Description:	WC_T307_STR_100_USC_2 30.268157, -97.462716 Upstream channel

	Photo ID: Coordinates: Description:	WC_T307_STR_100_USC_3 30.268157, -97.462716 Upstream channel
	Photo ID: Coordinates: Description:	WC_T307_STR_100_USF_1 30.268157, -97.462716 Upstream face

	Photo ID: Coordinates: Description:	WC_T307_STR_100_USF_2 30.268157, -97.462716 Upstream face
	Photo ID: Coordinates: Description:	WC_T307_STR_100_DSC_1 30.268157, -97.462716 Downstream channel

	Photo ID: Coordinates: Description:	WC_T307_STR_100_DSC_2 30.268157, -97.462716 Downstream channel
	Photo ID: Coordinates: Description:	WC_T307_STR_100_DSC_3 30.268157, -97.462716 Downstream channel

	Photo ID: Coordinates: Description:	WC_T307_STR_100_DSF_1 30.268157, -97.462716 Downstream face
	Photo ID: Coordinates: Description:	WC_T307_STR_100_DSF_2 30.268157, -97.462716 Downstream face

	Photo ID: Coordinates: Description:	WC_T307_STR_100_DS_Erosion_1 30.268157, -97.462716 Downstream face
	Photo ID: Coordinates: Description:	WC_T307_STR_100_ DS_Erosion_2 30.268157, -97.462716 Downstream face

	Photo ID: Coordinates: Description:	WC_T307_STR_100_LOB 30.268157, -97.462716 Left overbank
	Photo ID: Coordinates: Description:	WC_T307_STR_100_ROB 30.268157, -97.462716 Right overbank

	Photo ID: Coordinates: Description:	WC_T307_STR_100_OVERVIEW 30.268157, -97.462716 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: NC-T326_STR-100, Old Austin Rd. CREW: _____

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 2 Shape: Circ. Length: 40' Height: 3' Width: _____ Skew: _____

CULVERT: I/O Type: Flush (not projecting) Material: CMP Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

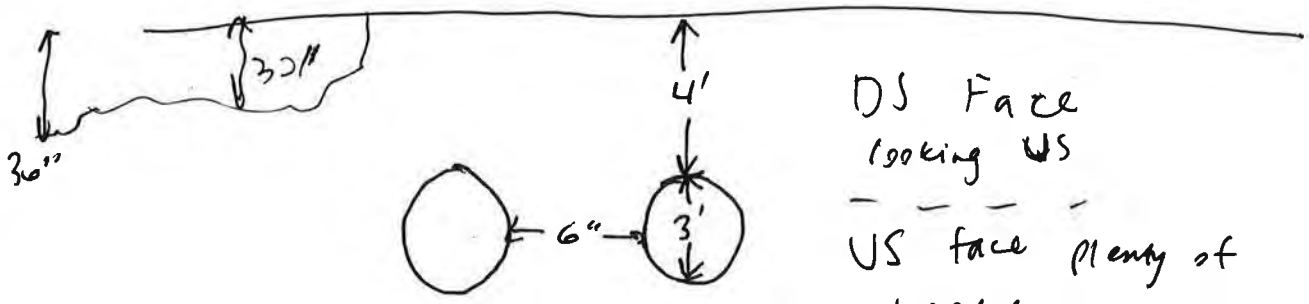
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1, 2 USF: 3 DSF: 4 DSC: 5 LOB: 6 ROB: 7

Additional Info: (talked to Gary @ end of road) Overtops @ 34' on 1704 gage, have flooding @ 38' on 1704 gage

File Name: More Photos - LOB Deck Erosion: 8

PROFILE VIEW:
(Left to Right looking Downstream)



DS Face looking US

US face plenty of wooded debris

DS scour @ Channel

PLAN VIEW:

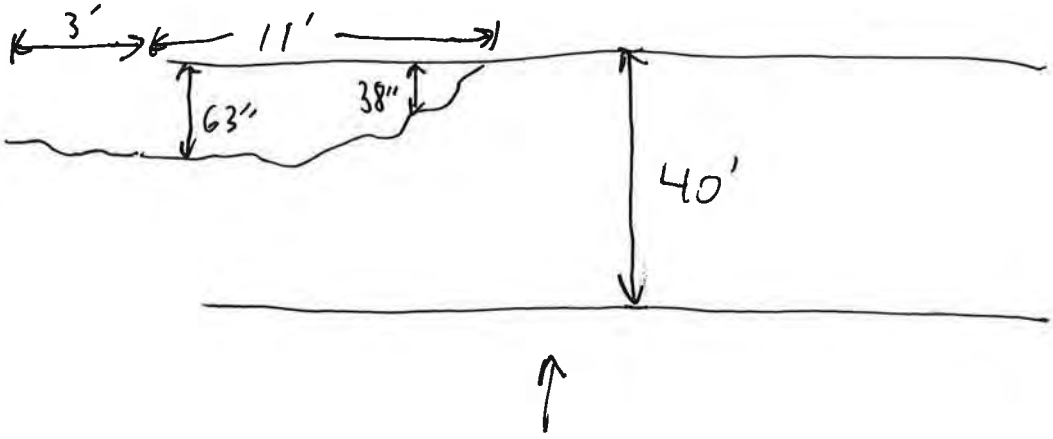


	Photo ID: Coordinates: Description:	WC_T326_STR_100_DSC 30.235143, -97.438466 Downstream channel
	Photo ID: Coordinates: Description:	WC_T326_STR_100_DSF 30.235143, -97.438466 Downstream face

	Photo ID: Coordinates: Description:	WC_T326_STR_100_LOB 30.235143, -97.438466 Left overbank
	Photo ID: Coordinates: Description:	WC_T326_STR_100_LOB_Deck_Erosion 30.235143, -97.438466 Erosion on the left overbank

	Photo ID: Coordinates: Description:	WC_T326_STR_100_ROB 30.235143, -97.438466 Right overbank
	Photo ID: Coordinates: Description:	WC_T326_STR_100_USC_1 30.235143, -97.438466 Upstream channel

	Photo ID: Coordinates: Description:	WC_T326_STR_100_USC_2 30.235143, -97.438466 Upstream channel
	Photo ID: Coordinates: Description:	WC_T326_STR_100_USF 30.235143, -97.438466 Upstream face

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: WC_T826_STR_200, Settlers Rd. CREW: JG + ML

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 2 Shape: circ. Length: 30' 3" Height: 2' Width: _____ Skew: _____

CULVERT: I/O Type: flush (not projecting) Material: CMP Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

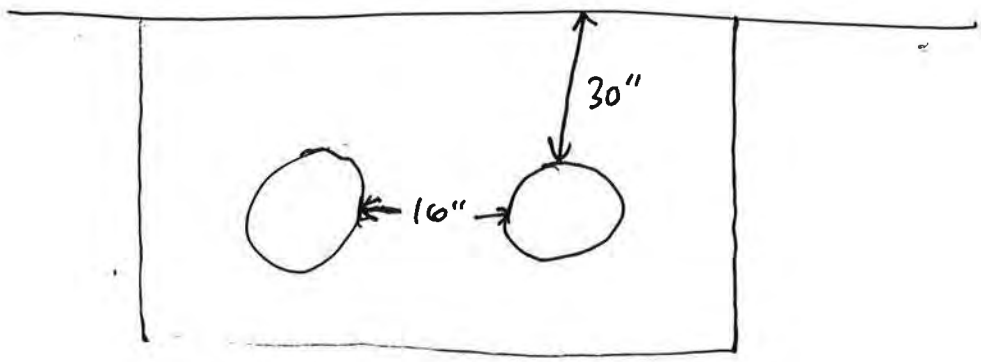
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOB: 5 ROB: 6

Additional Info: LOB DS Erosion: 7 Overview: 8

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

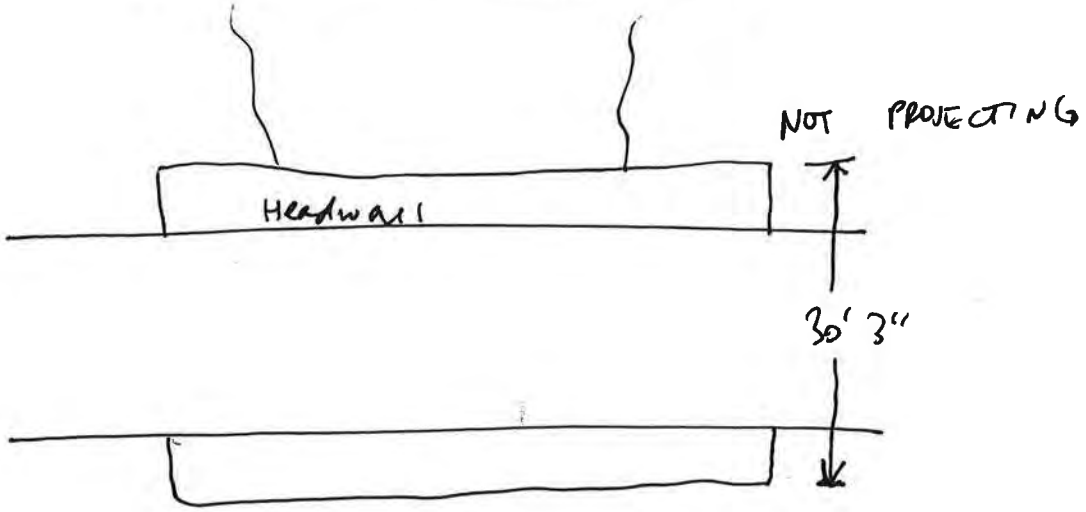


	Photo ID: Coordinates: Description:	WC_T326_STR_200_DSC 30.234899, -97.446355 Downstream channel
	Photo ID: Coordinates: Description:	WC_T326_STR_100_DSF 30.234899, -97.446355 Downstream face

	Photo ID: Coordinates: Description:	WC_T326_STR_200_LOB 30.234899, -97.446355 Left overbank
	Photo ID: Coordinates: Description:	WC_T326_STR_200_LOB_DS_Erosion 30.234899, -97.446355 Erosion on the left overbank

	Photo ID: Coordinates: Description:	WC_T326_STR_200_OVERVIEW 30.234899, -97.446355 Overview of structure
	Photo ID: Coordinates: Description:	WC_T326_STR_200_ROB 30.234899, -97.446355 Right overbank

	Photo ID: Coordinates: Description:	WC_T326_STR_200_USC 30.234899, -97.446355 Upstream channel
	Photo ID: Coordinates: Description:	WC_T326_STR_200_USF 30.235143, -97.438466 Upstream face

Appendix C-3: Field Reconnaissance – Travis County

HALFF

Survey Field Sheet

PROJECT: 35837 (WLB) SURVEY NAME:

STREAM NAME: LITTLE RD. Cottonmouth Creek DATE:

LOCATION: TRAVIS Co CREW:

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:

CULVERT: Number: Shape: Length: Height: Width: Skew:

CULVERT: I/O Type: Material: Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

ERM Description: Coordinate System:

Photo Numbers: USC: 1 USF: 5 DSF: 6 DSC: 2

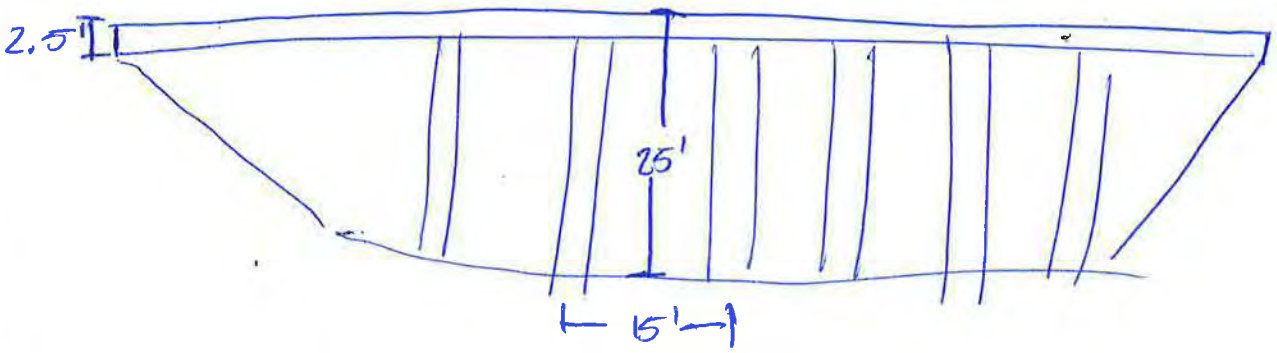
Additional Info: LOB: 3 ROB: 4 OA

File Name:

PROFILE VIEW:
(Left to Right looking Downstream)

27 SPANS

CC_STR_100



PLAN VIEW:

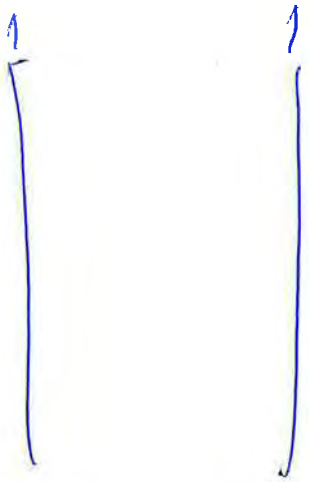


	Photo ID: Coordinates: Description:	CC_STR_100_USC 30.323536, -97.471035 Upstream channel
	Photo ID: Coordinates: Description:	CC_STR_100_USF 30.323536, -97.471035 Upstream face

	Photo ID: Coordinates: Description:	CC_STR_100_DSF 30.323536, -97.471035 Downstream face
	Photo ID: Coordinates: Description:	CC_STR_100_DSC 30.323536, -97.471035 Downstream channel

	Photo ID: Coordinates: Description:	CC_STR_100_LOB 30.323536, -97.471035 Left overbank
	Photo ID: Coordinates: Description:	CC_STR_100_ROB 30.323536, -97.471035 Right overbank

HALFF

Survey Field Sheet

PROJECT: 35837 WILCO. SURVEY NAME:

STREAM NAME: LITTLE RD Cottonmouth creek DATE:

LOCATION: TRAVIS Co. CREW:

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:

CULVERT: Number: Shape: Length: Height: Width: Skew:

CULVERT: I/O Type: Material: Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

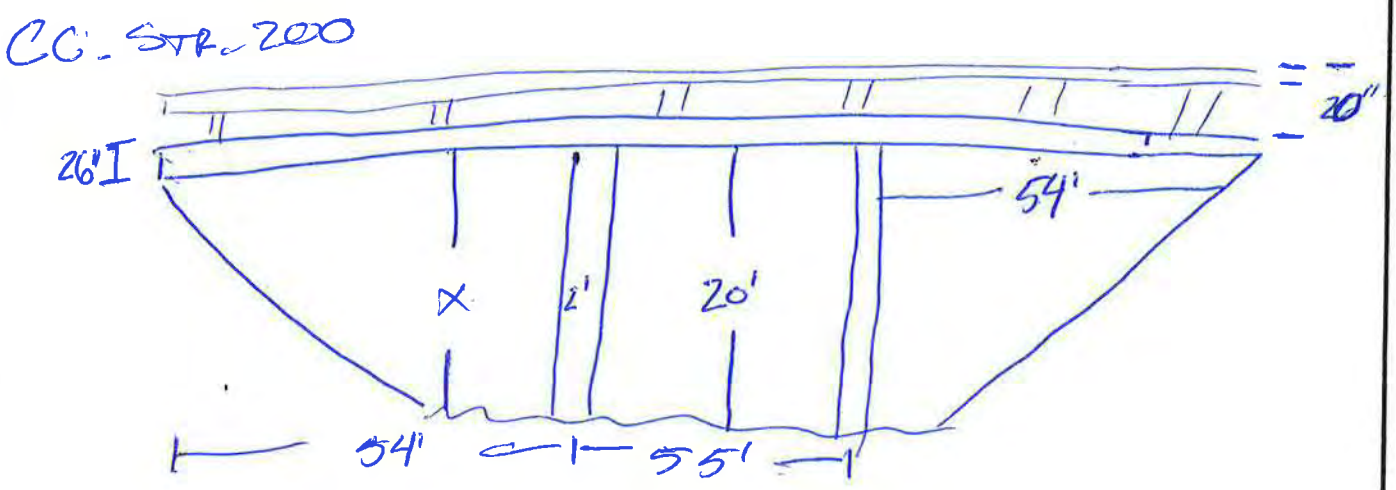
ERM Description: Coordinate System:

Photo Numbers: USC: 1,2 USF: 3 DSF: 4 DSC: 5

Additional Info: LOB: 6 ROB: 7 OA: 8

File Name:

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

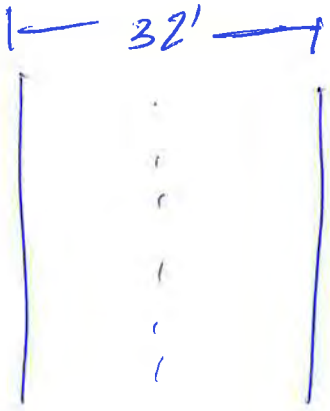


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	Photo ID: Coordinates: Description:	CC_STR_200_USF 30.323808, -97.471272 Upstream face
	Photo ID: Coordinates: Description:	CC_STR_200_DSF 30.323808, -97.471272 Downstream face

	Photo ID: Coordinates: Description:	CC_STR_200_DSC 30.323808, -97.471272 Downstream channel
	Photo ID: Coordinates: Description:	CC_STR_200_LOB 30.323808, -97.471272 Left overbank

	Photo ID: Coordinates: Description:	CC_STR_200_ROB 30.323808, -97.471272 Right overbank
	Photo ID: Coordinates: Description:	CC_STR_200_OVERALL 30.323808, -97.471272 Overall

HALFF

Survey Field Sheet

PROJECT: 35837 WICB

SURVEY NAME:

STREAM NAME: COTTONMOUTH CREEK

DATE:

LOCATION: TRAVIS CO.

CREW:

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:

CULVERT: Number: Shape: Length: Height: Width: Skew:

CULVERT: I/O Type: Material: Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

ERM Description: Coordinate System:

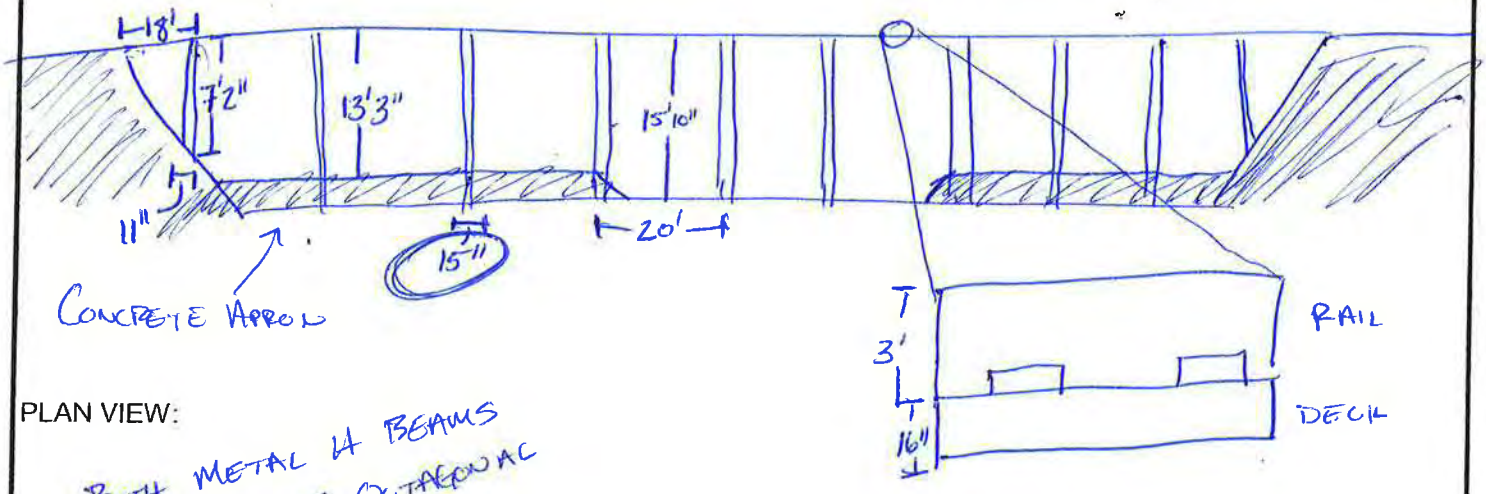
Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4

Additional Info: LOB: 5 ROB: 6

File Name:

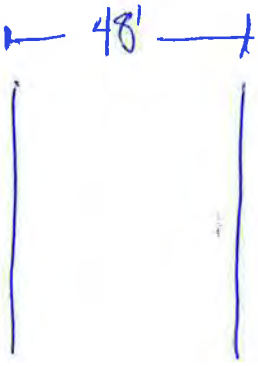
PROFILE VIEW:
(Left to Right looking Downstream)

CC - STR 300



PLAN VIEW:

BOTH METAL H BEAMS & CONCRETE OUTFALL PIERS



8'10"

	Photo ID: Coordinates: Description:	CC_STR_300_USC 30.350896, -97.48651 Upstream channel
	Photo ID: Coordinates: Description:	CC_STR_300_USF 30.350896, -97.48651 Upstream face

	Photo ID: Coordinates: Description:	CC_STR_300_DSF 30.350896, -97.48651 Downstream face
	Photo ID: Coordinates: Description:	CC_STR_300_DSC 30.350896, -97.48651 Downstream channel

	Photo ID: Coordinates: Description:	CC_STR_300_LOB 30.350896, -97.48651 Left overbank
	Photo ID: Coordinates: Description:	CC_STR_300_ROB 30.350896, -97.48651 Right overbank

	Photo ID: Coordinates: Description:	CC_STR_300_BRIDGE_NUMBER 30.350896, -97.48651 Bridge Number

HALFF

Survey Field Sheet

PROJECT: 35837 WILB. SURVEY NAME:

STREAM NAME: COTTONWOOD CREEK DATE:

LOCATION: TRAVIS CO. CREW:

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:

CULVERT: Number: Shape: Length: Height: Width: Skew:

CULVERT: I/O Type: Material: Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

ERM Description: Coordinate System:

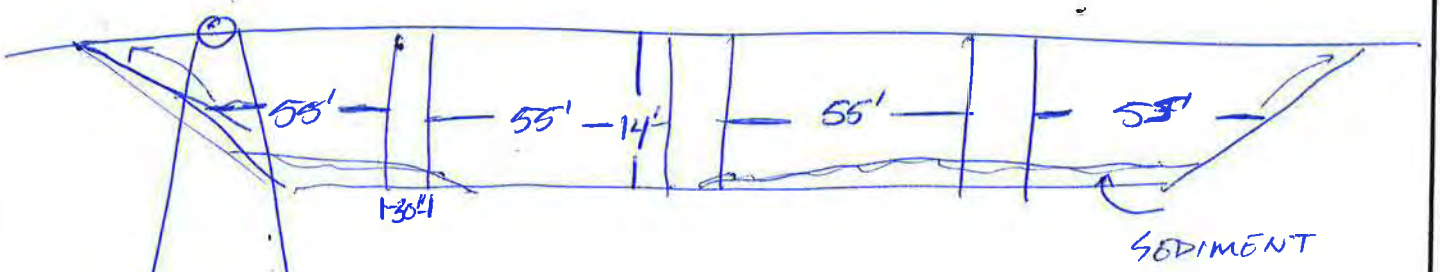
Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4

Additional Info: ROB: 5 LOB: 6

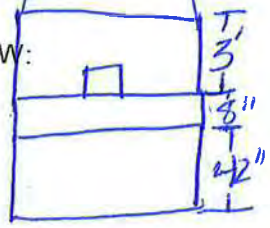
File Name:

PROFILE VIEW:
(Left to Right looking Downstream)

CC-STR-400



PLAN VIEW:



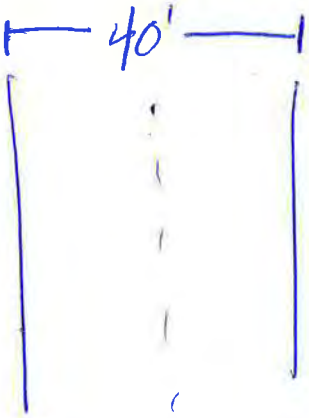


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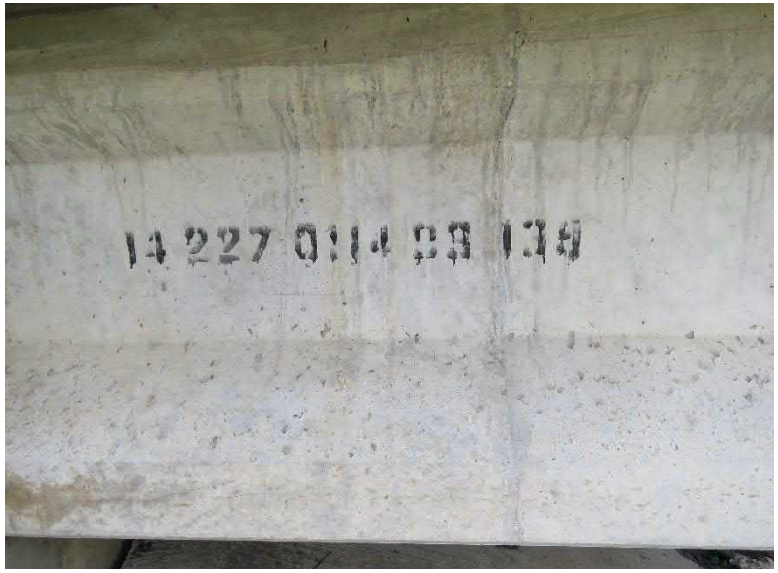
	Photo ID: Coordinates: Description:	CC_STR_400_USF 30.351199, -97.486559 Upstream face

	Photo ID: Coordinates: Description:	CC_STR_400_DSF 30.351199, -97.486559 Downstream face
	Photo ID: Coordinates: Description:	CC_STR_400_DSC 30.351199, -97.486559 Downstream channel

	Photo ID: Coordinates: Description:	CC_STR_400_LOB 30.351199, -97.486559 Left overbank
	Photo ID: Coordinates: Description:	CC_STR_400_ROB 30.351199, -97.486559 Right overbank

	Photo ID: Coordinates: Description:	CC_STR_400_BRIDGE_NUMBER 30.351199, -97.486559 Bridge Number
	Photo ID: Coordinates: Description:	CC_STR_400_DEBRIS 30.351199, -97.486559 Debris

HALFF

Survey Field Sheet

PROJECT: 35837 Wills. SURVEY NAME: _____

STREAM NAME: Cottonmouth Creek DATE: _____

LOCATION: Travis Co. CREW: _____

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

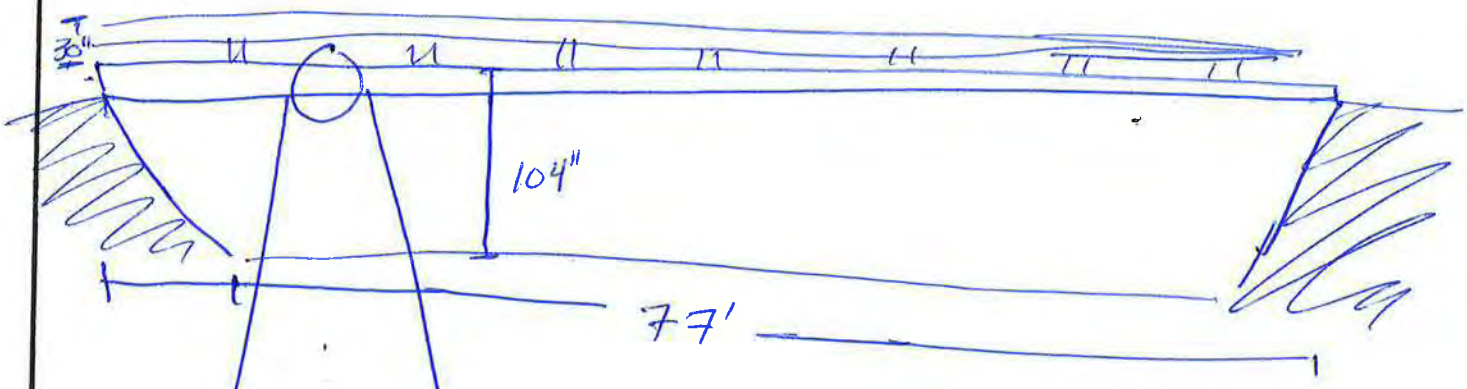
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4

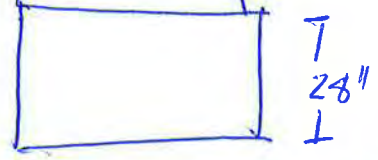
Additional Info: LOB: LOB:

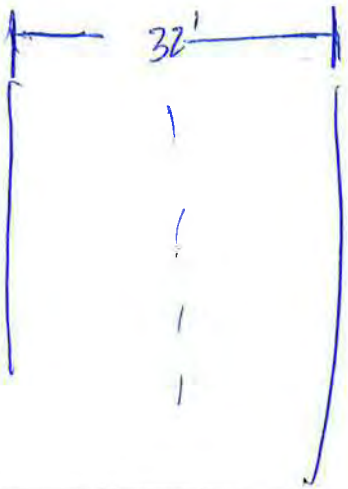
File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream) CC_STR_500



PLAN VIEW:





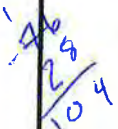


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	Photo ID: Coordinates: Description:	CC_STR_500_USF 30.35664, -97.487614 Upstream face
	Photo ID: Coordinates: Description:	CC_STR_500_DSF 30.35664, -97.487614 Downstream face

	Photo ID: Coordinates: Description:	CC_STR_500_DSC 30.35664, -97.487614 Downstream channel

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: Cottonmouth Creek DATE: 11/22/19

LOCATION: CC_STR_600 CREW: JG + ML

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 28" Deck: 2' Width: 36' Pier(s): 3 @ 2' Pier Shape: CIRC

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

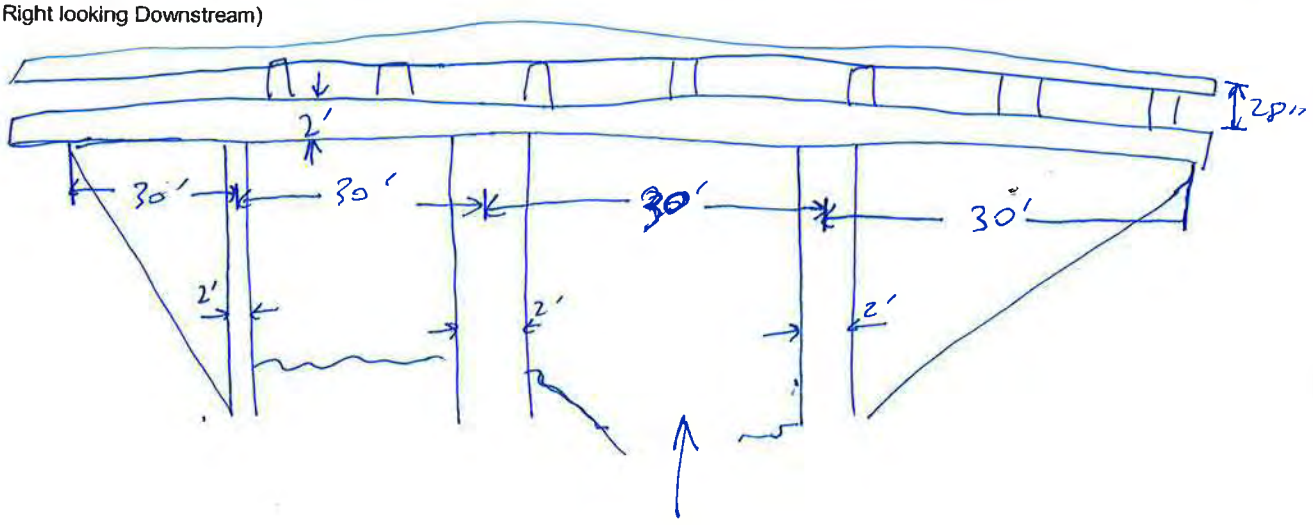
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4,5 LOB: 6 ROB: 7

Additional Info: Overview: 8

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

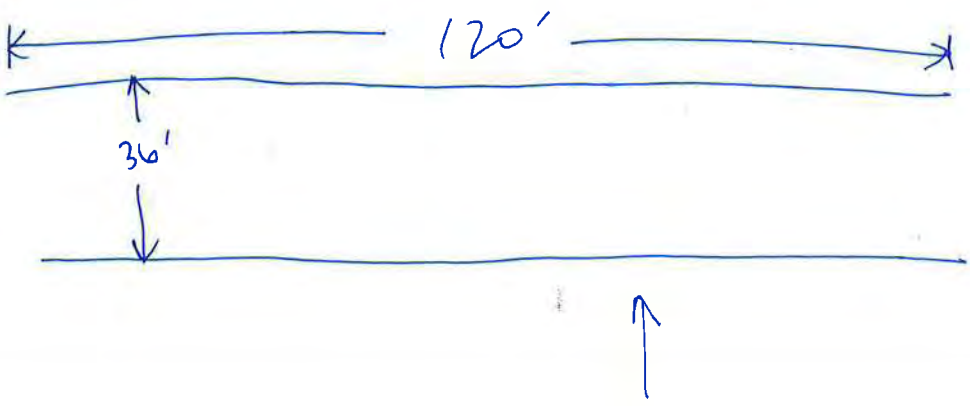


	Photo ID: Coordinates: Description:	CC_STR_600_USC 30.374379, -97.477479 Upstream channel
	Photo ID: Coordinates: Description:	CC_STR_600_USF 30.374379, -97.477479 Upstream face

	Photo ID: Coordinates: Description:	CC_STR_600_DSF 30.374379, -97.477479 Downstream face
	Photo ID: Coordinates: Description:	CC_STR_600_DSC_1 30.374379, -97.477479 Downstream channel

	Photo ID: Coordinates: Description:	CC_STR_600_DSC_2 30.374379, -97.477479 Downstream channel
	Photo ID: Coordinates: Description:	CC_STR_600_LOB 30.374379, -97.477479 Left overbank

	Photo ID: Coordinates: Description:	CC_STR_600_ROB 30.374379, -97.477479 Right overbank
	Photo ID: Coordinates: Description:	CC_STR_600_OVERVIEW 30.374379, -97.477479 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: 11/22/19

LOCATION: CC_STR_700 CREW: JG + ML

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 27" Deck: 25" Width: 36' Pier(s): 3 @ 2' Pier Shape: CIRC

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

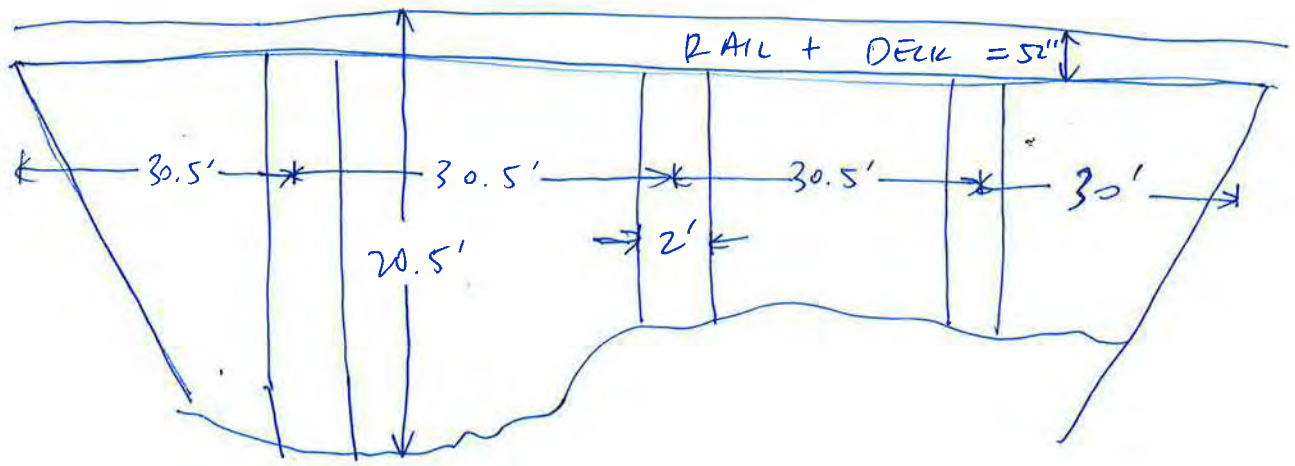
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2,3 DSF: 4 DSC: 5 LOB: 6 ROB: 7 Overview: 8

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

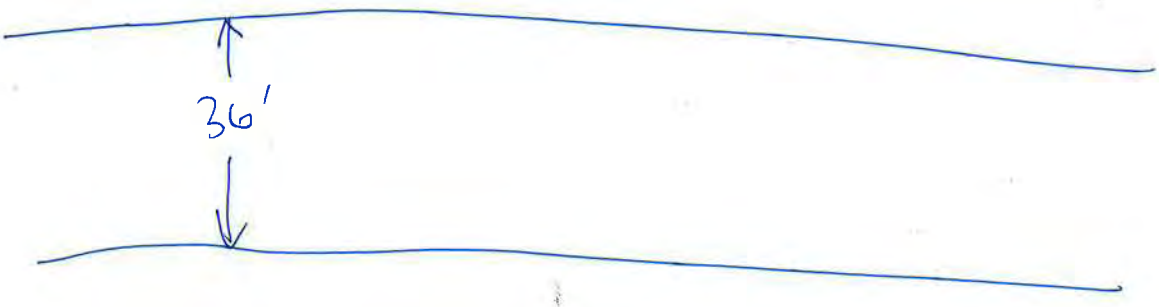


	Photo ID: Coordinates: Description:	CC_STR_700_USC 30.391254, -97.480077 Upstream channel
	Photo ID: Coordinates: Description:	CC_STR_700_USF_1 30.391254, -97.480077 Upstream face

	Photo ID: Coordinates: Description:	CC_STR_700_USF_2 30.391254, -97.480077 Upstream face
	Photo ID: Coordinates: Description:	CC_STR_700_DSF 30.391254, -97.480077 Downstream face

	Photo ID: Coordinates: Description:	CC_STR_700_DSC 30.391254, -97.480077 Downstream channel
	Photo ID: Coordinates: Description:	CC_STR_700_LOB 30.391254, -97.480077 Left overbank

	Photo ID: Coordinates: Description:	CC_STR_700_ROB 30.391254, -97.480077 Right overbank
	Photo ID: Coordinates: Description:	CC_STR_700_OVERVIEW 30.391254, -97.480077 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: 11/22/19

LOCATION: CC_STR_800 CREW: JG + ML

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 27" Deck: 48" Width: 36' Pier(s): 1 @ 2.5' Pier Shape: CIRC

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

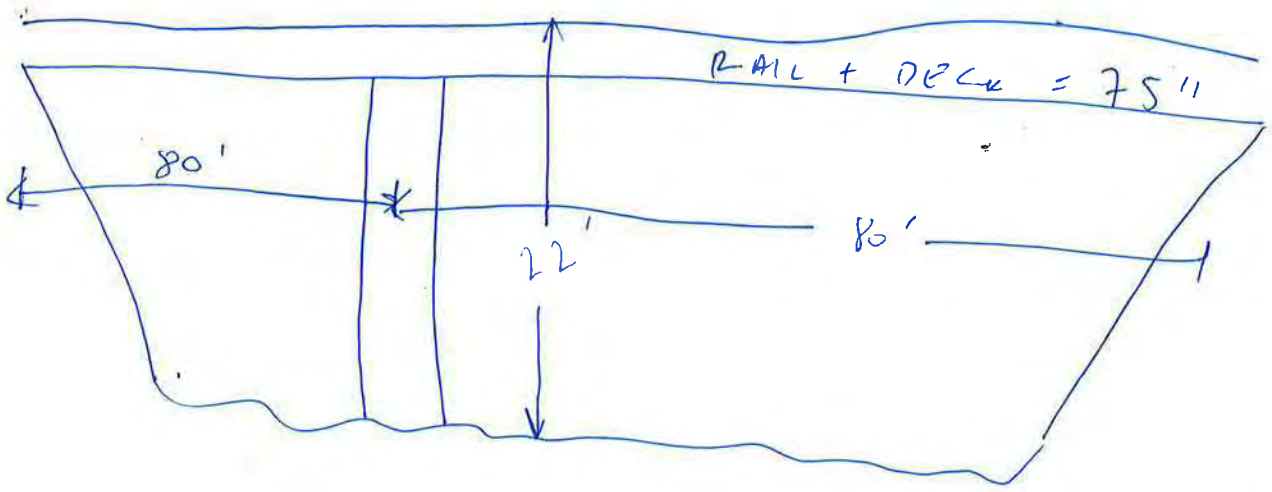
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1, 2 USF: 3, 4 DSF: 5, 6 DSC: 7 LOB: 8 ROB: 9

Additional Info: Web wall, confluence of 2 streams overview: 10

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

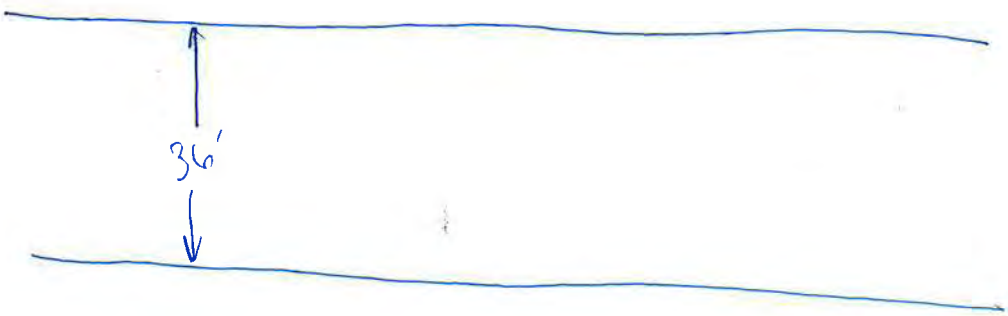


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	Photo ID: Coordinates: Description:	CC_STR_800_USC_2 30.401644, -97.478565 Upstream channel

	Photo ID: Coordinates: Description:	CC_STR_800_USF_1 30.401644, -97.478565 Upstream face
	Photo ID: Coordinates: Description:	CC_STR_800_USF_2 30.401644, -97.478565 Upstream face

	Photo ID: Coordinates: Description:	CC_STR_800_DSF_1 30.401644, -97.478565 Downstream face
	Photo ID: Coordinates: Description:	CC_STR_800_DSF_2 30.401644, -97.478565 Downstream face

	Photo ID: Coordinates: Description:	CC_STR_800_DSC 30.401644, -97.478565 Downstream channel
	Photo ID: Coordinates: Description:	CC_STR_800_LOB 30.401644, -97.478565 Left overbank

	Photo ID: Coordinates: Description:	CC_STR_800_ROB 30.401644, -97.478565 Right overbank
	Photo ID: Coordinates: Description:	CC_STR_800_OVERVIEW 30.401644, -97.478565 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: 11/25/19

LOCATION: CC_STR_900 CREW: JG & ML

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 4 Shape: BOX Length: 24' Height: 7' Width: 10' Skew: _____

CULVERT: I/O Type: Beveled/Chamfered wingwall Material: RCP Wingwall Angle 45°

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

ERM Description: _____ Coordinate System: _____

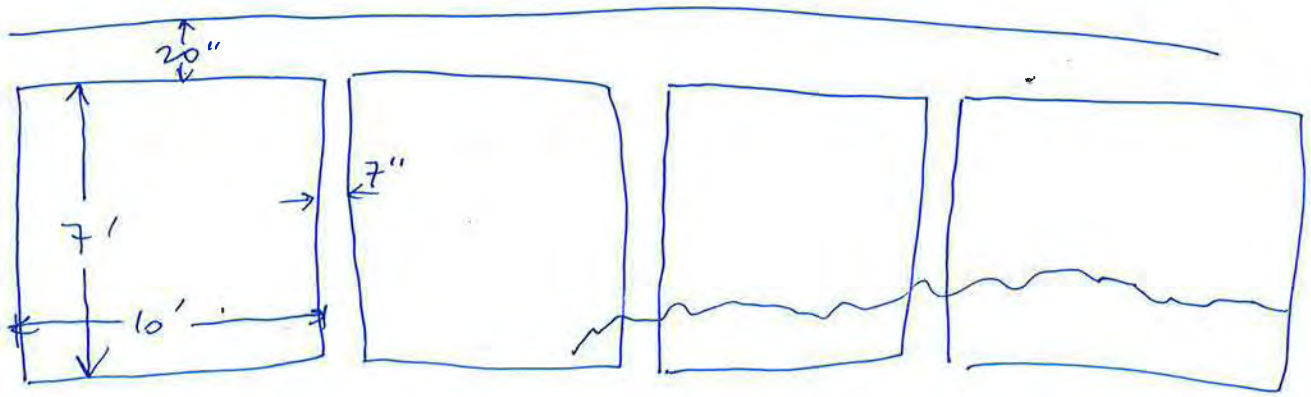
Photo Numbers: USC: 1 USF: 2, 3 DSF: 4, 5 DSC: 6 LOB: 7 ROB: 8 overview

Additional Info: According to prop. owner, culvert overtops, almost reaches driveway to east.

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)

Trails Plaque: 10



LOTS OF SEDIMENT & VEGETATION US & DS

PLAN VIEW:

FLOW

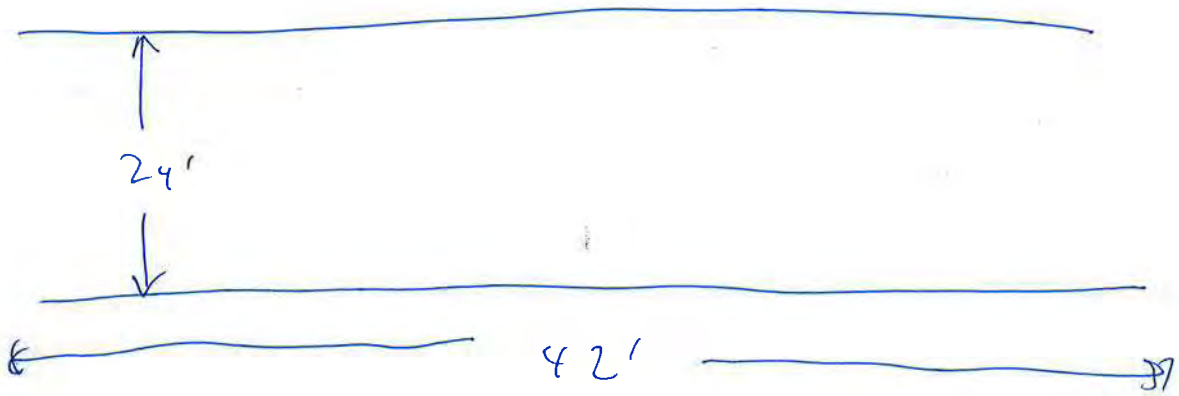


	Photo ID: Coordinates: Description:	CC_STR_900_USC 30.420179, -97.470854 Upstream channel
	Photo ID: Coordinates: Description:	CC_STR_900_USF_1 30.420179, -97.470854 Upstream face

	Photo ID: Coordinates: Description:	CC_STR_900_USF_2 30.420179, -97.470854 Upstream face
	Photo ID: Coordinates: Description:	CC_STR_900_DSF_1 30.420179, -97.470854 Downstream face

	Photo ID: Coordinates: Description:	CC_STR_900_DSF_2 30.420179, -97.470854 Downstream face
	Photo ID: Coordinates: Description:	CC_STR_900_DSC 30.420179, -97.470854 Downstream channel

	Photo ID: Coordinates: Description:	CC_STR_900_BR_PLAQUE 30.420179, -97.470854 Bridge plaque
	Photo ID: Coordinates: Description:	CC_STR_900_LOB 30.420179, -97.470854 Left overbank

	Photo ID: Coordinates: Description:	CC_STR_900_ROB 30.420179, -97.470854 Right overbank
	Photo ID: Coordinates: Description:	CC_STR_900_OVERVIEW 30.420179, -97.470854 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: LWL_STR 103 CREW: _____

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

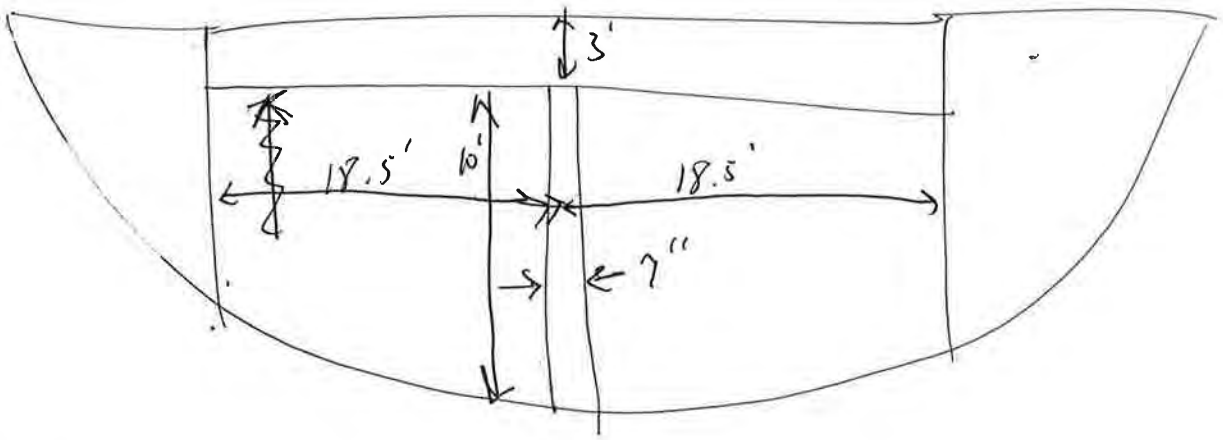
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1-2 USF: 3 DSF: 4 DSC: 5 LOB 6 overview 8 ROB 7

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

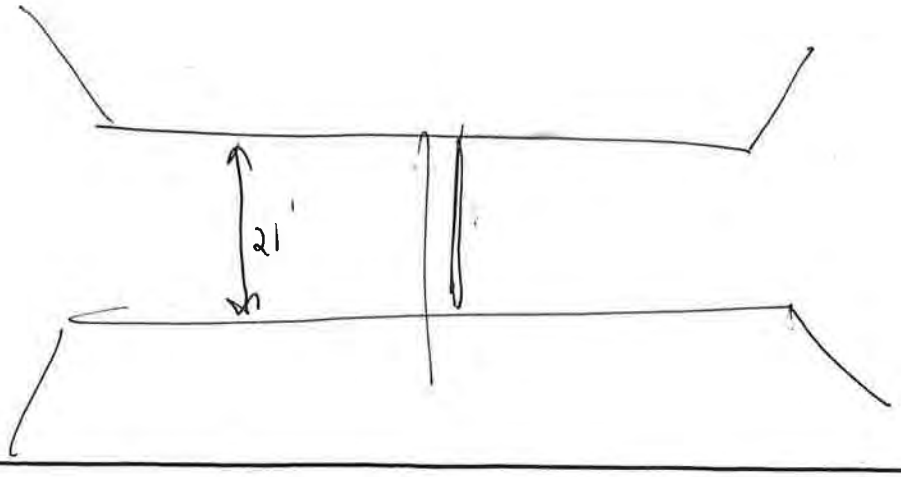


	Photo ID: Coordinates: Description:	LWC_STR_100_USC_1 30.369283, -97.461138 Upstream channel
	Photo ID: Coordinates: Description:	LWC_STR_100_USC_2 30.369283, -97.461138 Upstream channel

	Photo ID: Coordinates: Description:	LWC_STR_100_USF 30.369283, -97.461138 Upstream face
	Photo ID: Coordinates: Description:	LWC_STR_100_DSF 30.369283, -97.461138 Downstream face

	Photo ID: Coordinates: Description:	LWC_STR_100_DSC 30.369283, -97.461138 Downstream channel
	Photo ID: Coordinates: Description:	LWC_STR_100_LOB 30.369283, -97.461138 Left overbank

	Photo ID: Coordinates: Description:	LWC_STR_100_ROB 30.369283, -97.461138 Right overbank
	Photo ID: Coordinates: Description:	LWC_STR_100_OVERVIEW 30.369283, -97.461138 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: LWC-STR-200 DATE: _____

LOCATION: _____ CREW: _____

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 2' Deck: 3' Width: 28' Pier(s): 8 @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

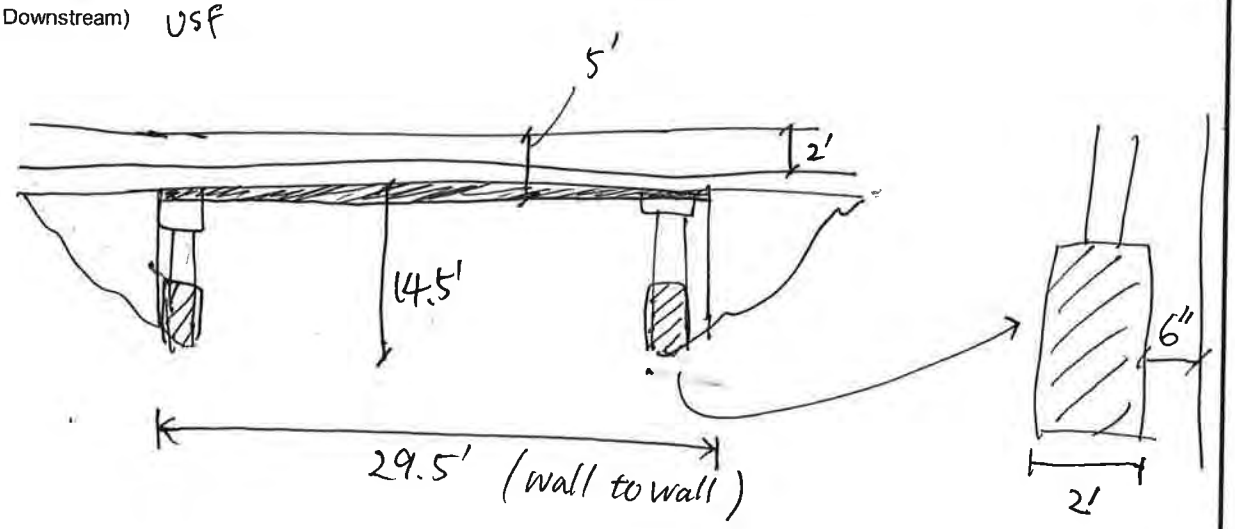
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4,5 LOB & ROB 7 Overview 8

Additional Info: piers inside of abutment

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream) USF



PLAN VIEW:

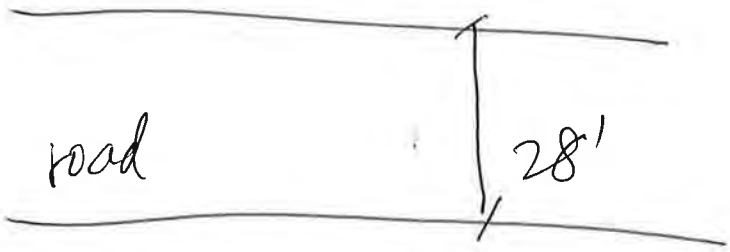
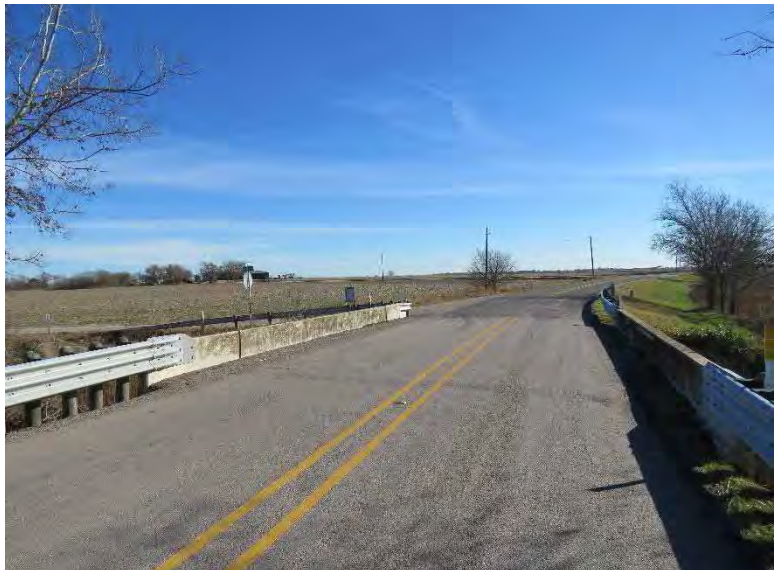


	Photo ID: Coordinates: Description:	LWC_STR_200_USC 30.381802, -97.460858 Upstream channel
	Photo ID: Coordinates: Description:	LWC_STR_200_USF 30.381802, -97.460858 Upstream face

	Photo ID: Coordinates: Description:	LWC_STR_200_DSF 30.381802, -97.460858 Downstream face
	Photo ID: Coordinates: Description:	LWC_STR_200_DSC_1 30.381802, -97.460858 Downstream channel

	Photo ID: Coordinates: Description:	LWC_STR_200_DSC_2 30.381802, -97.460858 Downstream channel
	Photo ID: Coordinates: Description:	LWC_STR_200_LOB 30.381802, -97.460858 Left overbank

	Photo ID: Coordinates: Description:	LWC_STR_200_ROB 30.381802, -97.460858 Right overbank
	Photo ID: Coordinates: Description:	LWC_STR_200_OVERVIEW 30.381802, -97.460858 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: LWC-STR-300 DATE: _____

LOCATION: _____ CREW: _____

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: 22' Pier(s): 1 @ 2' Pier Shape: ☐ wall

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

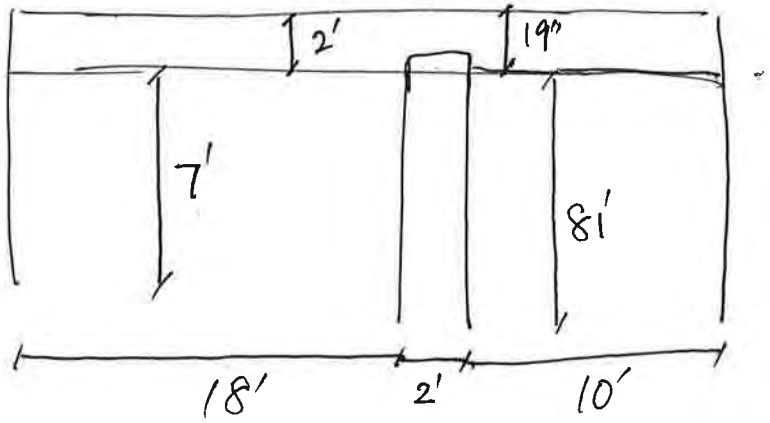
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOB 5 ROB 6 Profile 7 overview 8

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

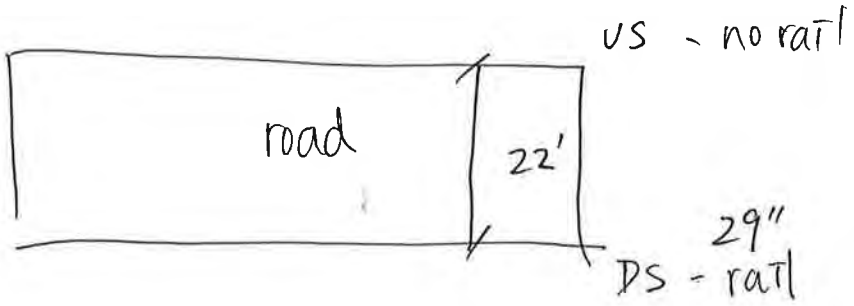
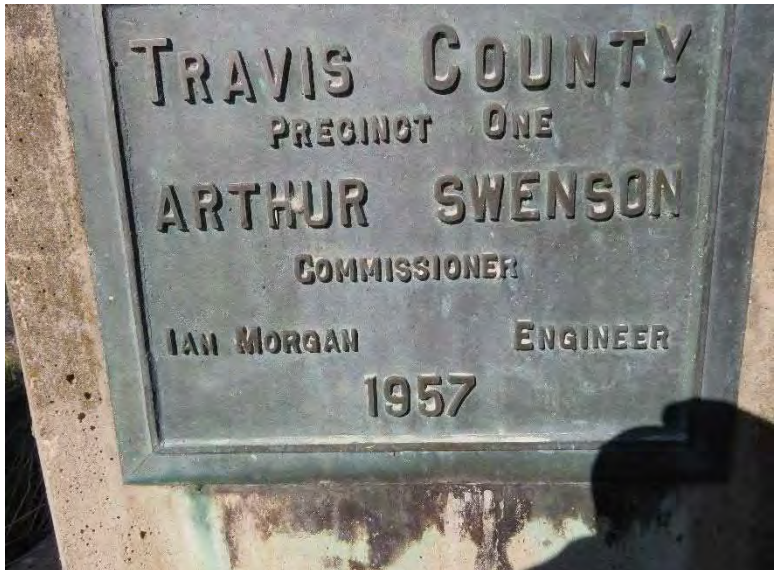


	Photo ID: Coordinates: Description:	LWC_STR_300_USC 30.394544, -97.456932 Upstream channel
	Photo ID: Coordinates: Description:	LWC_STR_300_USF 30.394544, -97.456932 Upstream face

	Photo ID: Coordinates: Description:	LWC_STR_300_DSF 30.394544, -97.456932 Downstream face
	Photo ID: Coordinates: Description:	LWC_STR_300_DSC 30.394544, -97.456932 Downstream channel

	Photo ID: Coordinates: Description:	LWC_STR_300_LOB 30.394544, -97.456932 Left overbank
	Photo ID: Coordinates: Description:	LWC_STR_300_ROB 30.394544, -97.456932 Right overbank

	Photo ID: Coordinates: Description:	LWC_STR_300_OVERVIEW 30.394544, -97.456932 Overview
	Photo ID: Coordinates: Description:	LWC_STR_300_BR_PLAQUE 30.394544, -97.456932 Bridge plaque

HALFF

Survey Field Sheet

PROJECT: 35837 Wilcs SURVEY NAME:

STREAM NAME: Little Willow Creek DATE:

LOCATION: Travis Co. CREW:

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:

CULVERT: Number: Shape: Length: Height: Width: Skew:

CULVERT: I/O Type: Material: Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

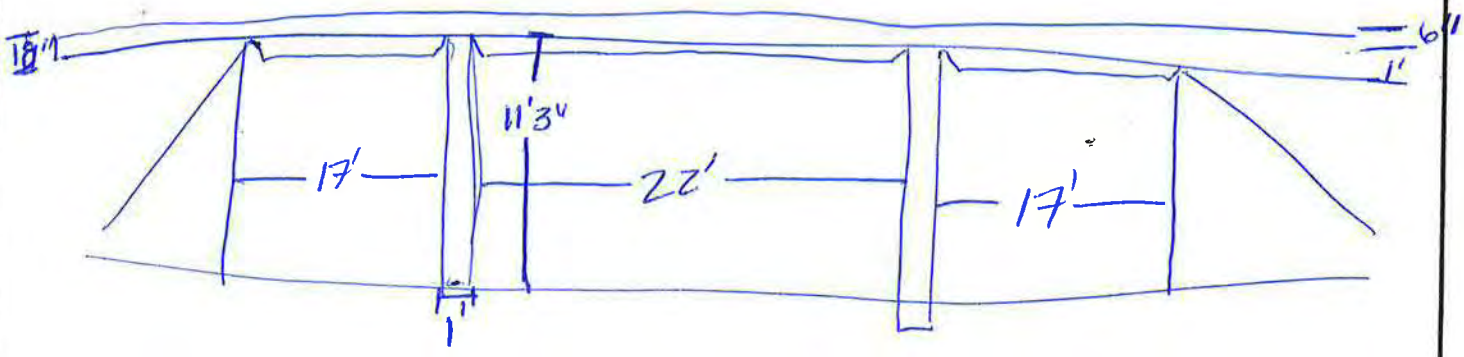
ERM Description: Coordinate System:

Photo Numbers: USC: 2 USF: 3, 4 DSF: 5 DSC: 6, 7

Additional Info: LOB: 8. ROB: 9

File Name:

PROFILE VIEW:
(Left to Right looking Downstream) LWC_STR_100



PLAN VIEW:

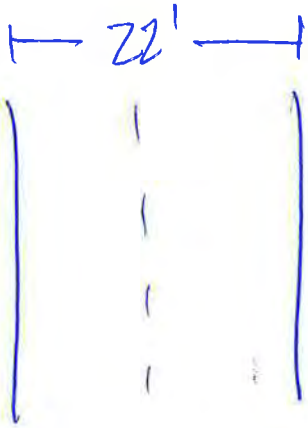


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	Photo ID: Coordinates: Description:	LWC_STR_400_USF 30.425142, -97.446434 Upstream face

	Photo ID: Coordinates: Description:	LWC_STR_400_USF_2 30.425142, -97.446434 Upstream face
	Photo ID: Coordinates: Description:	LWC_STR_400_DSF 30.425142, -97.446434 Downstream face

	Photo ID: Coordinates: Description:	LWC_STR_400_DSC 30.425142, -97.446434 Downstream channel
	Photo ID: Coordinates: Description:	LWC_STR_400_DSC_2 30.425142, -97.446434 Downstream channel

	Photo ID: Coordinates: Description:	LWC_STR_400_LOB 30.425142, -97.446434 Left overbank
	Photo ID: Coordinates: Description:	LWC_STR_400_ROB 30.425142, -97.446434 Right overbank

	Photo ID: Coordinates: Description:	LWC_STR_400_BRIDGE_PLAQUE 30.425142, -97.446434 Bridge Plaque
	Photo ID: Coordinates: Description:	LWC_STR_400_DEBRIS 30.425142, -97.446434 Debris

	Photo ID: Coordinates: Description:	LWC_STR_400_SEDIMENT_DEBRIS 30.425142, -97.446434 Sediment and Debris

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: _____ CREW: _____

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: _____ USF: _____ DSF: _____ DSC: _____

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)

WC_T047_STR_100 (USF:3, DSC:4)
& WC_T056_STR_200 (DSF:1; DSC:2

Confluence: 5, 6

PLAN VIEW:

	Photo ID: Coordinates: Description:	WC_T047_STR_100_USF 30.387254, -97.502072 Upstream face
	Photo ID: Coordinates: Description:	WC_T047_STR_100_DSC 30.387254, -97.502072 Downstream channel

	Photo ID: Coordinates: Description:	WC_T047_STR_100_WC_T056_STR_200_CONFLUENCE 30.387254, -97.502072 Confluence of WC_T047_STR_100 and WC_T056_STR_200

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: 11/22/19

LOCATION: WC_T047_STR_200 CREW: JG + ML

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 2 Shape: circ Length: 22.5' Height: [illegible] Width: 24" Skew: _____

CULVERT: I/O Type: mitered to slope/OS Material: CMP Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

ERM Description: _____ Coordinate System: _____

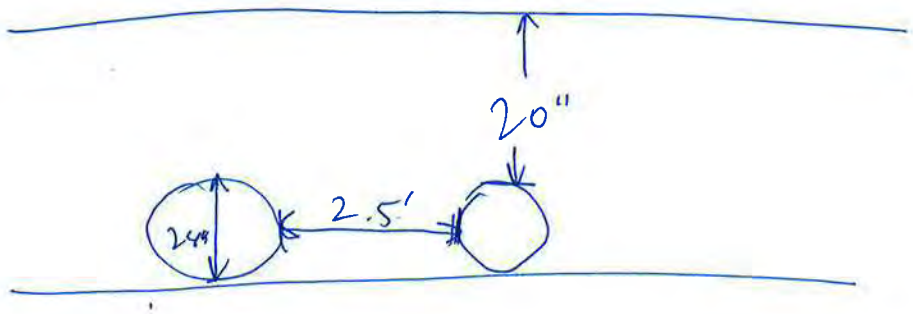
Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOB: 5 ROB: 6 Overview: 7

Additional Info: Was gotten Waist-high according to property owner

File Name: Seems very low, definite chance here to raise road easily

PROFILE VIEW:
(Left to Right looking Downstream)

Rip-rap protection along US side of road in ROB (US: 8, DS: 9, 10)



PLAN VIEW:

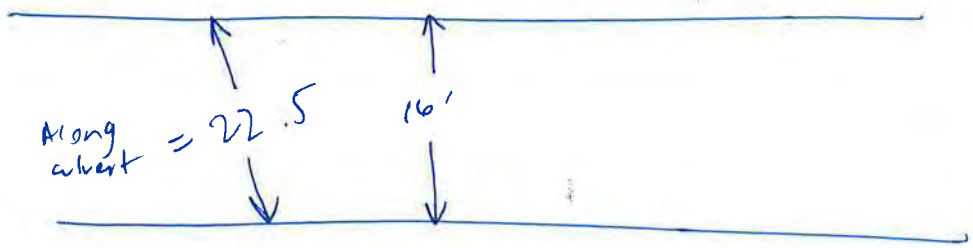


	Photo ID: Coordinates: Description:	WC_T047_STR_200_USC 30.388044, -97.503058 Upstream channel
	Photo ID: Coordinates: Description:	WC_T047_STR_200_USF 30.388044, -97.503058 Upstream face

	Photo ID: Coordinates: Description:	WC_T047_STR_200_DSF 30.388044, -97.503058 Downstream face
	Photo ID: Coordinates: Description:	WC_T047_STR_200_DSC 30.388044, -97.503058 Downstream channel

	Photo ID: Coordinates: Description:	WC_T047_STR_200_LOB 30.388044, -97.503058 Left overbank
	Photo ID: Coordinates: Description:	WC_T047_STR_200_ROB 30.388044, -97.503058 Right overbank

	Photo ID: Coordinates: Description:	WC_T047_STR_200_OVERVIEW 30.388044, -97.503058 Overview
	Photo ID: Coordinates: Description:	WC_T047_STR_200_RIPRAP_US 30.388044, -97.503058 Riprap protection along upstream side of road in tight overbank

	Photo ID: Coordinates: Description:	WC_T047_STR_200_RIPRAP_DS_1 30.388044, -97.503058 Riprap downstream
	Photo ID: Coordinates: Description:	WC_T047_STR_200_RIPRAP_DS_2 30.388044, -97.503058 Riprap downstream

HALFF

Survey Field Sheet

PROJECT: Wilbarger 047 SURVEY NAME:

STREAM NAME: WC_T047_STR_302 DATE: 01/30

LOCATION: Bobby Rd. 30.395839, -97.510836 CREW:

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: Deck: 15" Width: 20.5 Pier(s): @ Pier Shape:

CULVERT: Number: 6 Shape: round Length: Height: 3' Width: Skew:

CULVERT: I/O Type: Material: HDPE Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

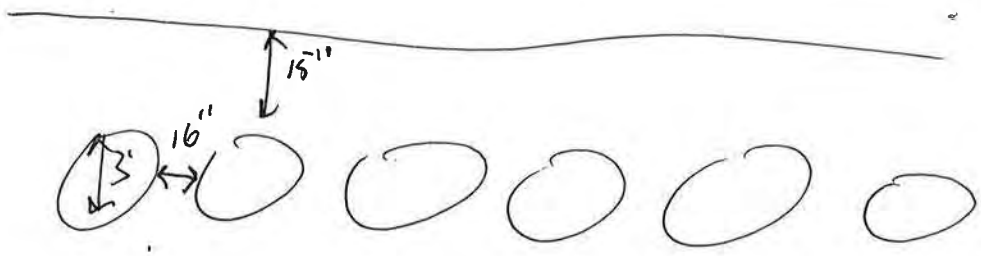
ERM Description: Coordinate System:

Photo Numbers: USC: USF: DSF: DSC:

Additional Info:

File Name:

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

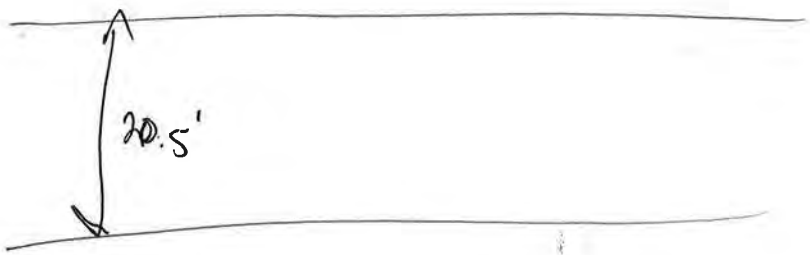


	Photo ID: Coordinates: Description:	WC_T047_STR_300_USC 30.395839, -97.510836 Upstream channel
	Photo ID: Coordinates: Description:	WC_T047_STR_300_USF 30.395839, -97.510836 Upstream face

	Photo ID: Coordinates: Description:	WC_T047_STR_300_DSF 30.395839, -97.510836 Downstream face
	Photo ID: Coordinates: Description:	WC_T047_STR_300_DSC 30.395839, -97.510836 Downstream channel

	Photo ID: Coordinates: Description:	WC_T047_STR_300_DSL 30.395839, -97.510836 Downstream left
	Photo ID: Coordinates: Description:	WC_T047_STR_300_DSR 30.395839, -97.510836 Downstream right

	Photo ID: Coordinates: Description:	WC_T047_STR_300_OVERVIEW 30.395839, -97.510836 Overview

HALFF

Survey Field Sheet

PROJECT: Wilbarger SURVEY NAME:

STREAM NAME: WC-T047-STR_400 DATE: 01/30/20

LOCATION: private rd., 30.396586, -97.511625 CREW:

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:

CULVERT: Number: 2 Shape: round Length: Height: 7' Width: Skew:

CULVERT: I/O Type: Material: metal Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

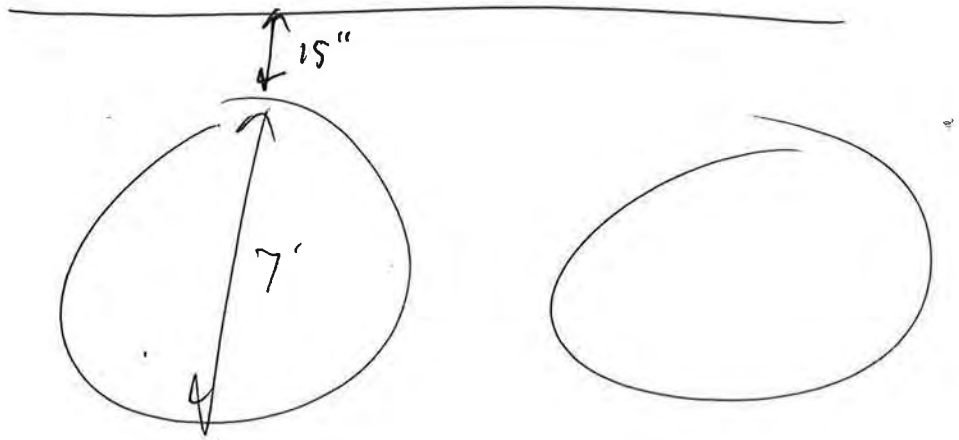
ERM Description: Coordinate System:

Photo Numbers: USC: 2 USF: 3 DSF: 1 DSC: 4 IMG 5 IMG 6

Additional Info:

File Name:

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

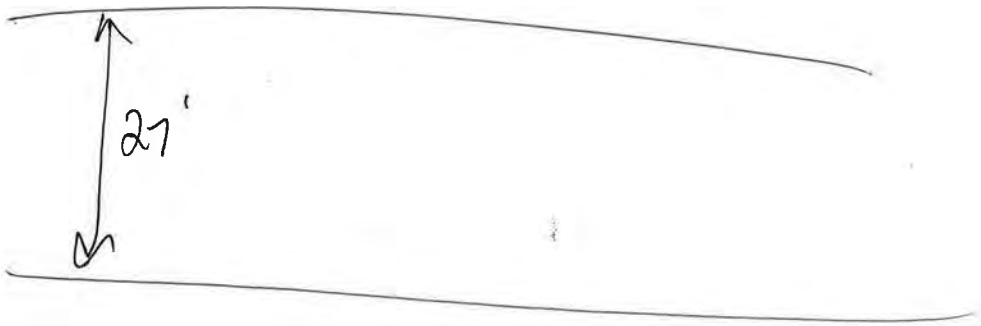


	Photo ID: Coordinates: Description:	WC_T047_STR_300_USC 30.396586, -97.511625 Upstream channel
	Photo ID: Coordinates: Description:	WC_T047_STR_300_USF 30.396586, -97.511625 Upstream face

	Photo ID: Coordinates: Description:	WC_T047_STR_300_DSF 30.396586, -97.511625 Downstream face
	Photo ID: Coordinates: Description:	WC_T047_STR_300_DSC 30.396586, -97.511625 Downstream channel

	Photo ID: Coordinates: Description:	WC_T047_STR_300_DSL 30.396586, -97.511625 Downstream left
	Photo ID: Coordinates: Description:	WC_T047_STR_300_DSR 30.396586, -97.511625 Downstream right

	Photo ID: Coordinates: Description:	WC_T047_STR_300_OVERVIEW 30.396586, -97.511625 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: WC_T047_STR-600 DATE: _____

LOCATION: _____ CREW: _____

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 28" Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 3 Shape: box Length: _____ Height: 8' Width: 10' Skew: _____

CULVERT: I/O Type: _____ Material: concrete Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

ERM Description: _____ Coordinate System: _____

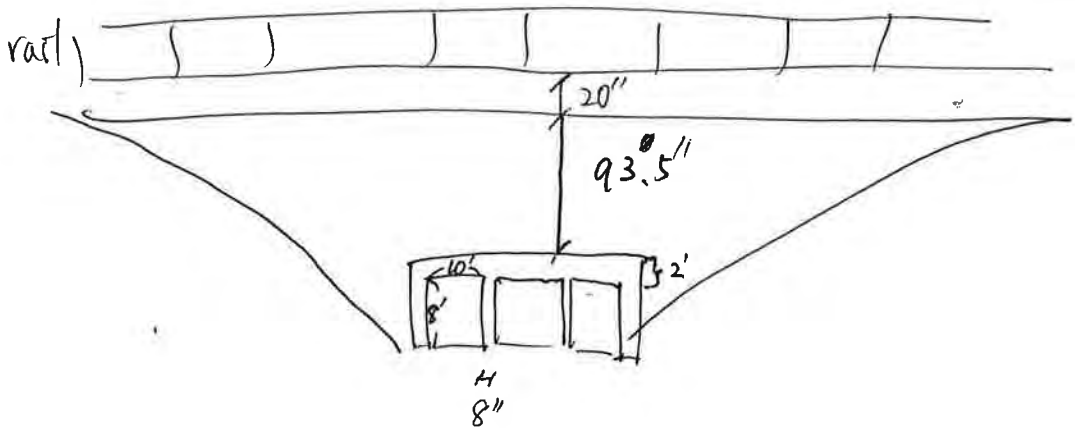
Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 20B_ROB_6

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)

TXDot bridge # 142271200 02021



PLAN VIEW:

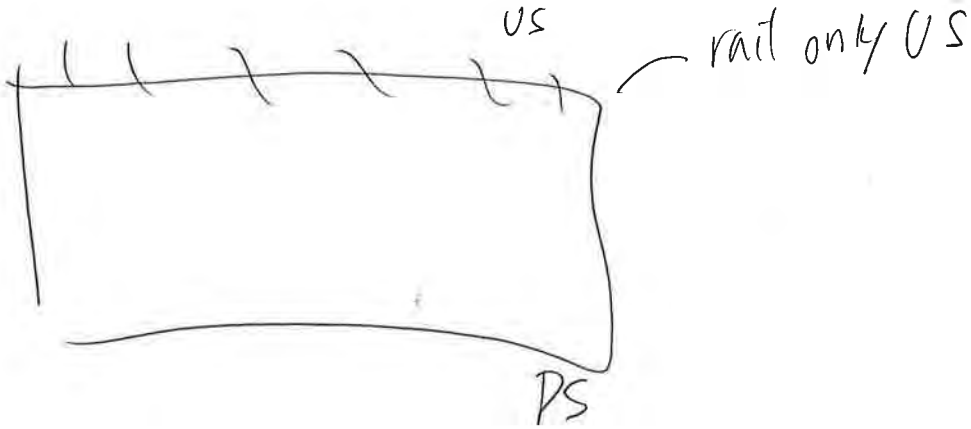


	Photo ID: Coordinates: Description:	WC_T047_STR_600_USC_1 30.403355, -97.516579 Upstream channel
	Photo ID: Coordinates: Description:	WC_T047_STR_600_USC_2 30.403355, -97.516579 Upstream channel

	Photo ID: Coordinates: Description:	WC_T047_STR_600_USF 30.403355, -97.516579 Upstream face
	Photo ID: Coordinates: Description:	WC_T047_STR_600_DSF 30.403355, -97.516579 Downstream face

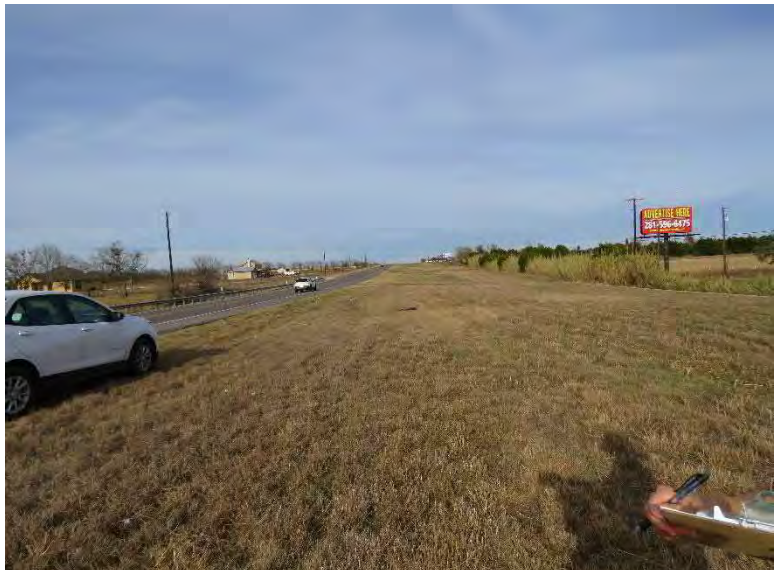
	Photo ID: Coordinates: Description:	WC_T047_STR_600_DSC 30.403355, -97.516579 Downstream channel
	Photo ID: Coordinates: Description:	WC_T047_STR_600_LOB 30.403355, -97.516579 Left overbank

	Photo ID: Coordinates: Description:	WC_T047_STR_600_ROB 30.403355, -97.516579 Right overbank
	Photo ID: Coordinates: Description:	WC_T047_STR_600_OVERVIEW 30.403355, -97.516579 Overview

HALFF

Survey Field Sheet

PROJECT: Wilbarger SURVEY NAME:

STREAM NAME: WC_T047_STR_700 DATE: 12/18/19

LOCATION: CREW: As a ME

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:

CULVERT: Number: 4 Shape: ~~Round~~ CHPSE Length: 55' Height: 4.5' Width: 6' Skew: yes

CULVERT: I/O Type: Material: CMP Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

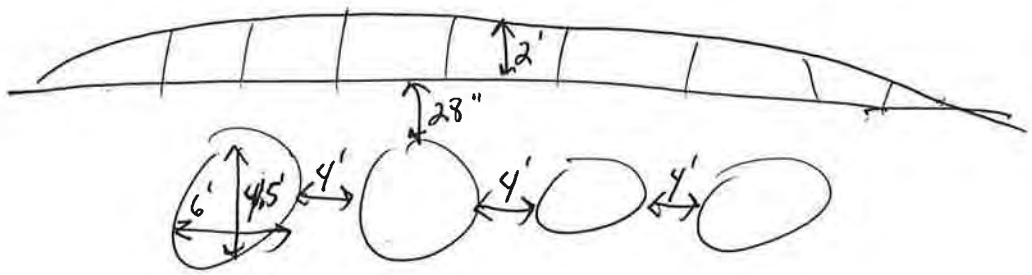
ERM Description: Coordinate System:

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOB 5 overall ROB 6

Additional Info: projecting from fill

File Name:

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

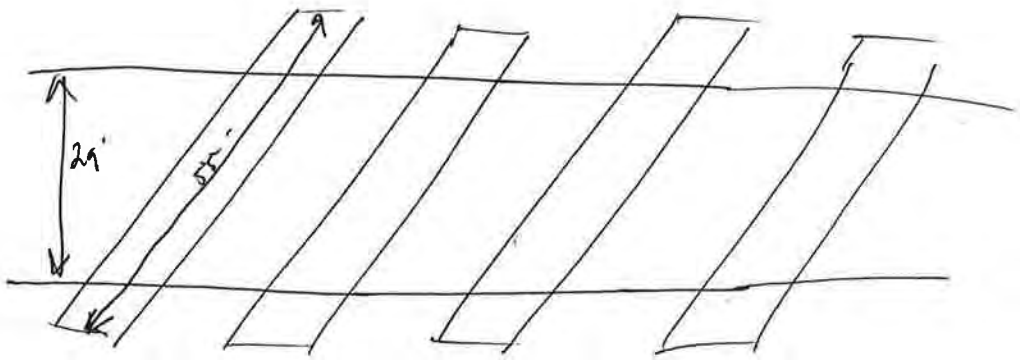


	Photo ID: Coordinates: Description:	WC_T047_STR_700_USC 30.427025, -97.531914 Upstream channel
	Photo ID: Coordinates: Description:	WC_T047_STR_700_USF 30.427025, -97.531914 Upstream face

	Photo ID: Coordinates: Description:	WC_T047_STR_700_DSF 30.427025, -97.531914 Downstream face
	Photo ID: Coordinates: Description:	WC_T047_STR_700_DSC 30.427025, -97.531914 Downstream channel

	Photo ID: Coordinates: Description:	WC_T047_STR_700_LOB 30.427025, -97.531914 Left overbank
	Photo ID: Coordinates: Description:	WC_T047_STR_700_ROB 30.427025, -97.531914 Right overbank

	Photo ID: Coordinates: Description:	WC_T047_STR_700_OVERVIEW 30.427025, -97.531914 Overview
	Photo ID: Coordinates: Description:	WC_T047_STR_700_CULV 30.427025, -97.531914 Culvert picture

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: Wilb. Creek TO56 DATE: 11/22/19

LOCATION: WC_TO56_STR_100 CREW: JG + ML

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: 24.5' Pier(s): 1 @ _____ Pier Shape:

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

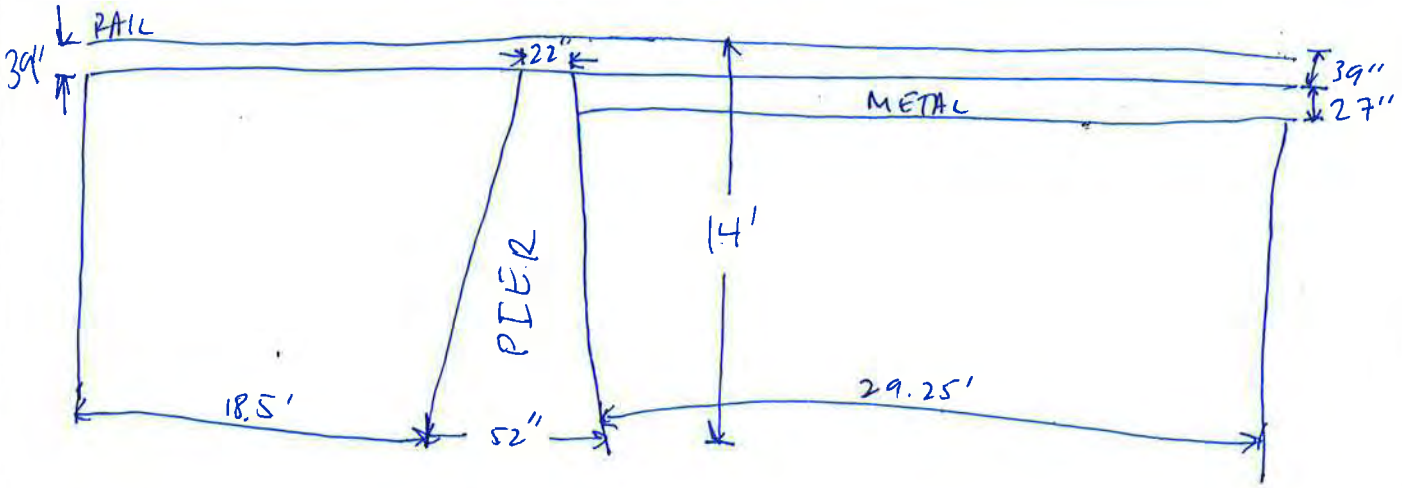
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 5 USF: 1, 2 DSF: 3, 4 DSC: 6 LOB: 7 ROB: 8

Additional Info: Beveled @ bottom of rail, ~45° wingwalls Overview: 9

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

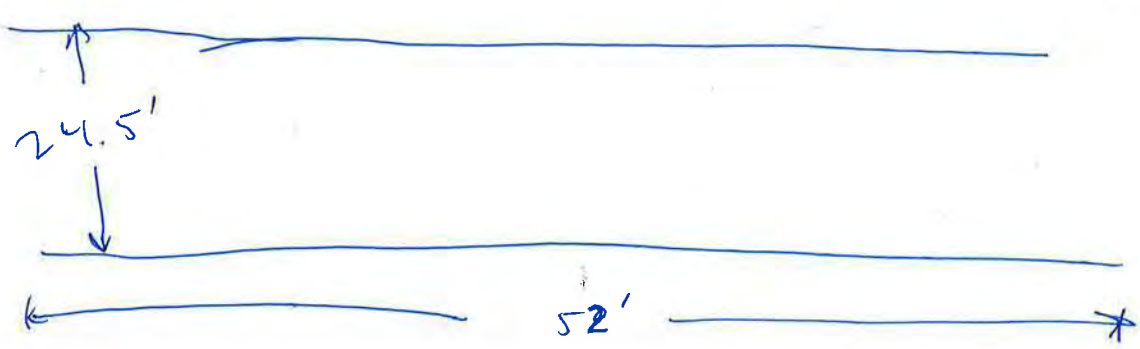


	Photo ID: Coordinates: Description:	WC_T056_STR_100_USC 30.378289, -97.488968 Upstream channel
	Photo ID: Coordinates: Description:	WC_T056_STR_100_USF_1 30.378289, -97.488968 Upstream face

	Photo ID: Coordinates: Description:	WC_T056_STR_100_USF_2 30.378289, -97.488968 Upstream face
	Photo ID: Coordinates: Description:	WC_T056_STR_100_DSF_1 30.378289, -97.488968 Downstream face

	Photo ID: Coordinates: Description:	WC_T056_STR_100_DSF_2 30.378289, -97.488968 Downstream face
	Photo ID: Coordinates: Description:	WC_T056_STR_100_DSC 30.378289, -97.488968 Downstream channel

	Photo ID: Coordinates: Description:	WC_T056_STR_100_LOB 30.378289, -97.488968 Left overbank
	Photo ID: Coordinates: Description:	WC_T056_STR_100_ROB 30.378289, -97.488968 Right overbank

	Photo ID: Coordinates: Description:	WC_T056_STR_100_OVERVIEW 30.378289, -97.488968 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: _____ CREW: _____

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: _____ USF: _____ DSF: _____ DSC: _____

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)

WC_T047_STR_100 (USF:3, DSC:4)
& WC_T056_STR_200 (DSF:1; DSC:2

Confluence: 5, 6

PLAN VIEW:

	Photo ID: Coordinates: Description:	WC_T056_STR_200_DSF 30.38743, -97.501753 Downstream face
	Photo ID: Coordinates: Description:	WC_T056_STR_200_DSC 30.38743, -97.501753 Downstream channel

	Photo ID: Coordinates: Description:	WC_T056_STR_200_WC_T056_STR_200_CONFLUENCE 30.38743, -97.501753 Confluence of WC_T056_STR_200 and WC_T056_STR_200

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: WC_T056_STR_300 DATE: _____

LOCATION: _____ CREW: _____

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 26" Deck: 20" Width: 34' Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 4 Shape: box Length: _____ Height: 7' Width: 10' Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

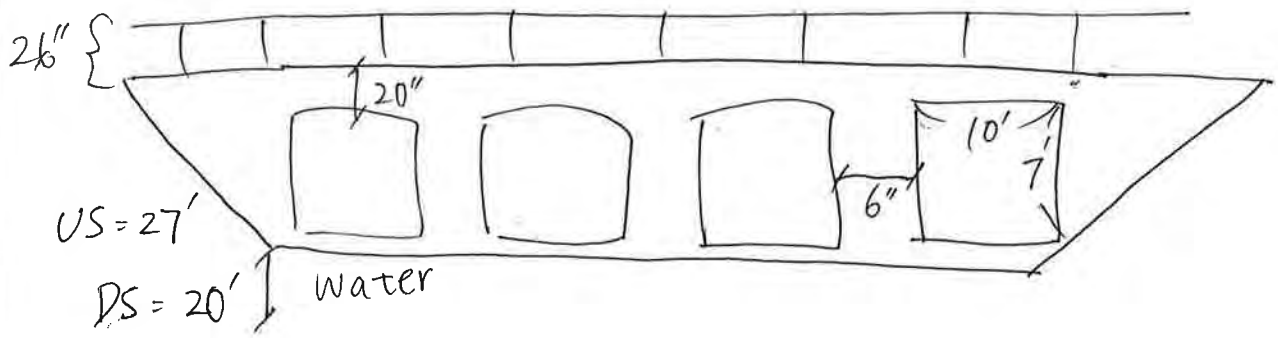
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2, 3 DSF: 4 DSC: 5 LOBGROBT

Additional Info: overview 8

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

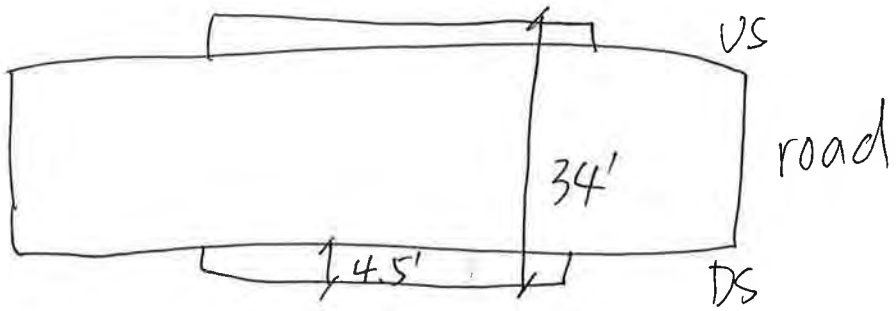
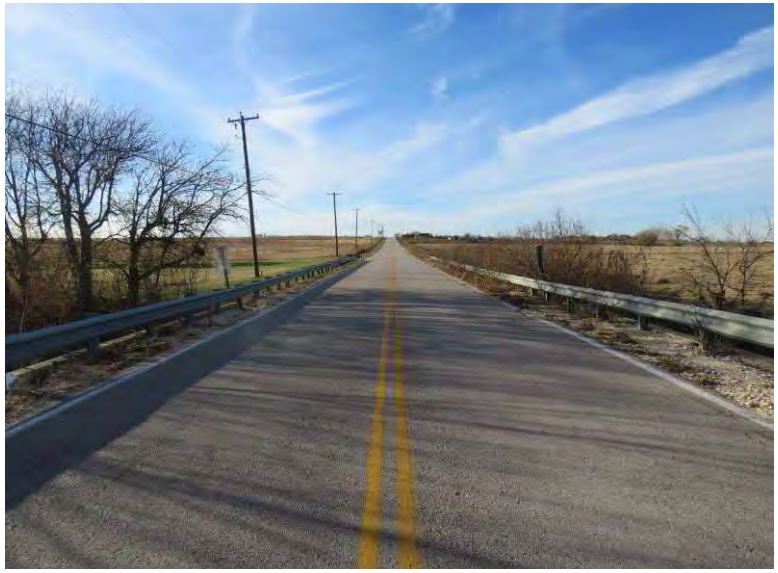


	Photo ID: Coordinates: Description:	WC_T056_STR_300_USC 30.405679, -97.506391 Upstream channel
	Photo ID: Coordinates: Description:	WC_T056_STR_300_USF_1 30.405679, -97.506391 Upstream face

	Photo ID: Coordinates: Description:	WC_T056_STR_300_USF_2 30.405679, -97.506391 Upstream face
	Photo ID: Coordinates: Description:	WC_T056_STR_300_DSF 30.405679, -97.506391 Downstream face

	Photo ID: Coordinates: Description:	WC_T056_STR_300_DSC 30.405679, -97.506391 Downstream channel
	Photo ID: Coordinates: Description:	WC_T056_STR_300_LOB 30.405679, -97.506391 Left overbank

	Photo ID: Coordinates: Description:	WC_T056_STR_300_ROB 30.405679, -97.506391 Right overbank
	Photo ID: Coordinates: Description:	WC_T056_STR_300_OVERVIEW 30.405679, -97.506391 Overview

HALFF

Survey Field Sheet

PROJECT: 056 SURVEY NAME:

STREAM NAME: WC-T[redacted]-STR-400[redacted] DATE:

LOCATION: CREW:

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: Deck: Width: [redacted] Pier(s): @ Pier Shape:

CULVERT: Number: 6 Shape: BOX Length: Height: 8' Width: 12' Skew: V

CULVERT: I/O Type: Material: Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

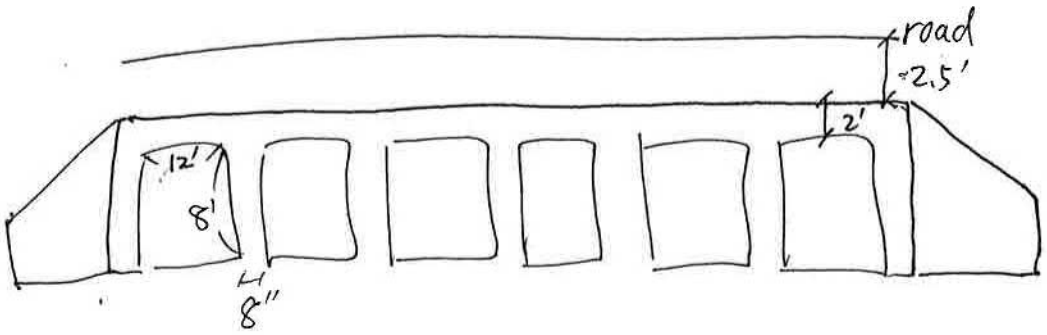
ERM Description: Coordinate System:

Photo Numbers: USC: 1 USF: 2,3 DSF: 4 DSC: 5 LOB & ROB overview

Additional Info:

File Name:

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

	Photo ID: Coordinates: Description:	WC_T056_STR_400_USC 30.414034, -97.509782 Upstream channel
	Photo ID: Coordinates: Description:	WC_T056_STR_400_USF_1 30.414034, -97.509782 Upstream face

	Photo ID: Coordinates: Description:	WC_T056_STR_400_USF_2 30.414034, -97.509782 Upstream face
	Photo ID: Coordinates: Description:	WC_T056_STR_400_DSF 30.414034, -97.509782 Downstream face

	Photo ID: Coordinates: Description:	WC_T056_STR_400_DSC 30.414034, -97.509782 Downstream channel
	Photo ID: Coordinates: Description:	WC_T056_STR_400_LOB 30.414034, -97.509782 Left overbank

	Photo ID: Coordinates: Description:	WC_T056_STR_400_ROB 30.414034, -97.509782 Right overbank

HALFF

Survey Field Sheet

PROJECT: Wilbarger SURVEY NAME:

STREAM NAME: WC_T056_STR_600 (500?) DATE: 12/18/19

LOCATION: CREW: As & me

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:

CULVERT: Number: 3.5 Shape: box Length: 21.5' Height: 7 Width: 10 Skew: no

CULVERT: I/O Type: Material: Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

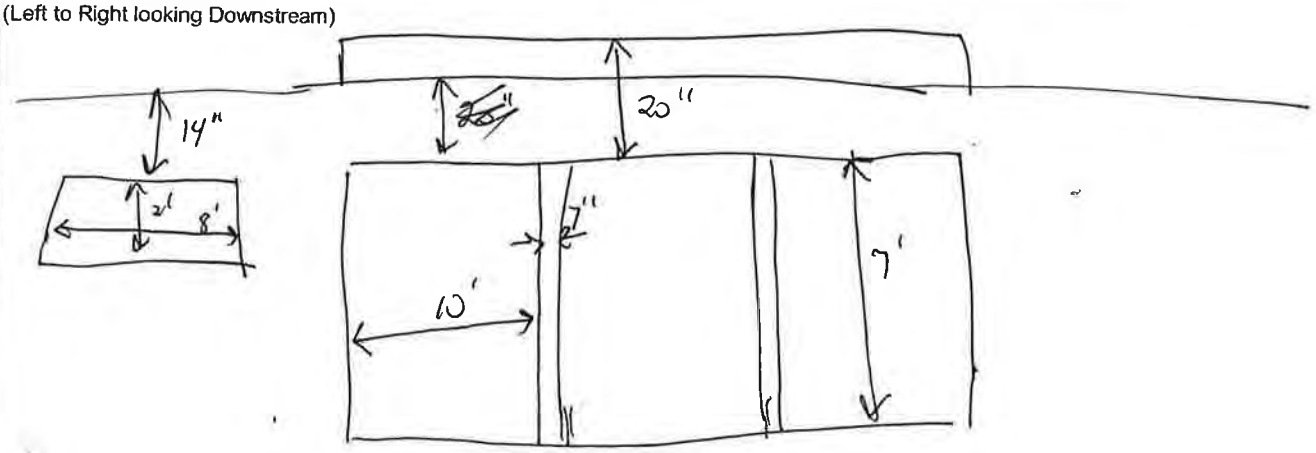
ERM Description: Coordinate System:

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOB 8 ROB 6 overview

Additional Info: blue house on US side & barn on DS side ~~flood~~ have flooded

File Name:

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

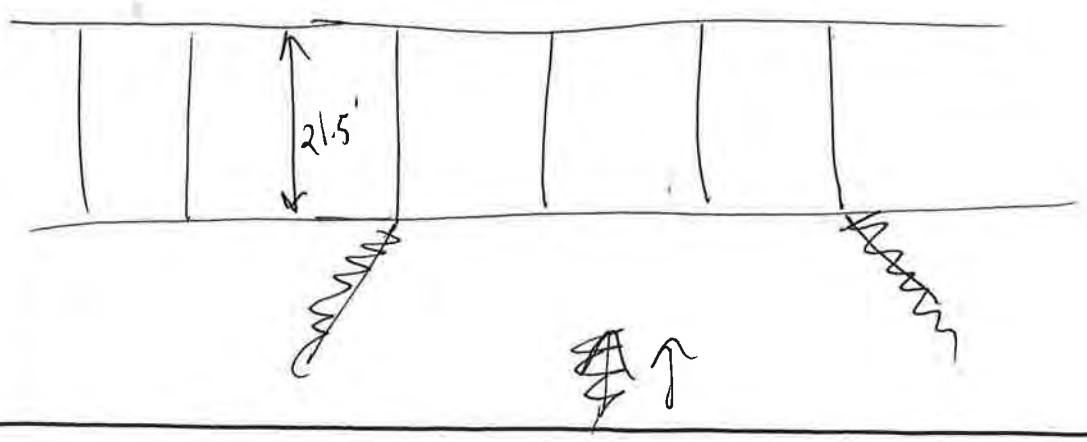


	Photo ID: Coordinates: Description:	WC_T056_STR_500_USC 30.440729, -97.521476 Upstream channel
	Photo ID: Coordinates: Description:	WC_T056_STR_500_USF 30.440729, -97.521476 Upstream face

	Photo ID: Coordinates: Description:	WC_T056_STR_500_DSF 30.440729, -97.521476 Downstream face
No photo	Photo ID: Coordinates: Description:	WC_T056_STR_500_DSC 30.440729, -97.521476 Downstream channel

	Photo ID: Coordinates: Description:	WC_T056_STR_500_LOB 30.440729, -97.521476 Left overbank
	Photo ID: Coordinates: Description:	WC_T056_STR_500_ROB 30.440729, -97.521476 Right overbank

	Photo ID: Coordinates: Description:	WC_T056_STR_500_OVERVIEW 30.440729, -97.521476 Overview

HALFF **Survey Field Sheet**

PROJECT: Wilbarger SURVEY NAME:

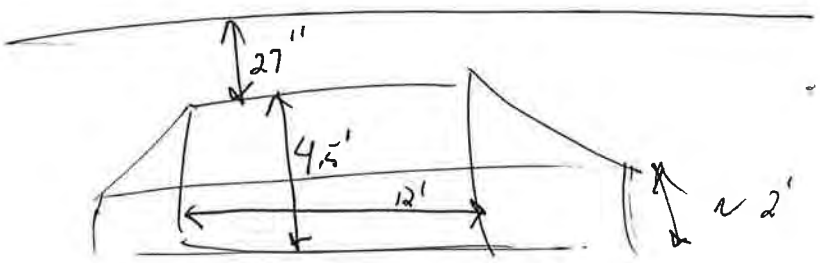
STREAM NAME: WC-T056-STR-800 DATE: 12/18/19

LOCATION: CREW: As & Me

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE:	Rail Height:		Deck:		Width:		Pier(s):		@		Pier Shape:
CULVERT:	Number:	1	Shape:	box	Length:	20'	Height:	4.5'	Width:	12'	Skew: NO
CULVERT:	I/O Type:				Material:		Wingwall Angle				
DAM:	Top Width:		Side Slope		Side Slope		US:		DS:		Outlet:
ERM Description:							Coordinate System:				
Photo Numbers:			USC:	-1	USF:	1	DSF:	2	DSC:	3	LOB 4 ROB 5 overview
Additional Info:			barn on DS side will flood occasionally, landowner said DS is a spring								
File Name:											

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

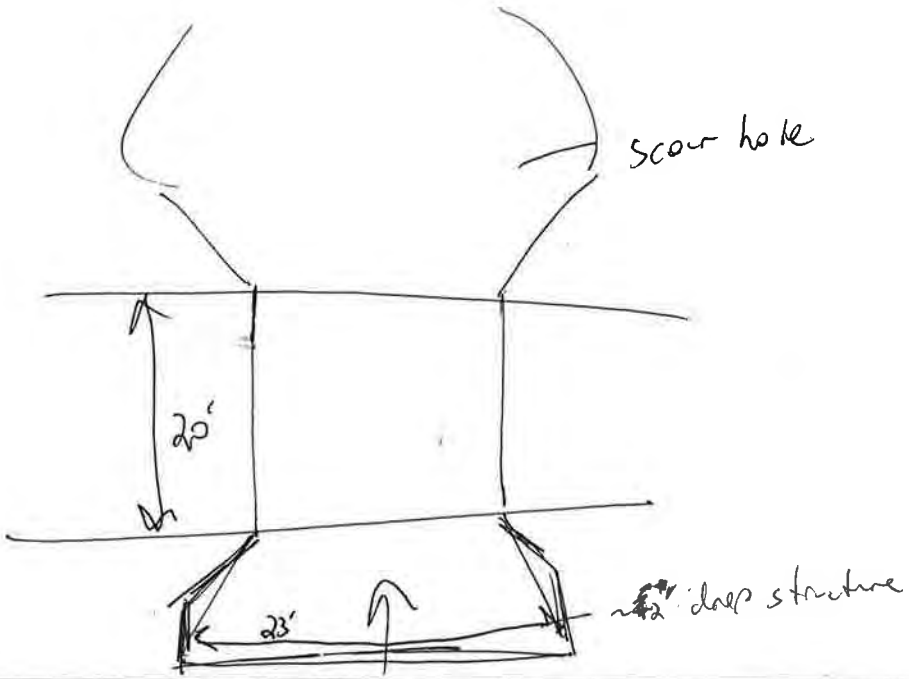


	Photo ID: Coordinates: Description:	WC_T056_STR_800_USC 30.464217, -97.524887 Upstream channel
	Photo ID: Coordinates: Description:	WC_T056_STR_800_USF 30.464217, -97.524887 Upstream face

	Photo ID: Coordinates: Description:	WC_T056_STR_800_DSF 30.464217, -97.524887 Downstream face
	Photo ID: Coordinates: Description:	WC_T056_STR_800_DSC 30.464217, -97.524887 Downstream channel

	Photo ID: Coordinates: Description:	WC_T056_STR_800_LOB 30.464217, -97.524887 Left overbank
	Photo ID: Coordinates: Description:	WC_T056_STR_800_ROB 30.464217, -97.524887 Right overbank

	Photo ID: Coordinates: Description:	WC_T056_STR_800_OVERVIEW 30.464217, -97.524887 Overview

HALFF

Survey Field Sheet

PROJECT: Wilbarger SURVEY NAME:

STREAM NAME: WC_T062_STR_200 DATE: 12/18/19

LOCATION: CREW: AS & ML

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:

CULVERT: Number: 1 Shape: Box Length: 19.5 Height: 5' Width: 12' Skew: N/A

CULVERT: I/O Type: Material: Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

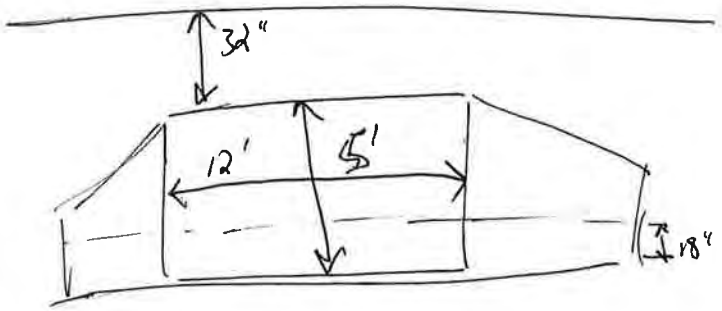
ERM Description: Coordinate System:

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOB 5 ROB 6 downstream

Additional Info:

File Name:

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

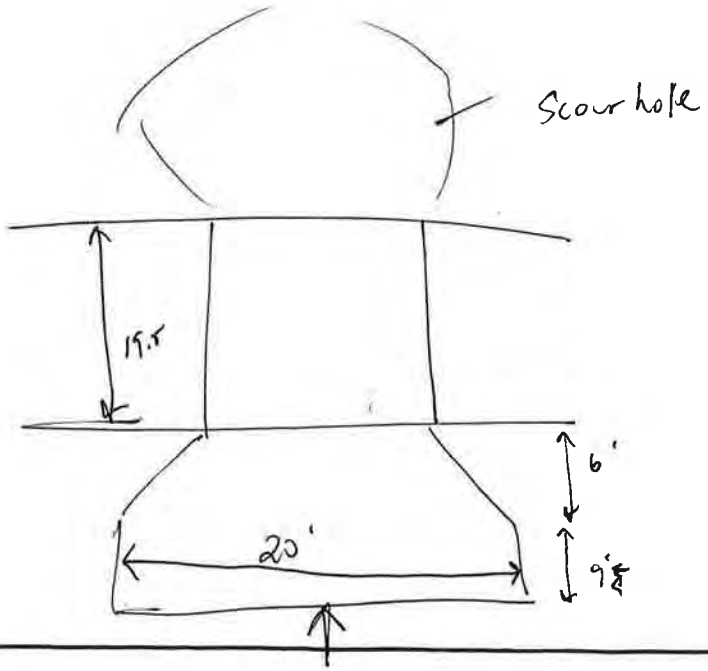


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	Photo ID: Coordinates: Description:	WC_T062_STR_200_USF 30.452489, -97.531254 Upstream face

	Photo ID: Coordinates: Description:	WC_T062_STR_200_DSF 30.452489, -97.531254 Downstream face
	Photo ID: Coordinates: Description:	WC_T062_STR_200_DSC 30.452489, -97.531254 Downstream channel

	Photo ID: Coordinates: Description:	WC_T062_STR_200_LOB 30.452489, -97.531254 Left overbank
	Photo ID: Coordinates: Description:	WC_T062_STR_200_ROB 30.452489, -97.531254 Right overbank

	Photo ID: Coordinates: Description:	WC_T062_STR_200_OVERVIEW 30.452489, -97.531254 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: 11/25/19

LOCATION: WC_T080_STR_100 CREW: JG + ML

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 20" Deck: 11.5" Width: _____ Pier(s): 2 @ 5" Pier Shape: I Beams RECT.

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

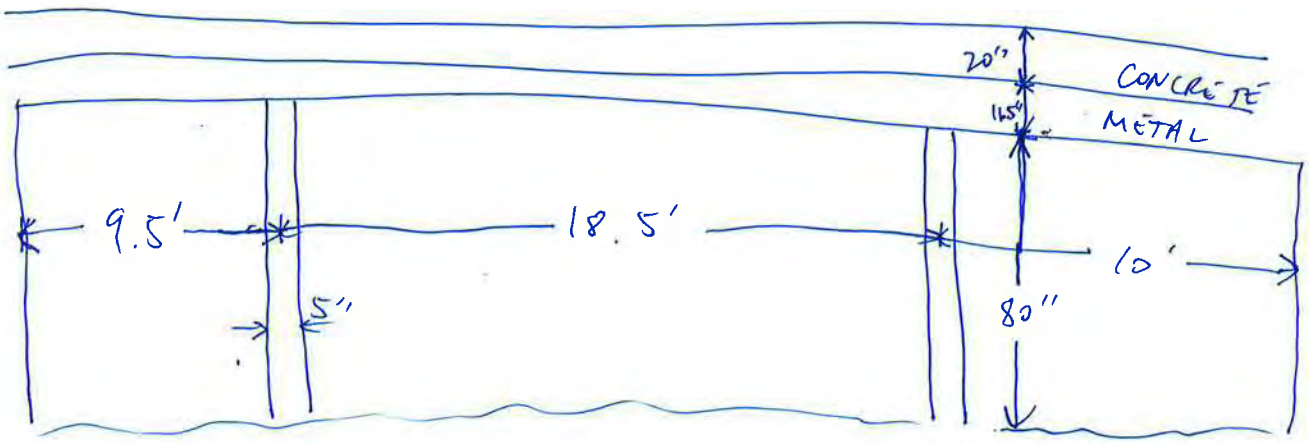
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2,3 DSF: 4 DSC: 6 CRACK: 5

Additional Info: Concrete abutments cracking, deck is sagging LOB: 7 ROB: 8 overview: 9

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

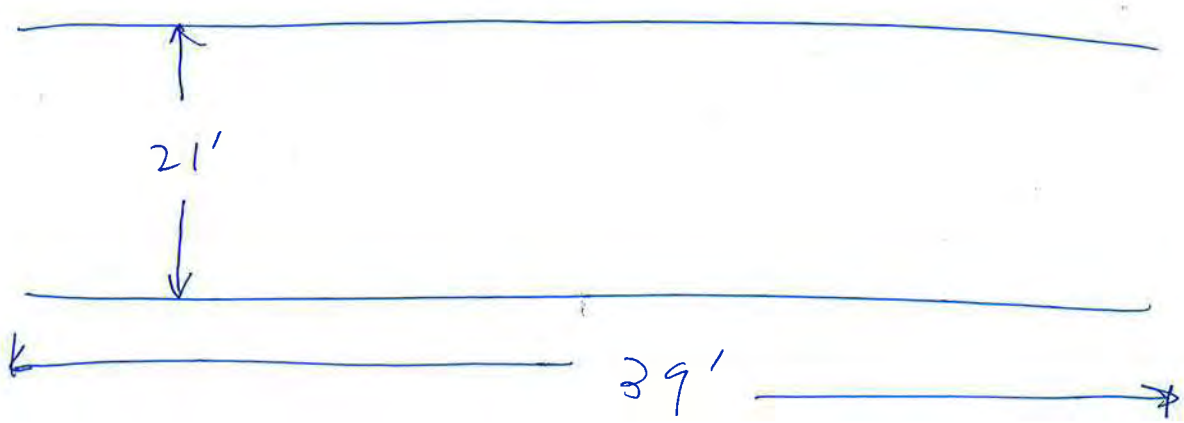


	Photo ID: Coordinates: Description:	WC_T080_STR_100_USC 30.417784, -97.482439 Upstream channel
	Photo ID: Coordinates: Description:	WC_T080_STR_100_USF_1 30.417784, -97.482439 Upstream face

	Photo ID: Coordinates: Description:	WC_T080_STR_100_USF_2 30.417784, -97.482439 Upstream face
	Photo ID: Coordinates: Description:	WC_T080_STR_100_DSF 30.417784, -97.482439 Downstream face

	Photo ID: Coordinates: Description:	WC_T080_STR_100_DSC 30.417784, -97.482439 Downstream channel
	Photo ID: Coordinates: Description:	WC_T080_STR_100_CRACK 30.417784, -97.482439 Bridge concrete abutments cracking

	Photo ID: Coordinates: Description:	WC_T080_STR_100_LOB 30.417784, -97.482439 Left overbank
	Photo ID: Coordinates: Description:	WC_T080_STR_100_ROB 30.417784, -97.482439 Right overbank

	Photo ID: Coordinates: Description:	WC_T080_STR_100_OVERVIEW 30.417784, -97.482439 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: 11/25/19

LOCATION: WC_T080_STR_200 CREW: JG + ML

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 3 Shape: RECT Length: 37.5' Height: 6' Width: 10' Skew: NO

CULVERT: I/O Type: Beveled Material: RCP Wingwall Angle 45°

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

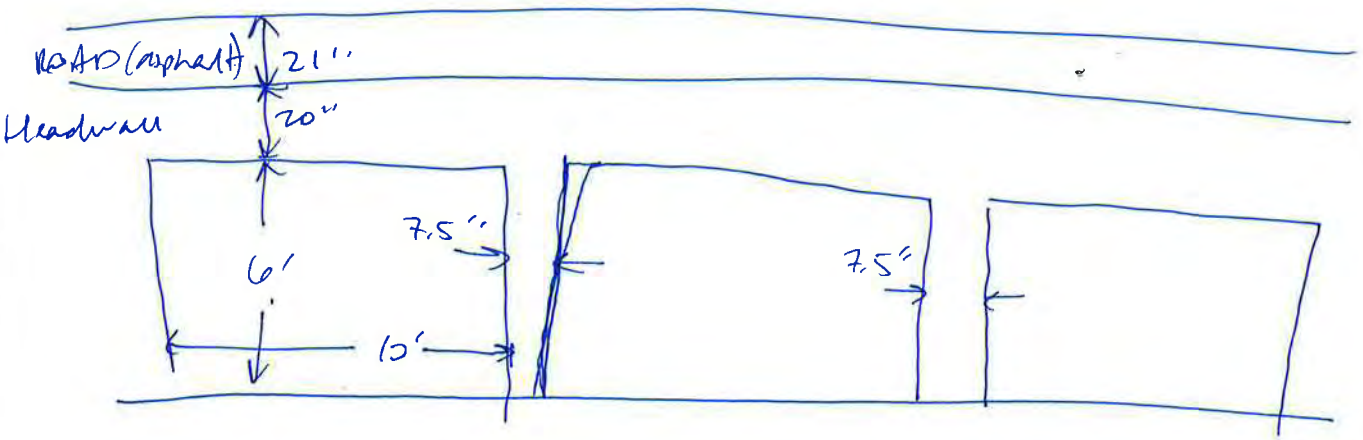
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1, 2 USF: 3 DSF: 4 DSC: 5 LOB: 6 ROB: 7

Additional Info: US concrete drop structure is failing, 5' drop from overlain structure to channel, plenty of erosion, found an exposed pipe, possible utility, possibly

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

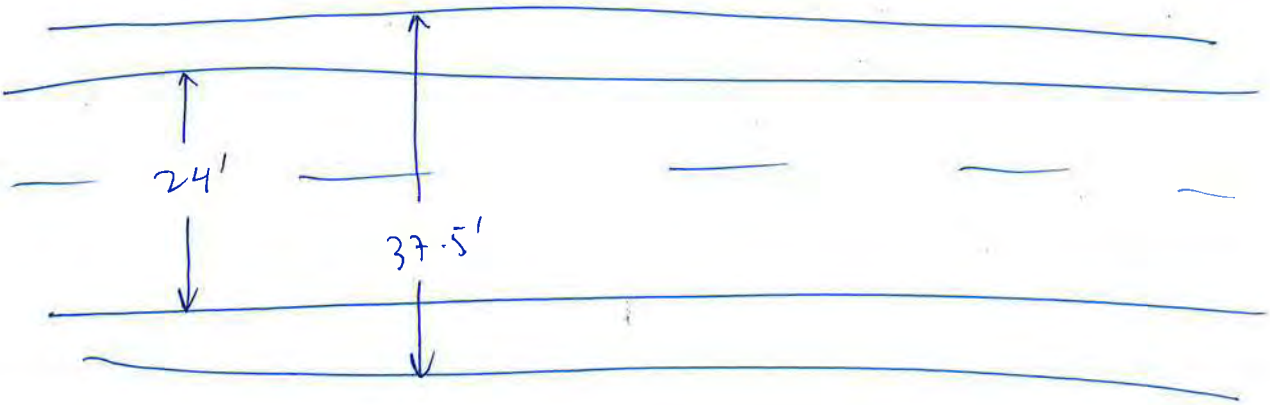


	Photo ID: Coordinates: Description:	WC_T080_STR_200_USC_1 30.432606, -97.485109 Upstream channel
	Photo ID: Coordinates: Description:	WC_T080_STR_200_USC_2 30.432606, -97.485109 Upstream channel

	Photo ID: Coordinates: Description:	WC_T080_STR_200_USF 30.432606, -97.485109 Upstream face
	Photo ID: Coordinates: Description:	WC_T080_STR_200_DSF 30.432606, -97.485109 Downstream face

	Photo ID: Coordinates: Description:	WC_T080_STR_200_DSC 30.432606, -97.485109 Downstream channel
	Photo ID: Coordinates: Description:	WC_T080_STR_200_LOB 30.432606, -97.485109 Left overbank

	Photo ID: Coordinates: Description:	WC_T080_STR_200_ROB 30.432606, -97.485109 Right overbank
	Photo ID: Coordinates: Description:	WC_T080_STR_200_OVERVIEW 30.432606, -97.485109 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: 11/25/19

LOCATION: WC_TD80_STR_300 CREW: JG & ML

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 30" Deck: 6'4" Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 6 Shape: RECT Length: 144.5' Height: 8' Width: 10' Skew: _____

CULVERT: I/O Type: beveled, 45° wingwall Material: RCP Wingwall Angle 45°

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

ERM Description: _____ Coordinate System: _____

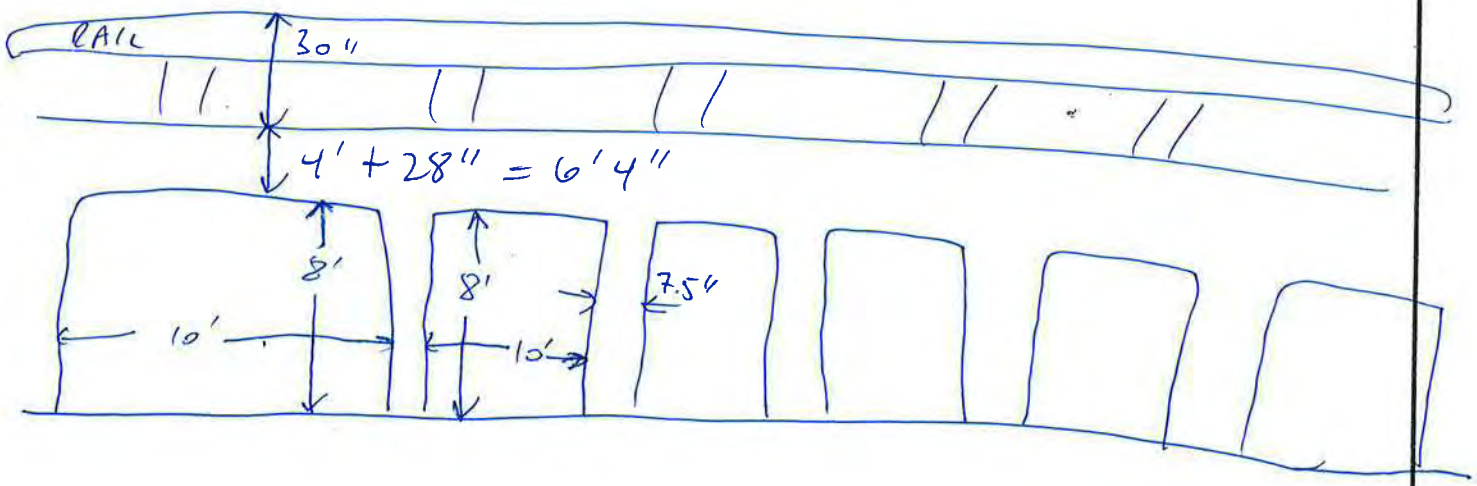
Photo Numbers: USC: 1, 2 USF: 3, 4 DSF: 5, 6 DSC: 7, 8 LOB: 9 ROB: 10

Additional Info: overview: 11

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)

Based on DS side (higher than US)



PLAN VIEW:

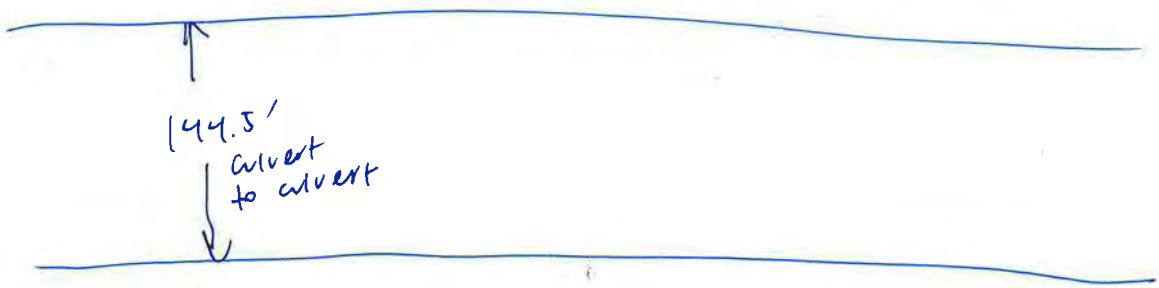


	Photo ID: Coordinates: Description:	WC_T080_STR_300_USC_1 30.435881, -97.485325 Upstream channel
	Photo ID: Coordinates: Description:	WC_T080_STR_300_USC_2 30.435881, -97.485325 Upstream channel

	Photo ID: Coordinates: Description:	WC_T080_STR_300_USF_1 30.435881, -97.485325 Upstream face
	Photo ID: Coordinates: Description:	WC_T080_STR_300_USF_2 30.435881, -97.485325 Upstream face

	Photo ID: Coordinates: Description:	WC_T080_STR_300_DSF_1 30.435881, -97.485325 Downstream face
	Photo ID: Coordinates: Description:	WC_T080_STR_300_DSF_2 30.435881, -97.485325 Downstream face

	Photo ID: Coordinates: Description:	WC_T080_STR_300_DSC_1 30.435881, -97.485325 Downstream channel
	Photo ID: Coordinates: Description:	WC_T080_STR_300_DSC_2 30.435881, -97.485325 Downstream channel

	Photo ID: Coordinates: Description:	WC_T080_STR_300_CULV_NUMBER 30.435881, -97.485325 Culvert number
	Photo ID: Coordinates: Description:	WC_T080_STR_300_LOB 30.435881, -97.485325 Left overbank

	Photo ID: Coordinates: Description:	WC_T080_STR_300_ROB 30.435881, -97.485325 Right overbank
	Photo ID: Coordinates: Description:	WC_T080_STR_300_OVERVIEW 30.435881, -97.485325 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: 4/25/19

LOCATION: NC-TOBD_STR-400 CREW: JCa & MC

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 4 Shape: ELLIPTICAL Length: 29'9" Height: 32.5" Width: 48" Skew: _____

CULVERT: I/O Type: No Swivel Material: CMP Wingwall Angle 90°

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

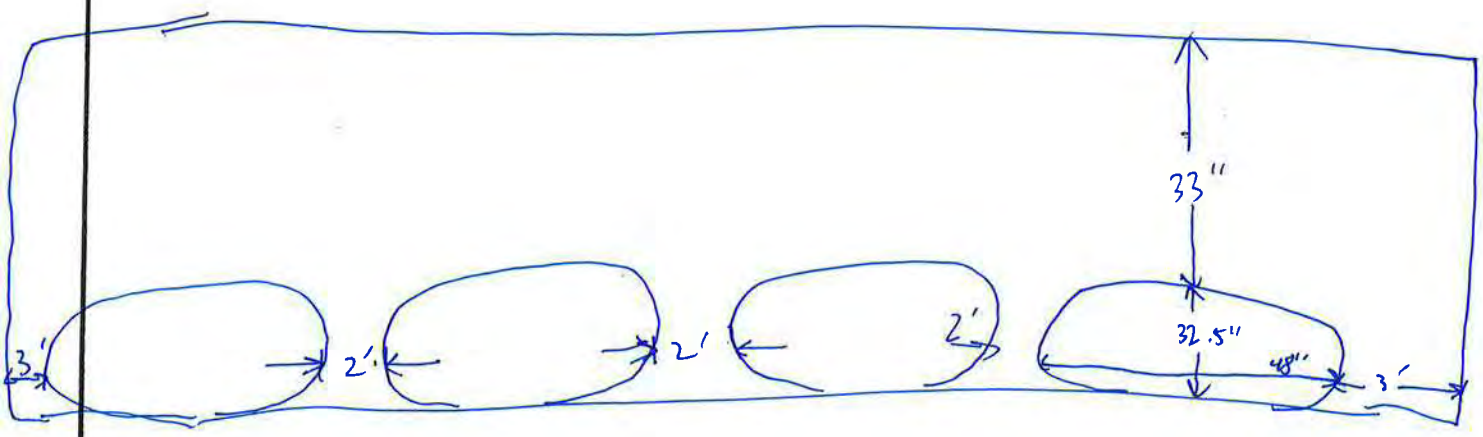
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 WB: 5 RoB: 6

Additional Info: US drop structure lets in roadside ditches on either side. Overview?

File Name: Drop structure 16", Baffles on DS side

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

	Photo ID: Coordinates: Description:	WC_T080_STR_400_USC 30.451746, -97.49602 Upstream channel
	Photo ID: Coordinates: Description:	WC_T080_STR_400_USF 30.451746, -97.49602 Upstream face

	Photo ID: Coordinates: Description:	WC_T080_STR_400_DSF 30.451746, -97.49602 Downstream face
	Photo ID: Coordinates: Description:	WC_T080_STR_400_DSC 30.451746, -97.49602 Downstream channel

	Photo ID: Coordinates: Description:	WC_T080_STR_400_LOB 30.451746, -97.49602 Left overbank
	Photo ID: Coordinates: Description:	WC_T080_STR_400_ROB 30.451746, -97.49602 Right overbank

	Photo ID: Coordinates: Description:	WC_T080_STR_400_OVERVIEW 30.451746, -97.49602 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: WC – TOBO – STR 502 DATE: _____

LOCATION: _____ CREW: _____

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 56" Deck: ~~(3' 8"~~ Width: 12' Pier(s): 0 @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

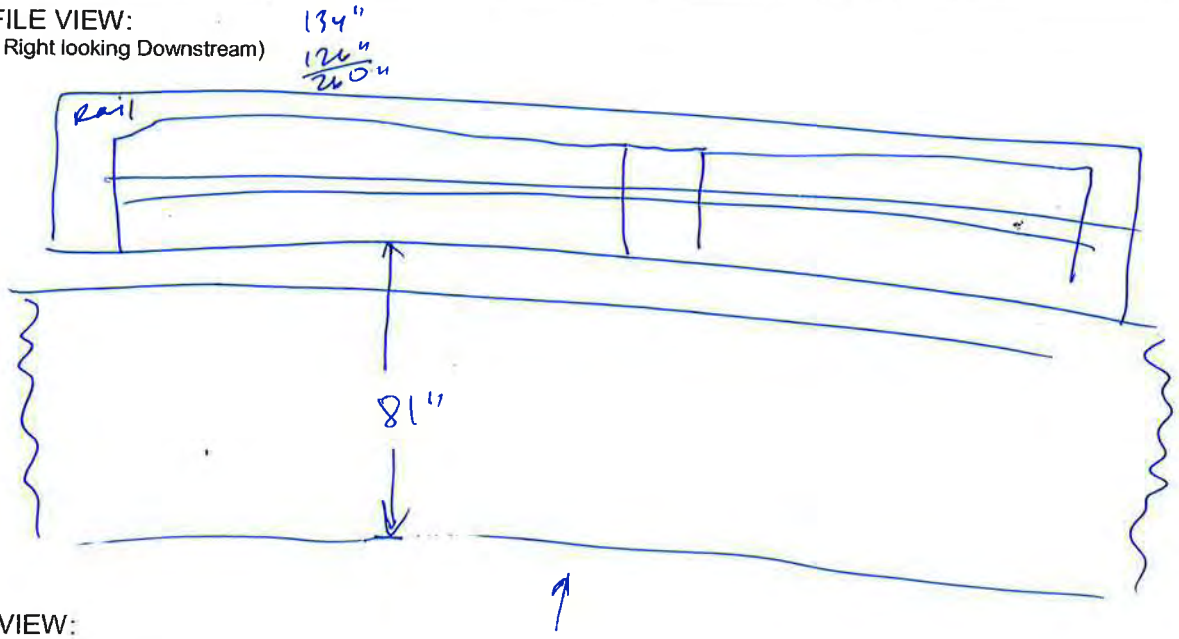
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOR: 5 ROR: 6 OUT: 7

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

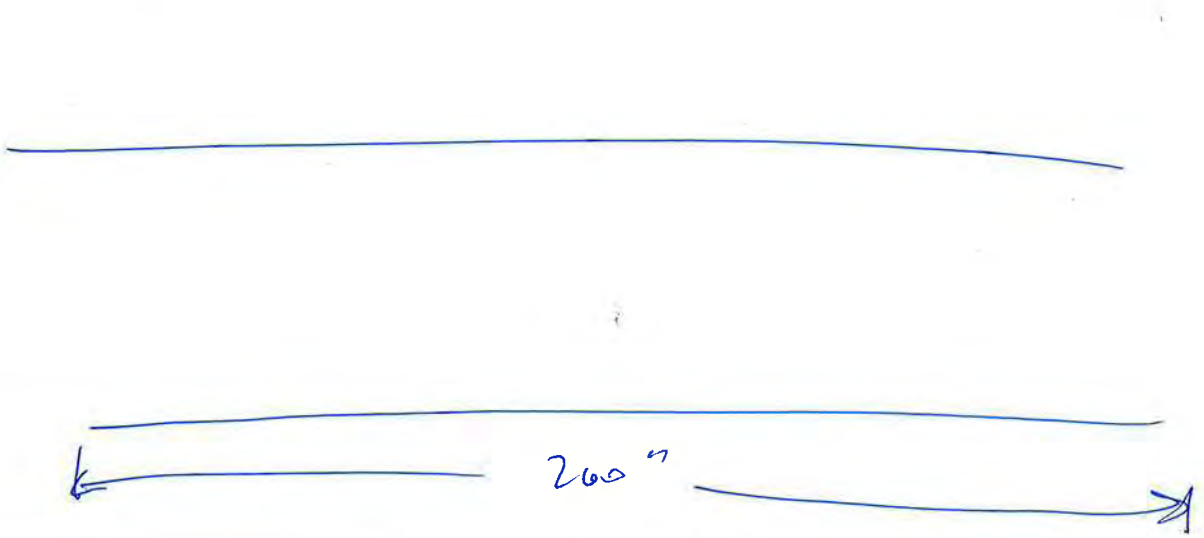


	Photo ID: Coordinates: Description:	WC_T080_STR_500_USC 30.454939, -97.498827 Upstream channel
	Photo ID: Coordinates: Description:	WC_T080_STR_500_USF 30.454939, -97.498827 Upstream face

	Photo ID: Coordinates: Description:	WC_T080_STR_500_DSF 30.454939, -97.498827 Downstream face
	Photo ID: Coordinates: Description:	WC_T080_STR_500_DSC 30.454939, -97.498827 Downstream channel

	Photo ID: Coordinates: Description:	WC_T080_STR_500_LOB 30.454939, -97.498827 Left overbank
	Photo ID: Coordinates: Description:	WC_T080_STR_500_ROB 30.454939, -97.498827 Right overbank

	Photo ID: Coordinates: Description:	WC_T080_STR_500_OVERVIEW 30.454939, -97.498827 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: WC_T080_STR-6020 CREW: _____

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 3 Shape: circ Length: 102" & 102" Height: 2' Width: 2' Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: _____ USF: _____ DSF: _____ DSC: _____

Additional Info: very broken up culvert, mostly just took pics bc private property

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)

PLAN VIEW:

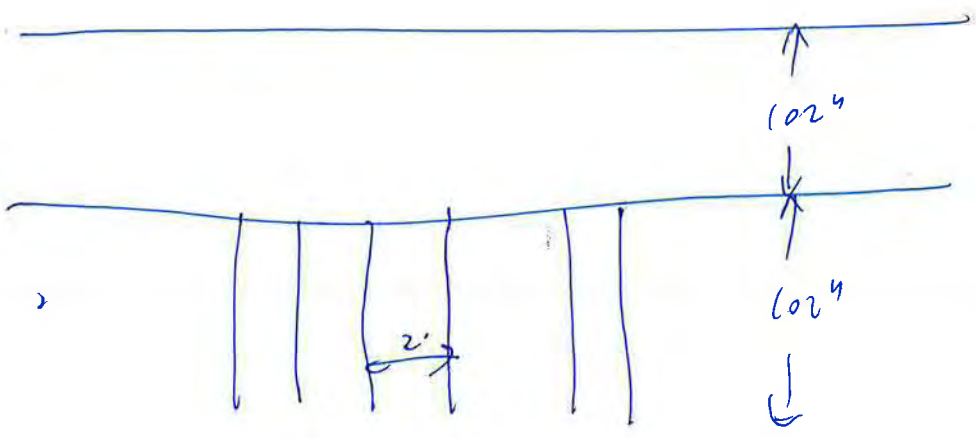


	Photo ID: Coordinates: Description:	WC_T080_STR_600_USC 30.45643, -97.49924 Upstream channel
	Photo ID: Coordinates: Description:	WC_T080_STR_600_USF 30.45643, -97.49924 Upstream face

	Photo ID: Coordinates: Description:	WC_T080_STR_600_DSF 30.45643, -97.49924 Downstream face
	Photo ID: Coordinates: Description:	WC_T080_STR_600_DSC 30.45643, -97.49924 Downstream channel

	Photo ID: Coordinates: Description:	WC_T080_STR_600_LOB 30.45643, -97.49924 Left overbank
	Photo ID: Coordinates: Description:	WC_T080_STR_600_ROB 30.45643, -97.49924 Right overbank

	Photo ID: Coordinates: Description:	WC_T080_STR_600_OVERVIEW 30.45643, -97.49924 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: WC-T080-STR-800 DATE: _____

LOCATION: _____ CREW: _____

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: 28" Width: 22' Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 2 Shape: box Length: _____ Height: 4' Width: 9' Skew: _____

CULVERT: I/O Type: _____ Material: concrete Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

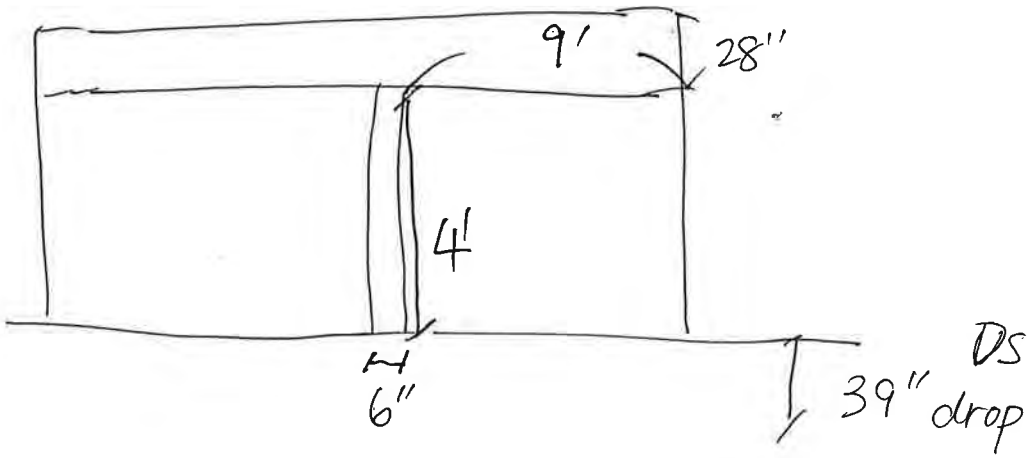
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOBS ROB 6 overview 7

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

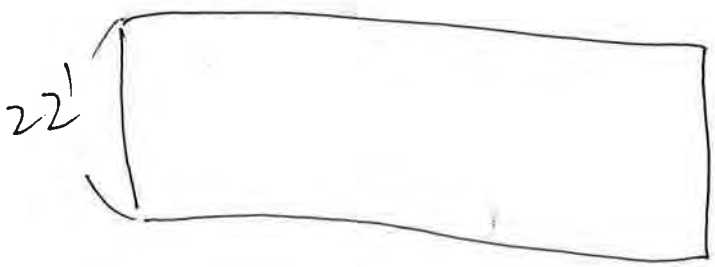


	Photo ID: Coordinates: Description:	WC_T080_STR_800_USC 30.46416, -97.504043 Upstream channel
	Photo ID: Coordinates: Description:	WC_T080_STR_800_USF 30.46416, -97.504043 Upstream face

	Photo ID: Coordinates: Description:	WC_T080_STR_800_DSF 30.46416, -97.504043 Downstream face
	Photo ID: Coordinates: Description:	WC_T080_STR_800_DSC 30.46416, -97.504043 Downstream channel

	Photo ID: Coordinates: Description:	WC_T080_STR_800_LOB 30.46416, -97.504043 Left overbank
	Photo ID: Coordinates: Description:	WC_T080_STR_800_ROB 30.46416, -97.504043 Right overbank

	Photo ID: Coordinates: Description:	WC_T080_STR_800_OVERVIEW 30.46416, -97.504043 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: WC-T080-STR-900 DATE: _____

LOCATION: _____ CREW: _____

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: 21' Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 1 Shape: box Length: 25.5' Height: 4' Width: 9' Skew: _____

CULVERT: I/O Type: _____ Material: concrete Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

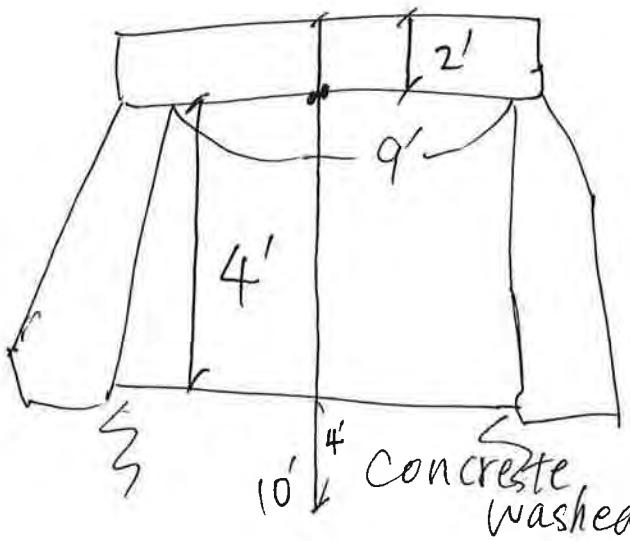
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 ~~LOB5 ROB6~~ overview 7

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

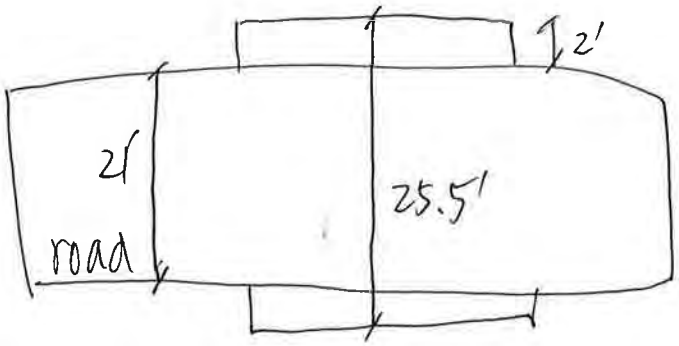


	Photo ID: Coordinates: Description:	WC_T080_STR_900_USC 30.470746, -97.504626 Upstream channel
	Photo ID: Coordinates: Description:	WC_T080_STR_900_USF 30.470746, -97.504626 Upstream face

	Photo ID: Coordinates: Description:	WC_T080_STR_900_DSF 30.470746, -97.504626 Downstream face
	Photo ID: Coordinates: Description:	WC_T080_STR_900_DSC 30.470746, -97.504626 Downstream channel

	Photo ID: Coordinates: Description:	WC_T080_STR_900_LOB 30.470746, -97.504626 Left overbank
	Photo ID: Coordinates: Description:	WC_T080_STR_900_ROB 30.470746, -97.504626 Right overbank

	Photo ID: Coordinates: Description:	WC_T080_STR_900_OVERVIEW 30.470746, -97.504626 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: 11/25/19

LOCATION: ~~WC_T082_STR_200~~ WC_T082_STR_100 CREW: JG + ML

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 2 Shape: RECT Length: 49'4" Height: 5' Width: 8' Skew: _____

CULVERT: I/O Type: beveled, 45° wingwall Material: RCP Wingwall Angle 45°

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

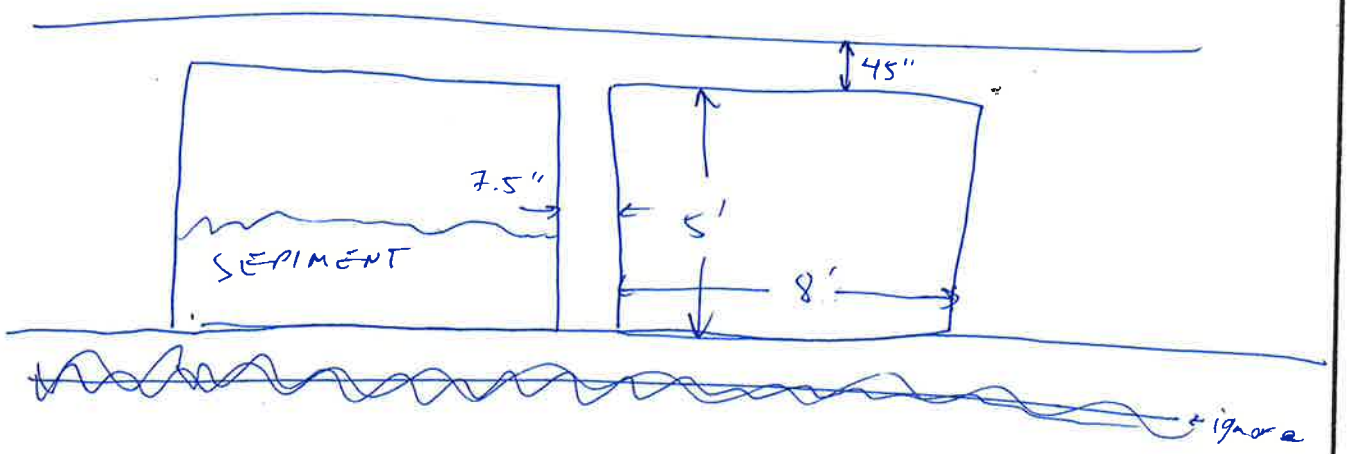
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1, 8, 9 USF: 2 DSF: 3 DSC: 4 LOB: 5 ROB: 6 overview: 7

Additional Info: More pics → US Conc.: 8 10, Road erosion: 11

File Name: Lots of erosion on road US side

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

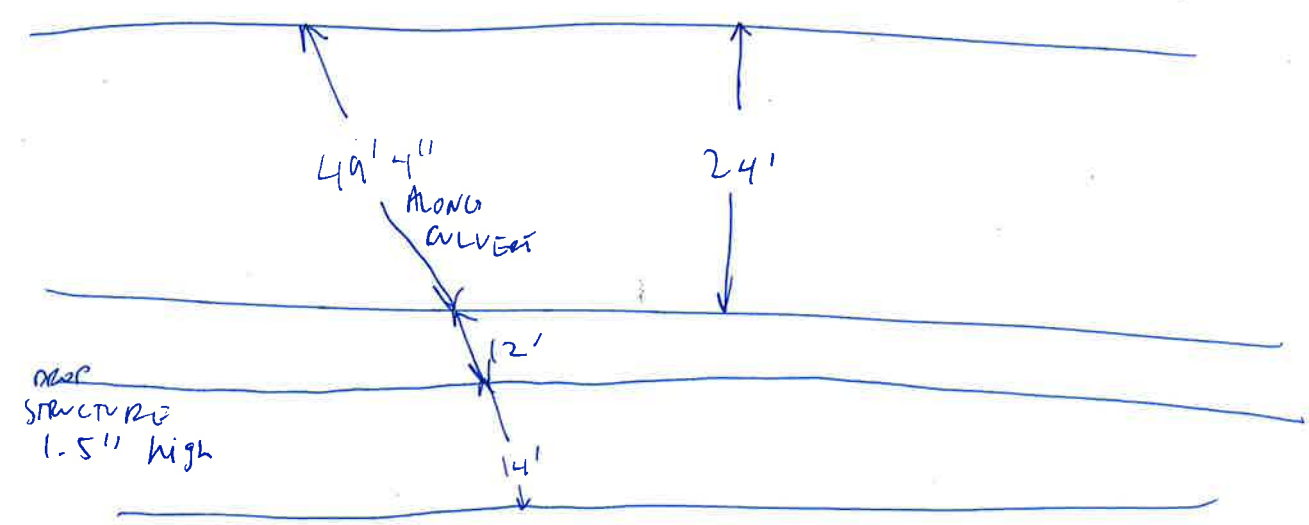


	Photo ID: Coordinates: Description:	WC_T082_STR_100_USC_1 30.432455, -97.488471 Upstream channel
	Photo ID: Coordinates: Description:	WC_T082_STR_100_USC_2 30.432455, -97.488471 Upstream channel

	Photo ID: Coordinates: Description:	WC_T082_STR_100_USC_3 30.432455, -97.488471 Upstream channel
	Photo ID: Coordinates: Description:	WC_T082_STR_100_USF 30.432455, -97.488471 Upstream face

	Photo ID: Coordinates: Description:	WC_T082_STR_100_DSF 30.432455, -97.488471 Downstream face
	Photo ID: Coordinates: Description:	WC_T082_STR_100_DSC 30.432455, -97.488471 Downstream channel

	Photo ID: Coordinates: Description:	WC_T082_STR_100_US_CONCRETE 30.432455, -97.488471 Concrete upstream
	Photo ID: Coordinates: Description:	WC_T082_STR_100_RD_EROSION 30.432455, -97.488471 Road erosion

	Photo ID: Coordinates: Description:	WC_T082_STR_100_LOB 30.432455, -97.488471 Left overbank
	Photo ID: Coordinates: Description:	WC_T082_STR_100_ROB 30.432455, -97.488471 Right overbank

	Photo ID: Coordinates: Description:	WC_T082_STR_100_OVERVIEW 30.432455, -97.488471 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: WC_T082_STR_200 DATE: 11/25/19

LOCATION: _____ CREW: JG & ML

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 31" Deck: 60" Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 3 Shape: RECT Length: 159.5' Height: 6' Width: 10' Skew: Yes

CULVERT: I/O Type: Buried Material: RCP Wingwall Angle 45°

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

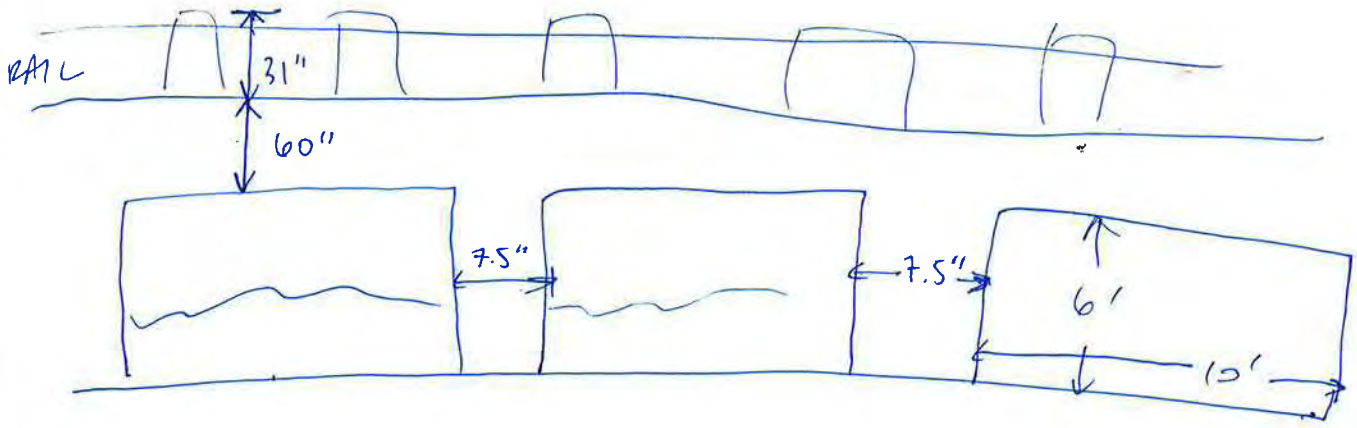
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOB: 5 ROB: 6 overview: 7

Additional Info: Lots of sediment build up & vegetation US & DS

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

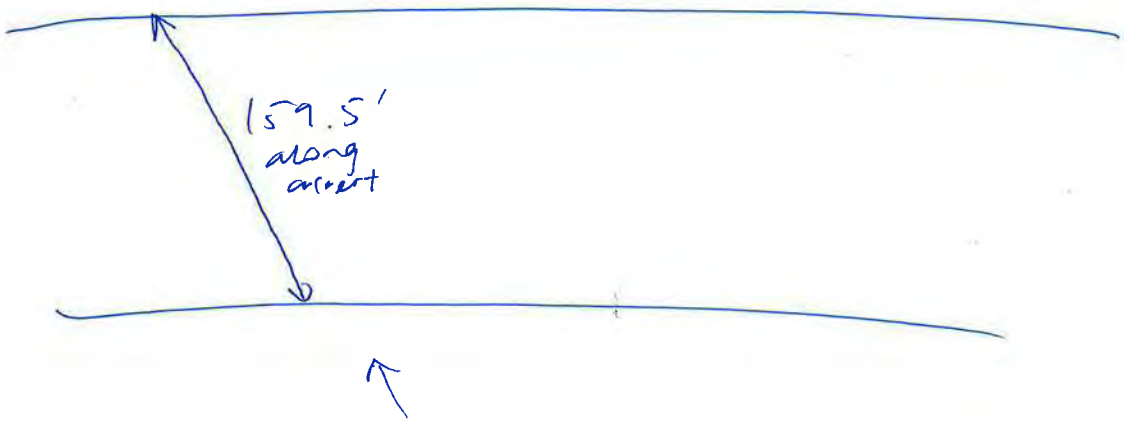


	Photo ID: Coordinates: Description:	WC_T082_STR_200_USC 30.43564, -97.490353 Upstream channel
	Photo ID: Coordinates: Description:	WC_T082_STR_200_USF 30.43564, -97.490353 Upstream face

	Photo ID: Coordinates: Description:	WC_T082_STR_200_DSF 30.43564, -97.490353 Downstream face
	Photo ID: Coordinates: Description:	WC_T082_STR_200_DSC 30.43564, -97.490353 Downstream channel

	Photo ID: Coordinates: Description:	WC_T082_STR_200_LOB 30.43564, -97.490353 Left overbank
	Photo ID: Coordinates: Description:	WC_T082_STR_200_ROB 30.43564, -97.490353 Right overbank

	Photo ID: Coordinates: Description:	WC_T082_STR_200_OVERVIEW 30.43564, -97.490353 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: 11/25/19

LOCATION: WC_T082_STR_300 CREW: JG & ML

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 1 Shape: RECT Length: 28' 3" Height: 2' (2.5' Berm) Width: 8' Skew: no

CULVERT: I/O Type: No bevel Material: RCP Wingwall Angle none

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

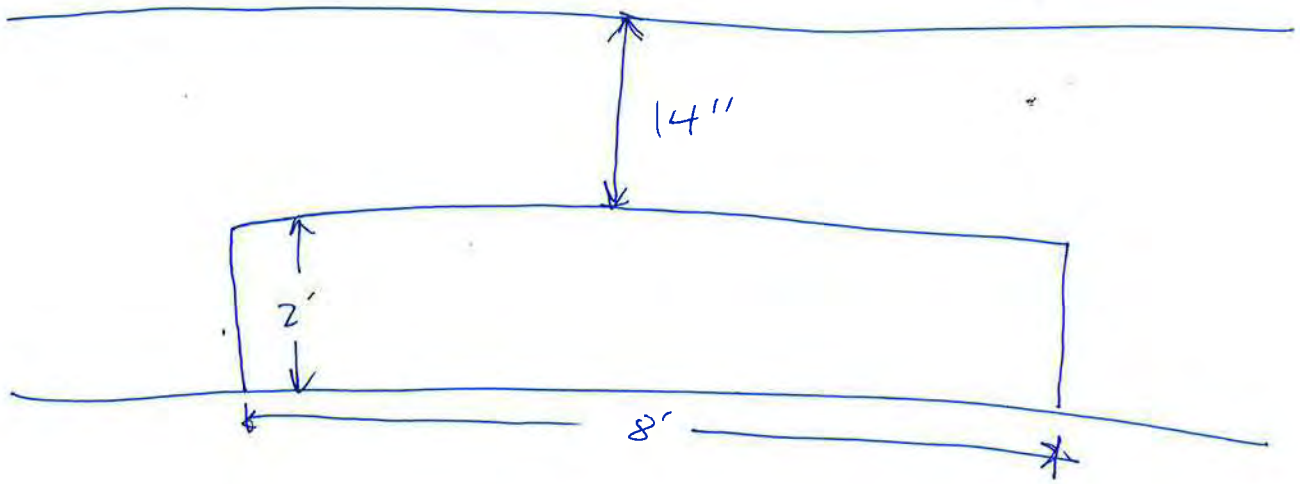
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOB: 5 ROB: 6 Overview: 7

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

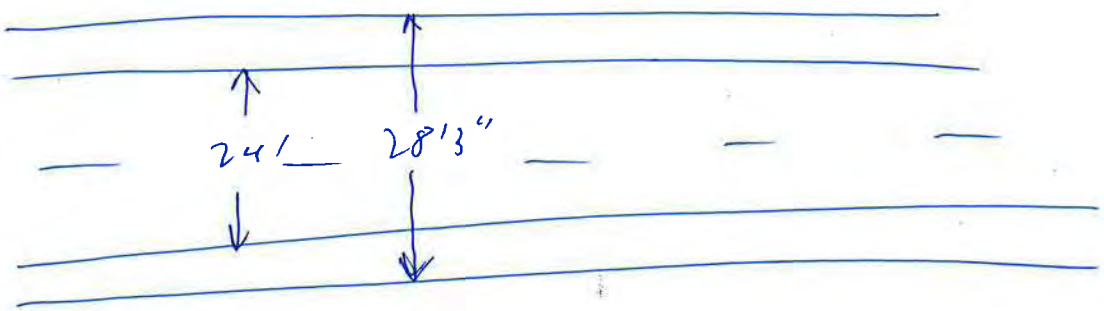


	Photo ID: Coordinates: Description:	WC_T082_STR_300_USC 30.443139, -97.501456 Upstream channel
	Photo ID: Coordinates: Description:	WC_T082_STR_300_USF 30.443139, -97.501456 Upstream face

	Photo ID: Coordinates: Description:	WC_T082_STR_300_DSF 30.443139, -97.501456 Downstream face
	Photo ID: Coordinates: Description:	WC_T082_STR_300_DSC 30.443139, -97.501456 Downstream channel

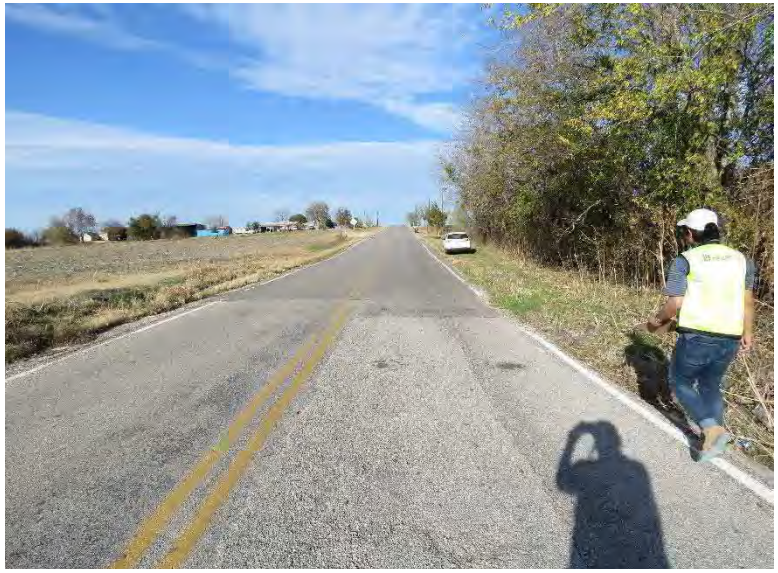
	Photo ID: Coordinates: Description:	WC_T082_STR_300_LOB 30.443139, -97.501456 Left overbank
	Photo ID: Coordinates: Description:	WC_T082_STR_300_ROB 30.443139, -97.501456 Right overbank

	Photo ID: Coordinates: Description:	WC_T082_STR_300_OVERVIEW 30.443139, -97.501456 Overview

HALFF

Survey Field Sheet

PROJECT: Willbarger melber Ln. SURVEY NAME:

STREAM NAME: WC_T086_STR_100 DATE: 01/30/20

LOCATION: 30.471957, -97.512375 CREW:

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:

CULVERT: Number: 1 Shape: box Length: 46' Height: 3' Width: 8' Skew: Yes

CULVERT: I/O Type: Material: Concrete Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

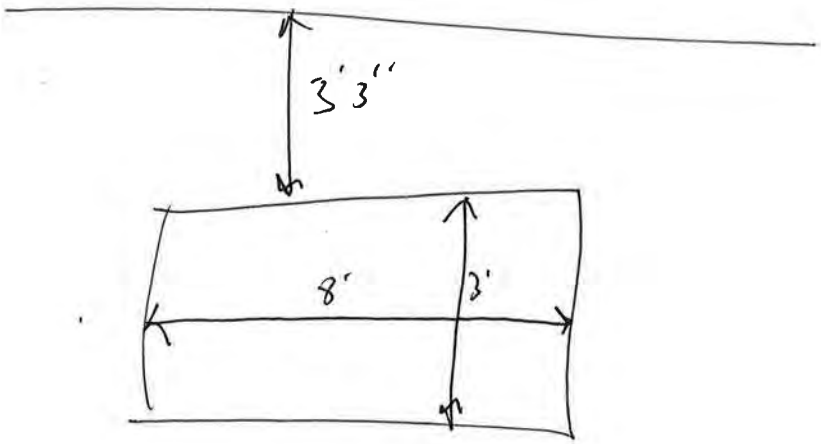
ERM Description: Coordinate System:

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOS 5 Rog 6 overview 7

Additional Info:

File Name:

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

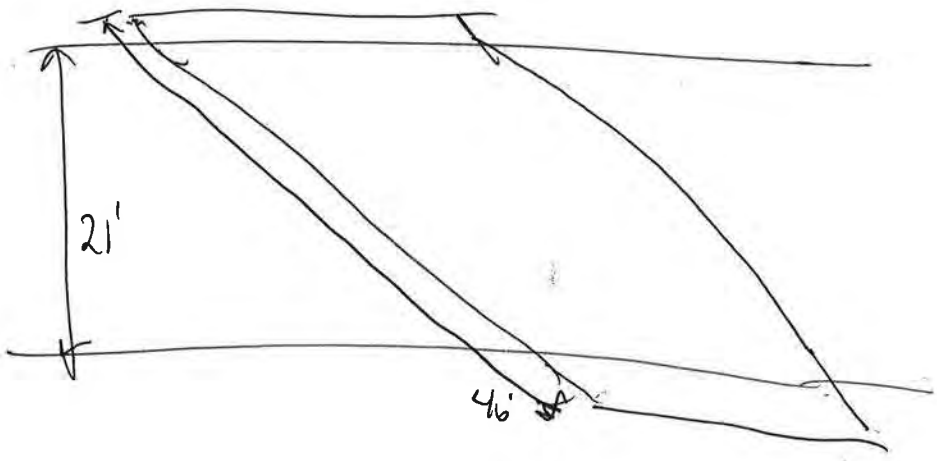


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	Photo ID: Coordinates: Description:	WC_T086_STR_100_USF 30.471907, -97.512375 Upstream face

	Photo ID: Coordinates: Description:	WC_T086_STR_100_DSF 30.471907, -97.512375 Downstream face
	Photo ID: Coordinates: Description:	WC_T086_STR_100_DSC 30.471907, -97.512375 Downstream channel

	Photo ID: Coordinates: Description:	WC_T086_STR_100_DSL 30.471907, -97.512375 Downstream left
	Photo ID: Coordinates: Description:	WC_T086_STR_100_DSR 30.471907, -97.512375 Downstream right

	Photo ID: Coordinates: Description:	WC_T086_STR_100_OVERVIEW 30.471907, -97.512375 Overview

HALFF

Survey Field Sheet

PROJECT: 35837 WILES SURVEY NAME:

STREAM NAME: ~~T90~~ T13 DATE:

LOCATION: TRAVIS CREW:

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:

CULVERT: Number: Shape: Length: Height: Width: Skew:

CULVERT: I/O Type: Material: Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

ERM Description: Coordinate System:

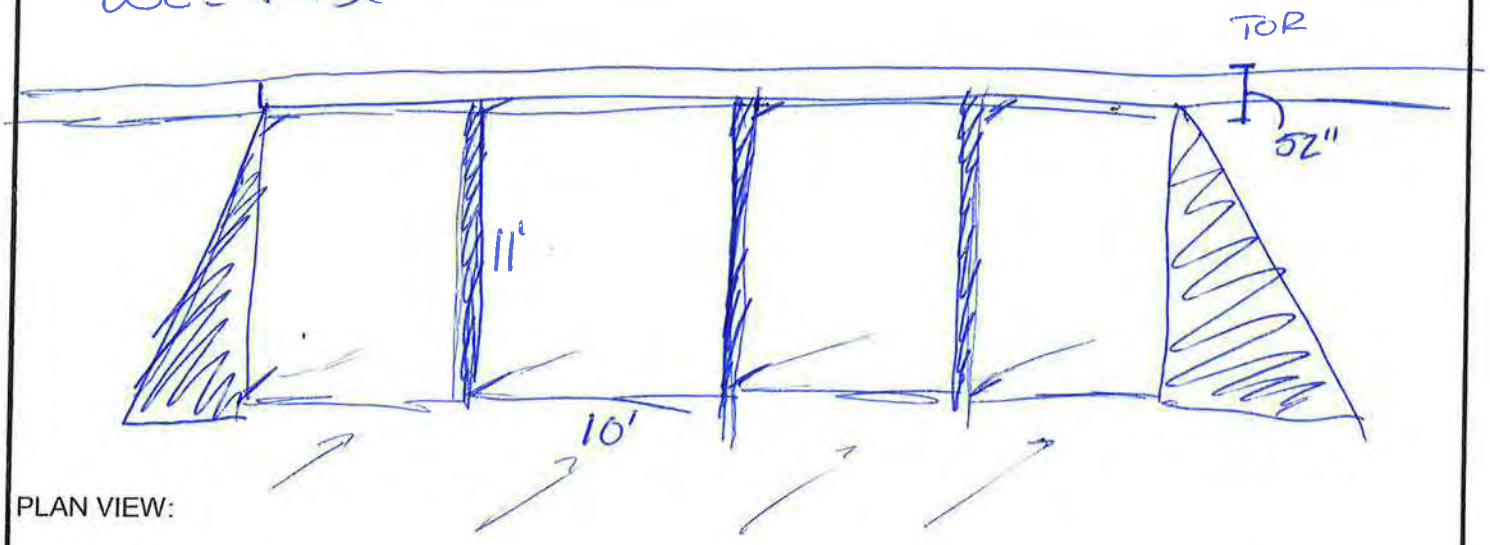
Photo Numbers: USC: 4 USF: 5 DSF: 2 DSC: 1,3

Additional Info: LOB: 6 ROB: 7

File Name:

PROFILE VIEW:
(Left to Right looking Downstream)

WC_T13_STR_200

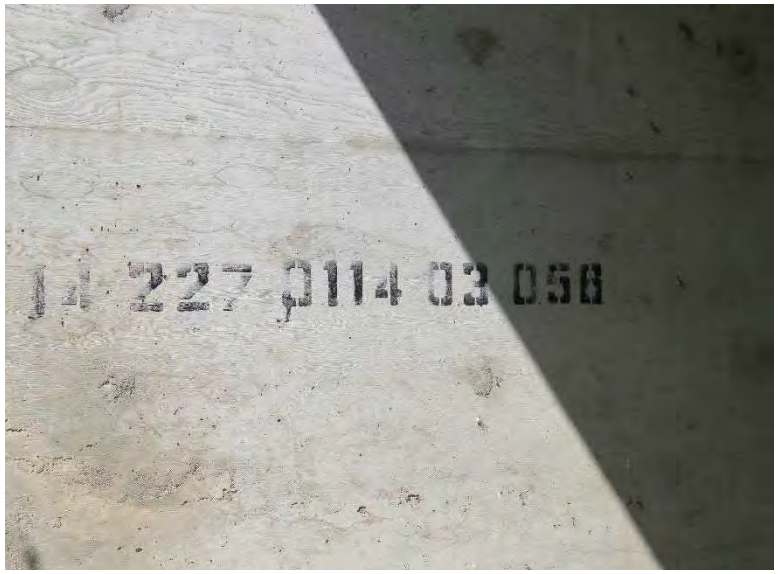


PLAN VIEW:

	Photo ID: Coordinates: Description:	WC_T113_STR_200_USC 30.350522, -97.497748 Upstream channel
	Photo ID: Coordinates: Description:	WC_T113_STR_200_USF 30.350522, -97.497748 Upstream face

	Photo ID: Coordinates: Description:	WC_T113_STR_200_DSF 30.350522, -97.497748 Downstream face
	Photo ID: Coordinates: Description:	WC_T113_STR_200_DSC_1 30.350522, -97.497748 Downstream channel

	Photo ID: Coordinates: Description:	WC_T113_STR_200_DSC_2 30.350522, -97.497748 Downstream channel
	Photo ID: Coordinates: Description:	WC_T113_STR_200_LOB 30.350522, -97.497748 Left overbank

	Photo ID: Coordinates: Description:	WC_T113_STR_200_ROB 30.350522, -97.497748 Right overbank
	Photo ID: Coordinates: Description:	WC_T113_STR_200_BRIDGE_NUMBER 30.350522, -97.497748 Bridge Number

HALFF

Survey Field Sheet

PROJECT: 35837 WILB

SURVEY NAME:

STREAM NAME: WC-T113

DATE:

LOCATION: TRAVIS CO.

CREW:

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:

CULVERT: Number: Shape: Length: Height: Width: Skew:

CULVERT: I/O Type: Material: Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

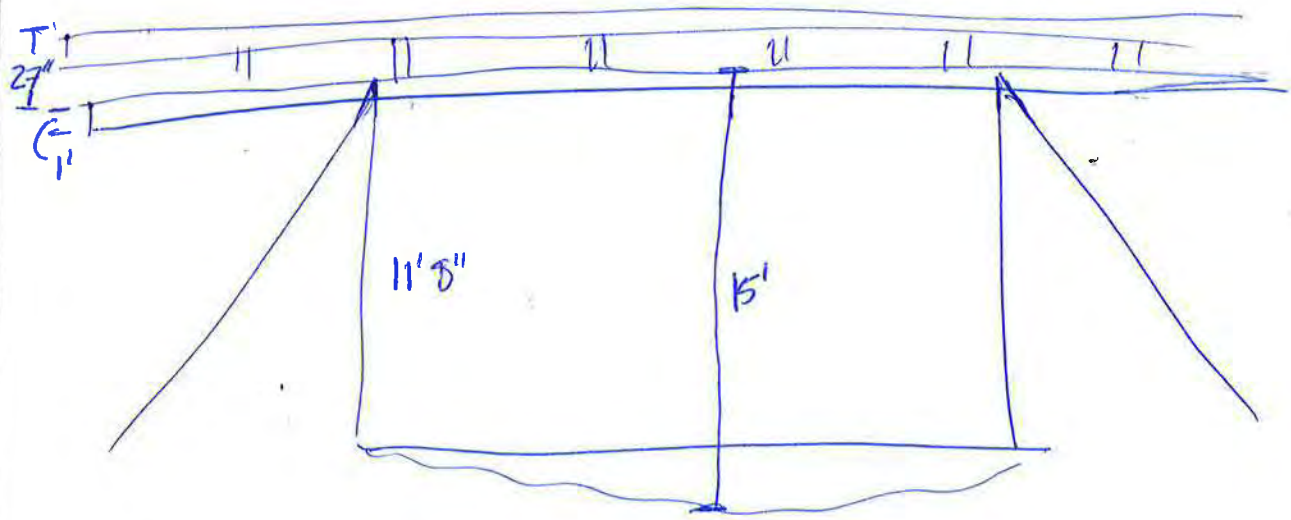
ERM Description: Coordinate System:

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 SCOUR: 5

Additional Info: LOB: ROB:

File Name:

PROFILE VIEW:
(Left to Right looking Downstream) WC-T113_STR-360



PLAN VIEW:

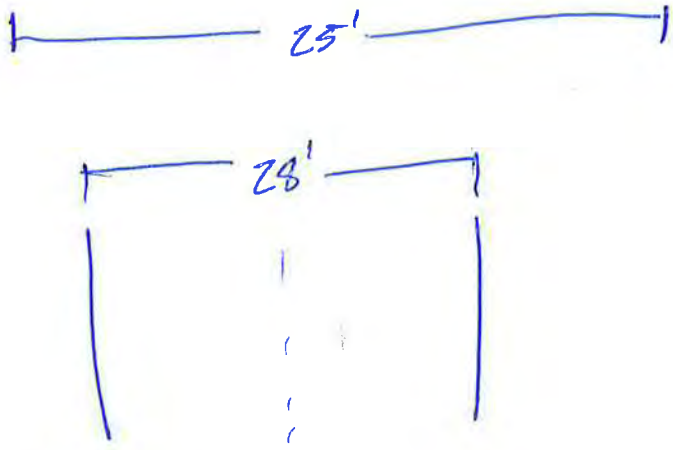


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	Photo ID: Coordinates: Description:	WC_T113_STR_300_USF 30.350522, -97.497748 Upstream face

	Photo ID: Coordinates: Description:	WC_T113_STR_300_DSF 30.350522, -97.497748 Downstream face
	Photo ID: Coordinates: Description:	WC_T113_STR_300_DSC 30.350522, -97.497748 Downstream channel

	Photo ID: Coordinates: Description:	WC_T113_STR_300_SCOUR 30.350522, -97.497748 Scour

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: 11/22/19

LOCATION: WC_T113_STR_400 CREW: JG & ML

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 27" Deck: 2' Width: 36.5' Pier(s): 1 @ 2' Pier Shape: CIRC

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

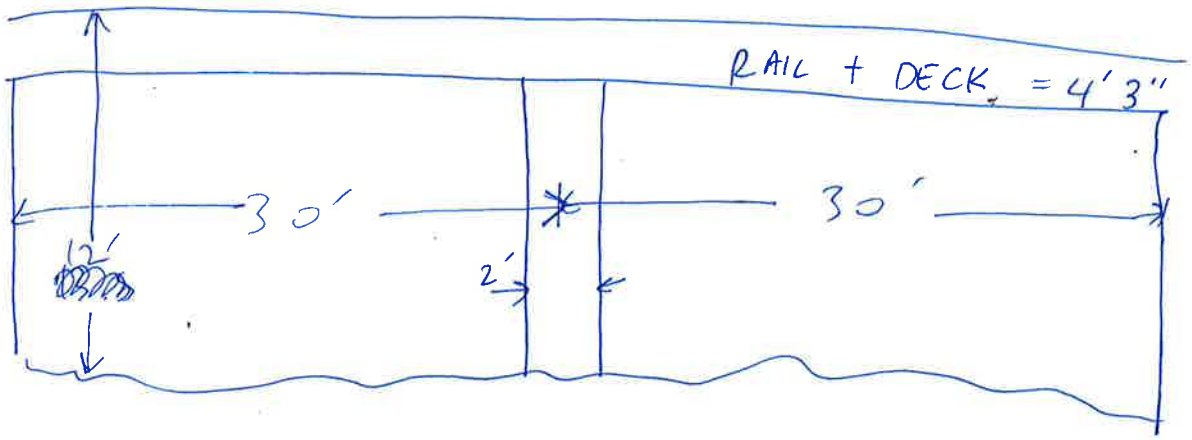
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOB: 5 ROB: 6 Overview: 7

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

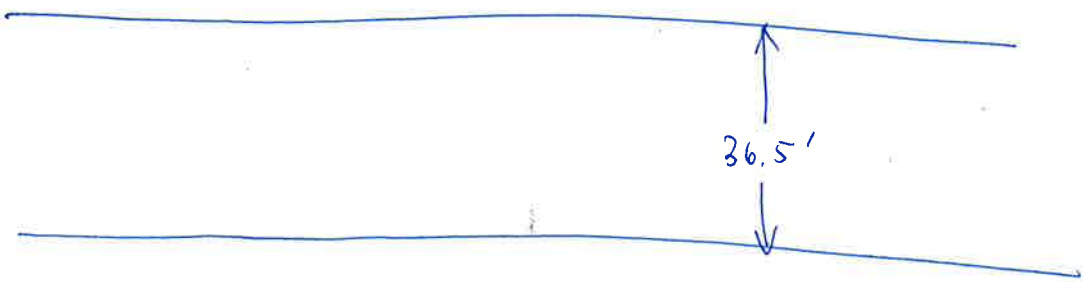


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	Photo ID: Coordinates: Description:	WC_T113_STR_400_USF 30.369694, -97.505996 Upstream face

	Photo ID: Coordinates: Description:	WC_T113_STR_400_DSF 30.369694, -97.505996 Downstream face
	Photo ID: Coordinates: Description:	WC_T113_STR_400_DSC 30.369694, -97.505996 Downstream channel

	Photo ID: Coordinates: Description:	WC_T113_STR_400_LOB 30.369694, -97.505996 Left overbank
	Photo ID: Coordinates: Description:	WC_T113_STR_400_ROB 30.369694, -97.505996 Right overbank

	Photo ID: Coordinates: Description:	WC_T113_STR_400_OVERVIEW 30.369694, -97.505996 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: 11/22/19

LOCATION: WC_T113_STR_600 (Left set → A) CREW: JG + MC

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: US drop structure 2' deep Material: ~~RCP~~ CMP Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

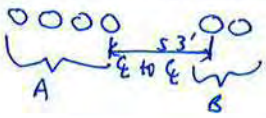
ERM Description: _____ Coordinate System: _____

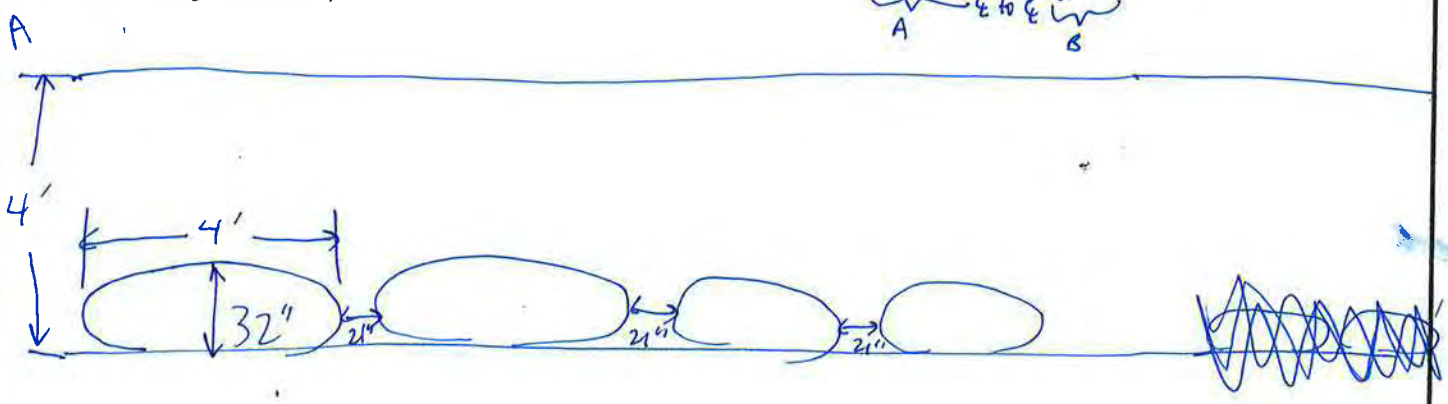
Photo Numbers: USC: 1 USF: 2,5 DSF: 3 DSC: 4 US Struct: 6

Additional Info: Some skew on LOB set, definite skew on ROB barrels

File Name: Talked to guy: Overtop ~6", probably Halloween flood blocked Box of Arc 9" rain → overtop ~1'

PROFILE VIEW:
(Left to Right looking Downstream)





PLAN VIEW:

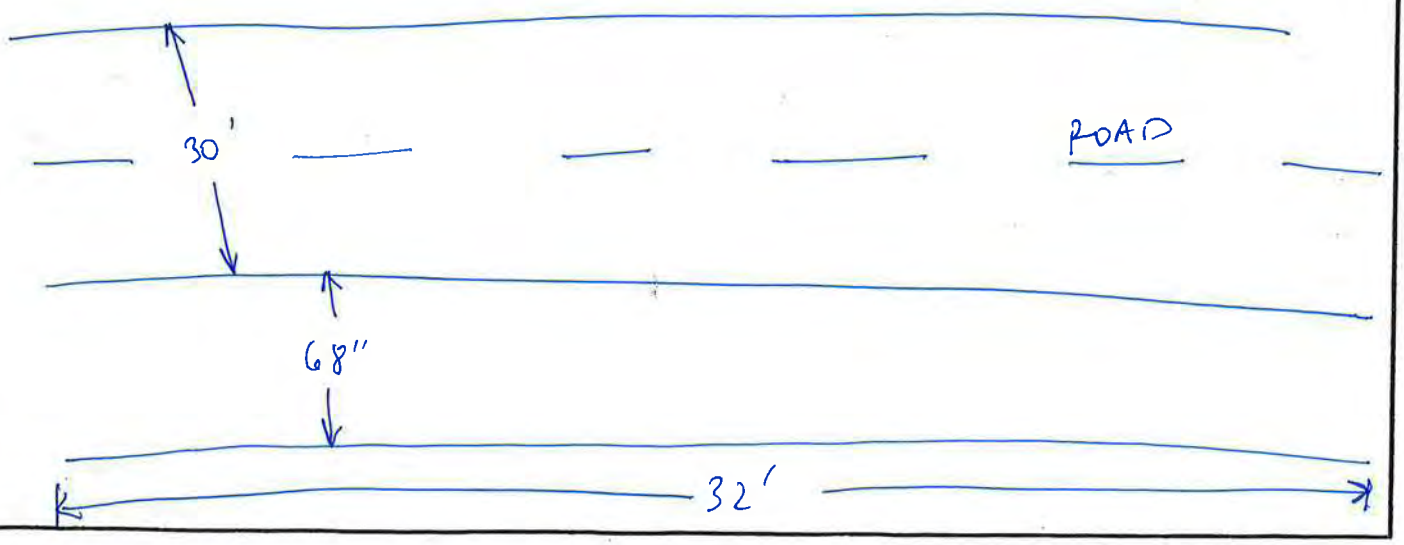


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	Photo ID: Coordinates: Description:	WC_T113_STR_600_A_USF_1 30.380991, -97.510135 Upstream face

	Photo ID: Coordinates: Description:	WC_T113_STR_600_A_USF_2 30.380991, -97.510135 Upstream face
	Photo ID: Coordinates: Description:	WC_T113_STR_600_A_DSF 30.380991, -97.510135 Downstream face

	Photo ID: Coordinates: Description:	WC_T113_STR_600_A_DSC 30.380991, -97.510135 Downstream channel
	Photo ID: Coordinates: Description:	WC_T113_STR_600_A_US_Strict 30.380991, -97.510135 Upstream structure

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: WC_T113_STR_600 DATE: 11/22/19

Right side → B

LOCATION: _____ CREW: JG & MC

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: ✓

CULVERT: I/O Type: US Drop Structure 3' deep Material: CMP Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

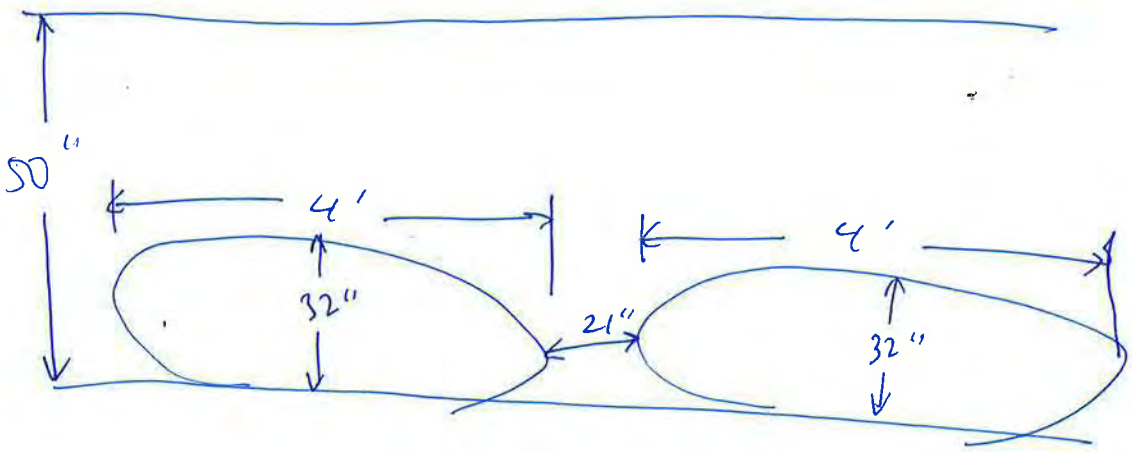
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2, 3, 4 DSF: 5 DSC: 6, 7, 8 WOB: 9 ROS: 10 Overview: 11

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

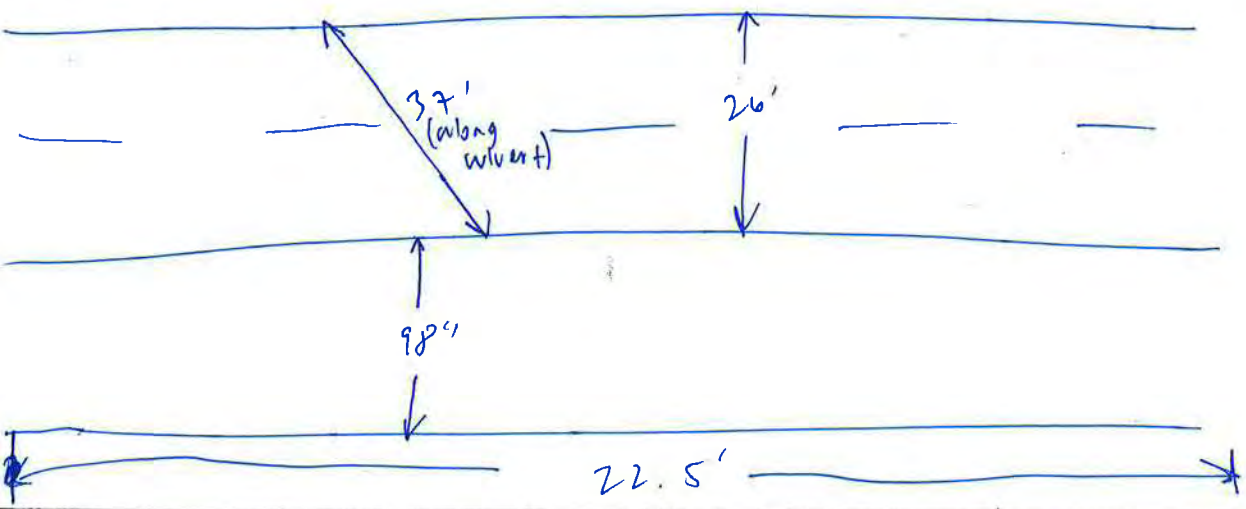


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	Photo ID: Coordinates: Description:	WC_T113_STR_600_B_USF_1 30.380991, -97.510135 Upstream face

	Photo ID: Coordinates: Description:	WC_T113_STR_600_B_USF_2 30.380991, -97.510135 Upstream face
	Photo ID: Coordinates: Description:	WC_T113_STR_600_B_USF_3 30.380991, -97.510135 Upstream face

	Photo ID: Coordinates: Description:	WC_T113_STR_600_B_DSF 30.380991, -97.510135 Downstream face
	Photo ID: Coordinates: Description:	WC_T113_STR_600_B_DSC_1 30.380991, -97.510135 Downstream channel

	Photo ID: Coordinates: Description:	WC_T113_STR_600_B_DSC_2 30.380991, -97.510135 Downstream channel
	Photo ID: Coordinates: Description:	WC_T113_STR_600_B_DSC_3 30.380991, -97.510135 Downstream channel

	Photo ID: Coordinates: Description:	WC_T113_STR_600_B_LOB 30.380991, -97.510135 Left Overbank
	Photo ID: Coordinates: Description:	WC_T113_STR_600_B_ROB 30.380991, -97.510135 Right Overbank

	Photo ID: Coordinates: Description:	WC_T113_STR_600_B_OVERVIEW 30.380991, -97.510135 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: WC-T113-STR-900 DATE: _____

LOCATION: _____ CREW: _____

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 28" Deck: 20"+1' Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 4 Shape: box Length: _____ Height: 4' Width: 8' Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

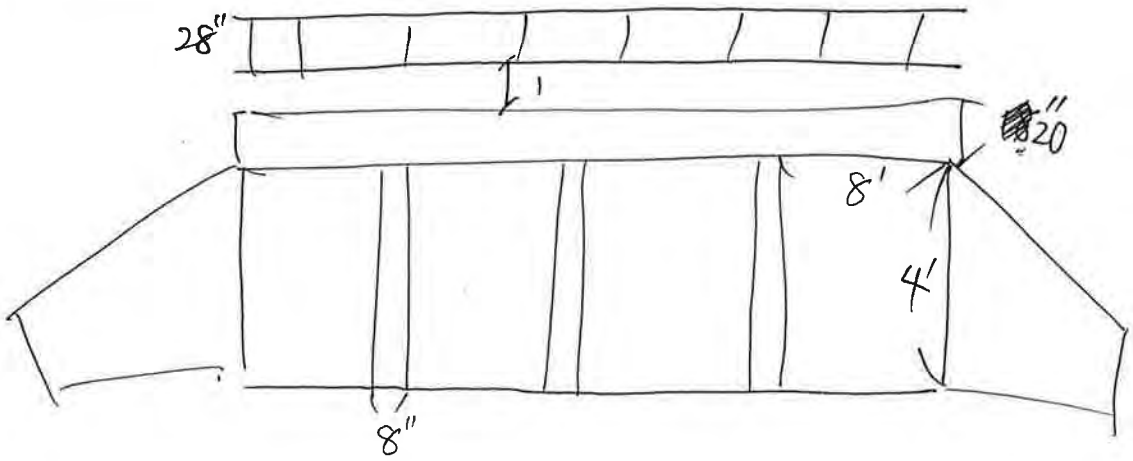
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOB&ROB 6

Additional Info: overview 7

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

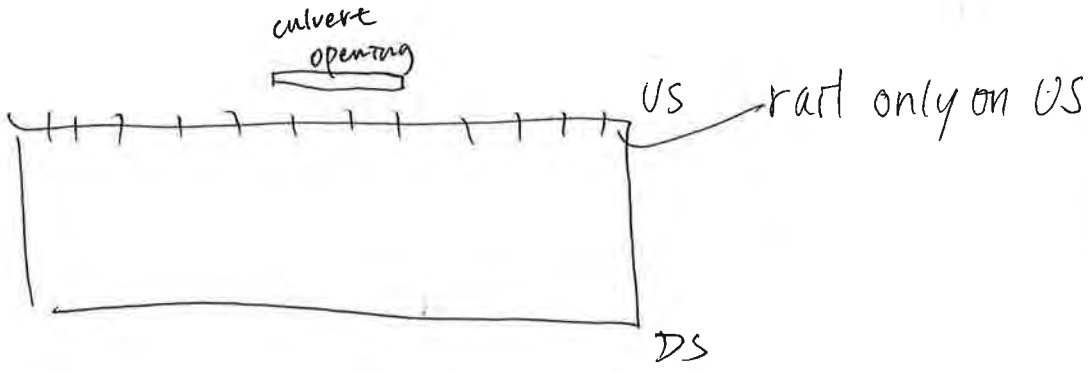


	Photo ID: Coordinates: Description:	WC_T113_STR_900_USC 30.386026, -97.522959 Upstream channel
	Photo ID: Coordinates: Description:	WC_T113_STR_900_USF 30.386026, -97.522959 Upstream face

	Photo ID: Coordinates: Description:	WC_T113_STR_900_DSF 30.386026, -97.522959 Downstream face
	Photo ID: Coordinates: Description:	WC_T113_STR_900_DSC 30.386026, -97.522959 Downstream channel

	Photo ID: Coordinates: Description:	WC_T113_STR_900_LOB 30.386026, -97.522959 Left overbank
	Photo ID: Coordinates: Description:	WC_T113_STR_900_ROB 30.386026, -97.522959 Right overbank

	Photo ID: Coordinates: Description:	WC_T113_STR_900_OVERVIEW 30.386026, -97.522959 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: 11/25/19

LOCATION: WC_T113_STR_1000 CREW: JCa + ML

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 3 Shape: ELLIPTICAL Length: _____ Height: 28" Width: 42" Skew: _____

CULVERT: I/O Type: US: 1' drop down to w/w DS: Mitered to slope Material: CMP Wingwall Angle N/A

DAM: Top Width: _____ Side Slope _____ Side Slope _____ US: _____ DS: _____ Outlet: _____

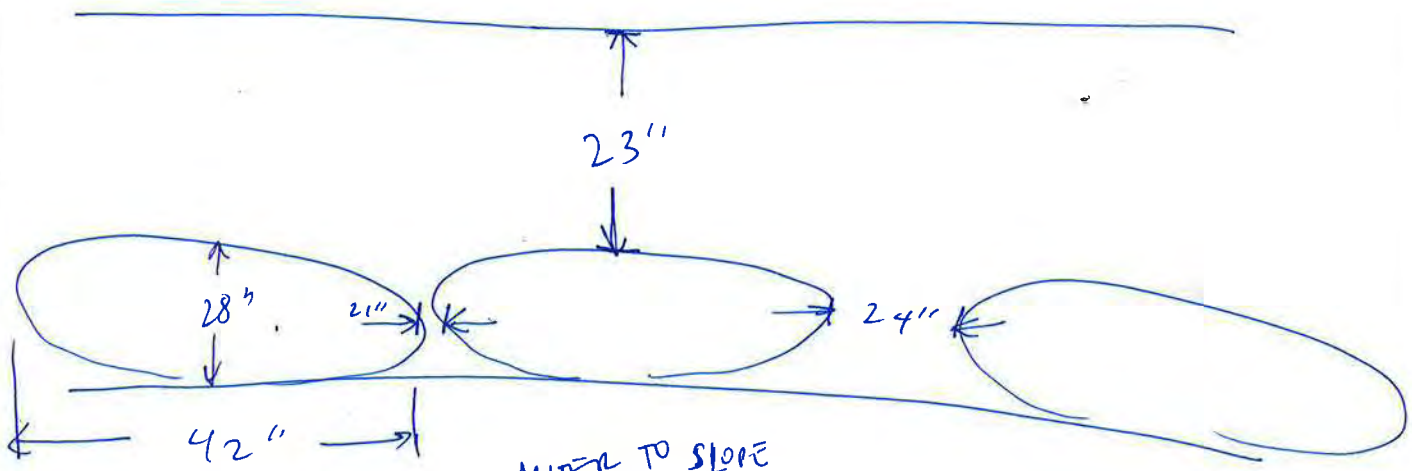
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4, 5 LOB: 6 ROB: 7 overview: 8

Additional Info: Lots of bamboo US & DS

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

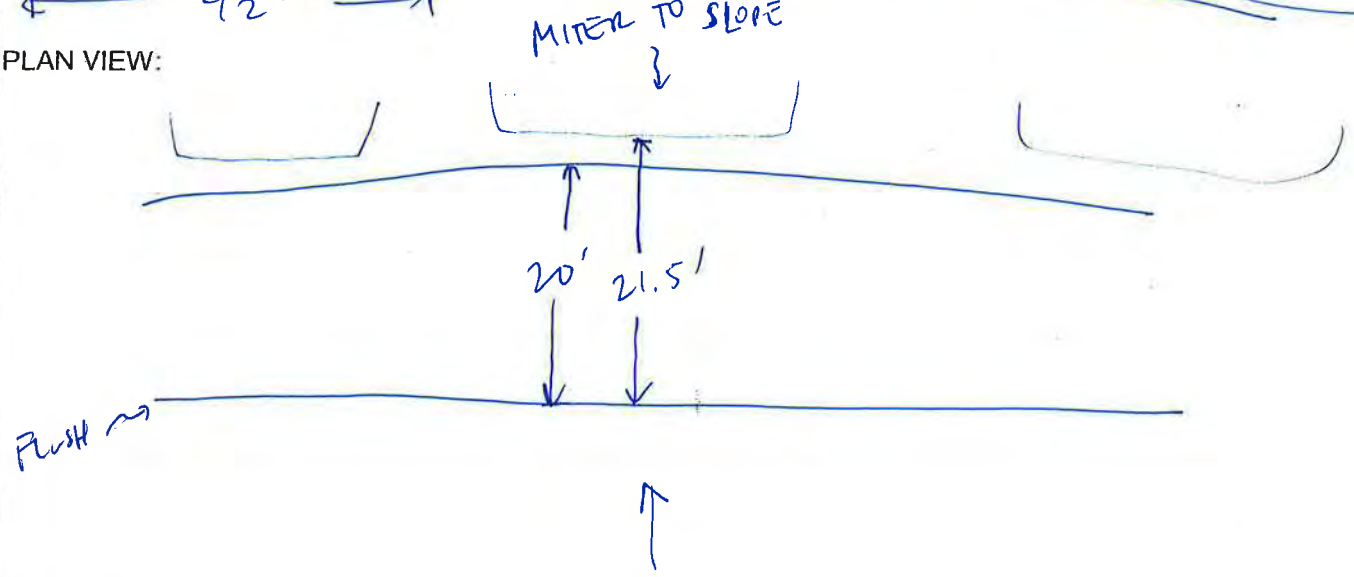


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	Photo ID: Coordinates: Description:	WC_T113_STR_1000_USF 30.393482, -97.528334 Upstream face

	Photo ID: Coordinates: Description:	WC_T113_STR_1000_DSF 30.393482, -97.528334 Downstream face
	Photo ID: Coordinates: Description:	WC_T113_STR_1000_DSC_1 30.393482, -97.528334 Downstream channel

	Photo ID: Coordinates: Description:	WC_T113_STR_1000_DSC_2 30.393482, -97.528334 Downstream channel
	Photo ID: Coordinates: Description:	WC_T113_STR_1000_LOB 30.393482, -97.528334 Left overbank

	Photo ID: Coordinates: Description:	WC_T113_STR_1000_ROB 30.393482, -97.528334 Right overbank
	Photo ID: Coordinates: Description:	WC_T113_STR_1000_OVERVIEW 30.393482, -97.528334 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: 11/25/19

LOCATION: NC_T167_STR_~~1000~~ 900 CREW: JG + ML

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 4 Shape: ELIPTICAL Length: 32' Height: 2' Width: 3' Skew: _____

CULVERT: I/O Type: Mitered to slope Material: CMP Wingwall Angle N/A

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

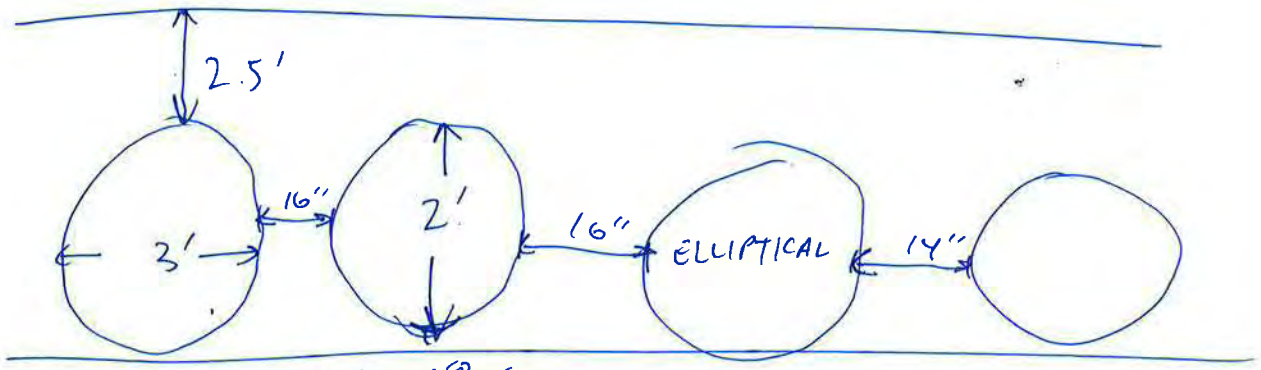
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOB: 5 ROB: 6 overview: 7

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

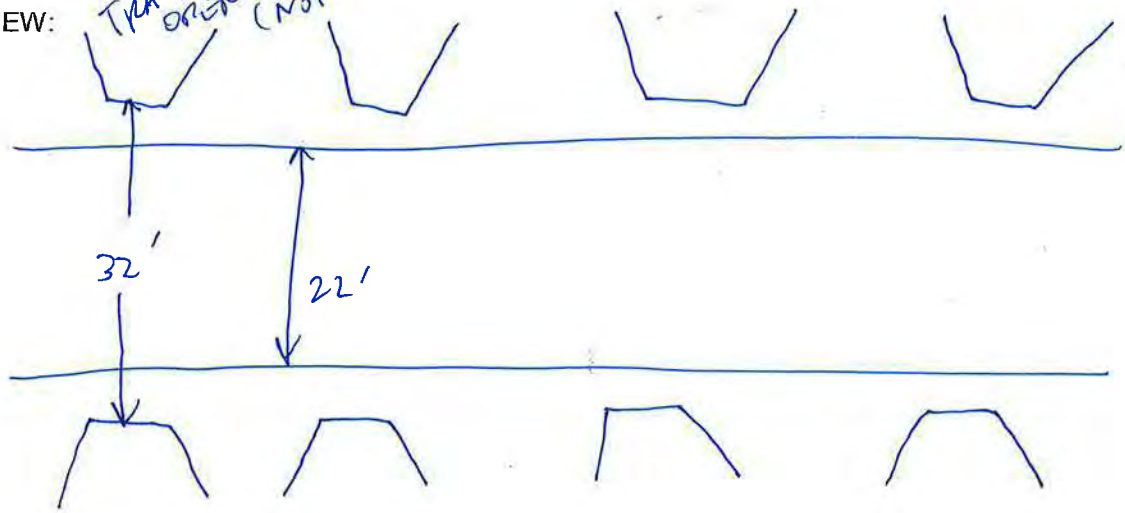


	Photo ID: Coordinates: Description:	WC_T167_STR_900_USC 30.341782, -97.529839 Upstream channel
	Photo ID: Coordinates: Description:	WC_T167_STR_900_USF 30.341782, -97.529839 Upstream face

	Photo ID: Coordinates: Description:	WC_T167_STR_900_DSF 30.341782, -97.529839 Downstream face
	Photo ID: Coordinates: Description:	WC_T167_STR_900_DSC 30.341782, -97.529839 Downstream channel

	Photo ID: Coordinates: Description:	WC_T167_STR_900_LOB 30.341782, -97.529839 Left overbank
	Photo ID: Coordinates: Description:	WC_T167_STR_900_ROB 30.341782, -97.529839 Right overbank

	Photo ID: Coordinates: Description:	WC_T167_STR_900_OVERVIEW 30.341782, -97.529839 Overview

HALFF

Survey Field Sheet

PROJECT: Wilbarger SURVEY NAME:

STREAM NAME: WC-T169-STR-100 DATE: 12/18/19

LOCATION: CREW: AS & ML

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:

CULVERT: Number: 1 Shape: Box Length: 47' Height: 4' Width: 8' Skew: ~~yes~~

CULVERT: I/O Type: Material: concrete Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

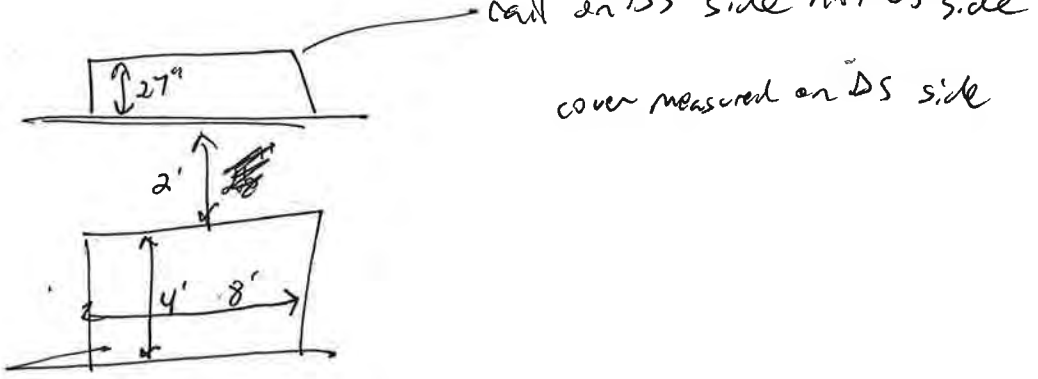
ERM Description: Coordinate System:

Photo Numbers: USC: ~1 USF: DSF: DSC:

Additional Info: rail on DS side so 2' cover measured on DS side

File Name:

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

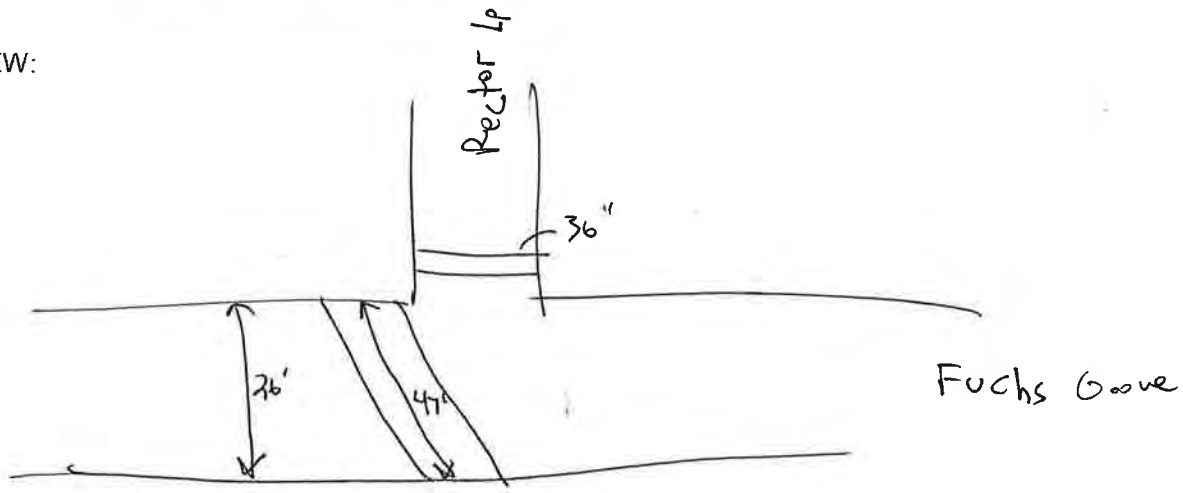
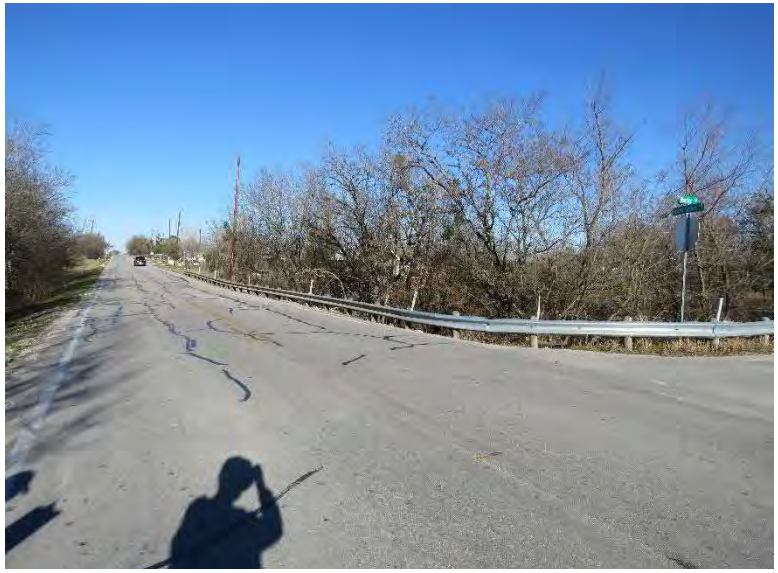
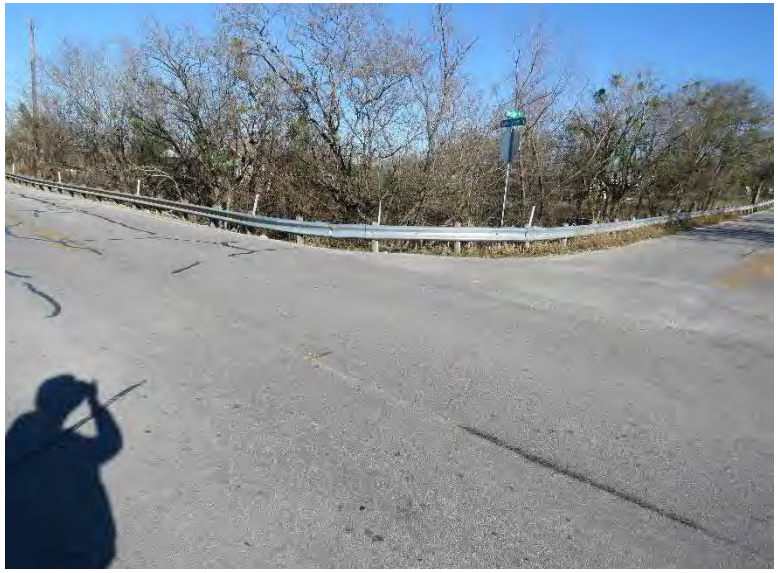


	Photo ID: Coordinates: Description:	WC_T169_STR_100_USC 30.374277, -97.561953 Upstream channel
	Photo ID: Coordinates: Description:	WC_T169_STR_100_USF 30.374277, -97.561953 Upstream face

	Photo ID: Coordinates: Description:	WC_T169_STR_100_DSF 30.374277, -97.561953 Downstream face
	Photo ID: Coordinates: Description:	WC_T169_STR_100_DSC 30.374277, -97.561953 Downstream channel

	Photo ID: Coordinates: Description:	WC_T169_STR_100_LOB 30.374277, -97.561953 Left overbank
	Photo ID: Coordinates: Description:	WC_T169_STR_100_ROB 30.374277, -97.561953 Right overbank

	Photo ID: Coordinates: Description:	WC_T169_STR_100_OVERVIEW 30.374277, -97.561953 Overview

HALFF

Survey Field Sheet

PROJECT: Wilbarger SURVEY NAME:

STREAM NAME: WC-T171_STR.100 DATE: 12/18/19

LOCATION: CREW: ML AS

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:

CULVERT: Number: 1 Shape: box Length: 20' Height: 8'9" Width: 18" Skew: NJ

CULVERT: I/O Type: Material: concrete Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

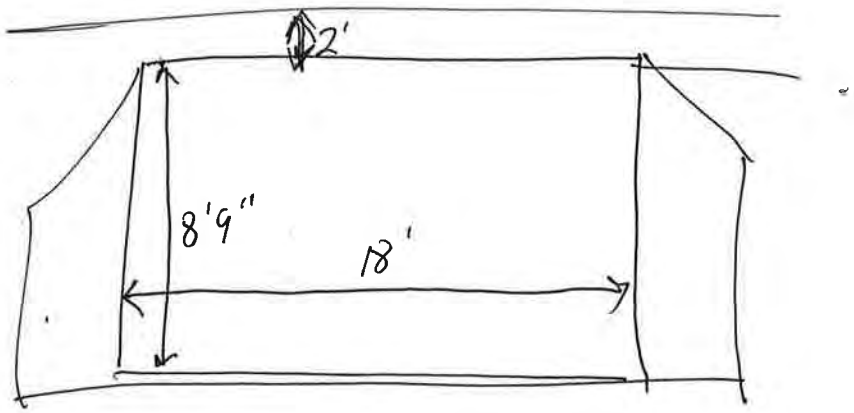
ERM Description: Coordinate System:

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 WB 5 overview 7 ROB 6

Additional Info:

File Name:

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

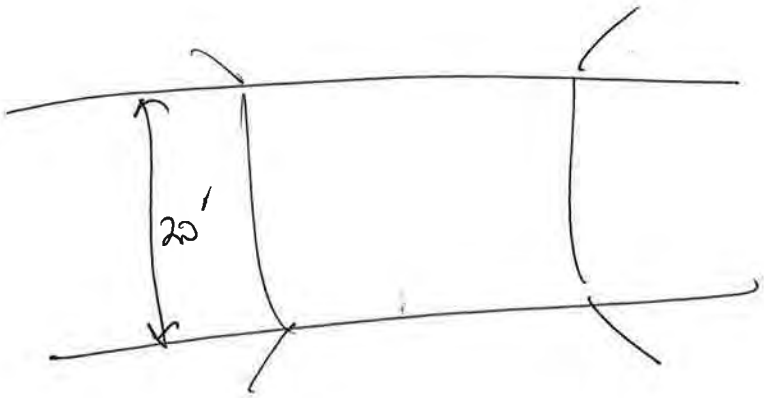


	Photo ID: Coordinates: Description:	WC_T171_STR_100_USC 30.378428, -97.559266 Upstream channel
	Photo ID: Coordinates: Description:	WC_T171_STR_100_USF 30.378428, -97.559266 Upstream face

	Photo ID: Coordinates: Description:	WC_T171_STR_100_DSF 30.378428, -97.559266 Downstream face
	Photo ID: Coordinates: Description:	WC_T171_STR_100_DSC 30.378428, -97.559266 Downstream channel

	Photo ID: Coordinates: Description:	WC_T171_STR_100_LOB 30.378428, -97.559266 Left overbank
	Photo ID: Coordinates: Description:	WC_T171_STR_100_ROB 30.378428, -97.559266 Right overbank

	Photo ID: Coordinates: Description:	WC_T171_STR_100_OVERVIEW 30.378428, -97.559266 Overview

HALFF

Survey Field Sheet

PROJECT: Wilbarger SURVEY NAME:

STREAM NAME: WC-T220-STR-100 DATE: 12/18/19

LOCATION: CREW: As a ML

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:

CULVERT: Number: 2 Shape: box Length: 24' ~~25'~~ Height: 5' Width: 10' Skew:

CULVERT: I/O Type: Material: Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

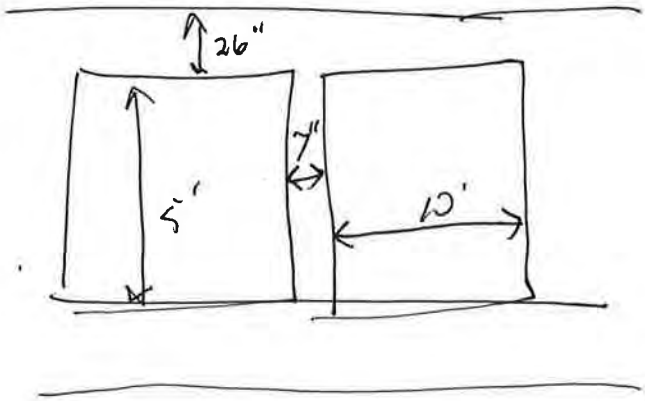
ERM Description: Coordinate System:

Photo Numbers: USC: 1 USF: 2-3 DSF: 4 DSC: 5 LOB 6 ROB 7 overview

Additional Info: there has been some scouring on DS side, there are exposed piper

File Name: & wires as a result of the scouring

PROFILE VIEW:
(Left to Right looking Downstream)



41" scour on DS side

PLAN VIEW:

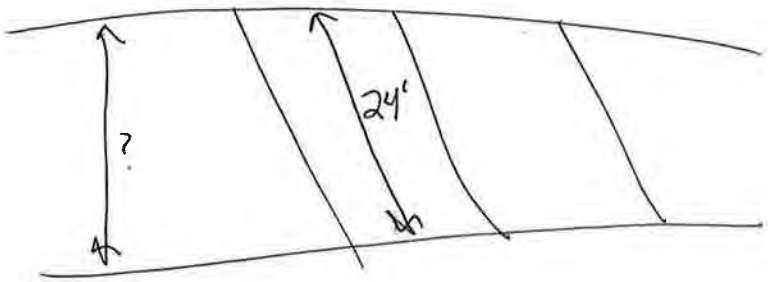


	Photo ID: Coordinates: Description:	WC_T220_STR_100_USC 30.385384, -97.549127 Upstream channel
	Photo ID: Coordinates: Description:	WC_T220_STR_100_USF_1 30.385384, -97.549127 Upstream face

	Photo ID: Coordinates: Description:	WC_T220_STR_100_USF_2 30.385384, -97.549127 Upstream face
	Photo ID: Coordinates: Description:	WC_T220_STR_100_DSF 30.385384, -97.549127 Downstream face

	Photo ID: Coordinates: Description:	WC_T220_STR_100_DSC 30.385384, -97.549127 Downstream channel
	Photo ID: Coordinates: Description:	WC_T220_STR_100_LOB 30.385384, -97.549127 Left overbank

	Photo ID: Coordinates: Description:	WC_T220_STR_100_ROB 30.385384, -97.549127 Right overbank
	Photo ID: Coordinates: Description:	WC_T220_STR_100_OVERVIEW 30.385384, -97.549127 Overview

HALFF

Survey Field Sheet

PROJECT: Wilbarger SURVEY NAME:

STREAM NAME: WC-T220-STR-200 DATE: 12/18/19

LOCATION: CREW: AS & MR

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:

CULVERT: Number: 3 Shape: box Length: 32' Height: 111"? Width: ? Skew: no

CULVERT: I/O Type: Material: Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

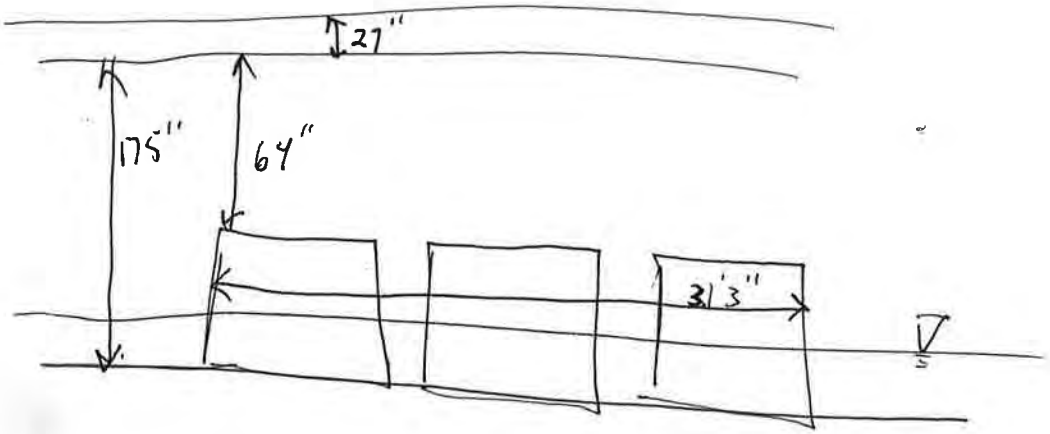
ERM Description: Coordinate System:

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOB 5 ROB 6 overview 7

Additional Info: no picture of the sheet was taken

File Name:

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

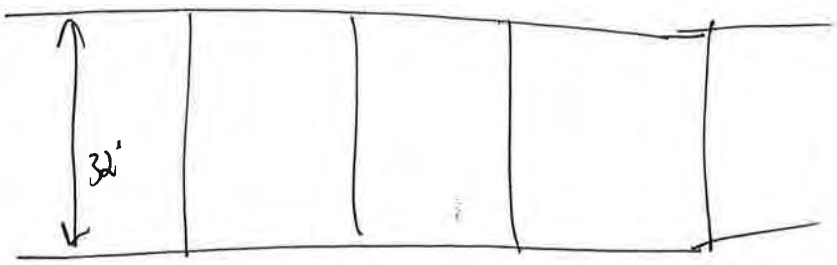
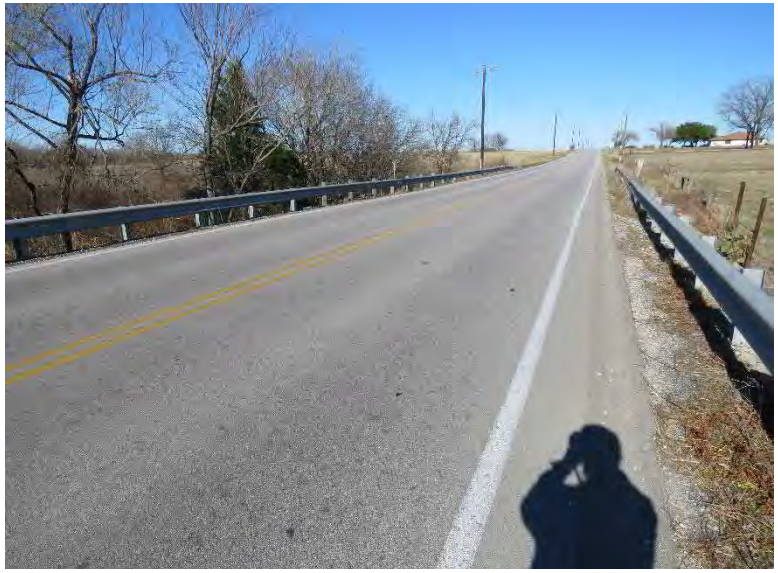


	Photo ID: Coordinates: Description:	WC_T220_STR_200_USC 30.389578, -97.552595 Upstream channel
	Photo ID: Coordinates: Description:	WC_T220_STR_200_USF 30.389578, -97.552595 Upstream face

	Photo ID: Coordinates: Description:	WC_T220_STR_200_DSF 30.389578, -97.552595 Downstream face
	Photo ID: Coordinates: Description:	WC_T220_STR_200_DSC 30.389578, -97.552595 Downstream channel

	Photo ID: Coordinates: Description:	WC_T220_STR_200_LOB 30.389578, -97.552595 Left overbank
	Photo ID: Coordinates: Description:	WC_T220_STR_200_ROB 30.389578, -97.552595 Right overbank

	Photo ID: Coordinates: Description:	WC_T220_STR_200_OVERVIEW 30.389578, -97.552595 Overview

HALFF **Survey Field Sheet**

PROJECT: Wilbarger Cameron Rd SURVEY NAME:

STREAM NAME: WC-T220, STR. 305 DATE: 01/30/20

LOCATION: 30.409715, -97.580728 CREW:

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: 29.5" Deck: Width: 25.5 Pier(s): @ Pier Shape:

CULVERT: Number: 3 Shape: Box Length: 32' Height: 5' Width: 10' Skew:

CULVERT: I/O Type: Material: Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

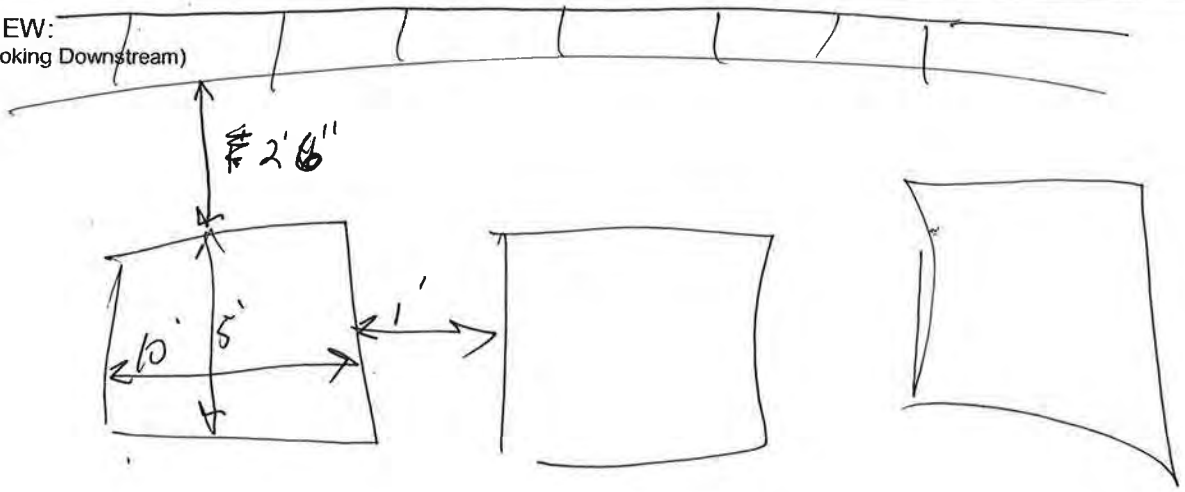
ERM Description: Coordinate System:

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 WB 5 RB 6 overview 7

Additional Info:

File Name:

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

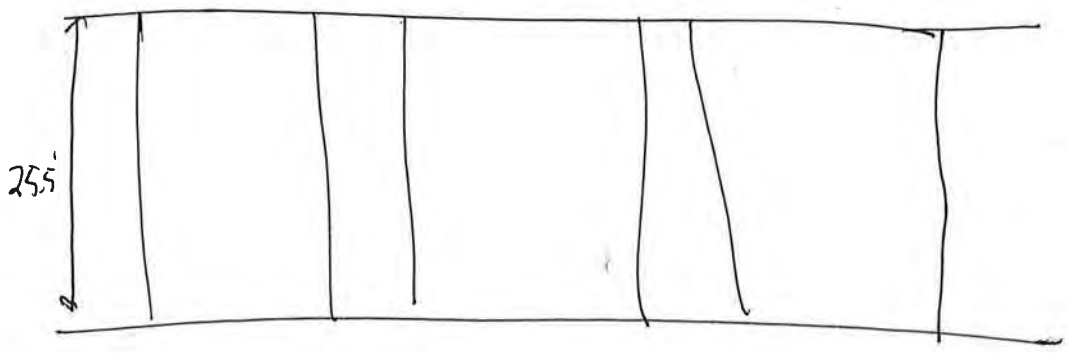


	Photo ID: Coordinates: Description:	WC_T220_STR_300_USC 30.409715, -97.580728 Upstream channel
	Photo ID: Coordinates: Description:	WC_T220_STR_300_USF 30.409715, -97.580728 Upstream face

	Photo ID: Coordinates: Description:	WC_T220_STR_300_DSF 30.409715, -97.580728 Downstream face
	Photo ID: Coordinates: Description:	WC_T220_STR_300_DSC 30.409715, -97.580728 Downstream channel

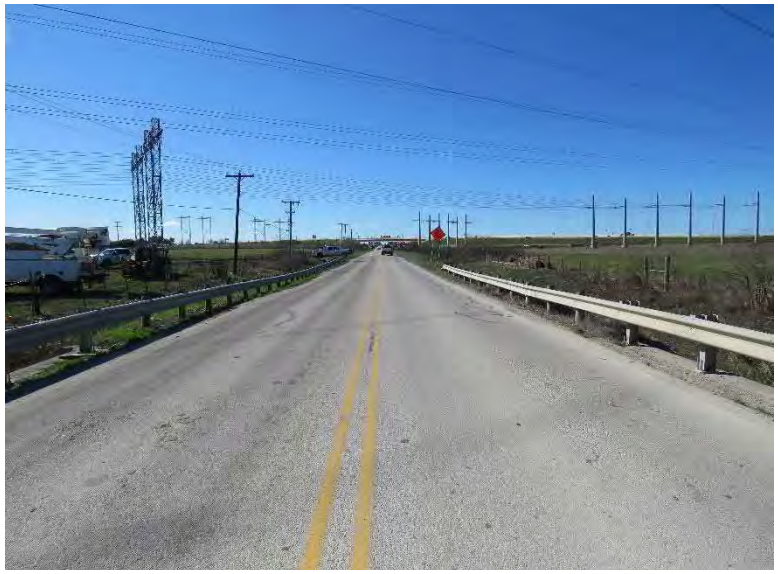
	Photo ID: Coordinates: Description:	WC_T220_STR_300_DSL 30.409715, -97.580728 Downstream left
	Photo ID: Coordinates: Description:	WC_T220_STR_300_DSR 30.409715, -97.580728 Downstream right

	Photo ID: Coordinates: Description:	WC_T220_STR_300_OVERVIEW 30.409715, -97.580728 Overview

HALFF

Survey Field Sheet

PROJECT: Wilburger SURVEY NAME:

STREAM NAME: WC_T227-STR 100 DATE: 12/18/19

LOCATION: CREW: ASML

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:

CULVERT: Number: 1 Shape: ~~Box~~ arch Length: 24' Height: Width: Skew:

CULVERT: I/O Type: Material: Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

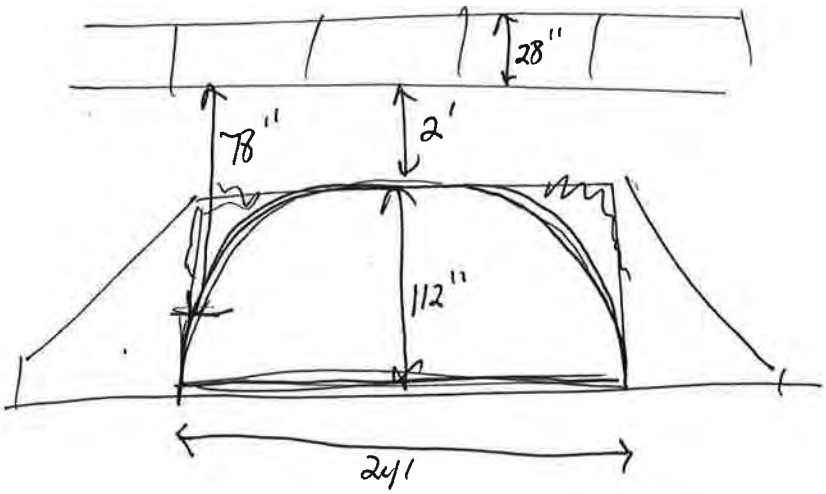
ERM Description: Coordinate System:

Photo Numbers: USC: -1 USF: 1 DSF: 2 DSC: 3 0034 0035 overview 6

Additional Info:

File Name:

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

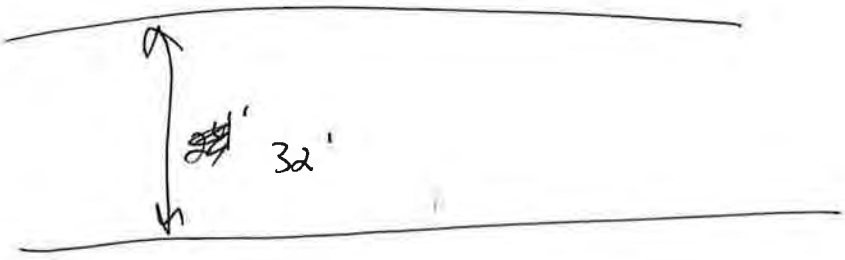


	Photo ID: Coordinates: Description:	WC_T227_STR_100_USC 30.383777, -97.555808 Upstream channel
	Photo ID: Coordinates: Description:	WC_T227_STR_100_USF 30.383777, -97.555808 Upstream face

	Photo ID: Coordinates: Description:	WC_T227_STR_100_DSF 30.383777, -97.555808 Downstream face
	Photo ID: Coordinates: Description:	WC_T227_STR_100_DSC 30.383777, -97.555808 Downstream channel

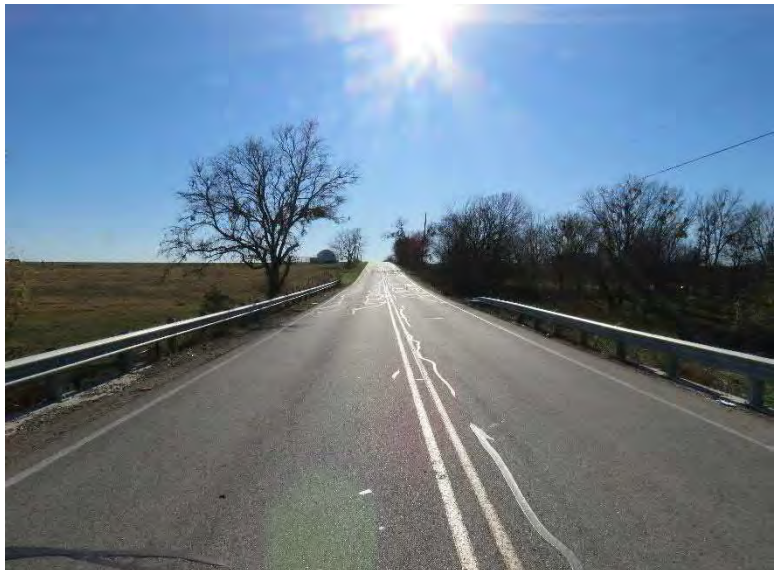
	Photo ID: Coordinates: Description:	WC_T227_STR_100_LOB 30.383777, -97.555808 Left overbank
	Photo ID: Coordinates: Description:	WC_T227_STR_100_ROB 30.383777, -97.555808 Right overbank

	Photo ID: Coordinates: Description:	WC_T227_STR_100_OVERVIEW 30.383777, -97.555808 Overview

HALFF

Survey Field Sheet

PROJECT: 35837 Wlc SURVEY NAME:

STREAM NAME: Little Rd. Willow Creek DATE:

LOCATION: Hays Co. CREW:

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:

CULVERT: Number: Shape: Length: Height: Width: Skew:

CULVERT: I/O Type: Material: Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

ERM Description: Coordinate System:

Photo Numbers: USC: 3 USF: 1,2 DSF: 59 DSC: 4,5

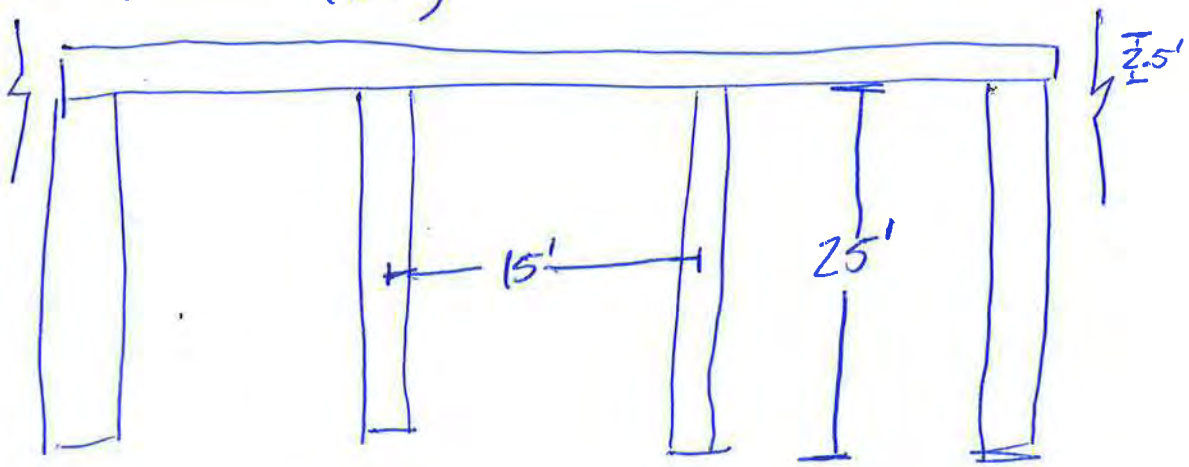
Additional Info: LGB: 6 ROB: 7 OA: 10

File Name:

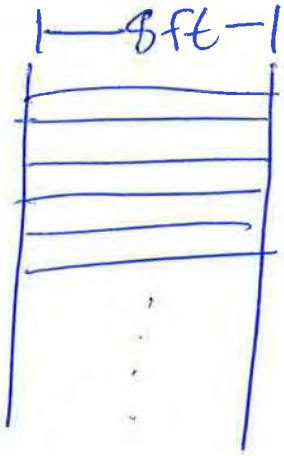
PROFILE VIEW:
(Left to Right looking Downstream)

21 SPANS

WLC_STR_166 (RR)



PLAN VIEW:



HH

	Photo ID: Coordinates: Description:	WLC_STR_100_USC 30.323051, -97.462335 Upstream channel
	Photo ID: Coordinates: Description:	WLC_STR_100_USF_1 30.323051, -97.462335 Upstream face

	Photo ID: Coordinates: Description:	WLC_STR_100_USF_2 30.323051, -97.462335 Upstream face
	Photo ID: Coordinates: Description:	WLC_STR_100_DSF_1 30.323051, -97.462335 Downstream face

	Photo ID: Coordinates: Description:	WLC_STR_100_DSF_2 30.323051, -97.462335 Downstream face
	Photo ID: Coordinates: Description:	WLC_STR_100_DSC_1 30.323051, -97.462335 Downstream channel

	Photo ID: Coordinates: Description:	WLC_STR_100_DSC_2 30.323051, -97.462335 Downstream channel
	Photo ID: Coordinates: Description:	WLC_STR_100_LOB 30.323051, -97.462335 Left overbank

	Photo ID: Coordinates: Description:	WLC_STR_100_ROB 30.323051, -97.462335 Right overbank
	Photo ID: Coordinates: Description:	WLC_STR_100_OVERALL 30.323051, -97.462335 Overall

HALFF

Survey Field Sheet

PROJECT: 35837 WILBARGER SURVEY NAME:

STREAM NAME: LITTLE RD. WILLOW CREEK DATE:

LOCATION: TRAVIS CO. CREW:

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:

CULVERT: Number: Shape: Length: Height: Width: Skew:

CULVERT: I/O Type: Material: Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

ERM Description: Coordinate System:

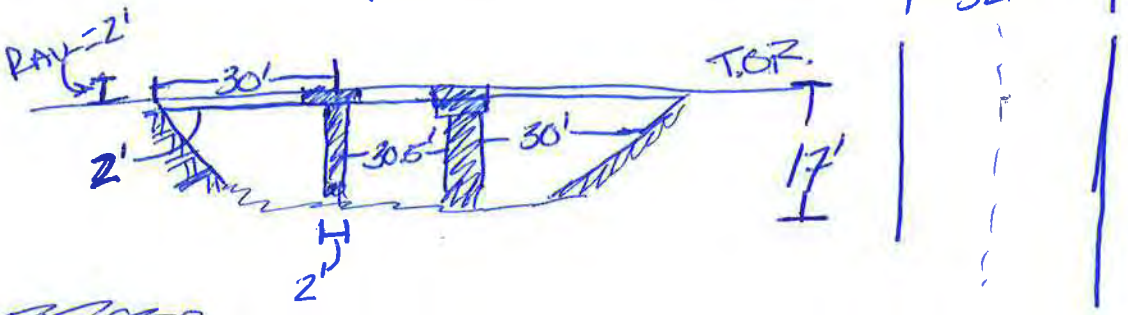
Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4

Additional Info: LOB: 5 ROB: 6 OA: 8 DEBRIS: 7

File Name:

PROFILE VIEW:
(Left to Right looking Downstream)

WLC_STR_200 (ROAD)



PLAN VIEW:

	Photo ID: Coordinates: Description:	WLC_STR_200_USC 30.323282, -97.462314 Upstream channel
	Photo ID: Coordinates: Description:	WLC_STR_200_USF 30.323282, -97.462314 Upstream face

	Photo ID: Coordinates: Description:	WLC_STR_200_DSF 30.323282, -97.462314 Downstream face
	Photo ID: Coordinates: Description:	WLC_STR_200_DSC 30.323282, -97.462314 Downstream channel

	Photo ID: Coordinates: Description:	WLC_STR_200_LOB 30.323282, -97.462314 Left overbank
	Photo ID: Coordinates: Description:	WLC_STR_200_ROB 30.323282, -97.462314 Right overbank

	Photo ID: Coordinates: Description:	WLC_STR_200_OVERALL 30.323282, -97.462314 Overall
	Photo ID: Coordinates: Description:	WLC_STR_200_DEBRIS 30.323282, -97.462314 Debris

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: WLC-STR-400 CREW: _____

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 42" Deck: _____ Width: _____ Pier(s): 2 @ 3' Pier Shape: round

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

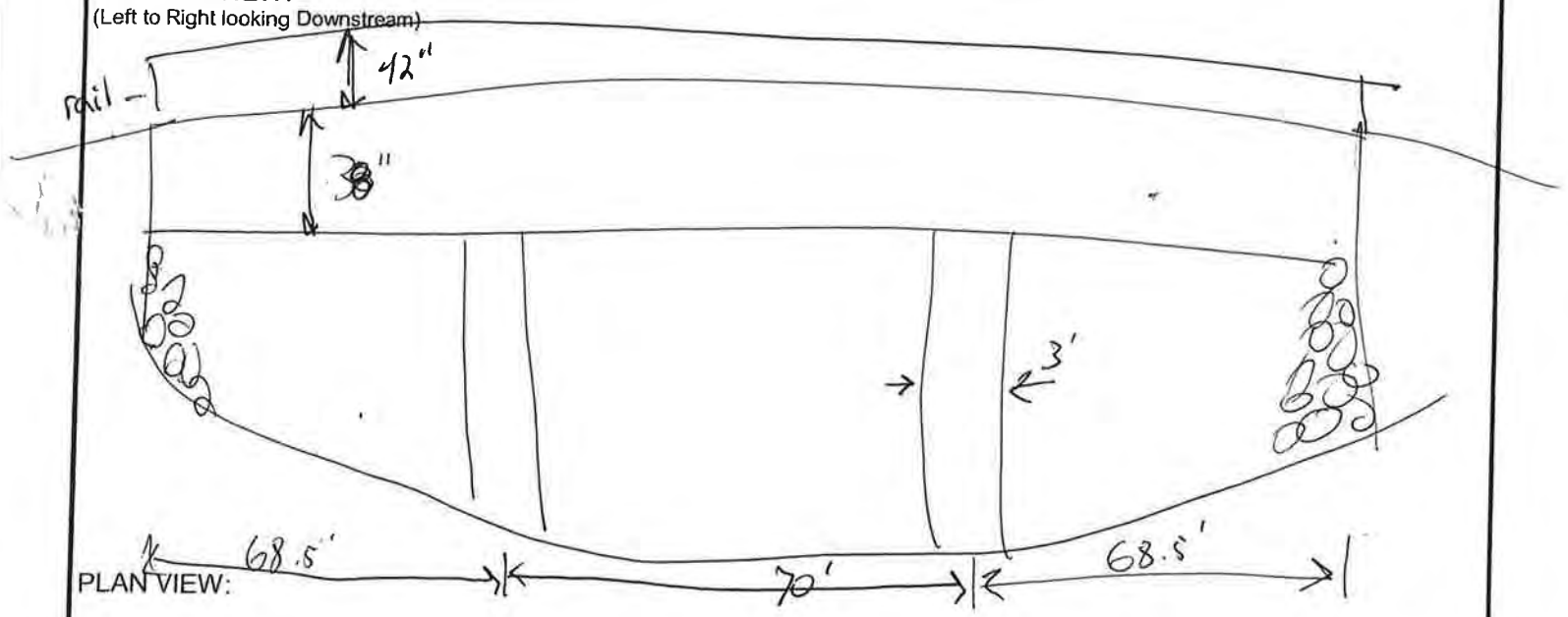
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 3 USF: 1 DSF: 2 DSC: 4 LOB 5 ROB 6

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

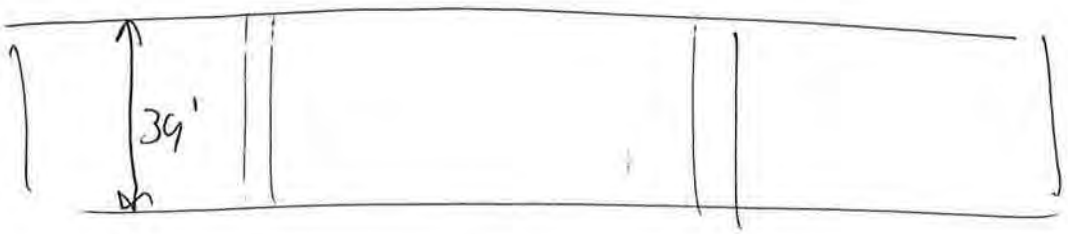


	Photo ID: Coordinates: Description:	WLC_STR_400_USC 30.351354, -97.458815 Upstream channel
	Photo ID: Coordinates: Description:	WLC_STR_400_USF 30.351354, -97.458815 Upstream face

	Photo ID: Coordinates: Description:	WLC_STR_400_DSF 30.351354, -97.458815 Downstream face
	Photo ID: Coordinates: Description:	WLC_STR_400_DSC 30.351354, -97.458815 Downstream channel

	Photo ID: Coordinates: Description:	WLC_STR_400_LOB 30.351354, -97.458815 Left overbank
	Photo ID: Coordinates: Description:	WLC_STR_400_ROB 30.351354, -97.458815 Right overbank

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: WLC - STR - ~~BR~~ 500 CREW: _____

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): 3 @ 2.5 Pier Shape: round

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

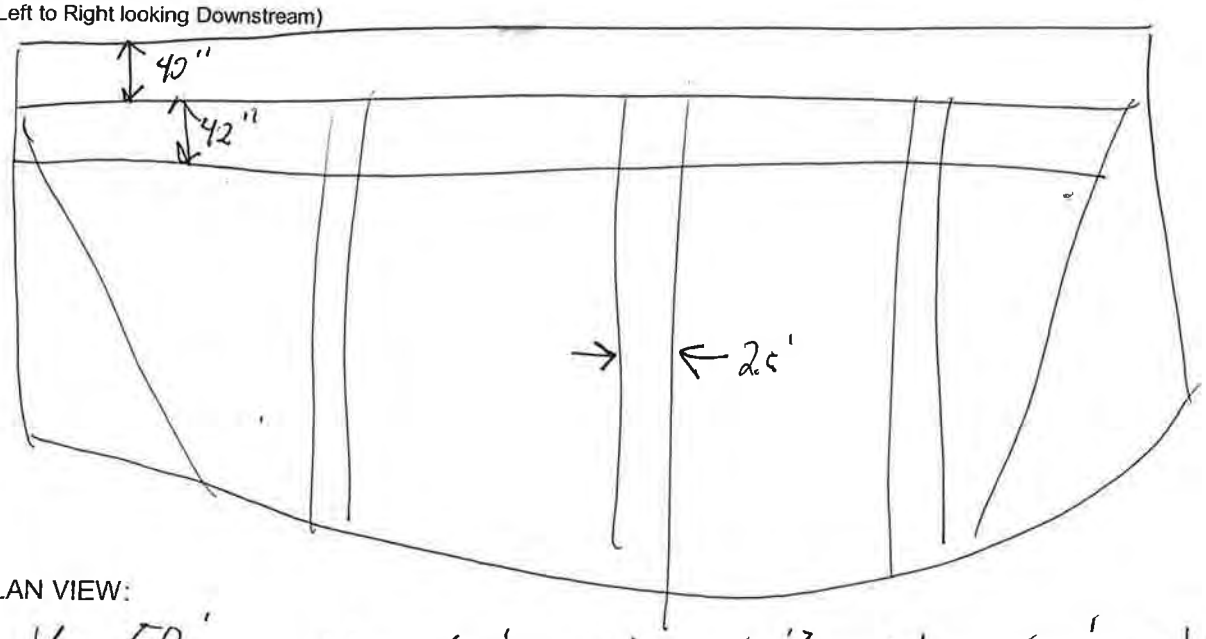
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: ~~4~~ 5

Additional Info: TxDOT bridge ID # picture 4

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

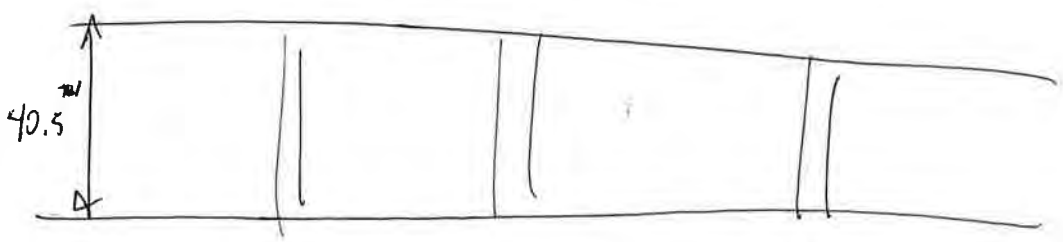
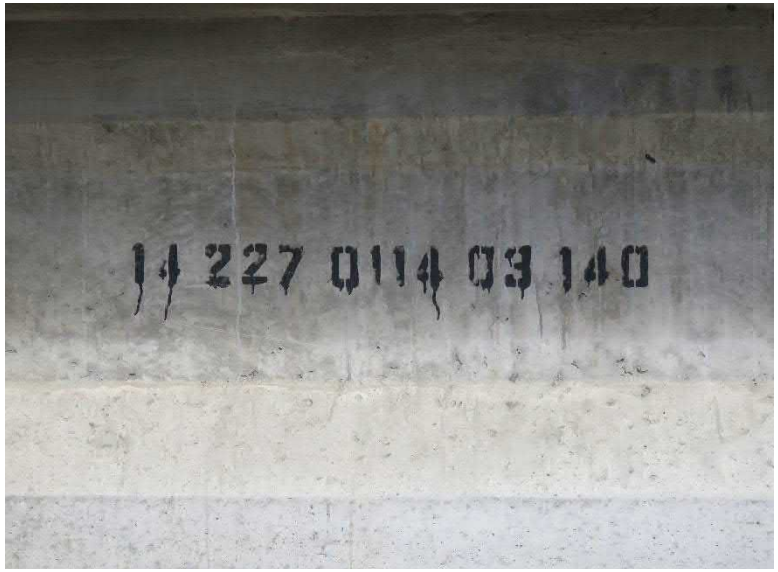


	Photo ID: Coordinates: Description:	WLC_STR_500_USC 30.351637, -97.45887 Upstream channel
	Photo ID: Coordinates: Description:	WLC_STR_500_USF 30.351637, -97.45887 Upstream face

	Photo ID: Coordinates: Description:	WLC_STR_500_DSF 30.351637, -97.45887 Downstream face
	Photo ID: Coordinates: Description:	WLC_STR_500_DSC 30.351637, -97.45887 Downstream channel

	Photo ID: Coordinates: Description:	WLC_STR_500_BR_ID 30.351637, -97.45887 TxDOT bridge ID

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: WLL-STR.605 DATE: 12/4

LOCATION: _____ CREW: JZ + ML

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 27" Deck: 29" Width: 29.5' Pier(s): N/A @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

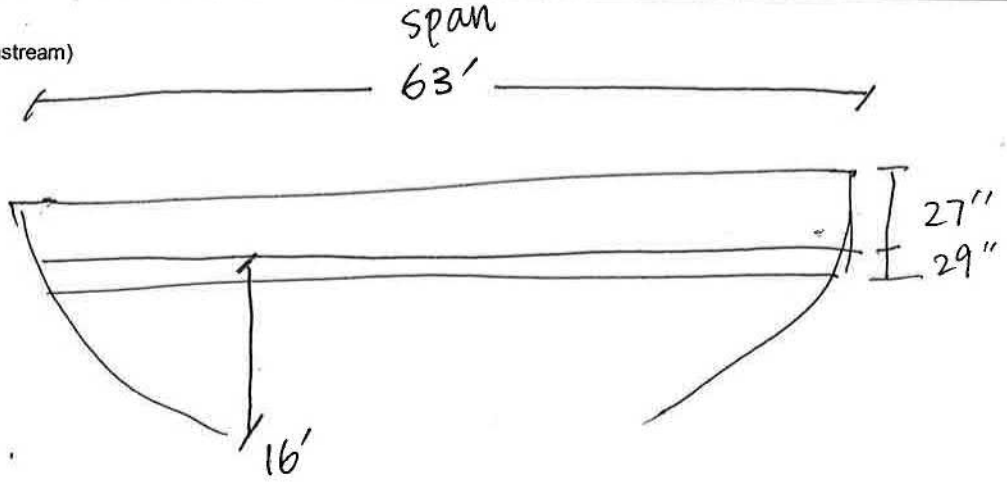
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOB 5 ROB 6 overview 7

Additional Info: construction scour, a lot of erosion

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

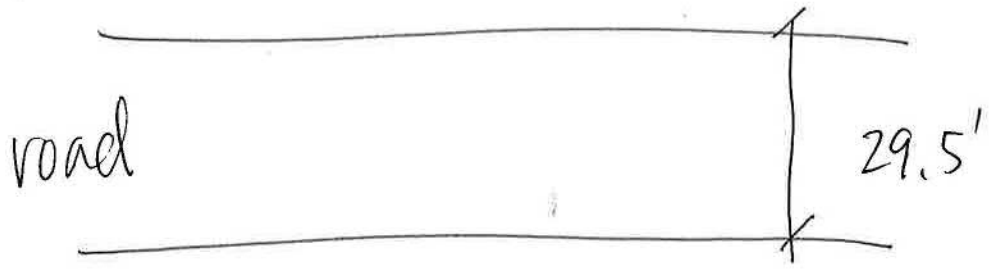


	Photo ID: Coordinates: Description:	WLC_STR_600_USC 30.366074, -97.454517 Upstream channel
	Photo ID: Coordinates: Description:	WLC_STR_600_USF 30.366074, -97.454517 Upstream face

	Photo ID: Coordinates: Description:	WLC_STR_600_DSF 30.366074, -97.454517 Downstream face
	Photo ID: Coordinates: Description:	WLC_STR_600_DSC 30.366074, -97.454517 Downstream channel

	Photo ID: Coordinates: Description:	WLC_STR_600_LOB 30.366074, -97.454517 Left overbank
	Photo ID: Coordinates: Description:	WLC_STR_600_ROB 30.366074, -97.454517 Right overbank

	Photo ID: Coordinates: Description:	WLC_STR_600_OVERVIEW 30.366074, -97.454517 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: WLC-STR-700 DATE: _____

LOCATION: _____ CREW: _____

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 28" Deck: 30"+8" Width: 46' Pier(s): 4 @ 2.5' Pier Shape: round

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

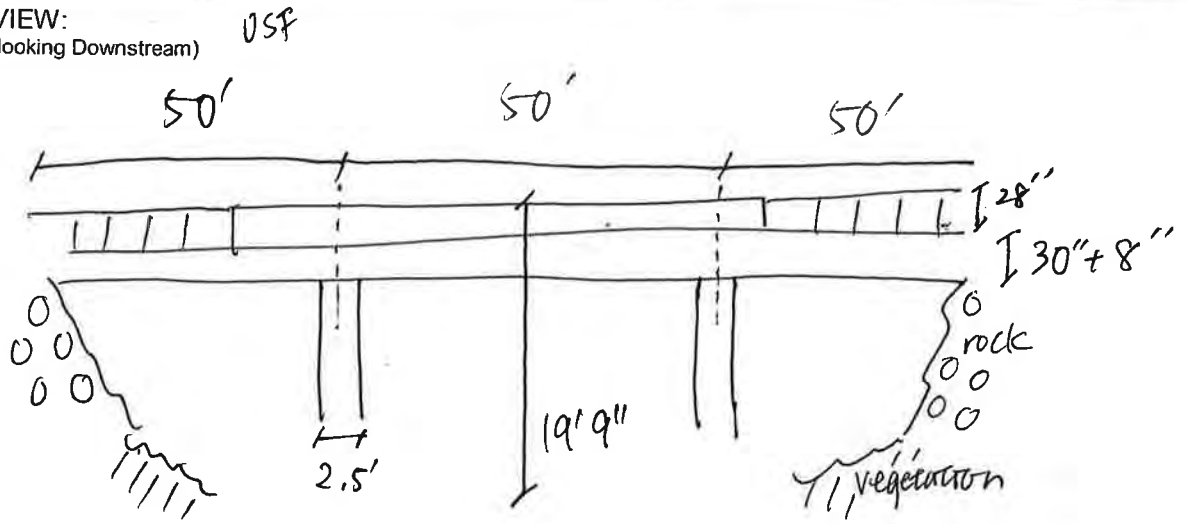
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 4 DSC: 5 Bridge # 3

Additional Info: LOB 6 ROB 7

File Name: overview 8

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

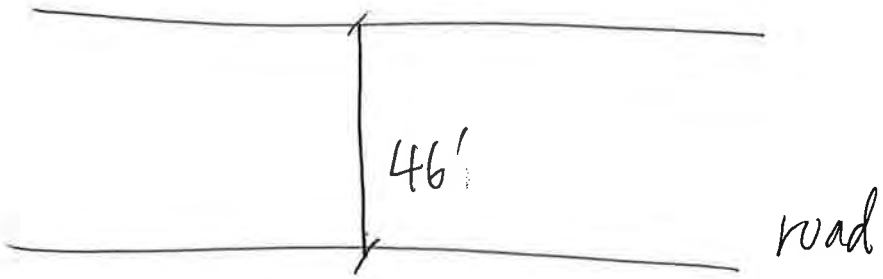


	Photo ID: Coordinates: Description:	WLC_STR_700_USC 30.376633, -97.445126 Upstream channel
	Photo ID: Coordinates: Description:	WLC_STR_700_USF 30.376633, -97.445126 Upstream face

	Photo ID: Coordinates: Description:	WLC_STR_700_DSF 30.376633, -97.445126 Downstream face
	Photo ID: Coordinates: Description:	WLC_STR_700_DSC 30.376633, -97.445126 Downstream channel

	Photo ID: Coordinates: Description:	WLC_STR_700_LOB 30.376633, -97.445126 Left overbank
	Photo ID: Coordinates: Description:	WLC_STR_700_ROB 30.376633, -97.445126 Right overbank

	Photo ID: Coordinates: Description:	WLC_STR_700_OVERVIEW 30.376633, -97.445126 Overview
	Photo ID: Coordinates: Description:	WLC_STR_700_BR_NUMBER 30.376633, -97.445126 TxDOT bridge number

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: WLC-STR-800 DATE: _____

LOCATION: _____ CREW: _____

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): 2 @ _____ Pier Shape: ☐ wall

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: ✓

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

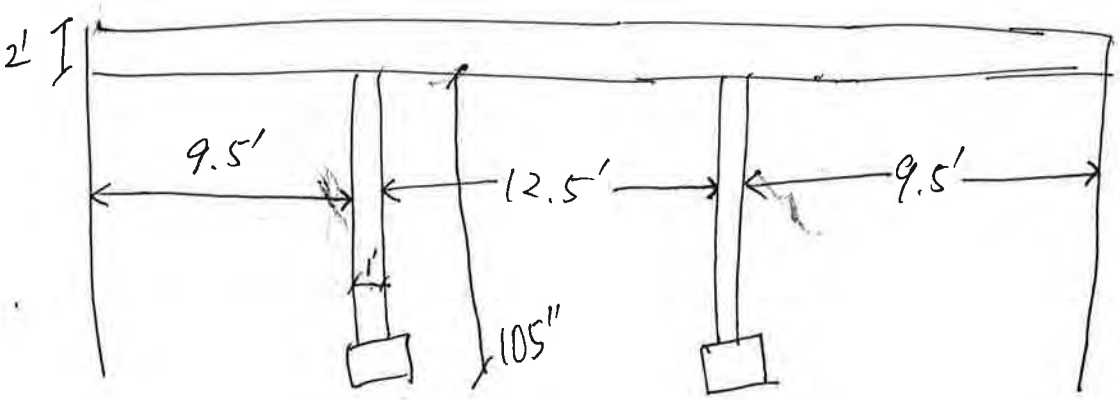
ERM Description: _____ Coordinate System: _____

Photo Numbers: Plaque 1 USC: 2 USF: 3,4 DSF: 5,6 DSC: 9 Pier foundation 2 LOB 7 ROB 10 overview 11

Additional Info: _____

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

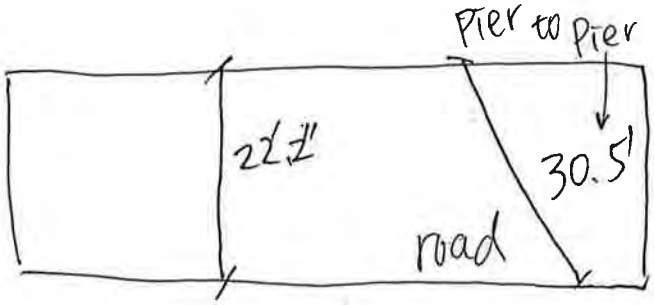


	Photo ID: Coordinates: Description:	WLC_STR_800_USC 30.387763, -97.44304 Upstream channel
	Photo ID: Coordinates: Description:	WLC_STR_800_USF_1 30.387763, -97.44304 Upstream face

	Photo ID: Coordinates: Description:	WLC_STR_800_USF_2 30.387763, -97.44304 Upstream face
	Photo ID: Coordinates: Description:	WLC_STR_800_DSF 30.387763, -97.44304 Downstream face

	Photo ID: Coordinates: Description:	WLC_STR_800_DSC 30.387763, -97.44304 Downstream channel
	Photo ID: Coordinates: Description:	WLC_STR_800_LOB 30.387763, -97.44304 Left overbank

	Photo ID: Coordinates: Description:	WLC_STR_800_ROB 30.387763, -97.44304 Right overbank
	Photo ID: Coordinates: Description:	WLC_STR_800_OVERVIEW 30.387763, -97.44304 Overview

	Photo ID: Coordinates: Description:	WLC_STR_800_PIER 30.387763, -97.44304 Bridge pier foundations
	Photo ID: Coordinates: Description:	WLC_STR_800_BR_PLAQUE 30.387763, -97.44304 Bridge plaque

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: WLC-STR-900 DATE: _____

LOCATION: _____ CREW: _____

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 28" Deck: 20' Width: 36' Pier(s): 6 @ 2' Pier Shape: round

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

ERM Description: _____ Coordinate System: _____

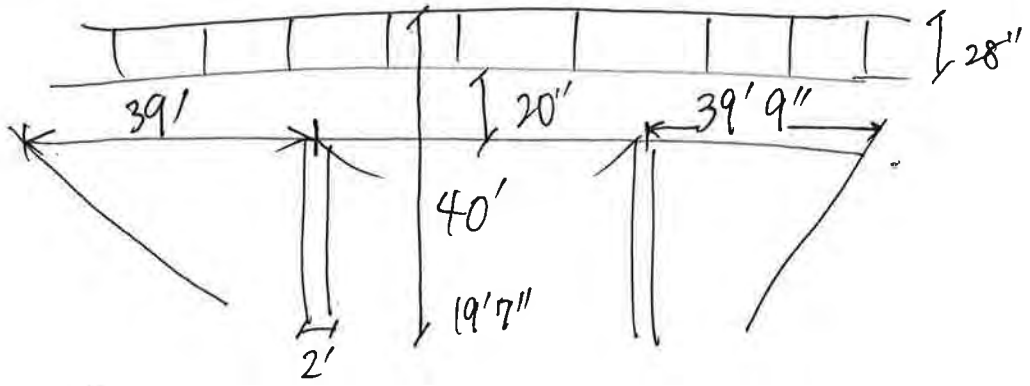
Photo Numbers: USC: 1 USF: 2,3 DSF: 4,5 DSC: 6 LOB 7 ROB 8

Additional Info: Overview 9

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)

2 sets of 3 piers



PLAN VIEW:

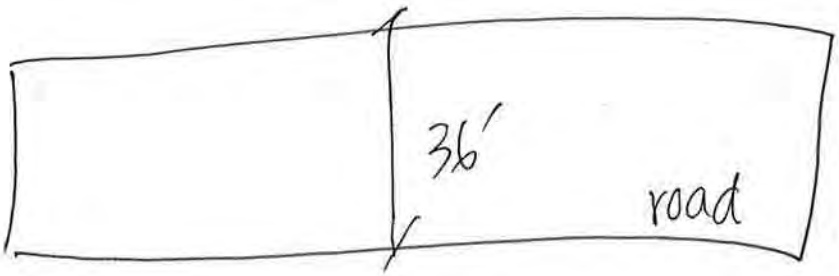


	Photo ID: Coordinates: Description:	WLC_STR_900_USC 30.404358, -97.425897 Upstream channel
	Photo ID: Coordinates: Description:	WLC_STR_900_USF_1 30.404358, -97.425897 Upstream face

	Photo ID: Coordinates: Description:	WLC_STR_900_USF_2 30.404358, -97.425897 Upstream face
	Photo ID: Coordinates: Description:	WLC_STR_900_DSF_1 30.404358, -97.425897 Downstream face

	Photo ID: Coordinates: Description:	WLC_STR_900_DSF_2 30.404358, -97.425897 Downstream face
	Photo ID: Coordinates: Description:	WLC_STR_900_DSC 30.404358, -97.425897 Downstream channel

	Photo ID: Coordinates: Description:	WLC_STR_900_LOB 30.404358, -97.425897 Left overbank
	Photo ID: Coordinates: Description:	WLC_STR_900_ROB 30.404358, -97.425897 Right overbank

	Photo ID: Coordinates: Description:	WLC_STR_900_OVERVIEW 30.404358, -97.425897 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: WLC-STR_1000 DATE: _____

LOCATION: _____ CREW: _____

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: 18" Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 3 Shape: O Length: 26' Height: 24" Width: 24" Skew: _____

CULVERT: I/O Type: _____ Material: Plastic Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

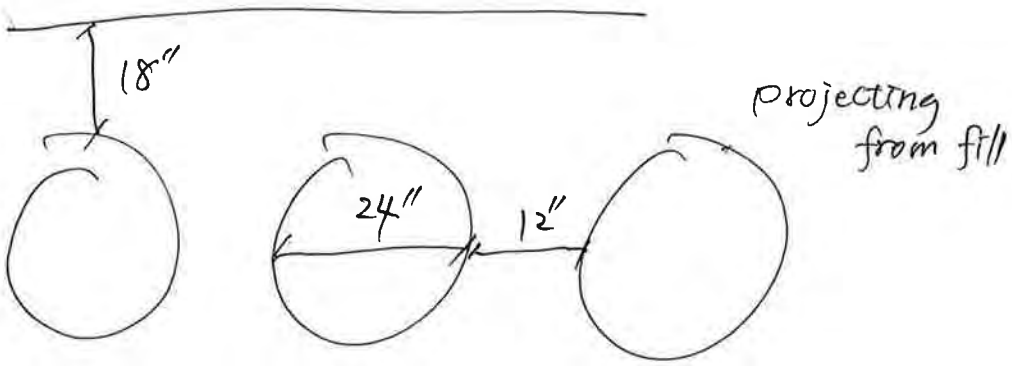
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOB 5 ROB 6 old BR 7 overview 8

Additional Info: there might be something else here that got washed out

File Name: Culverts 9

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

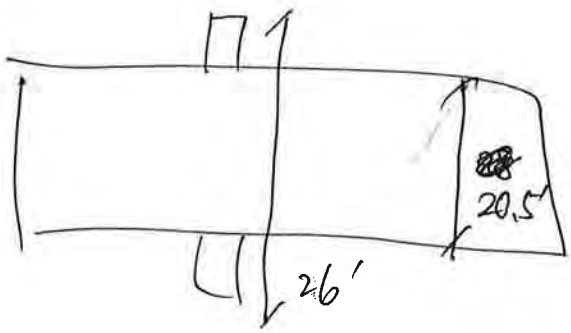


	Photo ID: Coordinates: Description:	WLC_STR_1000_USC 30.405919, -97.42405 Upstream channel
	Photo ID: Coordinates: Description:	WLC_STR_1000_USF 30.405919, -97.42405 Upstream face

	Photo ID: Coordinates: Description:	WLC_STR_1000_DSF 30.405919, -97.42405 Downstream face
	Photo ID: Coordinates: Description:	WLC_STR_1000_DSC 30.405919, -97.42405 Downstream channel

	Photo ID: Coordinates: Description:	WLC_STR_1000_LOB 30.405919, -97.42405 Left overbank
	Photo ID: Coordinates: Description:	WLC_STR_1000_ROB 30.405919, -97.42405 Right overbank

	Photo ID: Coordinates: Description:	WLC_STR_1000_OVERVIEW 30.405919, -97.42405 Overview
	Photo ID: Coordinates: Description:	WLC_STR_1000_OLD_BR 30.405919, -97.42405 Old, washed out bridge downstream

	Photo ID: Coordinates: Description:	WLC_STR_1000_CULVERTS 30.405919, -97.42405 A pile of culverts in the site

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: WLC_STR_1100 DATE: _____

LOCATION: _____ CREW: _____

TYPE: BR(X) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: 18" + 18" Width: 22' Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: _____ Height: _____ Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

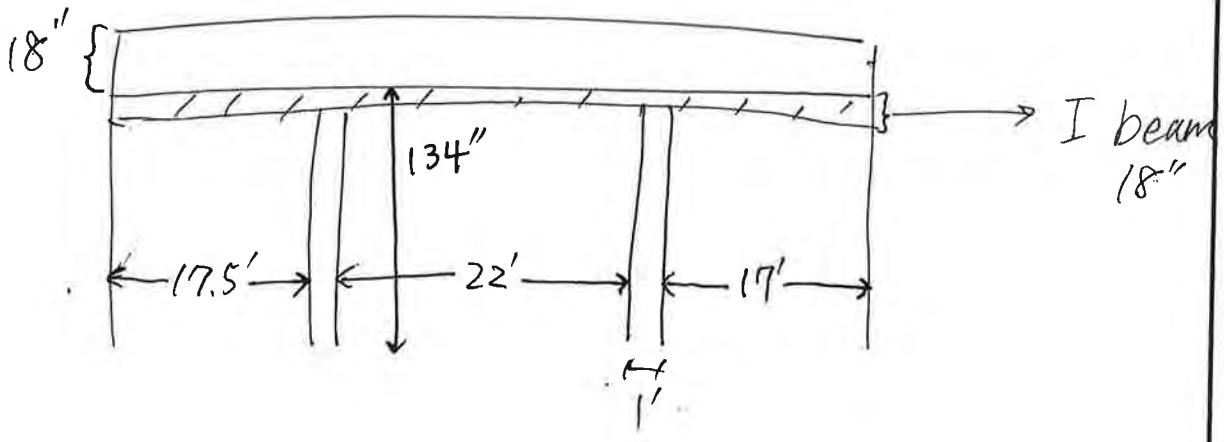
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOB 5 ROB 6

Additional Info: Plaque 7 overview 8

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

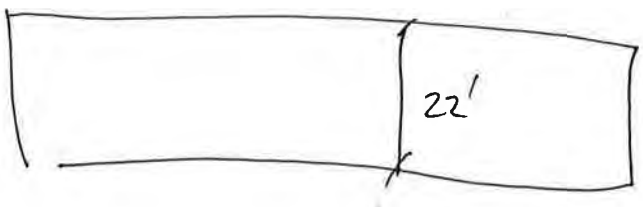
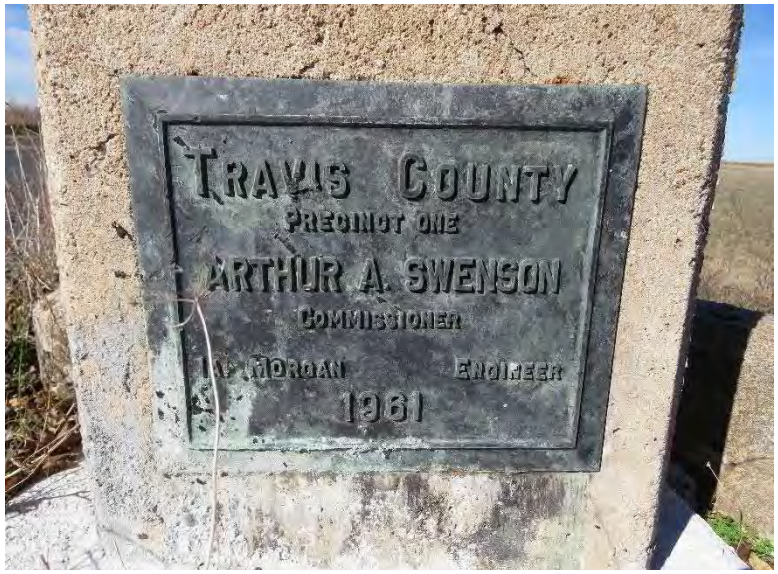


	Photo ID: Coordinates: Description:	WLC_STR_1100_USC 30.414781, -97.414873 Upstream channel
	Photo ID: Coordinates: Description:	WLC_STR_1100_USF 30.414781, -97.414873 Upstream face

	Photo ID: Coordinates: Description:	WLC_STR_1100_DSF 30.414781, -97.414873 Downstream face
	Photo ID: Coordinates: Description:	WLC_STR_1100_DSC 30.414781, -97.414873 Downstream channel

	Photo ID: Coordinates: Description:	WLC_STR_1100_LOB 30.414781, -97.414873 Left overbank
	Photo ID: Coordinates: Description:	WLC_STR_1100_ROB 30.414781, -97.414873 Right overbank

	Photo ID: Coordinates: Description:	WLC_STR_1100_OVERVIEW 30.414781, -97.414873 Overview
	Photo ID: Coordinates: Description:	WLC_STR_1100_BR_PLAQUE 30.414781, -97.414873 Bridge plaque

Appendix C-3: Field Reconnaissance – City of Pflugerville

HALFF

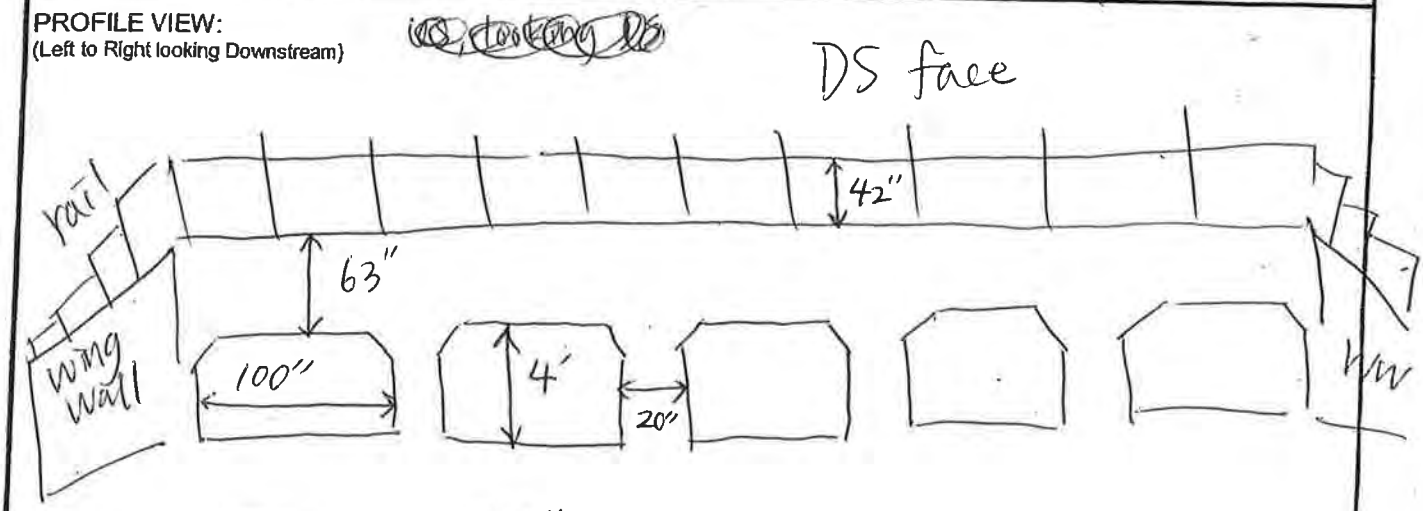
Survey Field Sheet

PROJECT: Bastrop FPP - Wilbarger Creek
STREAM NAME: Wilbarger Creek Trib 185
LOCATION: Cracers of the Moon Blvd
TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.:

SURVEY NAME: WC_T185_STR_1500
DATE: 11/21/2020
CREW: Jing Zhang
ERM ID: GEOID:

BRIDGE: Rail Ht: 42" Deck: 63" Width: GIS Pier(s): @ Shape:
CULVERT: Number: 5 Shape: Box Length: GIS Height: 4' Width: 100" Skew: yes
CULVERT: I/O Type: Material: concrete Wingwall Angle
DAM: Top Width: Side Slope US: DS: Outlet:
ERM Description: Coordinate System:
Photo Numbers: USC: 3 USF: 4 OTXS: DSF: 2 DSC: 1
Additional Info: OV: 5, LOB 6, ROB 7
File Name:

PROFILE VIEW:
(Left to Right looking Downstream)



US deck = 53"
no ww on ~~DS~~ side
US

PLAN VIEW:

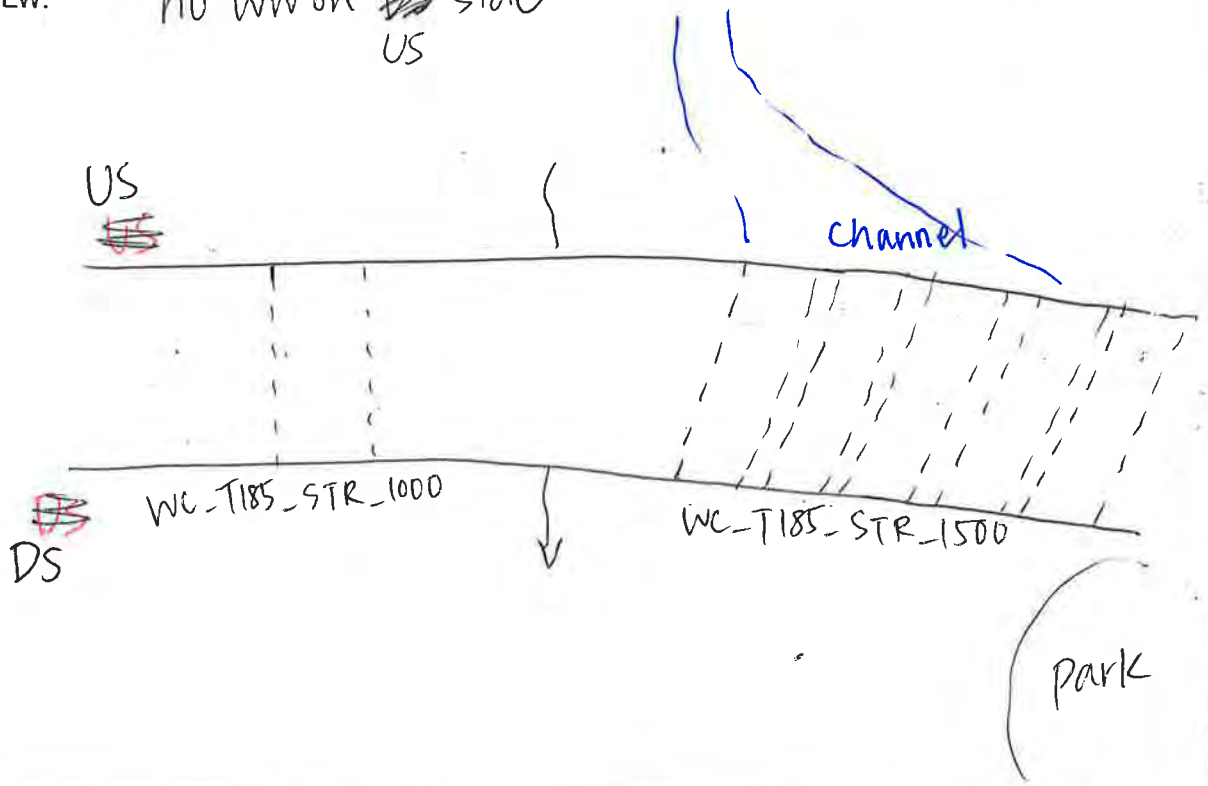


	Photo ID: Coordinates: Description:	WC_T185_STR_1500_USC 30.470383, -97.615474 Upstream channel
	Photo ID: Coordinates: Description:	WC_T185_STR_1500_USF 30.470383, -97.615474 Upstream face

	Photo ID: Coordinates: Description:	WC_T185_STR_1500_DSF 30.470383, -97.615474 Downstream face
	Photo ID: Coordinates: Description:	WC_T185_STR_1500_DSC 30.470383, -97.615474 Downstream channel

	Photo ID: Coordinates: Description:	WC_T185_STR_1500_LOB 30.470383, -97.615474 Left overbank
	Photo ID: Coordinates: Description:	WC_T185_STR_1500_ROB 30.470383, -97.615474 Right overbank

	Photo ID: Coordinates: Description:	WC_T185_STR_1500_OVERVIEW 30.470383, -97.615474 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: WC-T208-STR-100 CREW: _____

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: _____ Shape: _____ Length: 40' Height: 4' Width: _____ Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

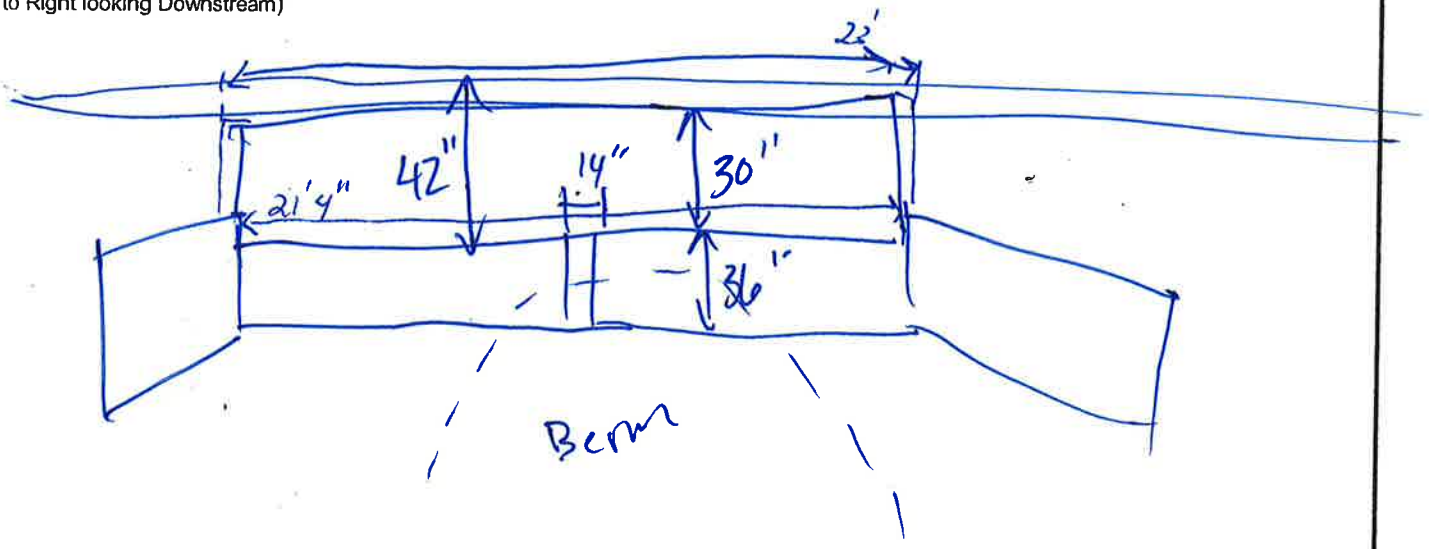
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2 3 DSF: 4 DSC: 5 cos 6 ROS 7 overview 8

Additional Info: lots of vegetation

File Name: _____

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

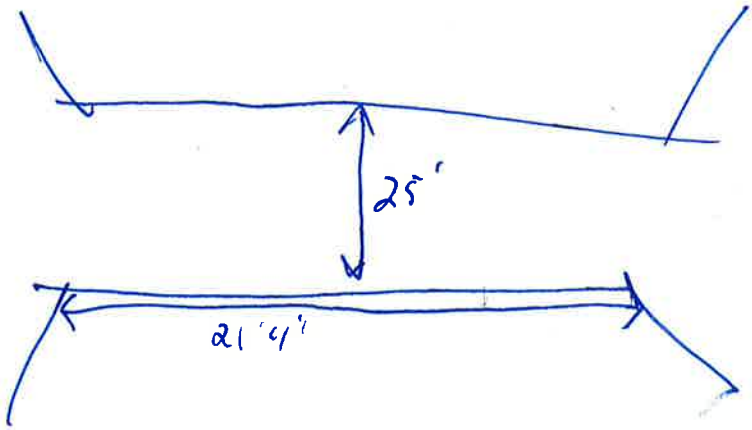


	Photo ID: Coordinates: Description:	WC_T208_STR_100_USC 30.463339, -97.550886 Upstream channel
	Photo ID: Coordinates: Description:	WC_T208_STR_100_USF_1 30.463339, -97.550886 Upstream face

	Photo ID: Coordinates: Description:	WC_T208_STR_100_USF_2 30.463339, -97.550886 Upstream face
	Photo ID: Coordinates: Description:	WC_T208_STR_100_DSC 30.463339, -97.550886 Downstream channel

	Photo ID: Coordinates: Description:	WC_T208_STR_100_DSF 30.463339, -97.550886 Downstream face
	Photo ID: Coordinates: Description:	WC_T208_STR_100_LOB 30.463339, -97.550886 Left overbank

	Photo ID: Coordinates: Description:	WC_T208_STR_100_ROB 30.463339, -97.550886 Right overbank
	Photo ID: Coordinates: Description:	WC_T208_STR_100_OVERVIEW 30.463339, -97.550886 Overview

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: WC_T209_STR_100 CREW: ML + MS

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: 33" Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 11 Shape: round & box Length: _____ Height: varies Width: varies Skew: _____

CULVERT: I/O Type: _____ Material: CMP & RCB Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

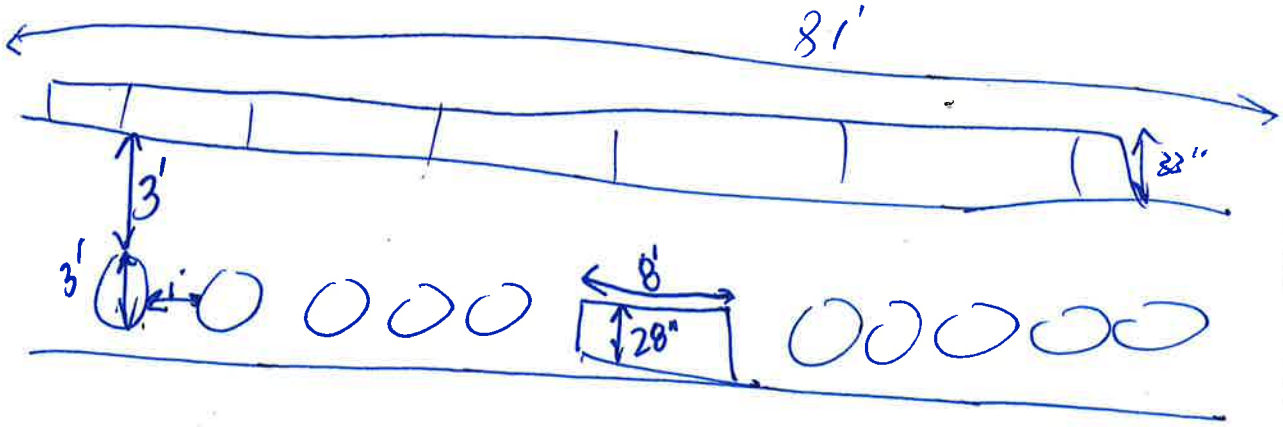
ERM Description: _____ Coordinate System: _____

Photo Numbers: USC: 1 USF: 2-3 DSF: 4 DSC: 5 LOB 6 ROB 7

Additional Info: creek needs some clearing needs sediment removal, creek comes to the

File Name: ~~right side~~ 5 round culverts on right side ~~[illegible]~~ flow doesn't really set to left side culverts debris build up on right side culverts

PROFILE VIEW:
(Left to Right looking Downstream)



PLAN VIEW:

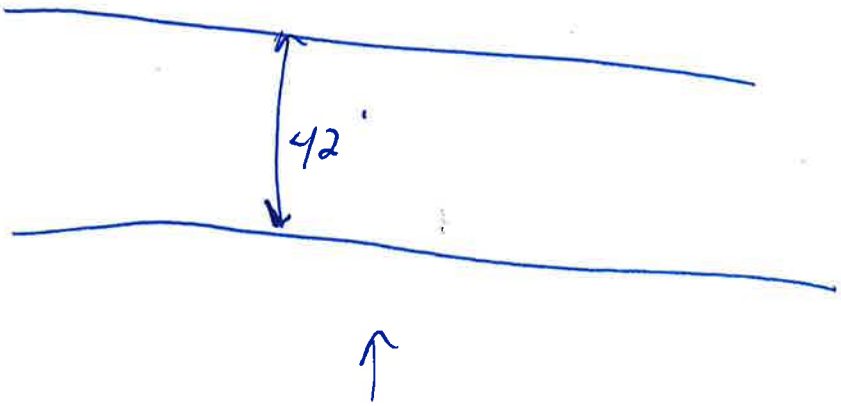


	Photo ID: Coordinates: Description:	WC_T209_STR_100_USC 30.482373, -97.565492 Upstream channel
	Photo ID: Coordinates: Description:	WC_T209_STR_100_USF_1 30.482373, -97.565492 Upstream face

	Photo ID: Coordinates: Description:	WC_T209_STR_100_USF_2 30.482373, -97.565492 Upstream face
	Photo ID: Coordinates: Description:	WC_T209_STR_100_DSC 30.482373, -97.565492 Downstream channel

	Photo ID: Coordinates: Description:	WC_T209_STR_100_DSF 30.482373, -97.565492 Downstream face
	Photo ID: Coordinates: Description:	WC_T209_STR_100_LOB 30.482373, -97.565492 Left overbank

	Photo ID: Coordinates: Description:	WC_T209_STR_100_ROB 30.482373, -97.565492 Right overbank
	Photo ID: Coordinates: Description:	WC_T209_STR_100_OVERVIEW 30.482373, -97.565492 Overview

	Photo ID: Coordinates: Description:	WC_T209_STR_100_DrainageDitch 30.482373, -97.565492 Road side drainage ditch, upstream, right overbank

HALFF

Survey Field Sheet

PROJECT: _____ SURVEY NAME: _____

STREAM NAME: _____ DATE: _____

LOCATION: WC-T209-STR-200 CREW: _____

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: _____ ERM ID: _____ GEOID: _____

BRIDGE: Rail Height: _____ Deck: _____ Width: _____ Pier(s): _____ @ _____ Pier Shape: _____

CULVERT: Number: 12 Shape: round Length: _____ Height: 24" Width: 24" Skew: _____

CULVERT: I/O Type: _____ Material: _____ Wingwall Angle _____

DAM: Top Width: _____ Side Slope Side Slope US: _____ DS: _____ Outlet: _____

ERM Description: _____ Coordinate System: _____

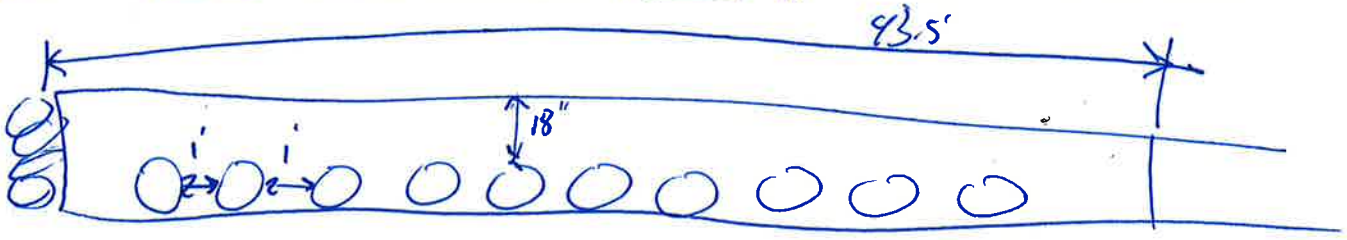
Photo Numbers: USC: 1 USF: 2 DSF: 3 DSC: 4 LOB: 5 ROB 6 overview 7 shot from ROB fence 8

Additional Info: downstream end has some sediment build up

File Name: upstream ROB chain link fence overtopped. lower on LOB do not flood left

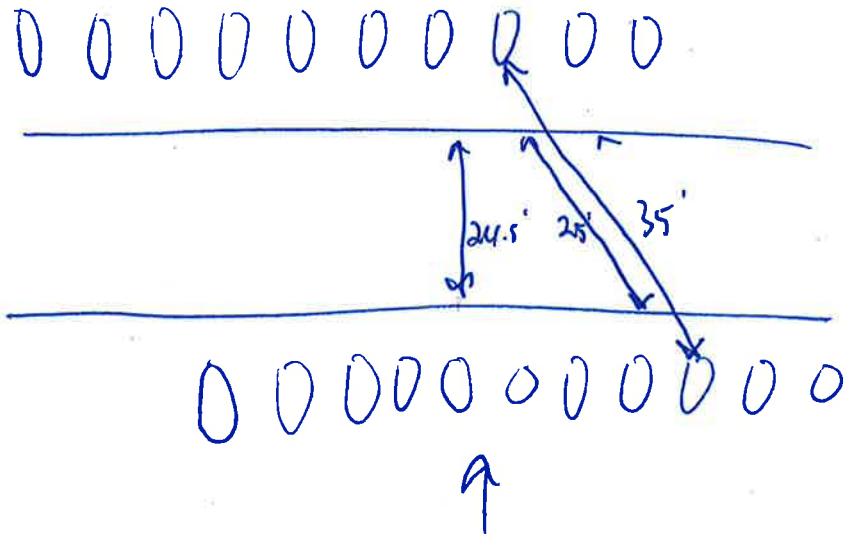
PROFILE VIEW:
(Left to Right looking Downstream)

got to mailbox on property upstream side.
resident tried to clear debris & sediment build up but can't do it all the time
east of intersection house @ rear measure a _____ 28" of water during last flood



Room for about 2' of water over topping during last flood
lots of debris from empty lot

PLAN VIEW:



9

	Photo ID: Coordinates: Description:	WC_T209_STR_200_USC 30.483043, -97.565687 Upstream channel
	Photo ID: Coordinates: Description:	WC_T209_STR_200_USF 30.483043, -97.565687 Upstream face

	Photo ID: Coordinates: Description:	WC_T209_STR_200_DSC 30.483043, -97.565687 Downstream channel
	Photo ID: Coordinates: Description:	WC_T209_STR_200_DSF_1 30.483043, -97.565687 Downstream face

	Photo ID: Coordinates: Description:	WC_T209_STR_200_DSF_2 30.483043, -97.565687 Downstream face
	Photo ID: Coordinates: Description:	WC_T209_STR_200_LOB 30.483043, -97.565687 Left overbank

	Photo ID: Coordinates: Description:	WC_T209_STR_200_ROB 30.483043, -97.565687 Right overbank
	Photo ID: Coordinates: Description:	WC_T209_STR_200_OVERVIEW 30.483043, -97.565687 Overview

HALFF

Survey Field Sheet

PROJECT: Wilbarger SURVEY NAME:

STREAM NAME: WC-T196 DS DATE: 01/30/20

LOCATION: Lone Star + Falcon Pointe Bld CREW:

TYPE: BR( ) CUL(orifice) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:

CULVERT: Number: Shape: Length: Height: Width: Skew:

CULVERT: I/O Type: Material: Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

ERM Description: Coordinate System:

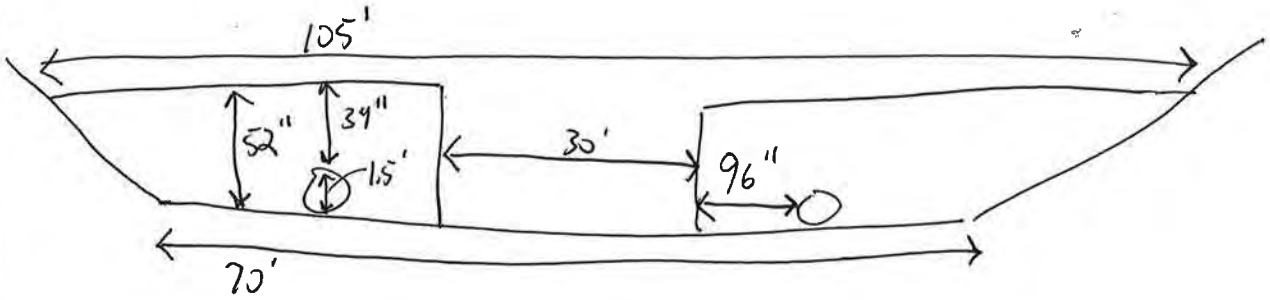
Photo Numbers: USC: USF: DSF: DSC:

Additional Info: 4" pipe drains low flow from slotted drain

File Name:

PROFILE VIEW:
(Left to Right looking Downstream)

outlet structure for pond not surveyed



PLAN VIEW:

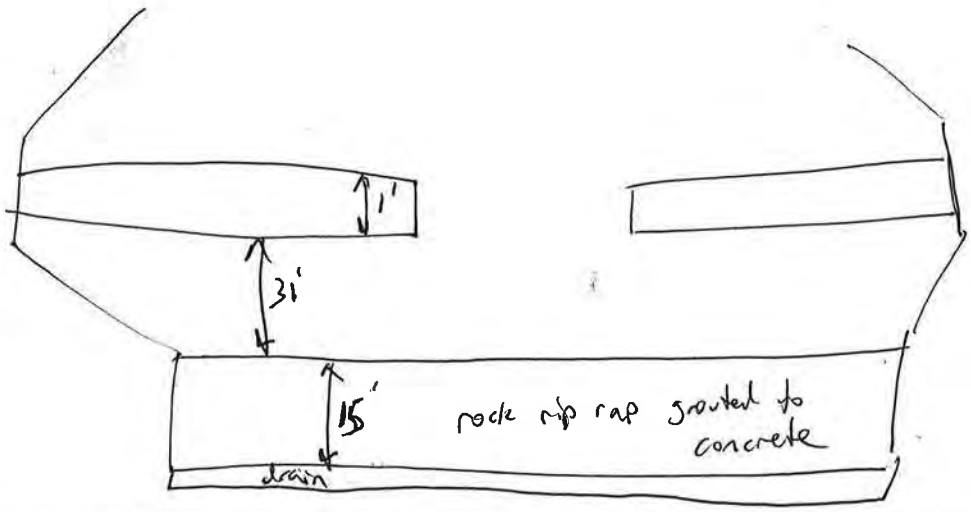


	Photo ID: Coordinates: Description:	WC_T196_DS_USC 30.455893, -97.584789 Upstream channel
	Photo ID: Coordinates: Description:	WC_T196_DS_USC_2 30.455893, -97.584789 Upstream channel

	Photo ID: Coordinates: Description:	WC_T196_DS_USF 30.455893, -97.584789 Upstream face
	Photo ID: Coordinates: Description:	WC_T196_DS_DSC 30.455893, -97.584789 Downstream channel

	Photo ID: Coordinates: Description:	WC_T196_DS_DSC_2 30.455893, -97.584789 Downstream channel
	Photo ID: Coordinates: Description:	WC_T196_DS_DSF 30.455893, -97.584789 Downstream face

	Photo ID: Coordinates: Description:	WC_T196_DS_DSOutlet 30.455893, -97.584789 Downstream outlet
	Photo ID: Coordinates: Description:	WC_T196_DS_ConcreteApron 30.455893, -97.584789 Concrete apron of the pond

	Photo ID: Coordinates: Description:	WC_T196_DS_OVERVIEW_1 30.455893, -97.584789 Overview
	Photo ID: Coordinates: Description:	WC_T196_DS_OVERVIEW_2 30.455893, -97.584789 Overview

HALFF

Survey Field Sheet

PROJECT: Wilbarger SURVEY NAME:

STREAM NAME: WC-T196 US DATE: 01/30/20

LOCATION: Long Star Ranch Blvd CREW:

TYPE: BR( ) CUL( ) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: 42" Deck: Width: Pier(s): @ Pier Shape:

CULVERT: Number: 4 Shape: Box Length: 72' Height: 4' Width: 8' Skew: No

CULVERT: I/O Type: Material: Concrete Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

ERM Description: Coordinate System:

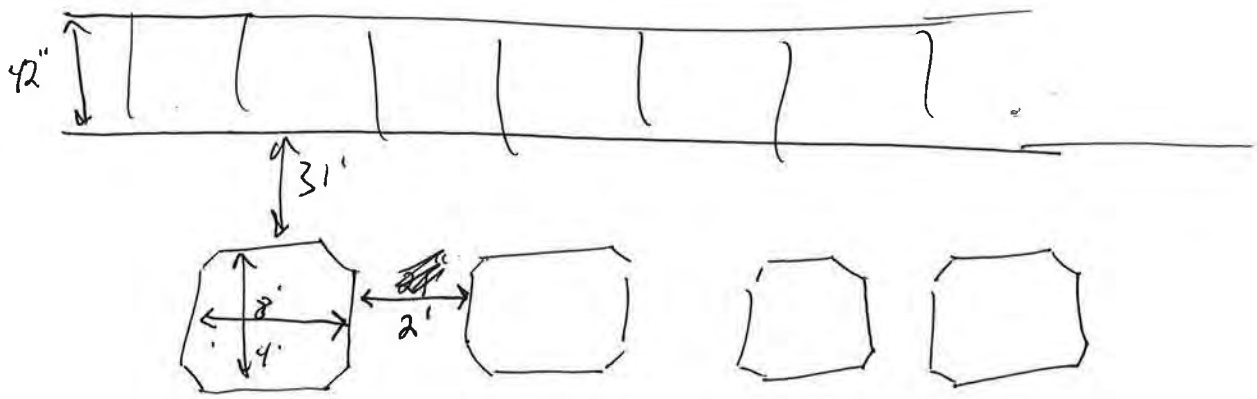
Photo Numbers: USC: 1-2 USF: 3 DSF: 5 DSC: 4, 6

Additional Info: ~2.5' scour DS of concrete apron

File Name:

PROFILE VIEW:
(Left to Right looking Downstream)

pond inlet structure surveyed



PLAN VIEW:

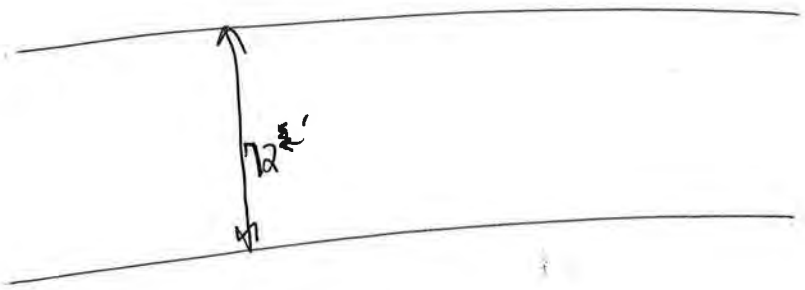


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	Photo ID: Coordinates: Description:	WC_T196_US_USC_2 30.45892, -97.58622 Upstream channel

	Photo ID: Coordinates: Description:	WC_T196_US_USF 30.45892, -97.58622 Upstream face
	Photo ID: Coordinates: Description:	WC_T196_US_DSC 30.45892, -97.58622 Downstream channel

	Photo ID: Coordinates: Description:	WC_T196_US_DSC_2 30.45892, -97.58622 Downstream channel
	Photo ID: Coordinates: Description:	WC_T196_US_DSF 30.45892, -97.58622 Downstream face

HALFF **Survey Field Sheet**

PROJECT: Wilbarger SURVEY NAME:

STREAM NAME: DATE: 01/30/20

LOCATION: Weiss Ln @ Hidden Lake Crossing CREW:

TYPE: BR( ) CUL(X) DAM( ) XS( ) ERM ELEV.: ERM ID: GEOID:

BRIDGE: Rail Height: Deck: Width: Pier(s): @ Pier Shape:

CULVERT: Number: Shape: Length: Height: Width: Skew:

CULVERT: I/O Type: Material: Wingwall Angle

DAM: Top Width: Side Slope Side Slope US: DS: Outlet:

ERM Description: Coordinate System:

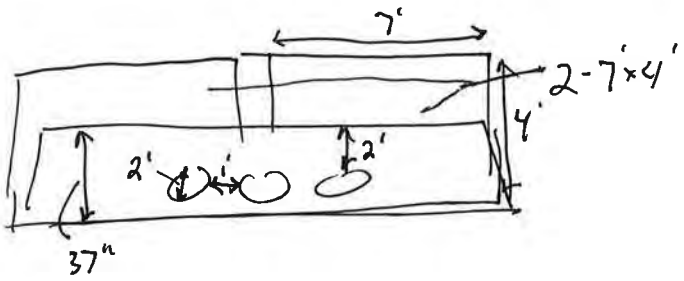
Photo Numbers: USC: 1, 4 USF: 2, 3 DSF: 5 DSC: 6, 7

Additional Info: tried to get shots of inside culvert to try and see the bend but it failed

File Name:

PROFILE VIEW:
(Left to Right looking Downstream)

survey also available pond inlet structure



PLAN VIEW:

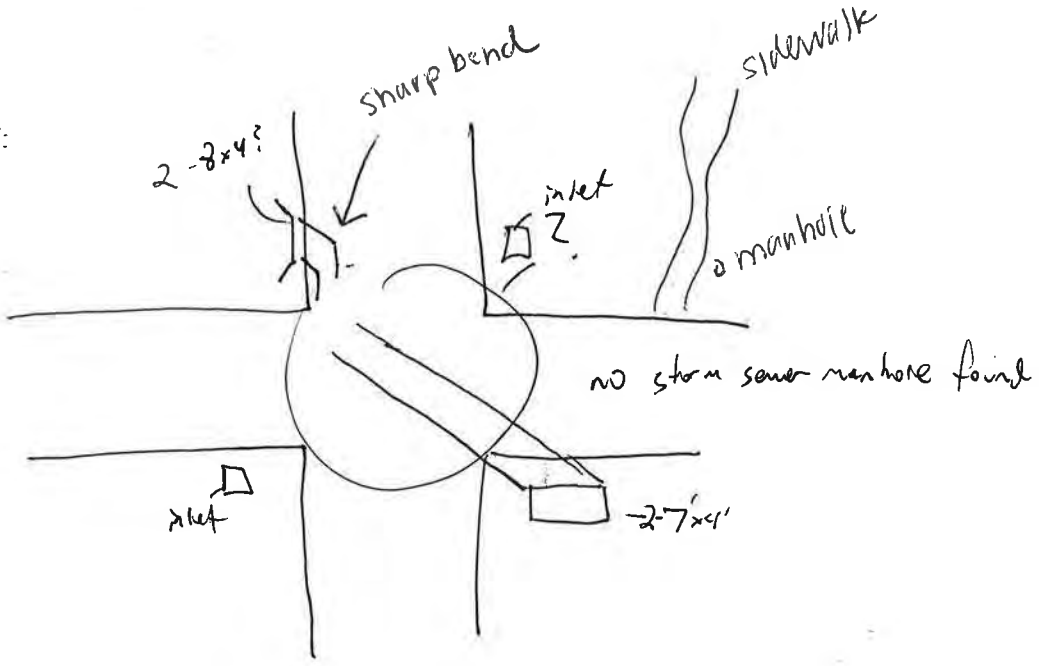


	Photo ID: Coordinates: Description:	WC_T207_WEISSLN_HIDDENLAKE_USC 30.447238, -97.56151 Upstream channel
	Photo ID: Coordinates: Description:	WC_T207_WEISSLN_HIDDENLAKE_USC_2 30.447238, -97.56151 Upstream channel

	Photo ID: Coordinates: Description:	WC_T207_WEISSLN_HIDDENLAKE_USF 30.447238, -97.56151 Upstream face
	Photo ID: Coordinates: Description:	WC_T207_WEISSLN_HIDDENLAKE_USF_2 30.447238, -97.56151 Upstream face

	Photo ID: Coordinates: Description:	WC_T207_WEISSLN_HIDDENLAKE_DSC 30.447238, -97.56151 Downstream channel
	Photo ID: Coordinates: Description:	WC_T207_WEISSLN_HIDDENLAKE_DSC_2 30.447238, -97.56151 Downstream channel

	Photo ID: Coordinates: Description:	WC_T207_WEISSLN_HIDDENLAKE_DSF 30.447238, -97.56151 Downstream face
	Photo ID: Coordinates: Description:	WC_T207_WEISSLN_HIDDENLAKE_DSF_2 30.447238, -97.56151 Downstream face

	Photo ID: Coordinates: Description:	WC_T207_WEISSLN_HIDDENLAKE_InnerCulvert1 30.447238, -97.56151 Inner Culvert
	Photo ID: Coordinates: Description:	WC_T207_WEISSLN_HIDDENLAKE_InnerCulvert2 30.447238, -97.56151 Inner Culvert

	Photo ID: Coordinates: Description:	WC_T207_WEISSLN_HIDDENLAKE_ InnerCulvert3 30.447238, -97.56151 Inner Culvert

Appendix D: Environmental Constraints

Environmental Constraints Analysis

Introduction

Bastrop County (County), with participation from Travis County and the City of Pflugerville, is conducting a floodplain study of the Wilbarger Creek Watershed as part of the Texas Water Development Board (TWDB) Flood Protection Plan (FPP) grant (see **Appendix A, Figures 1** and **2**). The study will determine floodplain extents and investigate structural and nonstructural flood damage reduction projects, which will be used to develop a comprehensive Flood Protection Plan for Wilbarger Creek. The study has thus far identified proposed projects in areas with a high-risk of flooding during storm events. The improvement areas include 10 different roadways/subdivision improvements. To support the County's studies, Halff Associates, Inc. (Halff) has prepared this desktop analysis to identify potential environmental constraints and permitting requirements for projects recommended by the flood protection study. **Table 1** table includes the proposed improvement locations and associated projects.

Table 1. Proposed Improvement Location and Projects

Project Label	Project Location	Proposed Improvement
P-1	Craters of the Moon Blvd Improvement for the Highland Park Subdivisions	Roadway Improvement
P-2	Kennemer Drive	Roadway Improvement
P-3	FM 685 & East Pflugerville Parkway	Roadway Improvement & Channel Benching
P-4	Cele Rd. and Reserve at West Creek Subdivisions	Roadway Improvement & Channel Benching for Subdivision
P-5	Cameron Road	Roadway Improvement
P-6	Gregg Lane	Roadway Improvement
P-7	Shadow Glen Subdivisions	Fill Removal, Highway Improvement, & Channel Benching for Subdivision
P-8	Monkey Road	Roadway Improvement
P-9	Youngs Prairie Road	Roadway Improvement
P-10	Upper Elgin Road	Roadway Improvement

The study area includes the Wilbarger Creek watershed, comprising 115,840 acres within Bastrop and eastern Travis Counties. Communities within the watershed include Pflugerville, Manor, and Elgin. Numerous sources were reviewed to identify potential environmental constraints in the study area, including: socioeconomic data from the U.S. Census Bureau (USCB), Texas Parks and Wildlife Department (TPWD) threatened and endangered species by county and Element of Occurrence locations, U.S. Fish and Wildlife Service (USFWS) critical habitats, iPaC report and

National Wetlands Inventory (NWI) maps, Texas Commission on Environmental Quality (TCEQ) hazardous materials, GeoSearch Radius Report and cultural resources data from the Texas Historical Commission (THC).

Study Area Description

Topographic Map Description

The U.S. Geological Survey (USGS) quadrangle maps for the study area (see **Appendix A**, **Figure A-1**) depict the study area as a mix of primarily urban development with small areas of undeveloped lands. Urban development within the study area is concentrated in the northwest and central portions of the study area, coincident with the SH 45, SH 130, and SH 290 corridors. The remainder of the study area consists of undeveloped land which is depicted as primarily herbaceous landcover in the northern portions (as indicated by no-or-sparse green shading) and dominated by forested landcover (as depicted by green shading) in the southern portion.

Wilbarger Creek is depicted as a perennial tributary (as indicated by solid blue line) to the Colorado River, and roughly bisecting the southern half of the study area. Numerous intermittent tributaries (as indicated by dashed blue line), including Cottonwood Creek, are depicted flowing generally south into Wilbarger Creek. Several lakes/ponds are depicted as impoundments of the tributary system, while others are depicted in isolation or at the headwaters of drainages (as indicated by contour alignment).

Figure A-1, Page 1, depicts project locations P-1 through P-4, to be primarily in developed areas along various tributaries of Wilbarger Creek. Project locations P-1, P-2, and P-4 appear to be in developed subdivisions, as indicated by street markings. P-3 appears to be outside of a developed subdivision along Wilbarger Creek near forested landcover (as depicted by green shading). Also in this region of the study area, Lake Pflugerville is shown south of P-3 and P-4.

The west-central region of the watershed is displayed in **Figure A-1, Page 2.** Project locations P-5 and P-7 are primarily located in developed land. Within this portion of the study area, there are small areas of forested landcover (indicated by the green shading), along Wilbarger Creek, north of the City of Manor. Finally, **Figure A-1, Page 3,** indicates the greatest area of herbaceous land cover and forested landcover in the southern region of the study area. While P-8 appears to be in undeveloped land, P-9 and P-10 are shown along Wilbarger Creek tributaries in the vicinity of forested landcover.

Aerial Photo Description

Aerial imagery maps for 1996 and 2018 (see **Appendix A**, **Figures A-2** and **A-3**) were reviewed and compared to other background resources within the study area. The aerial imagery maps depict the study area as consistent with the topographic map. The significant difference shown in the 1996 aerial to 2018 aerial is the development of several subdivisions in the northern and western regions of the study area.

The aerial imagery shown for the first region of the study area (**Figures A-2** and **A-3, Page 1**), depicts developed land where project locations P-1 through P-4 are located. Portions of undeveloped land are depicted just east of SH 130. East of P-4, there are several large tracts of undeveloped land. Additionally, the aerial imagery depicts the northern portion of the study area as having been subjected to agricultural production.

Aerial imagery for the west-central portion (**Figures A-2** and **A-3, Page 2**), of the study area depicts less developed land around the project locations. P-5 and P-6 are located in undeveloped land, while P-7 is located in a developed subdivision.

Moving into the southern portion of the study area (**Figures A-2** and **A-3, Page 2**), land is primarily undeveloped throughout. Project locations are all located in undeveloped areas. Towards the City of Manor the presence of developed land is depicted through subdivision street segments.

Geology

Surface geology, derived from the USGS Texas Geology[1] database, was reviewed to identify rock units within the study area. The database identified nine rock units within the study area (see **Appendix A**, **Figure A-4**), further identified as: Calvert Bluff formation (Ecb), Hooper formation (Eh), Midway Group (Emi), Simsboro formation (Esb), Austin chalk (Kau), Keys Valley marl (Kvm), Navaro and Taylor (Knt), Pecan Gap chalk (Kpg), alluvium (Qal), high gravel deposits (Qhg), and fluviatile terrace deposits (Qt).

Project Label	Project Location	Rock Unit
P-1	Craters of the Moon Blvd Improvement for the Highland Park Subdivisions	Austin chalk (Kau)
P-2	Kennemer Drive	Austin chalk (Kau)
P-3	FM 685 & East Pflugerville Parkway	Austin chalk (Kau)
P-4	Cele Rd. and Reserve at West Creek Subdivisions	Navaro and Taylor (Knt)
P-5	Cameron Road	Navaro and Taylor (Knt)

[1] https://txpub.usgs.gov/txgeology/

Project Label	Project Location	Rock Unit
P-6	Gregg Lane	Navaro and Taylor (Knt)
P-7	Shadow Glen Subdivisions	alluvium (Qal)
P-8	Monkey Road	Midway Group (Emi)
P-9	Youngs Prairie Road	Midway Group (Emi)
P-10	Upper Elgin Road	fluviatile terrace deposits (Qt)

The USFWS Travis/Williamson Counties Karst Zone Mapper[2] identified karst zone areas in Travis and Williamson Counties. The four karst zone definitions include:

- Zone 1: Areas known to contain endangered cave fauna;
- Zone 2: Areas having a high probability of suitable habitat for endangered or other endemic invertebrate cave fauna (refined in 2007 to only include endangered cave fauna);
- Zone 3: Areas that probably do not contain endangered cave fauna;
- Zone 4: Areas which do not contain endangered cave fauna.

Based on the information provided in the karst zone mapper, the study area does not contain any karst zone areas. Location P-3 is the project nearest a USFWS mapped Karst Zone (Zone 4). Additionally, according to the TCEQ Edwards Aquifer Viewer[3], the study area is not within the Edwards Aquifer recharge, transition, or contributing zones.

Soil Survey

Soil data for the study area was obtained from the Natural Resource Conservation Service (NRCS) Web Soil Survey, which is derived from the U.S. Department of Agriculture (USDA) Soil Survey for Bastrop County, Texas. The soil units derived from the USDA Geographic Information System (GIS) data are shown atop recent aerial imagery in **Appendix A**, **Figures A-5** to **A-5.5**. **Table 2** provides key characteristics for these soil types. The project locations are all located in "Not Prime Farmland" areas.

Table 2. Soil Units within the Study Area

Soil Unit	Topography	Farmland Classification
AfA – Axtell fine sandy loam	0-1% Slopes	Farmland of Statewide Importance
AfC – Edge fine sandy loam	1-5% Slopes	Farmland of Statewide Importance

[2] https://www.fws.gov/southwest/es/austintexas/maps_data.html
[3] https://tceq.maps.arcgis.com/apps/webappviewer/index.html?id=2e5afa3ba8144c30a49d3dc1ab49edcd

Soil Unit	Topography	Farmland Classification
AfC2 – Edge fine sandy loam	2-5% Slopes, moderately eroded	Not Prime Farmland
AfE2 – Edge fine sandy loam	5-12% Slopes, eroded	Not Prime Farmland
AtD – Edge gravelly fine sandy loam	3-8% Slopes	Not Prime Farmland
BaB – Bastrop fine sandy loam	1-3% Slopes	All Areas are Prime Farmland
BeB – Behring clay loam	1-3% Slopes	All Areas are Prime Farmland
BeC2 – Behring clay loam	3-5% Slopes, eroded	Not Prime Farmland
Bo – Bosque loam	0-1% Slopes, occasionally flooded	Not Prime Farmland
BuB – Burleson clay	1-3% Slopes	All Areas are Prime Farmland
CfB – Crockett fine sandy loam	1-3% Slopes	Farmland of Statewide Importance
CgC – Crockett gravely fine sandy loams	1-5% Slopes	Not Prime Farmland
ChE – Crockett gravelly loam	5-10% Slopes	Not Prime Farmland
CsC2 – Crockett fine sandy loam	2-5% Slopes, eroded	Not Prime Farmland
CsD3 – Crockett fine sandy loam	3-8% Slopes, severely eroded	Not Prime Farmland
CsE2 – Crockett fine sandy loam	5-10% Slopes	Not Prime Farmland
DeC – Robco-Tanglewood complex	1-5% Slopes	Farmland of Statewide Importance, if drained
Dm – Robco loamy fine sand	0-2% Slopes	Farmland of Statewide Importance, if drained
DoB – Dutek loamy fine sand	0-3% Slopes	Not Prime Farmland
DoD – Dutek loamy fine sand	3-8% Slopes	Not Prime Farmland
FeF2 – Ferris clay	5-20% Slopes, eroded	Not Prime Farmland
Gs – Whitesboro clay loam	0-1% Slopes, frequently flooded	Not Prime Farmland
HeB – Heiden clay	1-3% Slopes	All Areas are Prime Farmland
HeC2 – Heiden clay	3-5% Slopes, eroded	Not Prime Farmland
HeD2 – Heiden clay	5-8% Slopes	Not Prime Farmland
HoA – Houston black clay	0-1% Slopes	All Areas are Prime Farmland
HoB – Houston black clay	1-3% Slopes	All Areas are Prime Farmland
JeF – Jedd gravelly fine sandy loam	5-20% Slopes	Not Prime Farmland
KrA – Krum silty clay	0-1% Slopes	All Areas are Prime Farmland
Ls – Gad fine sand	0-1% Slopes, occasionally flooded	Not Prime Farmland

Soil Unit	Topography	Farmland Classification
MaA – Mabank loam	0-1% Slopes	Farmland of Statewide Importance
MaB – Mabank loam	1-3% Slopes	Farmland of Statewide Importance
No – Weswood silty clay loam	0-1% Slopes, rarely flooded	All Areas are Prime Farmland
PaE – Padina fine sand	1-12% Slopes	Not Prime Farmland
RoB – Rosanky fine sandy loam	1-3% Slopes	All Areas are Prime Farmland
RoD – Rosanky fine sandy loam	3-8% Slopes	Not Prime Farmland
Sa – Sayers fine sandy loam	0-1% Slopes, occasionally flooded	Not Prime Farmland
SeD2 – Shep clay loam	3-8% Slopes, eroded	Not Prime Farmland
Sg – Ships silty clay	0-1% Slopes, occasionally flooded	Not Prime Farmland
SkC – Silstid loamy fine sand	1-5% Slopes	Not Prime Farmland
TfA – Tabor fine sandy loam	0-1% Slopes	Farmland of Statewide Importance
TfB – Tabor fine sandy loam	1-3% Slopes	Farmland of Statewide Importance
Tr – Tinn clay	0-1% Slopes	All Areas are Prime Farmland
Tw – Tinn clay	0-1% Slopes	All Areas are Prime Farmland
Uh – Uhland clay loam	0-1% Slopes, frequently flooded	Not Prime Farmland
VeD – Vernia very gravelly loamy sand	1-8% Slopes	Not Prime Farmland
W – Water	-	-
WgB – Wilson gravelly clay loam	1-3% Slopes	Not Prime Farmland
WgC – Wilson gravelling clay loam	3-5% Slopes	Not Prime Farmland
WsA – Wilson clay loam	0-1% Slopes	Farmland of Statewide Importance
WsB – Wilson clay loam	1-3% Slopes	Farmland of Statewide Importance

Water Resources

Potential water resource constraints including surface water features[4] (wetlands, tributaries, rivers, impoundments, and other potential waters of the United States), floodplains[5], and groundwater features were evaluated along the proposed study area to identify local, state,

[4] Pursuant to EO 11990, Section 404 of the Clean Water Act (CWA), Section 401 of the CWA, Section 303(d) of the CWA, and Sections 9 and 10 of the Rivers and Harbors Act
[5] Pursuant to Executive Order (EO) 11988

and/or federal permitting requirements that may be associated with construction of the proposed projects.

National Wetlands Inventory

Wetlands are identified as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Based on the review of the NWI data and the National Hydrography Dataset (NHD), surface water features within the study area include 58 freshwater forested/shrub wetlands, 209 freshwater emergent wetlands, 1,531 freshwater ponds, and 1,046 riverine features (see **Appendix A**, **Figure A-6**). Project locations P-1, P-2, P-3, P-4, P-6, P-7 and P-9 are all situated around riverine features, while P-5, P-8 and P-10 are located along freshwater forested/shrub wetlands.

Section 303(d)

Under section 303(d) of the CWA, states, territories and authorized tribes, collectively referred to in the act as "states," are required to develop lists of impaired waters. These are waters for which technology-based regulations and other required controls are not stringent enough to meet the water quality standards set by states. The law requires that states establish priority rankings for waters on the lists and develop Total Maximum Daily Loads (TMDLs) for these waters. A TMDL includes a calculation of the maximum amount of a pollutant that can be present in a waterbody and still meet water quality standards. As required under Sections 303(d) and 305(b) of the federal Clean Water Act, the Texas 303(d) List[6] identifies the water bodies in or bordering Texas for which effluent limitations are not stringent enough to implement water quality standards, and for which the associated pollutants are suitable for measurement by maximum daily load. According the Texas 303(d) List and corresponding GIS data, there are no impaired waters within the study area.

Biological Resources

Review of the USFWS Information for Planning and Consultation (IPaC) report identified eight federally-listed species that should be considered in an effects analysis for the study area. The report also identified one critical habitat located wholly or partially within the study area. Critical habitats are specific geographic areas that contain features essential for the conservation of a threatened or endangered species and that may require special management and protection. There are no USFWS designated critical habitats located within the study area. USFWS designated critical habitat for the threatened Jollyville Plateau Salamnder (*Eurycea tonkawae)* is located approximately 2.8-miles northwest of the study area, while habitat for the federally endangered

[6] https://www.tceq.texas.gov/assets/public/waterquality/swqm/assess/20txir/2020_303d.pdf

Houston toad (*Bufo houstonensis*) is located approximately 13-miles southeast of the study area, (see **Appendix A**, **Figure A-7**).

Review of the TPWD county list identified 18 state-listed species for Bastrop County. A database search for protected species was also conducted using the Texas Natural Diversity Database (TXNDD) on March 12, 2020. The TXNDD search revealed 20 Element of Occurrence Records (records of sightings of rare or endangered species) or managed areas within a two-mile radius of the study area (see **Appendix A**, **Figure A-8**). These Element Occurrence records include the net-leaf bundleflower (*Desmanthus reticulatus* [EOID 10460]), bald eagle (*Haliaeetus leucocephalus* [EOID 7363]), Guadalupe bass (*Micropterus treculii* [EOID 14106, 14088]), Texas shiner (*Notropis amabilis* [EOID 13588]), silverband shiner (*Notropis shumardi* [EOID 14123]), Texas almond *(Prunus minutiflora* [EOID 10554, 10728]), Little Bluestem-indiangrass Series (*Schizachyrium scoparium-sorghastrum nutans series* [EOID 6719, 3598]), Vertisol Blackland Prairie (*Schizachyrium scoparium - Sorghastrum nutans - Andropogon gerardii - Bifora americana Vertisol Grassland* [EOID 11993, 11977, 11978, 11979, 11980]), western spotted skunk (*Spilogale gracilis* [EOID 14266]), eastern spotten skunk (*Spilogale putorius* [EOID 12810]), and Texas garter snake (*Thamnophis sirtalis annectens* [EOID 5791, 6167]).

Given the small proportion of public versus private land in Texas, the TXNDD does not include a representative inventory of rare resources in the state. Although it is based on the TPWD's best available data regarding rare species, the data cannot provide a definitive statement as to the presence, absence, or condition of special status species, natural communities, or other significant features in any area. The data cannot substitute for on-site evaluation by qualified biologists. The TXNDD information is intended to assist users in avoiding harm to rare and special species or significant ecological features. Refer all requests back to the TXNDD to obtain the most current information. A field visit by a qualified biologist is recommended prior to construction to determine the presence or absence of suitable habitat for protected species.

Socioeconomic/Environmental Justice

Executive order (EO) 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" requires each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations."

The USCB Quick Facts[7] demographic data was reviewed to determine if minority or low-income persons have the potential to be adversely affected by the proposed project. According to the Quick Facts statistics, Bastrop County had a population estimate of 88,723 in 2019 and

[7] https://www.census.gov/quickfacts/fact/table/bastropcountytexas/INC110218

approximately 50.0 percent of the population was composed of minorities. The American Community Survey (ACS) 5-year average income and poverty data for 2015-2019 indicates that the median household income for Bastrop County is $64,597. Review of the United States Department of Health and Human Services (USDHHS) 2021 poverty guideline indicates that the annual income for a household of four is $26,500. Based on this data, the median household income for Bastrop County in 2018 is greater than the 2019 USDHHS poverty guideline; however, approximately 14.0 percent of Bastrop County are considered to be in poverty.

Although minority and low-income persons are located within the study area, the proposed project is not expected to have adverse or disproportionate impacts on minority or low-income populations. The benefits of the flood studies are expected to equally benefit all residents in Bastrop County. Public outreach planning for any future public involvement activities should take into consideration low-income and minority populations.

Hazardous Materials

A database search for regulated hazardous materials sites located within the vicinity of proposed improvement locations within the study area (see **Appendix A**, **Figure A-9**) was provided by GeoSearch in March 2021 (see **Appendix B**). The *GeoSearch Radius Report* identified 8 hazardous materials sites within a 1/4-mile radius of two improvement locations located SW of the State Highway (SH) 45 and TX-130 intersection.

Based on a preliminary review of data provided by the Railroad Commission of Texas, oil and gas facilities, including wells and pipelines, were identified within 0.5 mile of the project area.

Cultural Resources

As a political subdivision of the State, projects undertaken by Travis or Bastrop County are subject to the *Antiquities Code of Texas*. In addition, given the number of surface water features within the study area that could fall under jurisdiction of USACE, the project could be considered a federal undertaking, requiring compliance with Section 106 of the National Historic Preservation Act (NHPA). Therefore, a Cultural Resources Background Review was conducted to evaluate the potential for the proposed project to impact cultural resources.

A review of the *Texas Archeological Sites Atlas* (Atlas) identified numerous cultural resource sites within the study area, including 108 prehistoric and historic aged archeological sites, one National Register of Historic Places marker, nine State Historic markers, and 18 cemeteries. The physiographic setting along the alluvial terraces of Wilbarger Creek, Willow Creek, and Cottonwood Creek are considered conducive to the preservation of cultural resources in the study area. In addition, the presence of many previously documented cultural resource sites in the study area indicates that cultural resource coordination under Texas Antiquities Code and

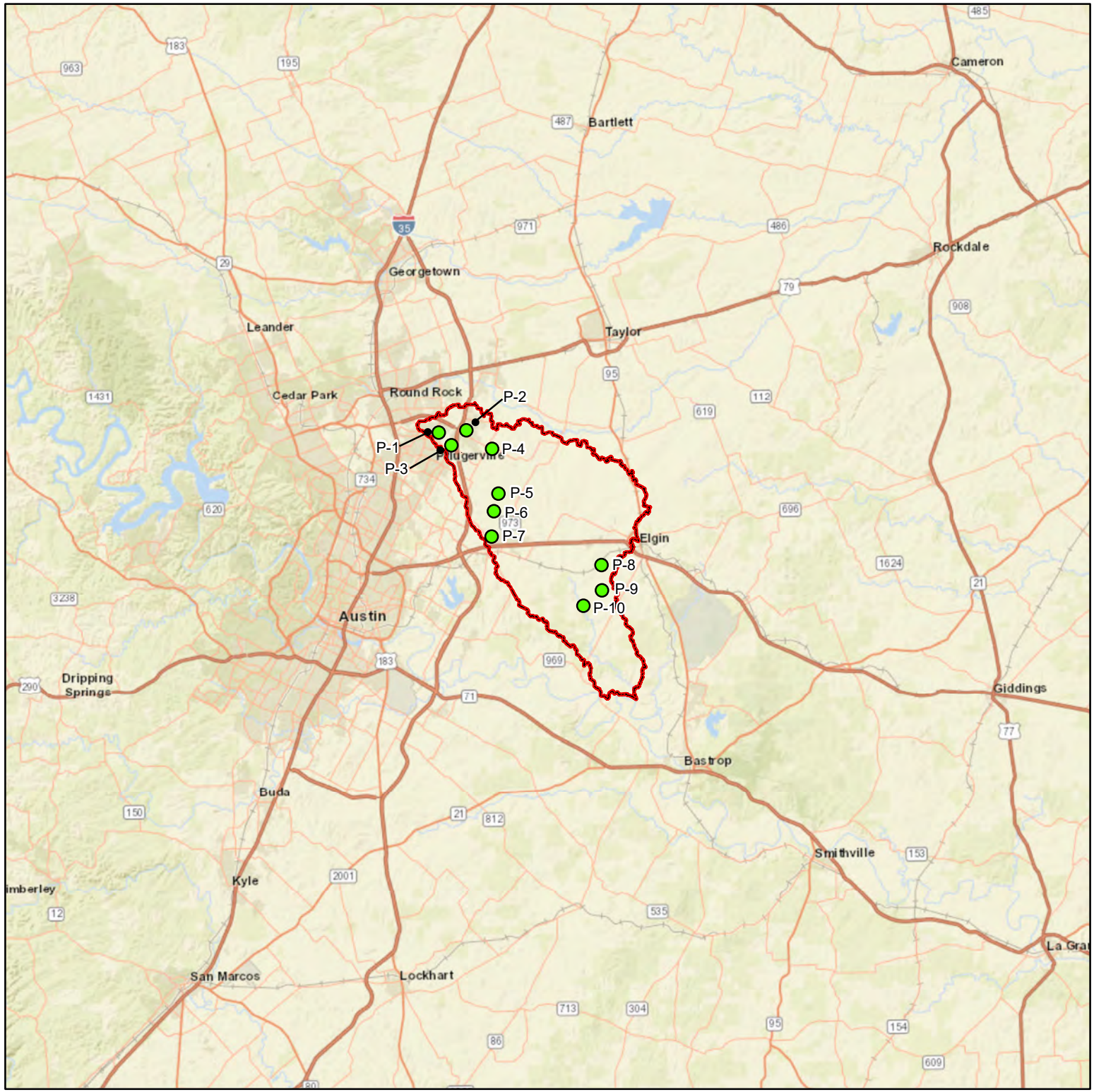
potentially, Section 106 of the NHPA will likely be required should ground disturbing activity be proposed within the study area.

Conclusions and Recommendations

Based on the assessment of potential environmental constraints for the proposed project, additional actions regarding potential environmental impacts may be required, including:

- The proposed improvements may result in a discharge of fill into waters of the United States (Wilbarger Creek, tributaries of Wilbarger Creek, and adjacent wetlands if present), thereby requiring authorization from the United States Army Corps of Engineers under a Nationwide Permit (NWP). For roadway associated improvements, NWP-14 may be applicable. For channel improvements, NWP 13 - Bank Stabilization or NWP 43 - Stormwater Management Facilities may be applicable, depending on the nature and extent of impacts to waters of the United States. If improvements are expected to result in greater than 0.5 acre of impacts to waters of the United States, the project will need to be authorized under an Individual Permit
- As a political subdivision of the State, the County must notify the THC prior to commencing any project on public land and/or affecting publicly-owned buildings that will involve 5 or more acres of ground disturbance, 5,000 or more cubic yards of earth moving, will occur within a historic district, or will affect a recorded archeological site.
- Based on a review of preliminary project details, archeological surveys are recommended if any of the following criterion are met:
    - the project is on public land and/or would impact publicly-owned buildings,
    - the project will involve 5 or more acres of ground disturbance or 5,000 or more cubic yards of earth moving,
    - the project will occur within a historic district ,or will affect a recorded archeological site.
- Furthermore, should deep impacts be proposed near any tributary crossings (i.e., installation of bridge columns) or additional right-of-way is required, additional surveys and mechanized trenching (i.e., deep testing) may be warranted.
- Based on a review of the *GeoSearch Radius Report*, hazardous material sites were identified within 0.5 mile of two of the improvement locations. A Phase I Environmental Site Assessment is recommended if property acquisition is anticipated for the improvement locations.

FIGURES



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Legend

- Study Area
- Proposed Improvement Locations

Notes:
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2.Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)

Wilbarger Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/14/2021 AVO: 35837
Location Map
Figure 1

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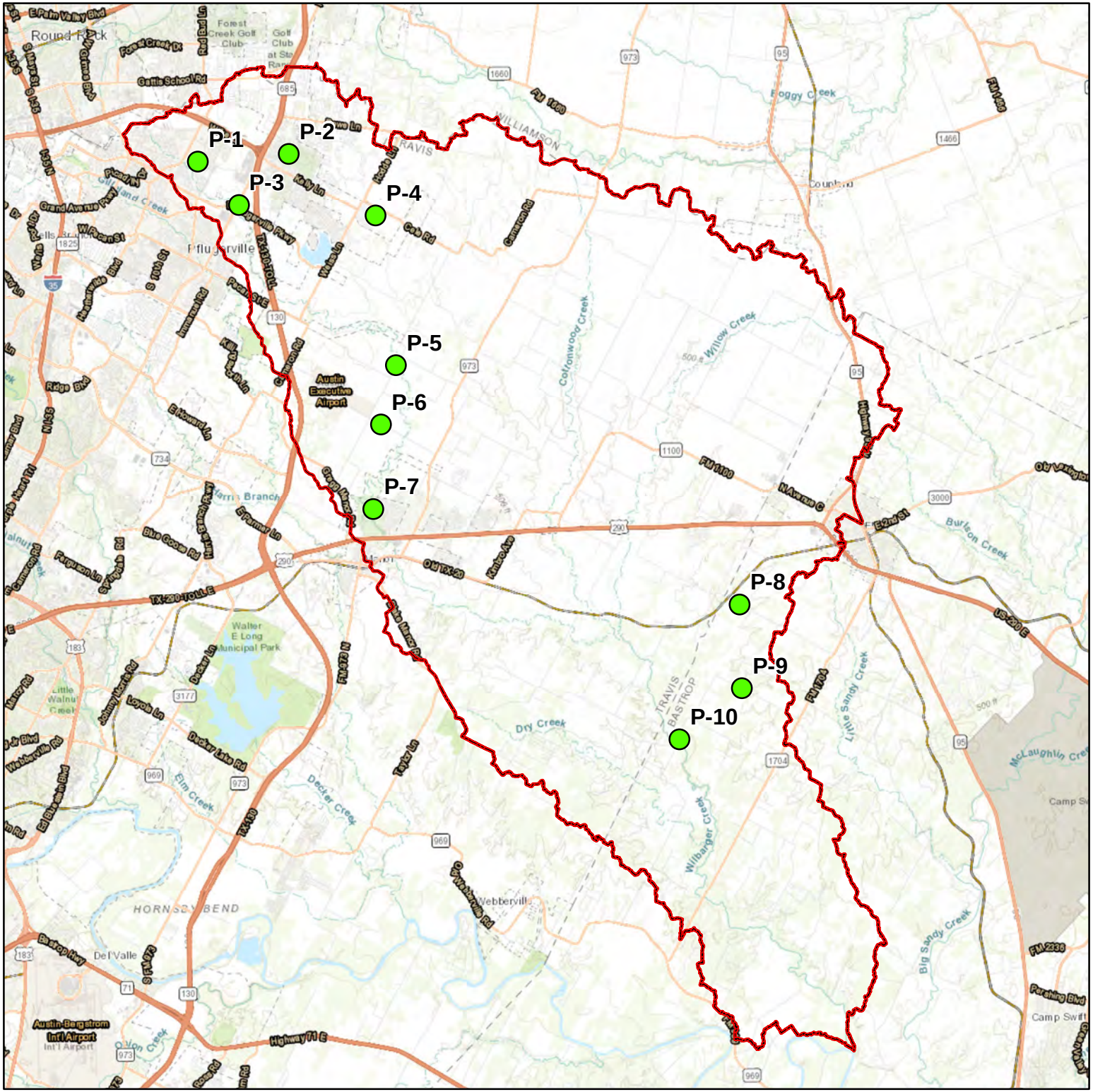

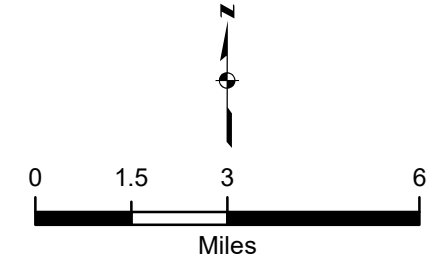

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- Study Area
- Proposed Improvement Locations

Notes:
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2.Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO,

Wilbarger Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/8/2021 AVO: 35837
Vicinity Map
Figure 2

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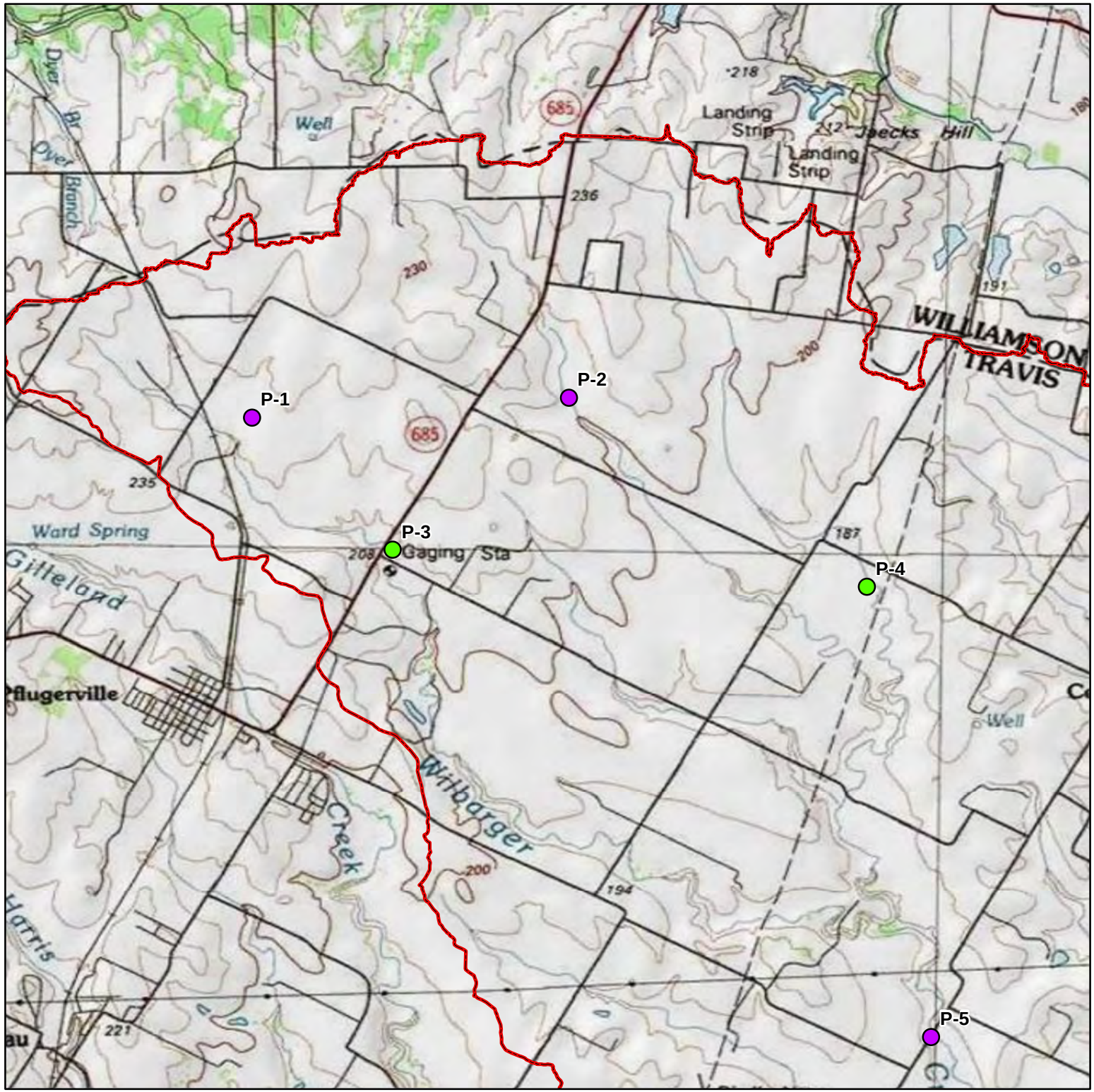
APPENDIX A

Supporting Documentation



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Miles

Legend

Study Area

Proposed Improvement Locations

- Fill Removal, Highway Improvement & Channel Benching
- Roadway Improvement
- Roadway Improvement & Channel Benching

Notes:
1. LAT: 30.4568°, LONG: -97.5843°
2. USGS TopoView Maps

Wilbarger Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/8/2021 AVO: 35837
USGS Topographic Map Figure A-1
Page 1

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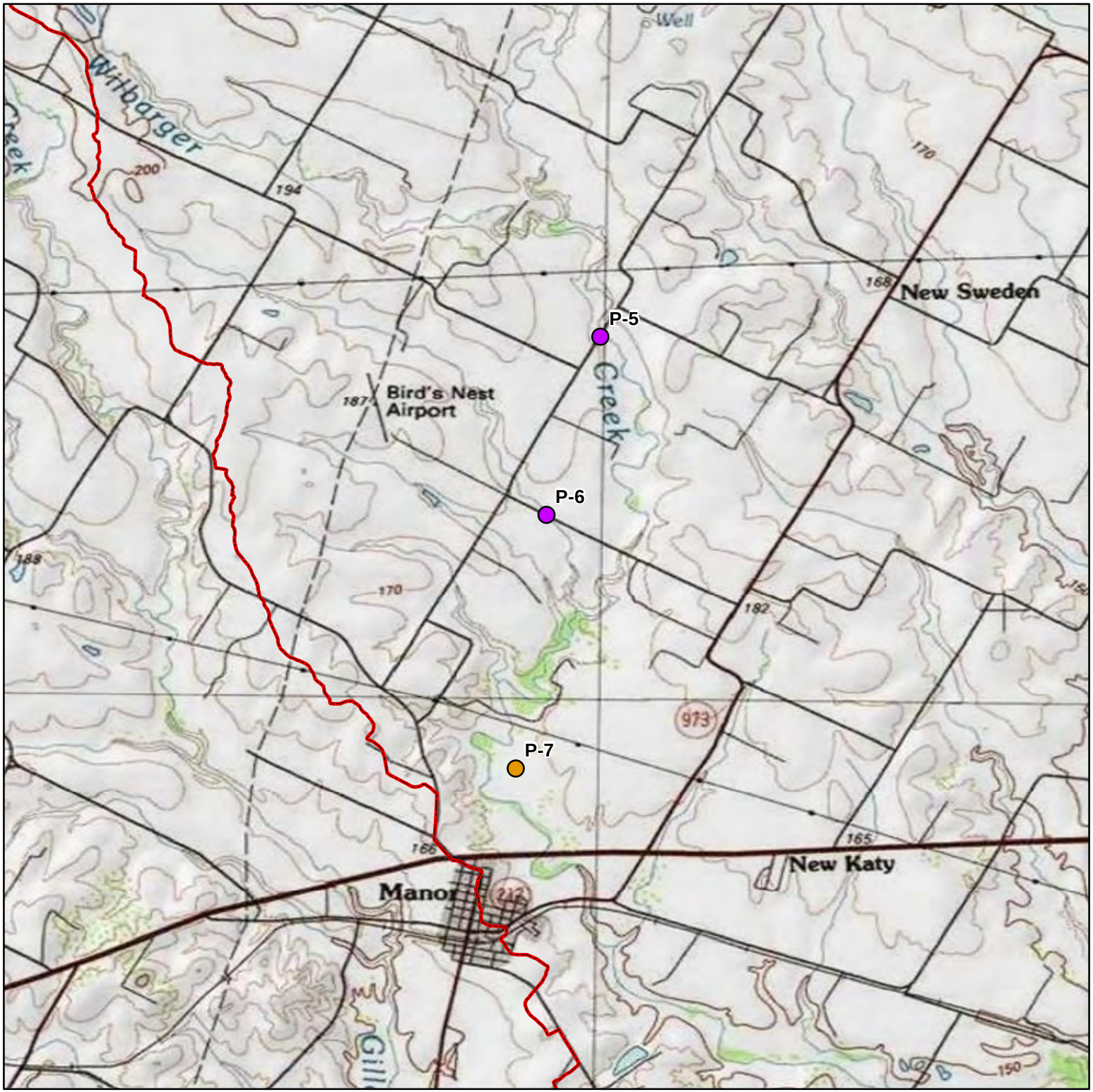

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Legend

Study Area

Proposed Improvement Locations

- Fill Removal, Highway Improvement & Channel Benching
- Roadway Improvement
- Roadway Improvement & Channel Benching

Notes:
1. LAT: 30.3820°, LONG: -97.5492°
2. USGS TopoView Maps

Wilbarger Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/8/2021 AVO: 35837
USGS Topographic Map Figure A-1
Page 2

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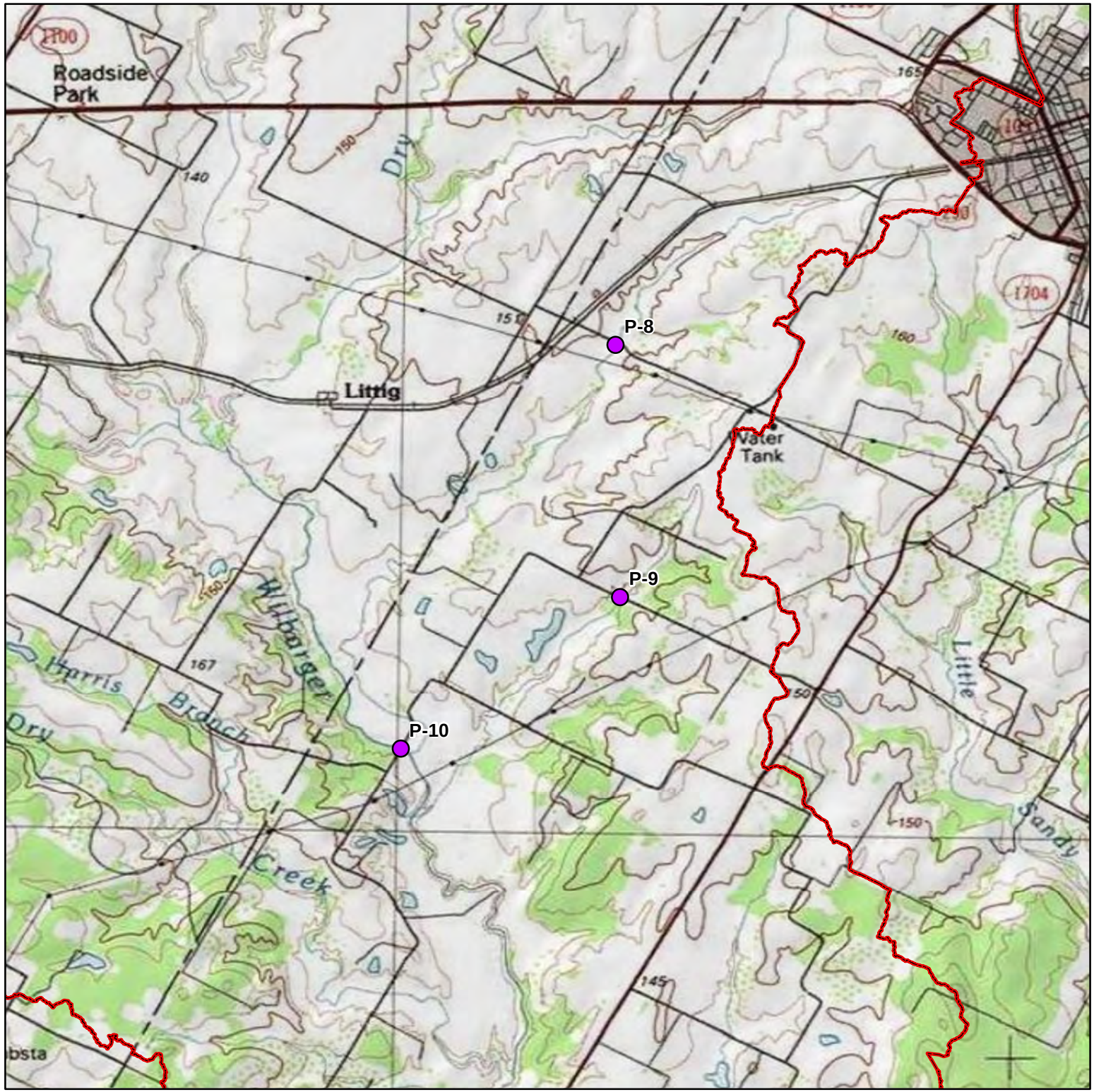

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Miles

Legend

Study Area

Proposed Improvement Locations

- Fill Removal, Highway Improvement & Channel Benching
- Roadway Improvement
- Roadway Improvement & Channel Benching

Notes:
1. LAT: 30.3047°, LONG: -97.4246°
2. USGS TopoView Maps

Wilbarger Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/8/2021 AVO: 35837
USGS Topographic Map Figure A-1
Page 3

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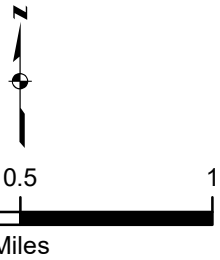

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Study Area

Proposed Improvement Locations

- Fill Removal, Highway Improvement & Channel Benching
- Roadway Improvement
- Roadway Improvement & Channel Benching

Notes:
1. LAT: 30.4568°, LONG: -97.5843°
2. TNRIS - Texas TOP Imagery 1996

Alum Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/8/2021 AVO: 35837
1996 Aerial Imagery Map Figure A-2
Page 1
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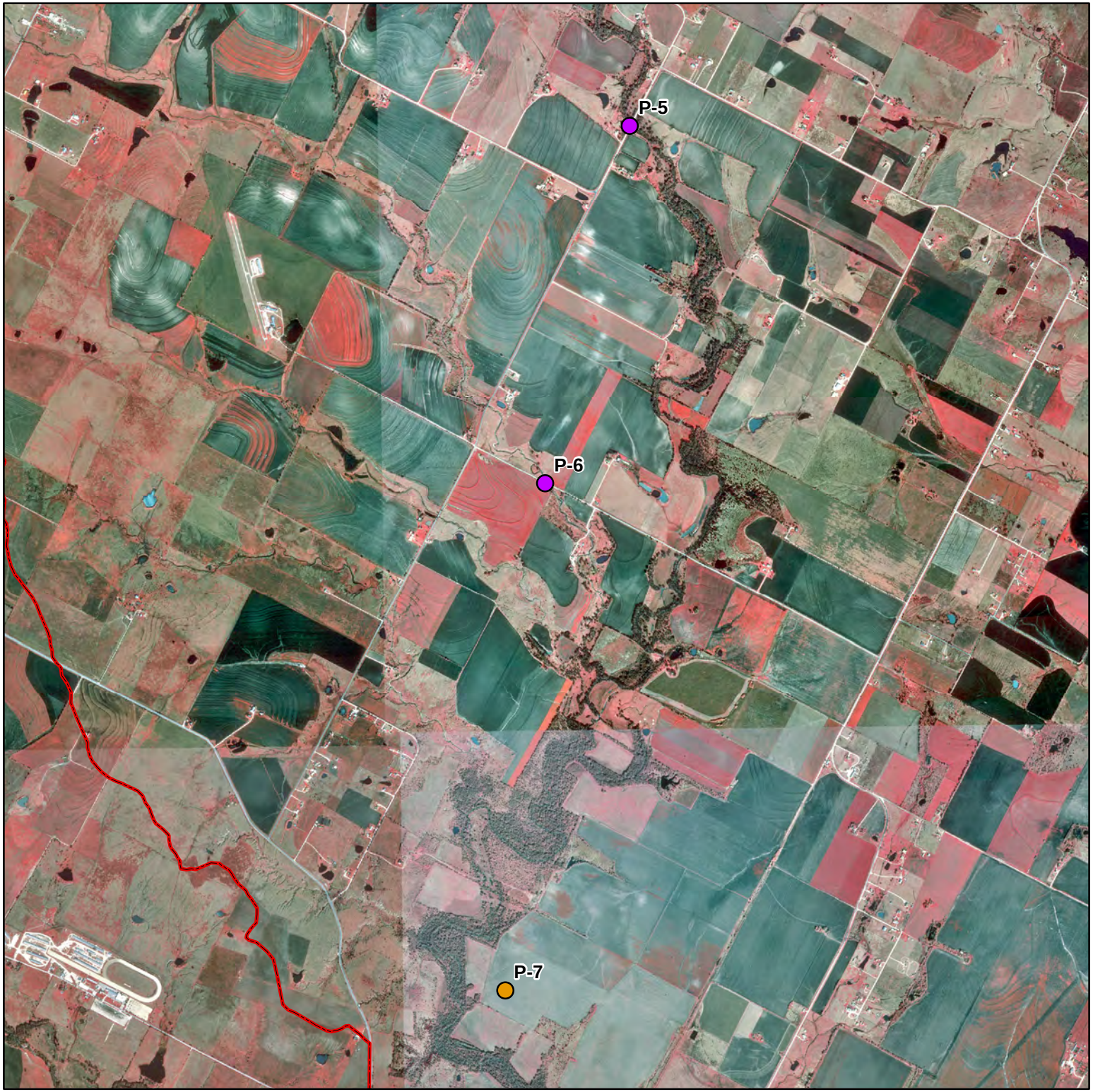

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Study Area

Proposed Improvement Locations

- Fill Removal, Highway Improvement & Channel Benching
- Roadway Improvement
- Roadway Improvement & Channel Benching

Notes:
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2. TNRIS - Texas TOP Imagery 1996

Alum Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/8/2021 AVO: 35837
1996 Aerial Imagery Map Figure A-2
Page 2

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Legend

Study Area

Proposed Improvement Locations

- Fill Removal, Highway Improvement & Channel Benching
- Roadway Improvement
- Roadway Improvement & Channel Benching

Notes:
1. LAT: 30.3047°, LONG: -97.4246°
2. TNRIS - Texas TOP Imagery 1996

Alum Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/8/2021 AVO: 35837
1996 Aerial Imagery Map Figure A-2
Page 3

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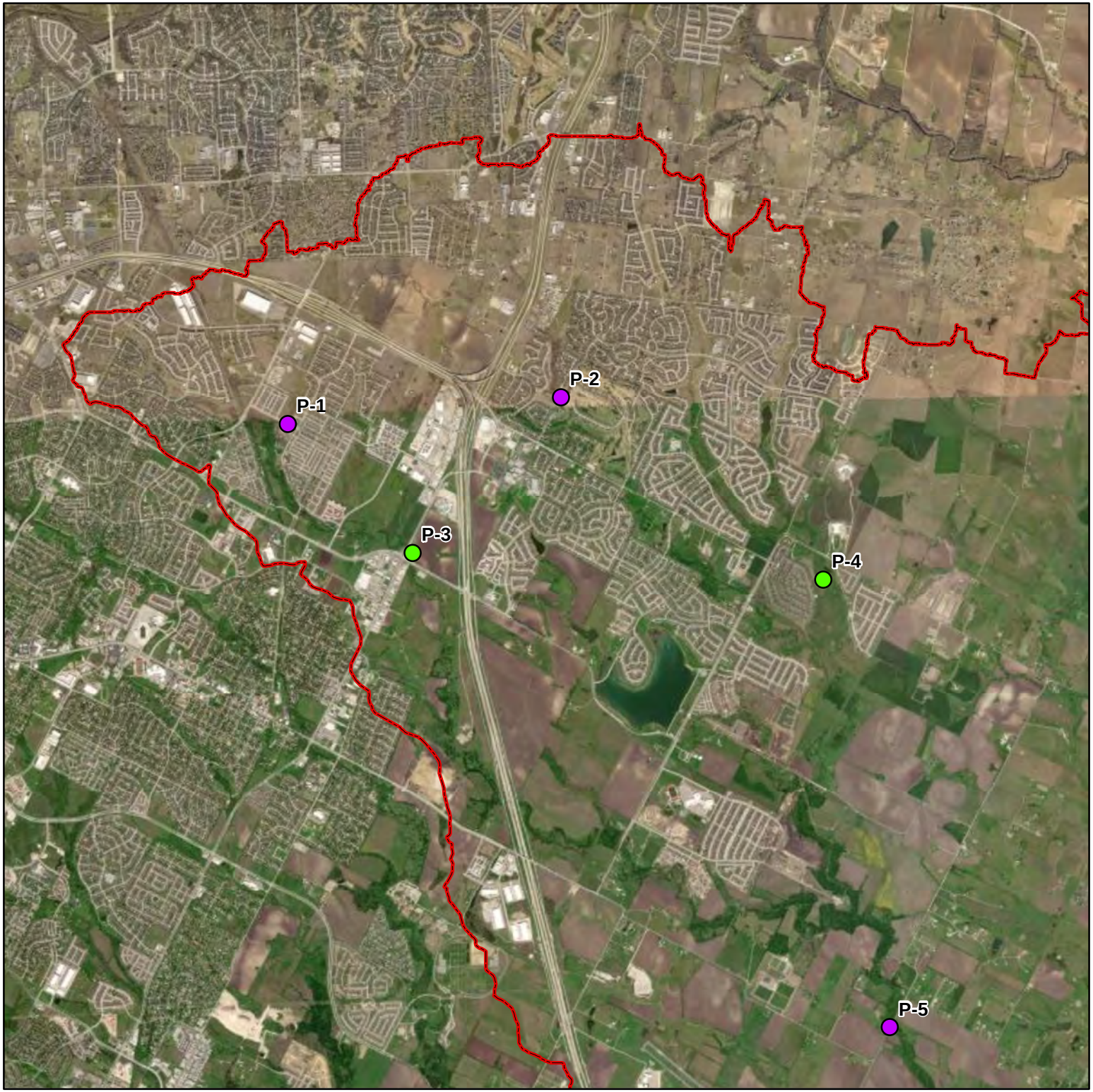

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Study Area

Proposed Improvement Locations

- Fill Removal, Highway Improvement & Channel Benching
- Roadway Improvement
- Roadway Improvement & Channel Benching

Notes:
1. LAT: 30.4568°, LONG: -97.5843°
2. TNRIS 2018 NAIP Imagery

Wilbarger Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/8/2021 AVO: 35837
2020 Aerial Imagery Map Figure A-3
Page 1

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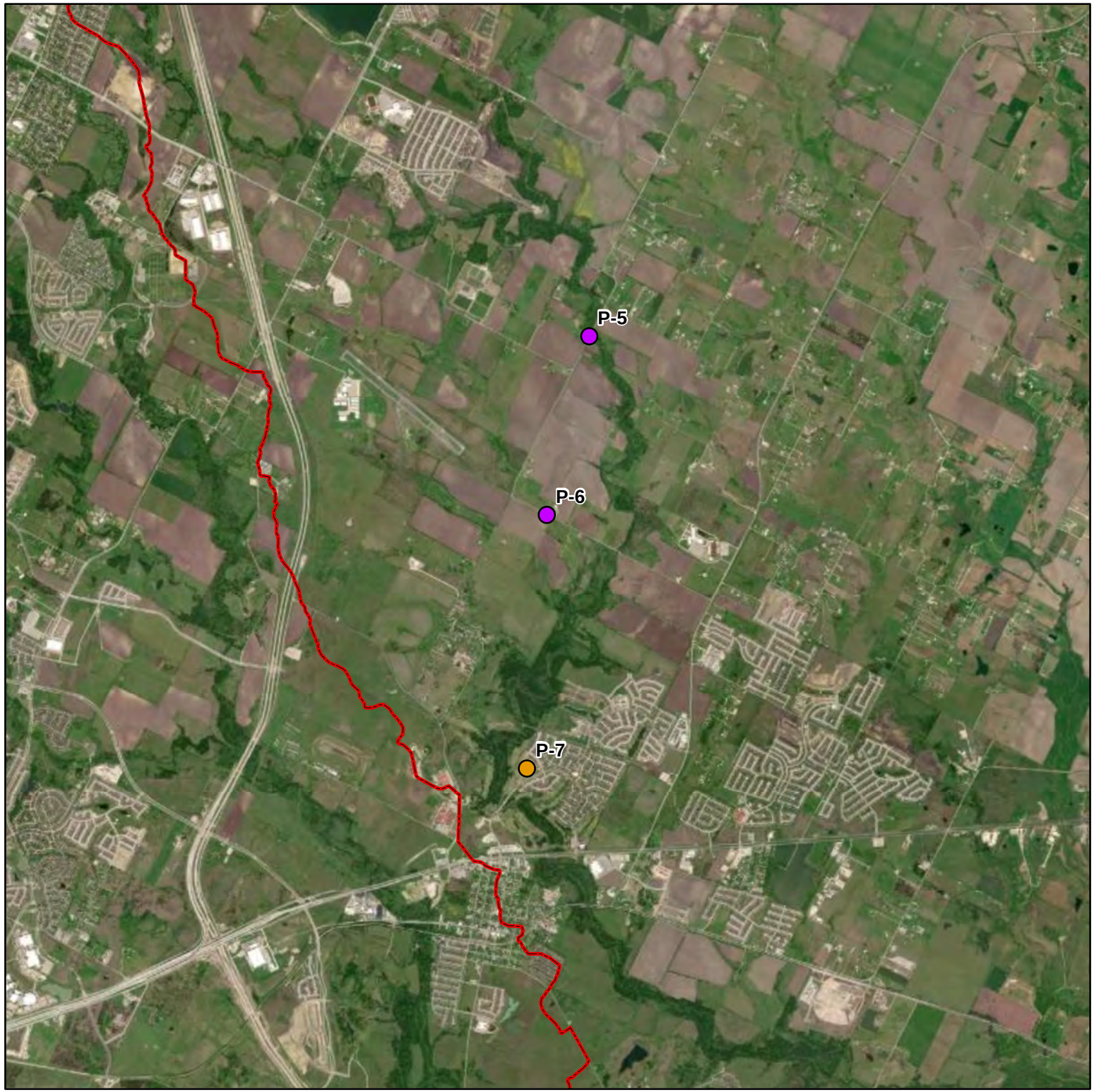

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Legend

Study Area

Proposed Improvement Locations

Fill Removal, Highway Improvement & Channel Benching

Roadway Improvement

Roadway Improvement & Channel Benching

Notes:
1. LAT: 30.3821°, LONG: -97.5492°
2. TNRIS 2018 NAIP Imagery

Wilbarger Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/8/2021 AVO: 35837
2020 Aerial Imagery Map Figure A-3
Page 2

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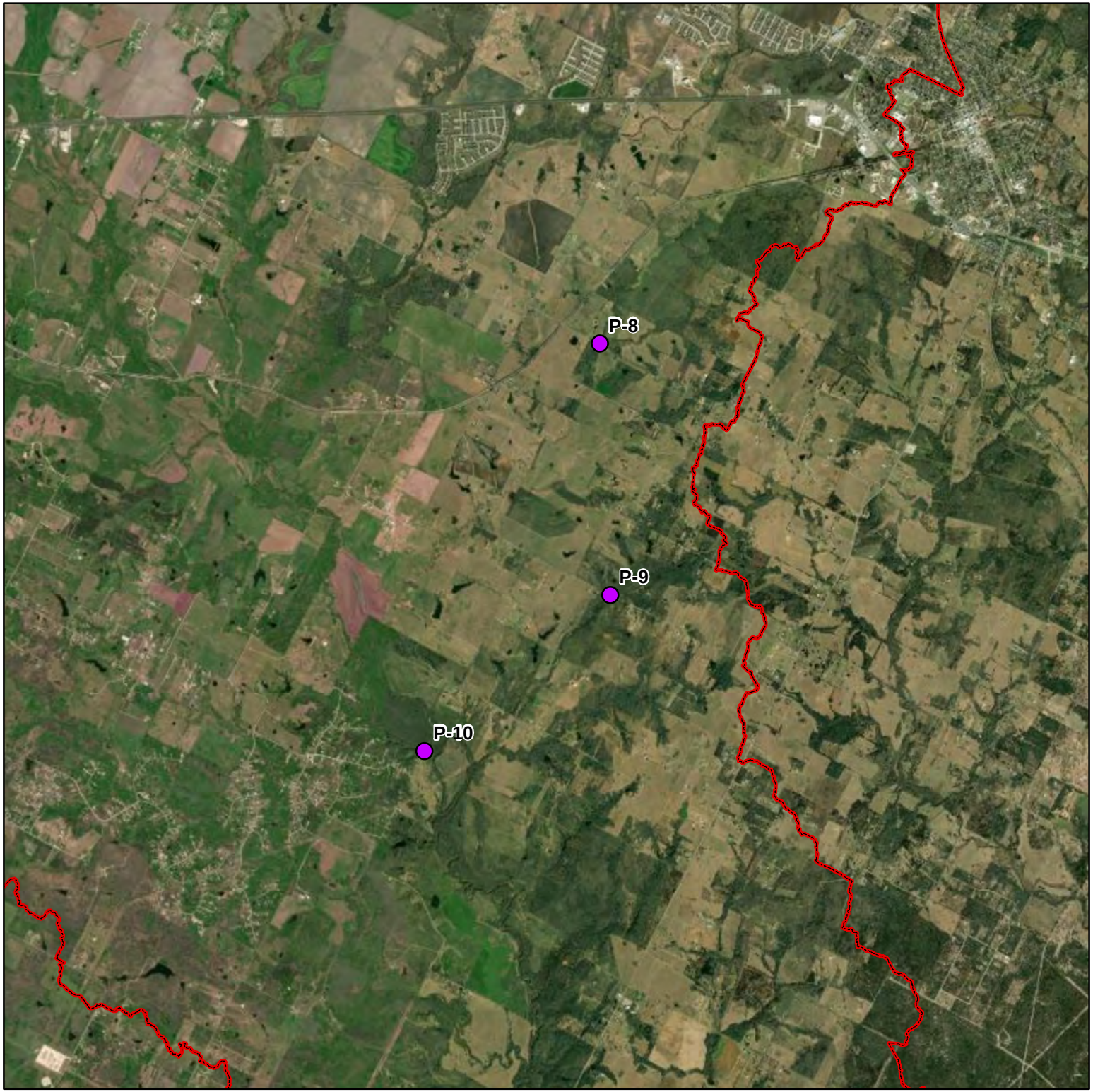

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Legend

Study Area

Proposed Improvement Locations

- Fill Removal, Highway Improvement & Channel Benching
- Roadway Improvement
- Roadway Improvement & Channel Benching

Notes:
1. LAT: 30.3047°, LONG: -97.4246°
2. TNRIS 2018 NAIP Imagery

Wilbarger Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/8/2021 AVO: 35837
2020 Aerial Imagery Map Figure A-3
Page 3

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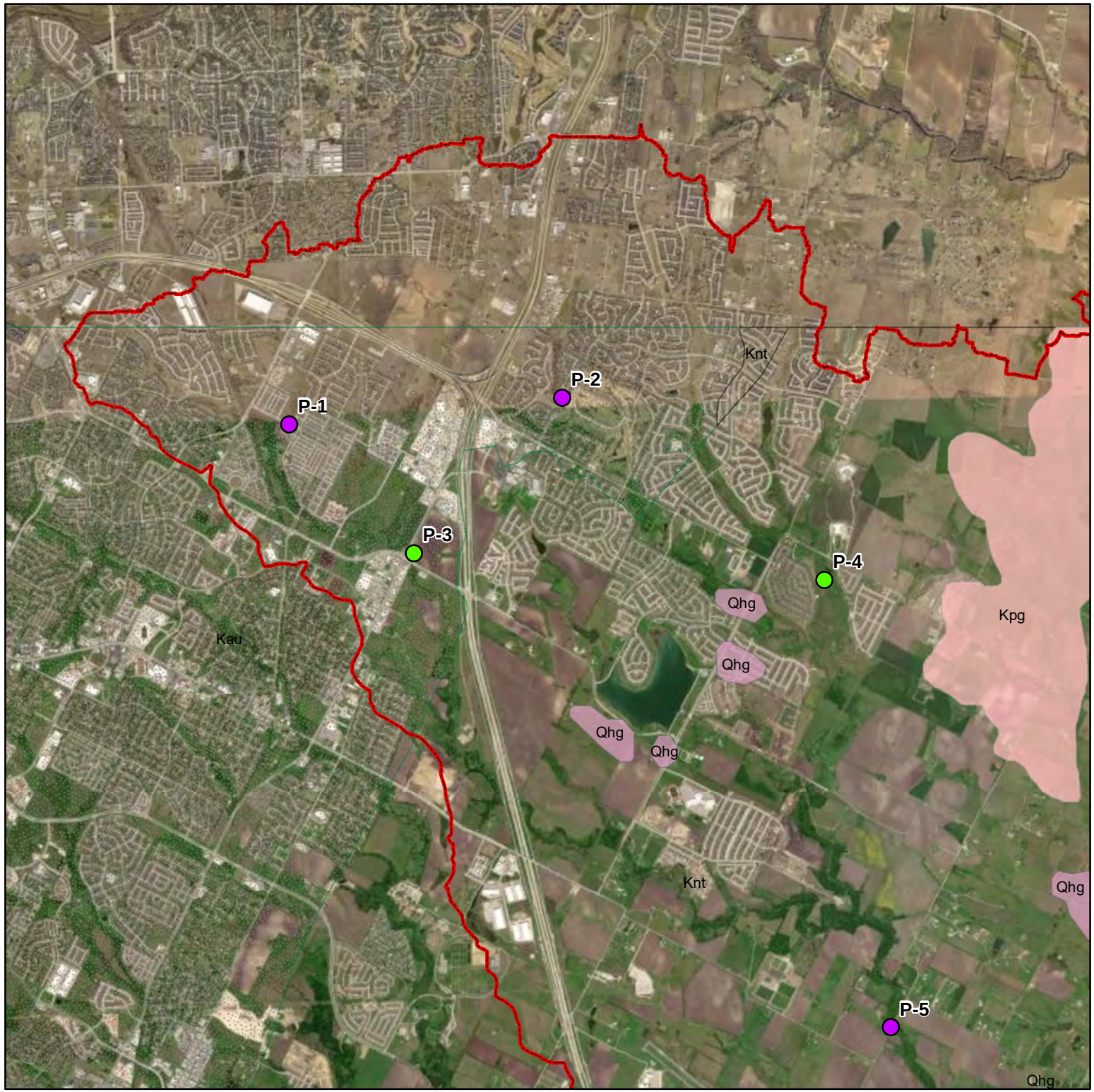

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0 0.5 1 2

Miles

Legend

Study Area

Proposed Improvement Locations

Roadway Improvement

Roadway Improvement & Channel Benching

USGS Geologic Rock Units

Kau

Knt

Kpg

Qhg - High Gravel Deposits

Notes:
1. LAT: 30.4568°, LONG: -97.5843°
2.Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. TNRIS 2014 USGS Texas Geology

Wilbarger Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/8/2021 AVO: 35837
USGS Geology Map Figure A-4
Page 1

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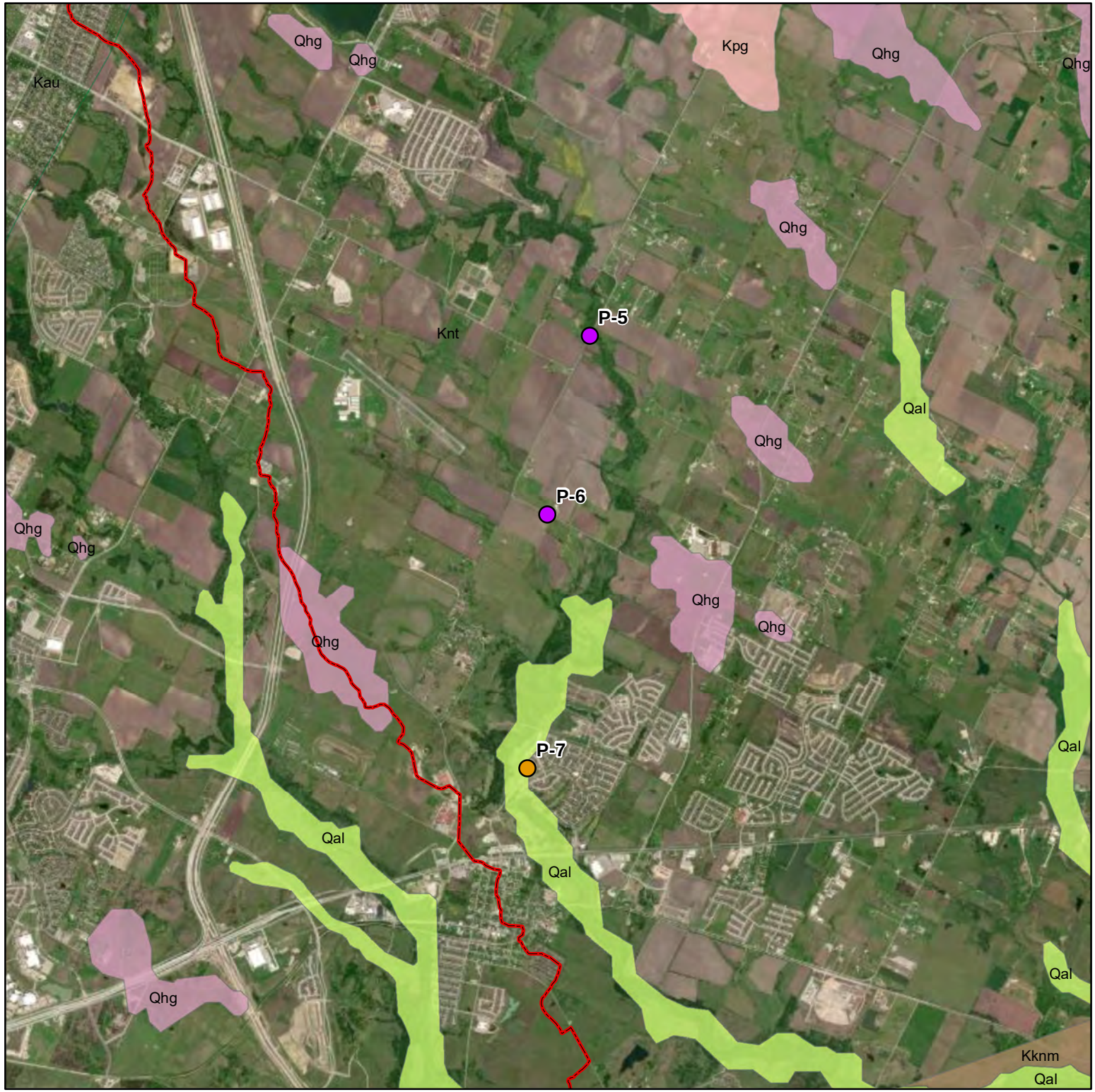

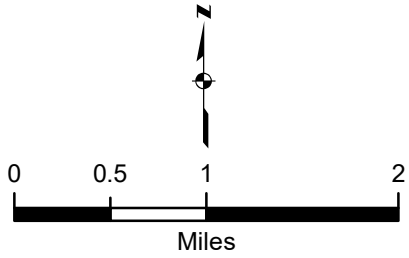

Legend

Study Area

Proposed Improvement Locations

- Fill Removal, Highway Improvement & Channel Benching
- Roadway Improvement

USGS Geologic Rock Units

- Kau
- Kknm
- Knt
- Kpg
- Qal - Alluvium
- Qhg - High Gravel Deposits

Notes:

1. LAT: 30.3821°, LONG: -97.5492°
2. Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. TNRIS 2014 USGS Texas Geology

Wilbarger Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/8/2021 AVO: 35837
USGS Geology Map Figure A-4
Page 2

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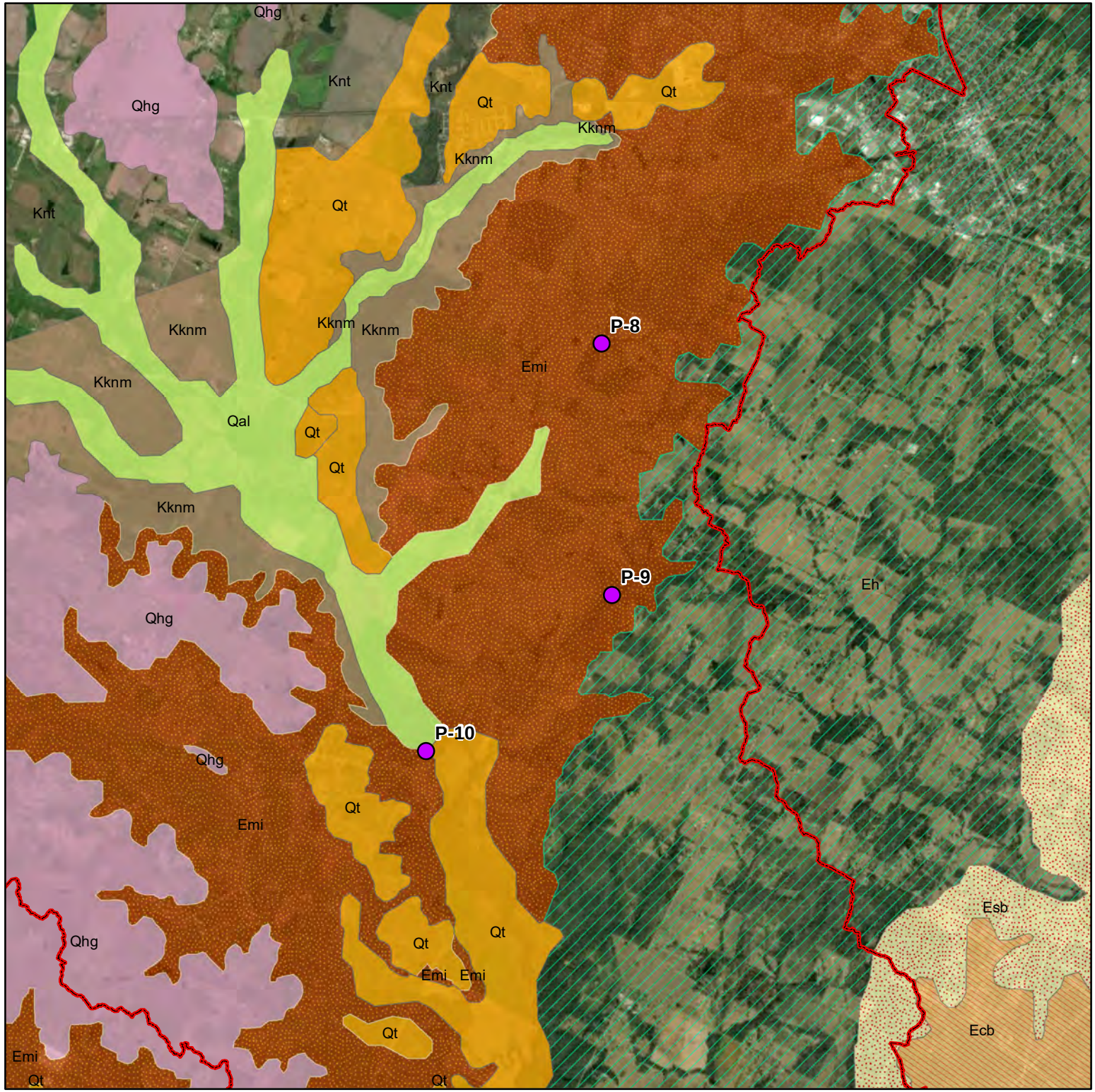

0 0.5 1 2

Miles

Legend

Study Area

Proposed Improvement Locations

Roadway Improvement

USGS Geologic Rock Units

- Ecb - Calvert Bluff
- Eh
- Emi
- Esb - Simsboro Formation
- Kknm
- Knt
- Qal - Alluvium
- Qhg - High Gravel Deposits
- Qt - Fluviatile Terrace Deposits

Notes:
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2.Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. TNRIS 2014 USGS Texas Geology

Wilbarger Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/8/2021 AVO: 35837
USGS Geology Map Figure A-4
Page 3

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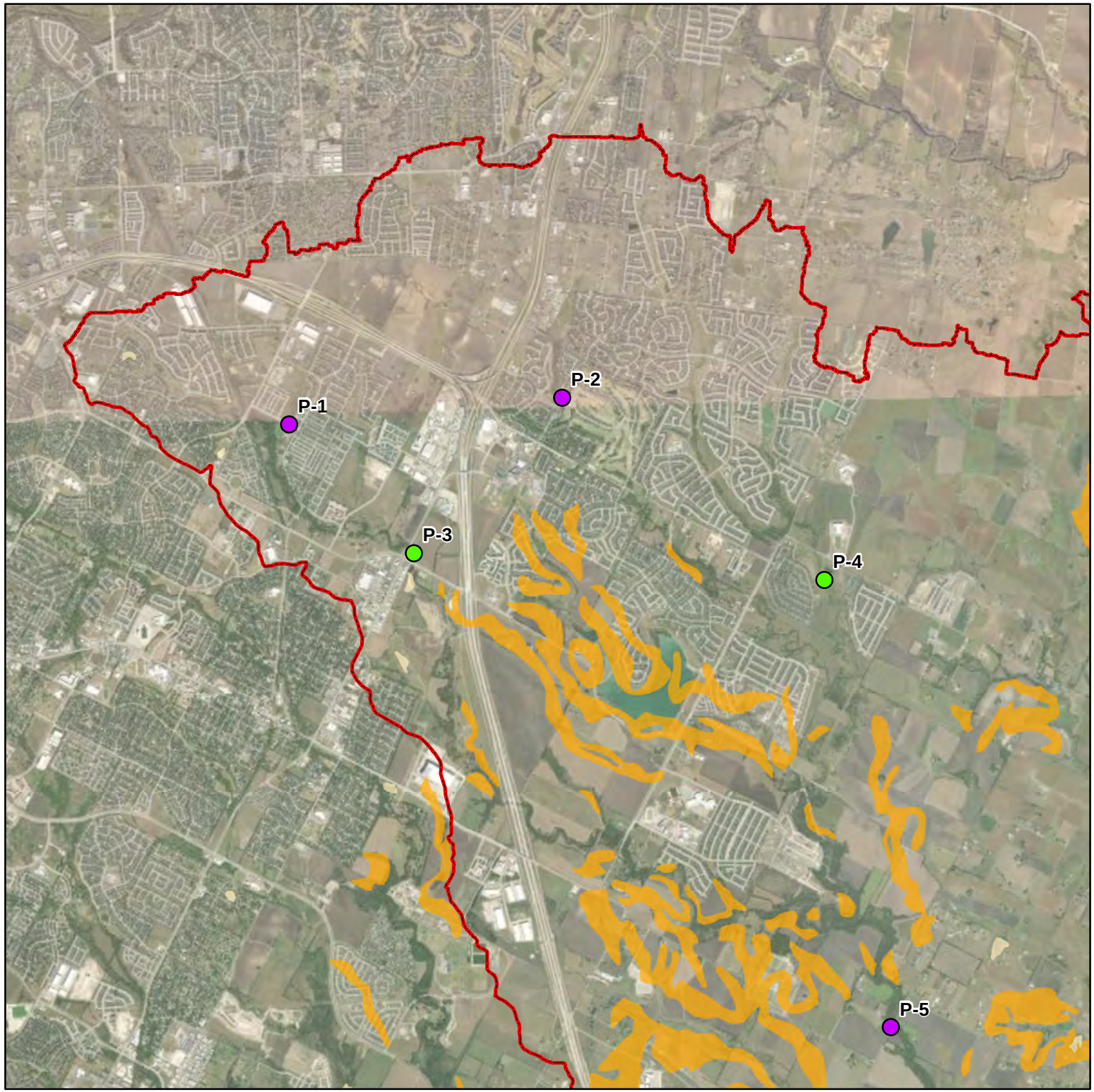

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Miles

Legend

Study Area

Proposed Improvement Locations

- Fill Removal, Highway Improvement & Channel Benching
- Roadway Improvement
- Roadway Improvement & Channel Benching

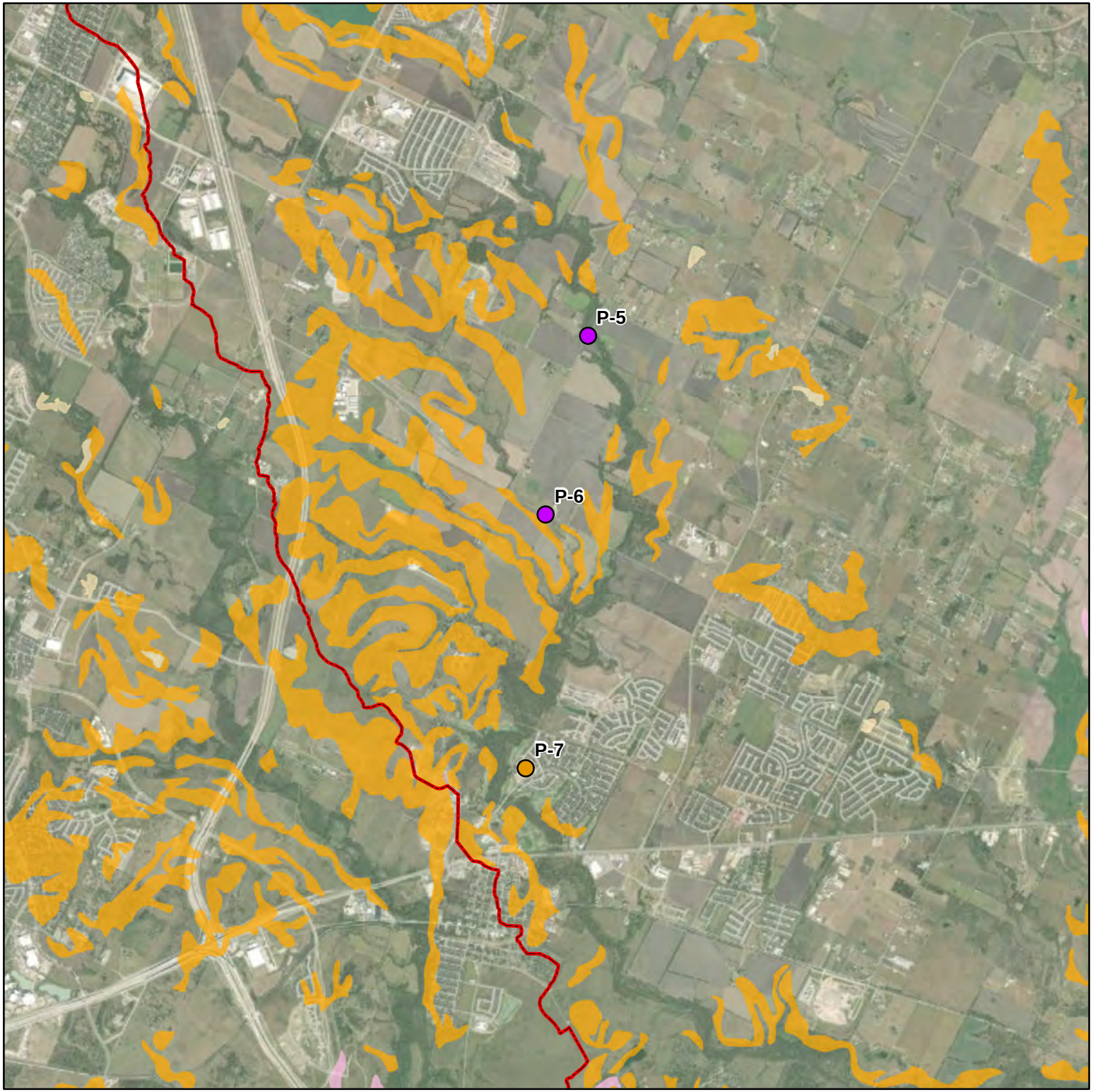
NRCS Soil Survey

- Farmland of Statewide Importance
- Not Prime Farmland
- All Areas are Prime Farmland
- Farmland of Statewide Importance, if drained
- No Farmland Classification

Notes:
1. LAT: 30.4568°, LONG: -97.5843°
2.Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. USDA Web Soil Survey NRCS SSURGO

Wilbarger Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/14/2021 AVO: 35837
NRCS SSURGO Map Figure A-5
Page 1

HALFF



N

0 0.5 1 2

Miles

Legend

Study Area

Proposed Improvement Locations

- Fill Removal, Highway Improvement & Channel Benching
- Roadway Improvement
- Roadway Improvement & Channel Benching

NRCS Soil Survey

- Farmland of Statewide Importance
- Not Prime Farmland
- All Areas are Prime Farmland
- Farmland of Statewide Importance, if drained
- No Farmland Classification

Notes:
1. LAT: 30.3821°, LONG: -97.5492°
2.Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. USDA Web Soil Survey NRCS SSURGO

Wilbarger Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/14/2021 AVO: 35837
NRCS SSURGO Map Figure A-5
Page 2

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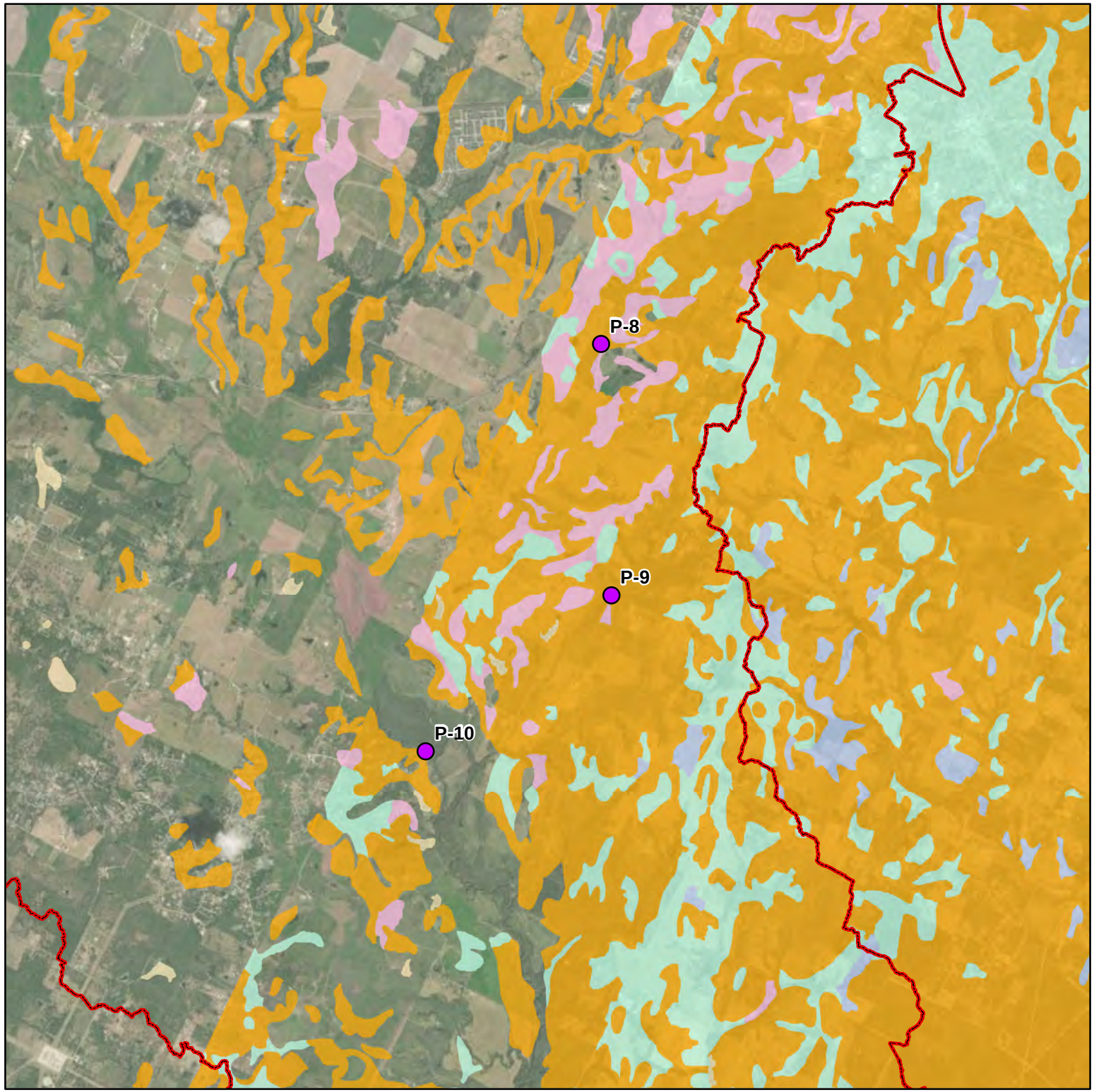


N

0 0.5 1 2

Miles

Legend

Study Area

Proposed Improvement Locations

- Fill Removal, Highway Improvement & Channel Benching
- Roadway Improvement
- Roadway Improvement & Channel Benching

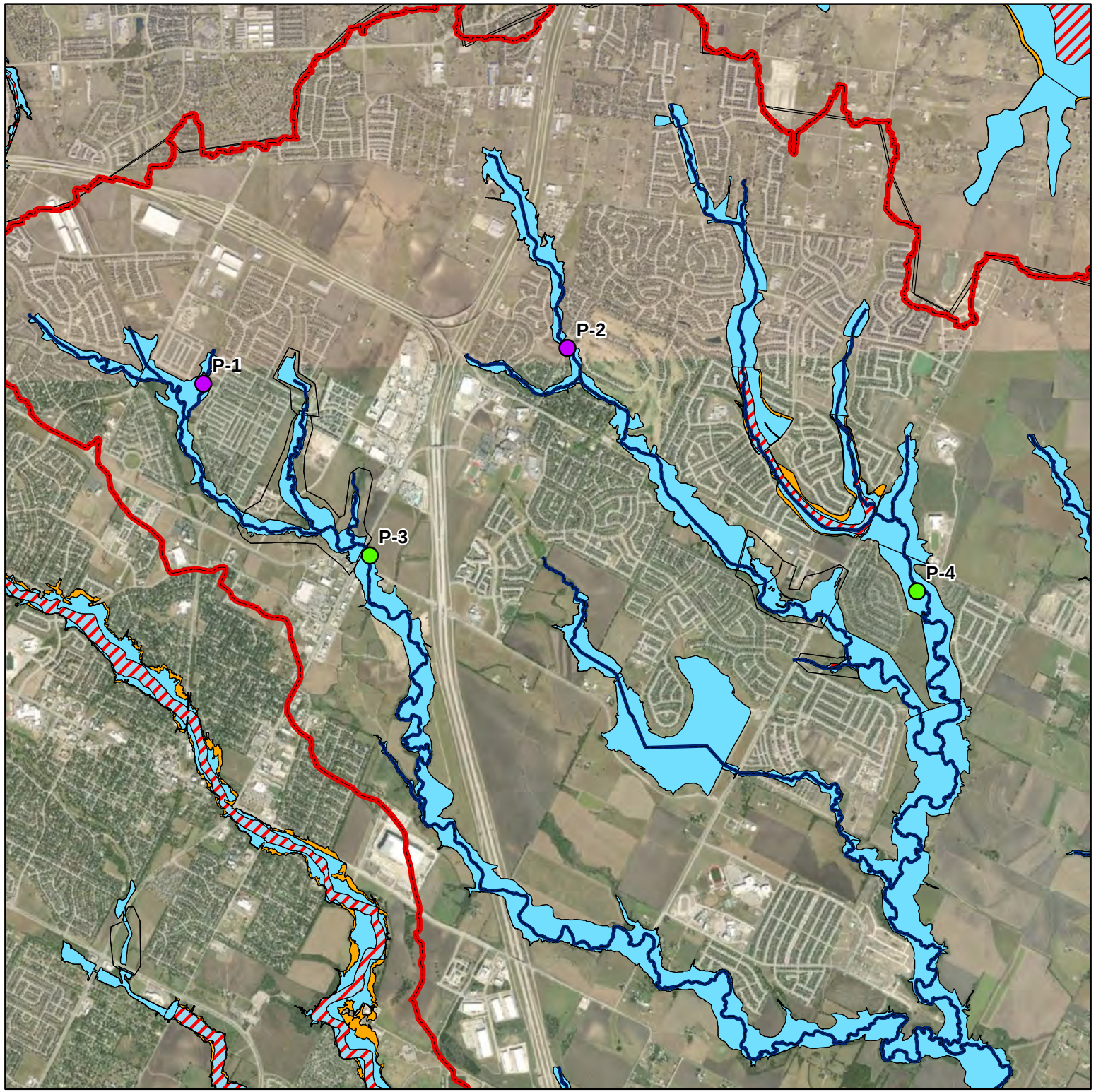
NRCS Soil Survey

- Farmland of Statewide Importance
- Not Prime Farmland
- All Areas are Prime Farmland
- Farmland of Statewide Importance, if drained
- No Farmland Classification

Notes:
1. LAT: 30.3047°, LONG: -97.4246°
2.Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. USDA Web Soil Survey NRCS SSURGO

Wilbarger Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/14/2021 AVO: 35837
NRCS SSURGO Map Figure A-5
Page 3

HALFF



N

0 0.375 0.75 1.5

Miles

Legend

Study Area

Proposed Improvement Locations

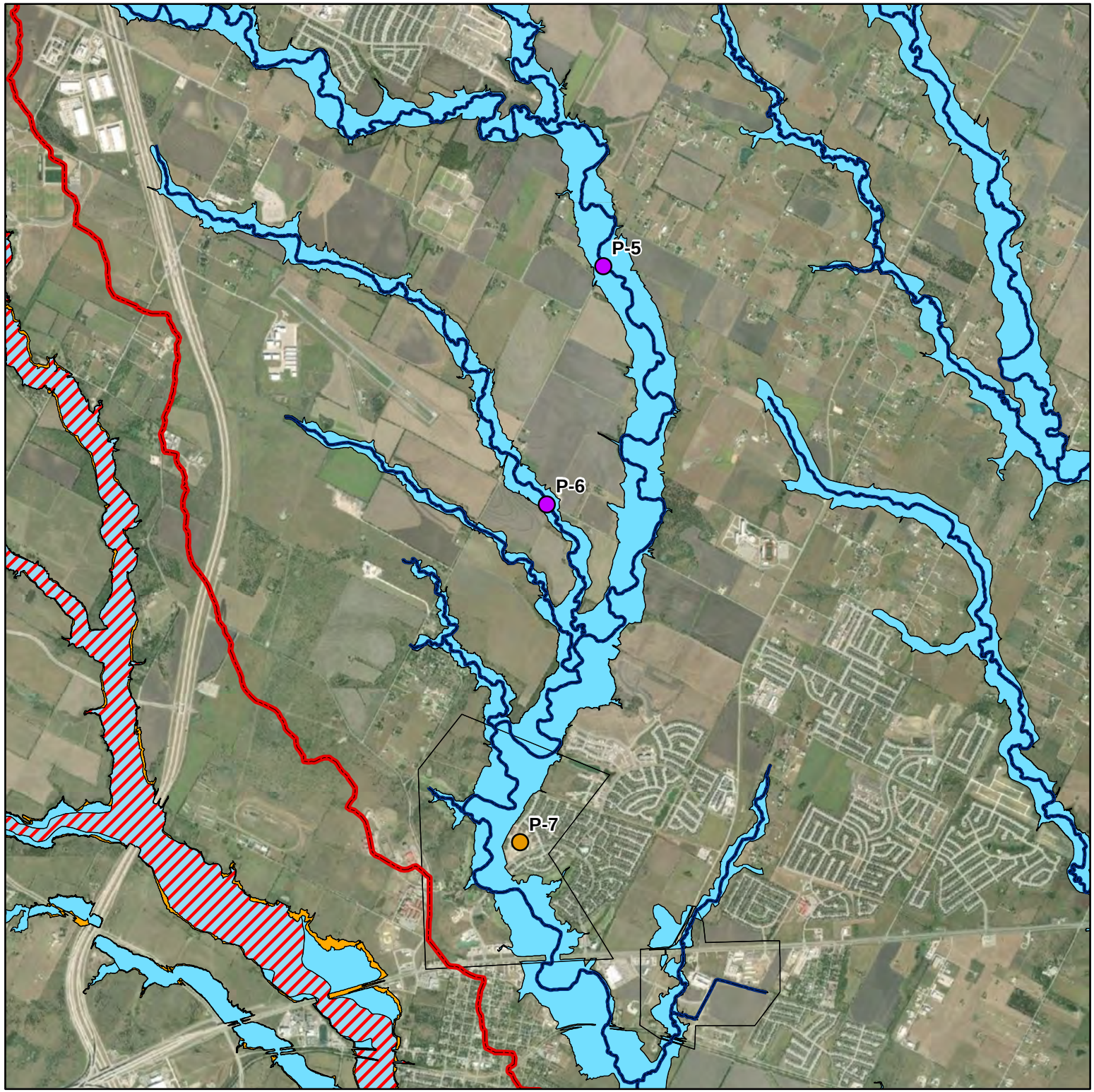
- Fill Removal, Highway Improvement & Channel Benching
- Roadway Improvement
- Roadway Improvement & Channel Benching

FEMA NFHL

- 1% Annual Chance Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Area of Minimal Flood Hazard
- Regulatory Floodway

Notes:
1. LAT: 30.4568°, LONG: -97.5843°
2.Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. FEMA NFHL

Wilbarger Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/16/2021 AVO: 35837
FEMA National Flood Hazard Layer Map
Figure A-6



N

0 0.375 0.75 1.5

Miles

Legend

Study Area

Proposed Improvement Locations

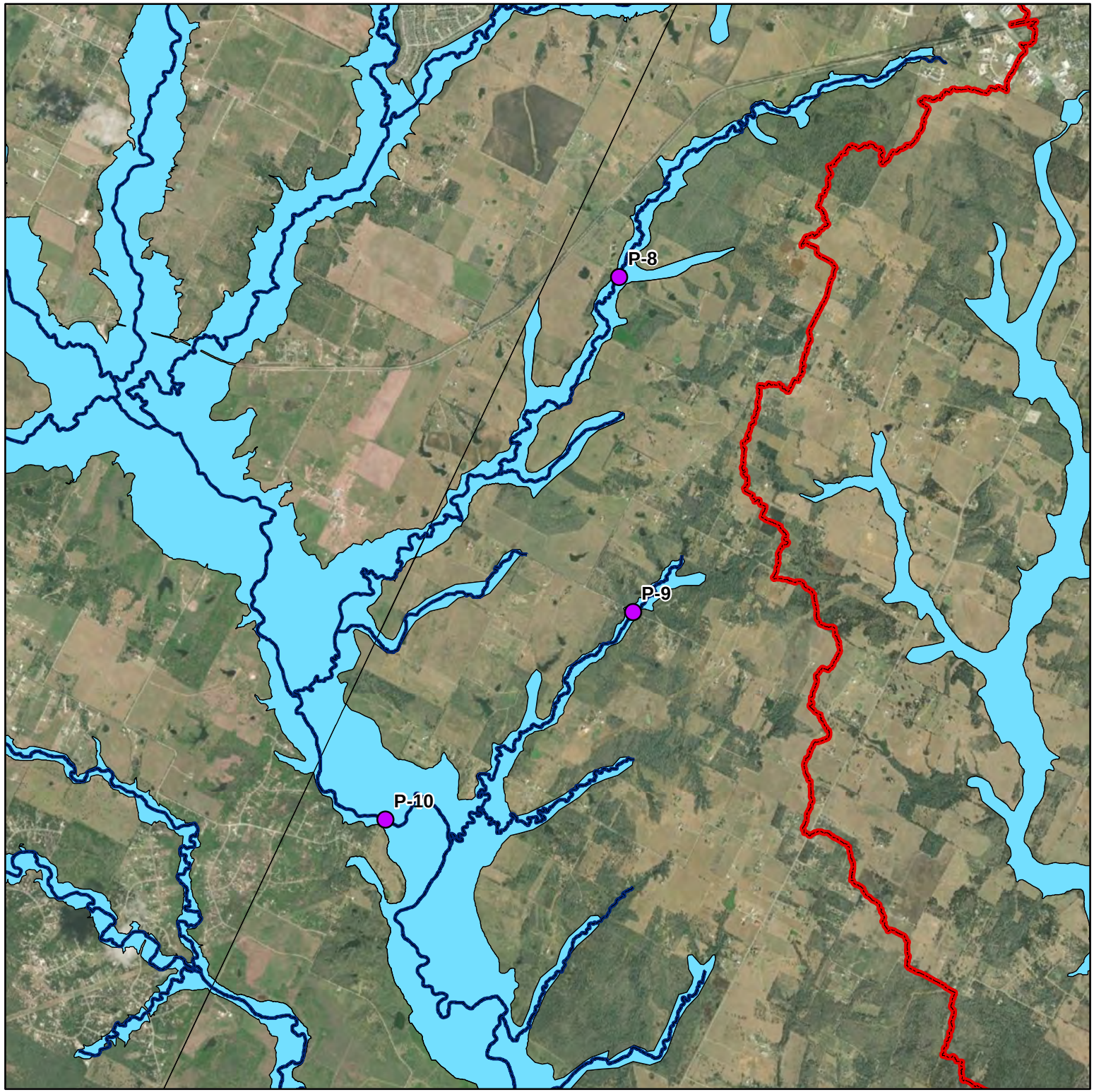
- Fill Removal, Highway Improvement & Channel Benching
- Roadway Improvement
- Roadway Improvement & Channel Benching

FEMA NFHL

- 1% Annual Chance Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Area of Minimal Flood Hazard
- Regulatory Floodway

Notes:
1. LAT: 30.3821°, LONG: -97.5492°
2.Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. FEMA NFHL

Wilbarger Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/16/2021 AVO: 35837
FEMA National Flood Hazard Layer Map
Figure A-6



N

0 0.375 0.75 1.5

Miles

Legend

Study Area

Proposed Improvement Locations

Fill Removal, Highway Improvement & Channel Benching

Roadway Improvement

Roadway Improvement & Channel Benching

FEMA NFHL

1% Annual Chance Flood Hazard

0.2% Annual Chance Flood Hazard

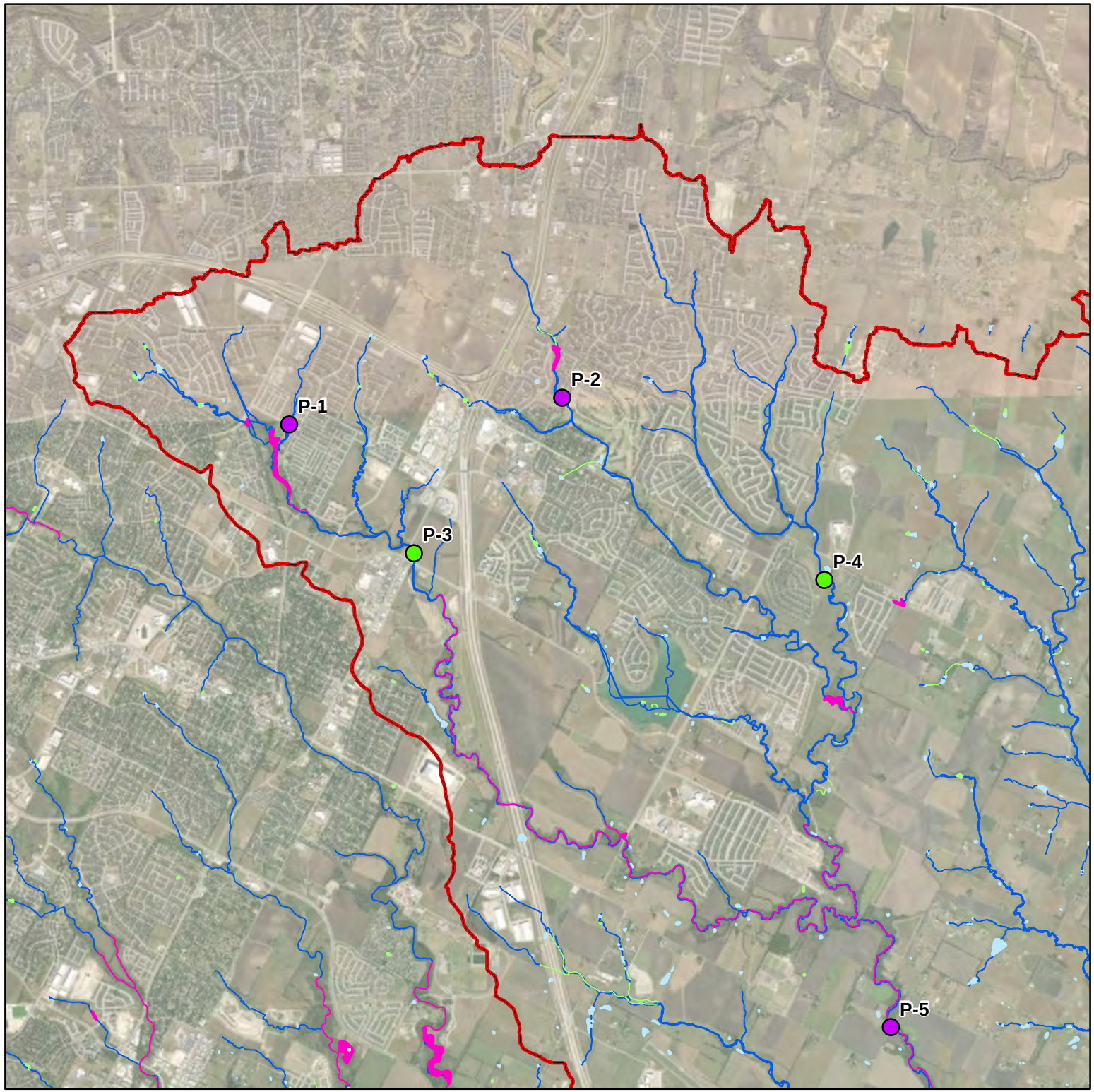
Area of Minimal Flood Hazard

Regulatory Floodway

Notes:

1. LAT: 30.3047°, LONG: -97.4246°
2. Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. FEMA NFHL

Wilbarger Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/16/2021 AVO: 35837
FEMA National Flood Hazard Layer Map
Figure A-6



N

0 0.5 1 2

Miles

Legend

Study Area

Proposed Improvement Locations

Roadway Improvement

Roadway Improvement & Channel Benching

NWI Wetland Type

Freshwater Emergent Wetland

Freshwater Forested/Shrub Wetland

Freshwater Pond

Riverine

Notes:
1. LAT: 30.4568°, LONG: -97.5843°
2.Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. USFWS NWI

Wilbarger Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/14/2021 AVO: 35837
NWI Map Figure A-6
Page 1

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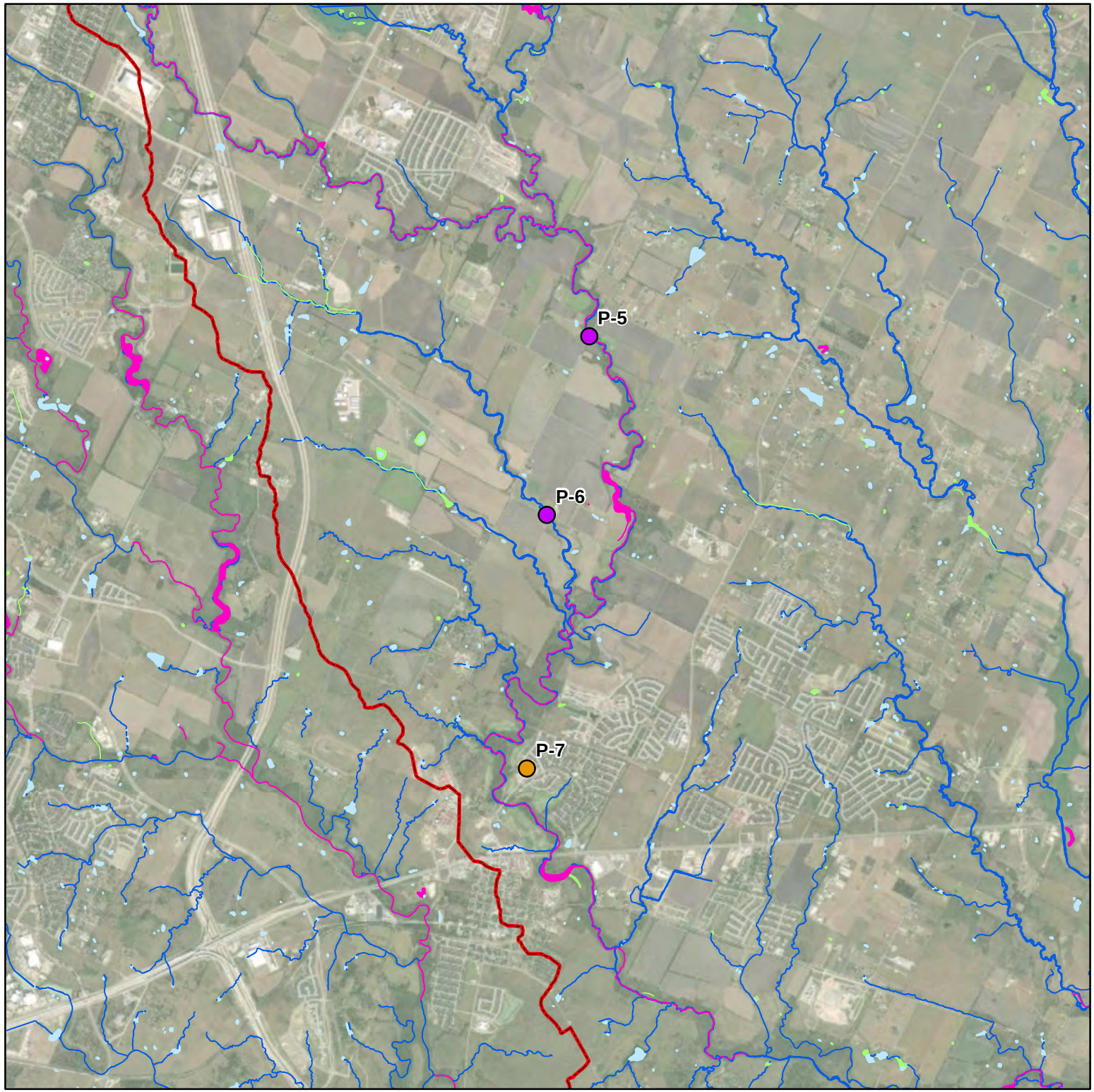


N

0 0.5 1 2

Miles

Legend

Study Area

Proposed Improvement Locations

Fill Removal, Highway Improvement & Channel Benching

Roadway Improvement

NWI Wetland Type

Freshwater Emergent Wetland

Freshwater Forested/Shrub Wetland

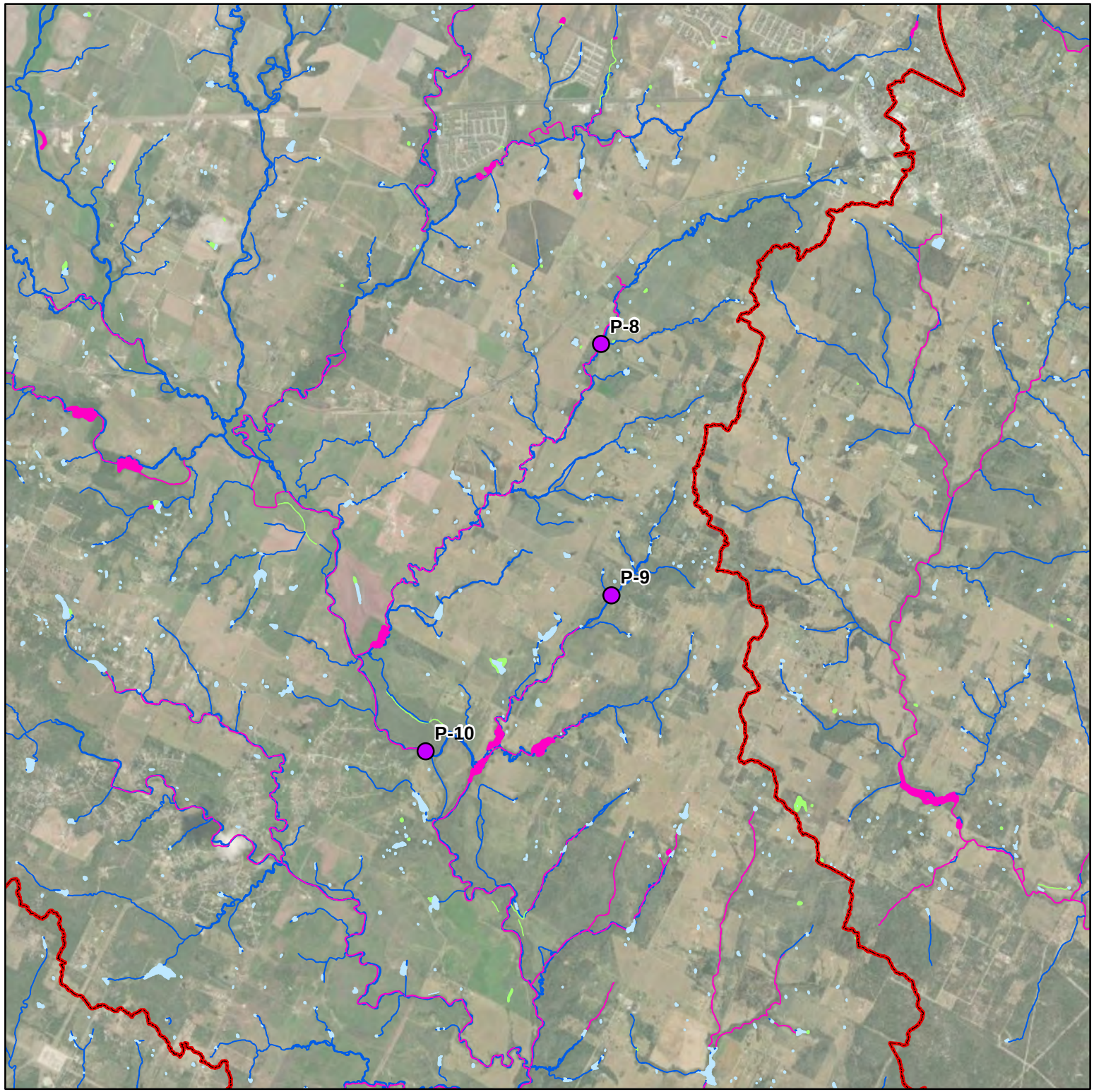
Freshwater Pond

Riverine

Notes:
1. LAT: 30.3821°, LONG: -97.5492°
2.Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. USFWS NWI

Wilbarger Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/14/2021 AVO: 35837
NWI Map Figure A-6
Page 2

HALFF



N

0 0.5 1 2

Miles

Legend

Study Area

Proposed Improvement Locations

Roadway Improvement

NWI Wetland Type

Freshwater Emergent Wetland

Freshwater Forested/Shrub Wetland

Freshwater Pond

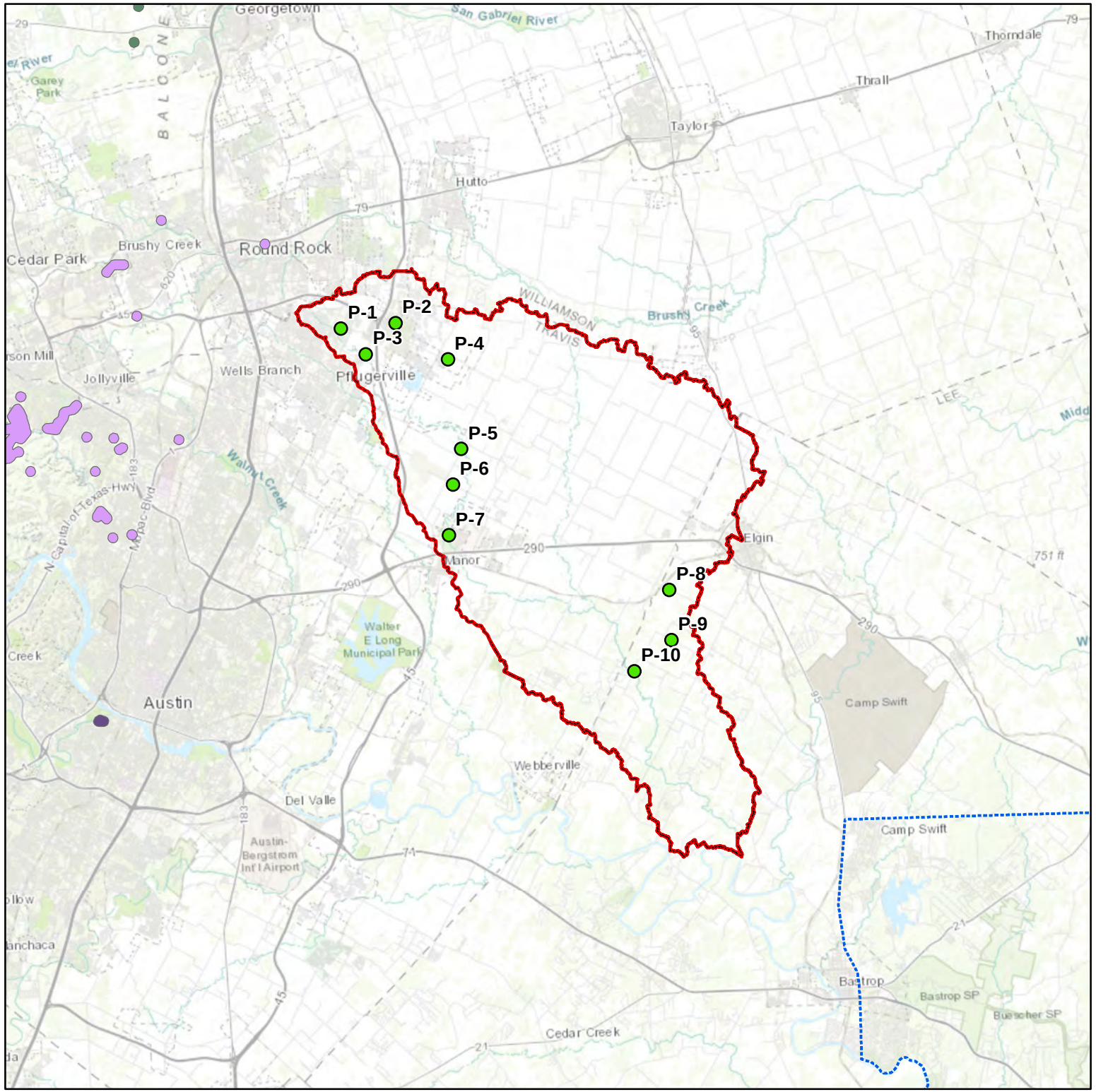
Riverine

Notes:

1. LAT: 30.3047°, LONG: -97.4246°
2. Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. USFWS NWI

Wilbarger Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/14/2021 AVO: 35837
NWI Map Figure A-6
Page 3

HALFF



N

0 2.5 5 10

Miles

Legend

- Study Area

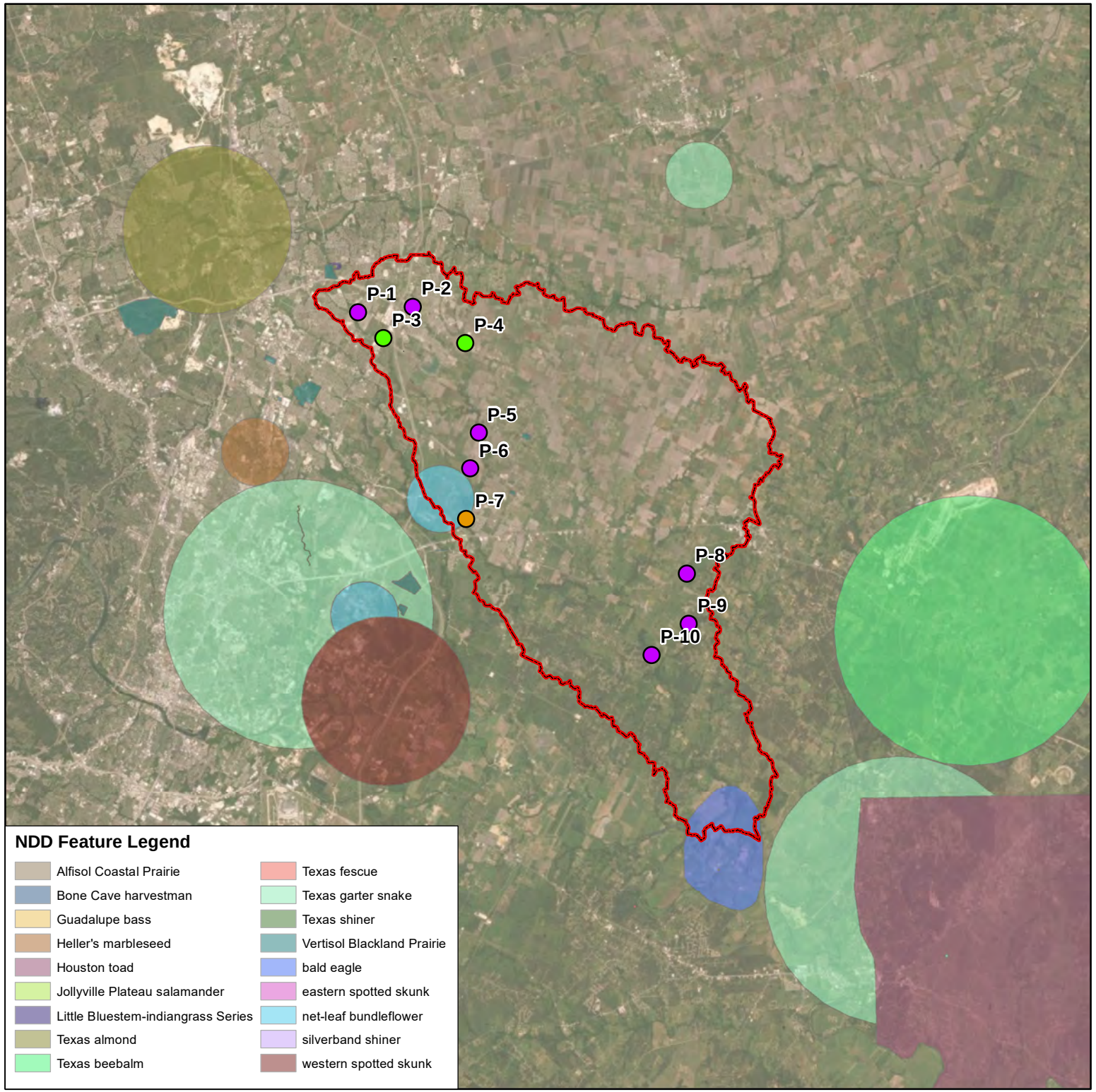
Proposed Improvement Locations

- Proposed Improvement Locations
- Austin blind Salamander
- Georgetown Salamander
- Houston toad Critical Habitat
- Jollyville Plateau Salamander

Notes:
1. LAT: 30.3513°, LONG: -97.4917°
2.Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap

Wilbarger Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/8/2021 AVO: 35837
USFWS Critical Habitat Map
Figure A-7

HALFF



N

0 2.5 5 10

Miles

Legend

Study Area

Proposed Improvement Locations

- Fill Removal, Highway Improvement & Channel Benching
- Roadway Improvement
- Roadway Improvement & Channel Benching

NDD Feature Legend

- Alfisol Coastal Prairie
- Bone Cave harvestman
- Guadalupe bass
- Heller's marbleseed
- Houston toad
- Jollyville Plateau salamander
- Little Bluestem-indiangrass Series
- Texas almond
- Texas beebalm
- Texas fescue
- Texas garter snake
- Texas shiner
- Vertisol Blackland Prairie
- bald eagle
- eastern spotted skunk
- net-leaf bundleflower
- silverband shiner
- western spotted skunk

Notes:
1. LAT: 30.3428°, LONG: -97.5026°
2.Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. TPWD Texas Natural Diversity Database

Wilbarger Creek Watershed Study
Bastrop County, Texas

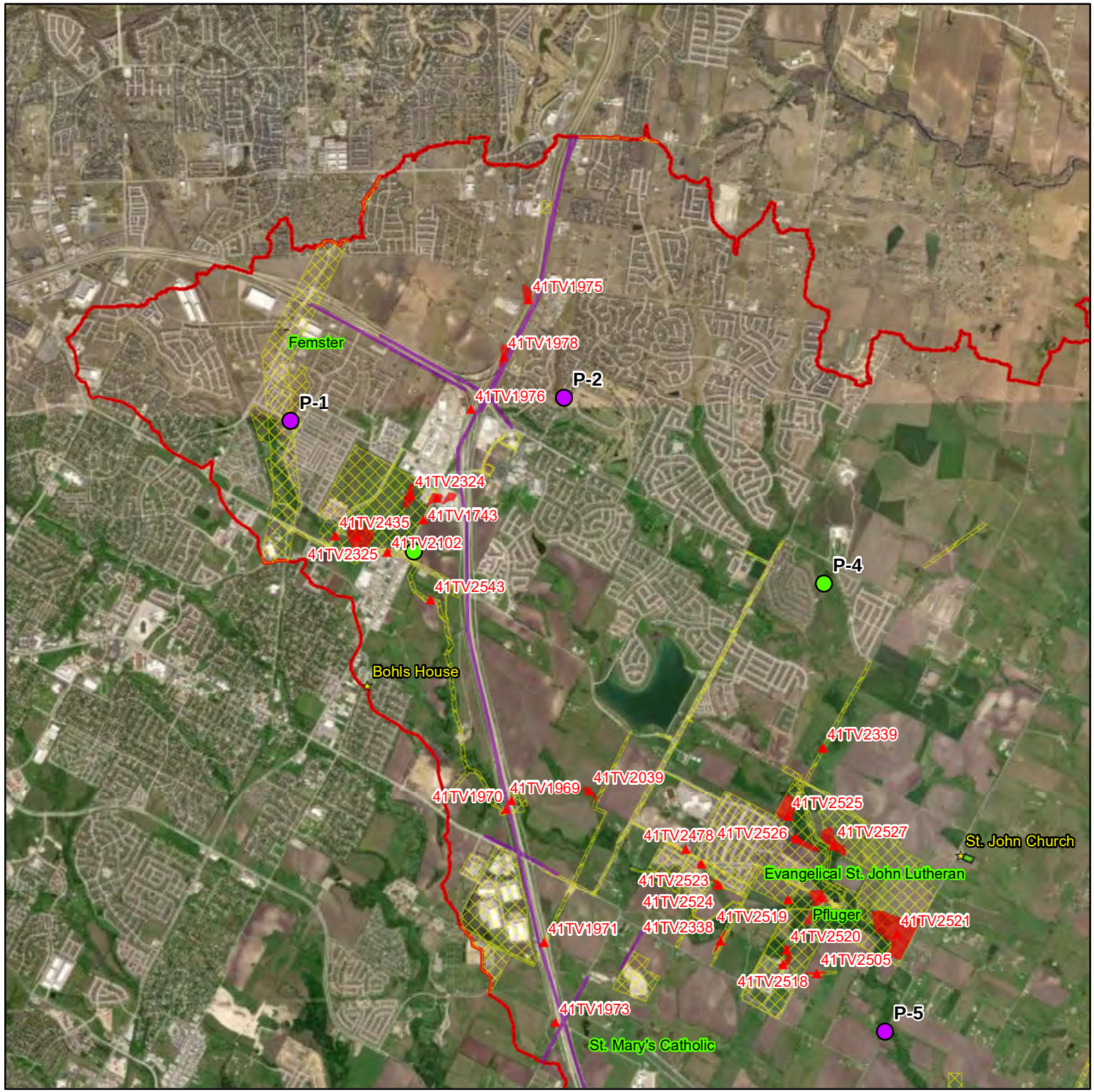
Project Number: N/A

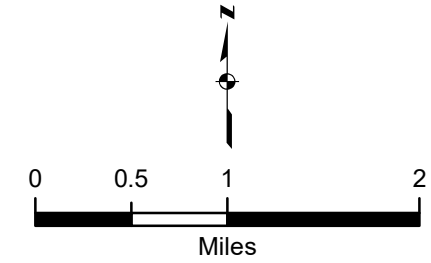
Date: 4/14/2021 AVO: 35837

TPWD TXNDD Map

Figure A-8

HALFF





Legend

- Study Area

Proposed Improvement Locations

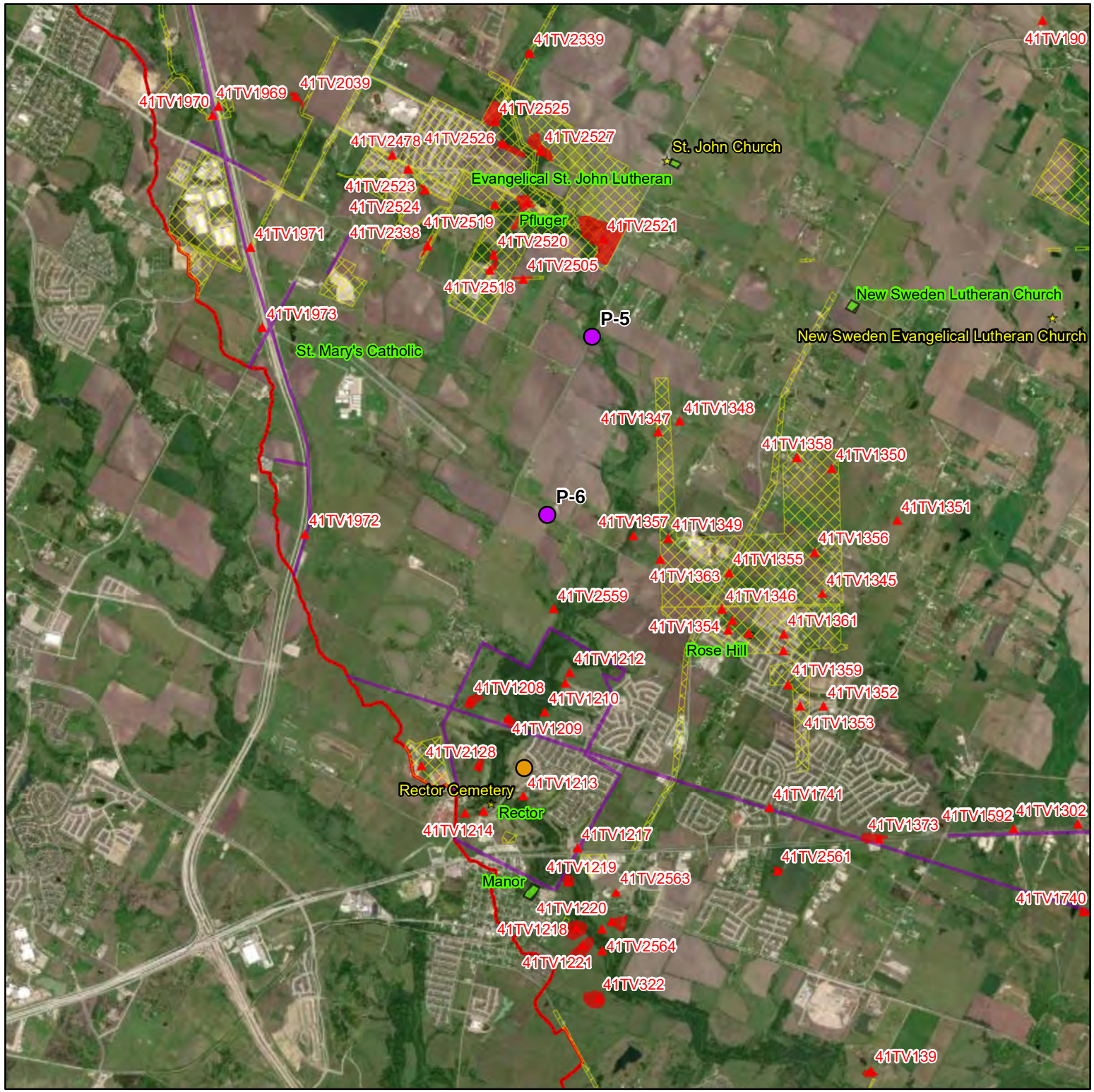
- Fill Removal, Highway Improvement & Channel Benching
- Roadway Improvement
- Roadway Improvement & Channel Benching
- Archeological Site
- Archeological Site Boundary
- Cemetery
- Previous Survey Area
- Historical Marker

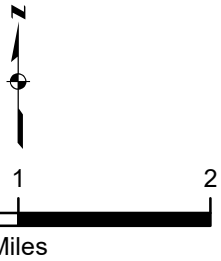
Notes:

1. LAT: 30.4568°, LONG: -97.5843°
2. Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Wilbarger Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/8/2021 AVO: 35837
Cultural Resources Map Figure A-9
Page 1

HALFF





Legend

- Study Area

Proposed Improvement Locations

- Fill Removal, Highway Improvement & Channel Benching
- Roadway Improvement
- Roadway Improvement & Channel Benching
- Archeological Site
- Archeological Site Boundary
- Cemetery
- Previous Survey Area
- Historical Marker

Notes:

1. LAT: 30.3821°, LONG: -97.5492°
2. Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Wilbarger Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/8/2021 AVO: 35837
Cultural Resources Map Figure A-9
Page 2

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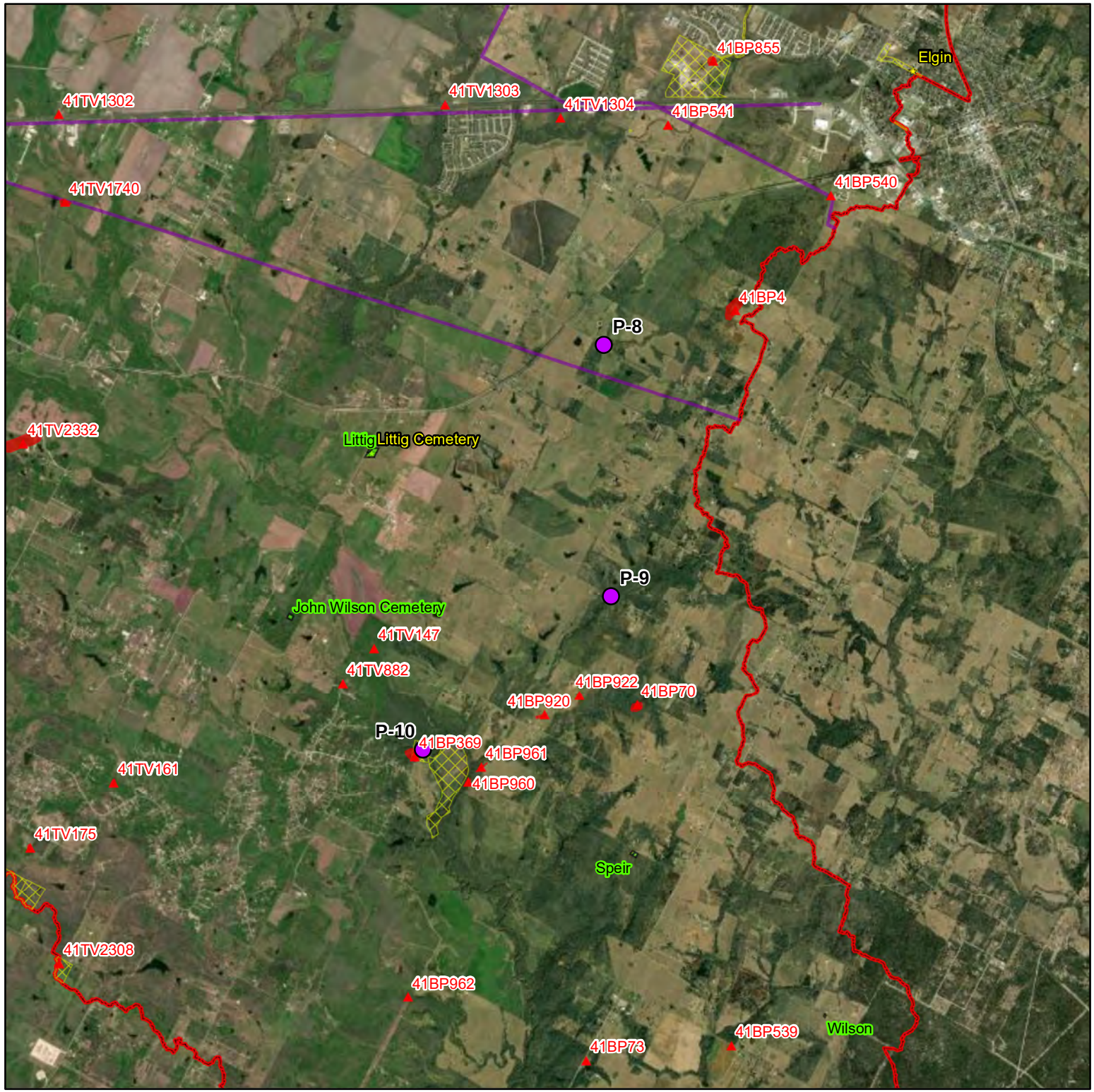


N

0 0.5 1 2

Miles

Legend

- Study Area

Proposed Improvement Locations

- Fill Removal, Highway Improvement & Channel Benching
- Roadway Improvement
- Roadway Improvement & Channel Benching
- Archeological Site
- Archeological Site Boundary
- Cemetery
- Previous Survey Area
- Historical Marker

Notes:

1. LAT: 30.3047°, LONG: -97.4246°
2. Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Wilbarger Creek Watershed Study Bastrop County, Texas
Project Number: N/A
Date: 4/8/2021 AVO: 35837
Cultural Resources Map Figure A-9
Page 3

HALFF

APPENDIX B

GeoSearch Radius Report

GeoSearch
On time. On target. In touch.™

Radius Report

GeoLens by GeoSearch

Target Property:

Wilbarger Creek Watershed Study
Pflugerville, Travis County, Texas

Prepared For:

Halff-Austin

Order #: 161812
Job #: 399054
Project #: AVO 35837
Date: 02/26/2021

Radius Map 1

Target Property (TP)
FRSTX
ECHOR06
RCRAGR06
PST
ALTFUELS
PST
IHW

Wilbarger Creek Watershed Study
Pflugerville, Texas

N
W E
S

0' 1600' 3200' 4800'
SCALE: 1" = 3200'

Radius Map 2

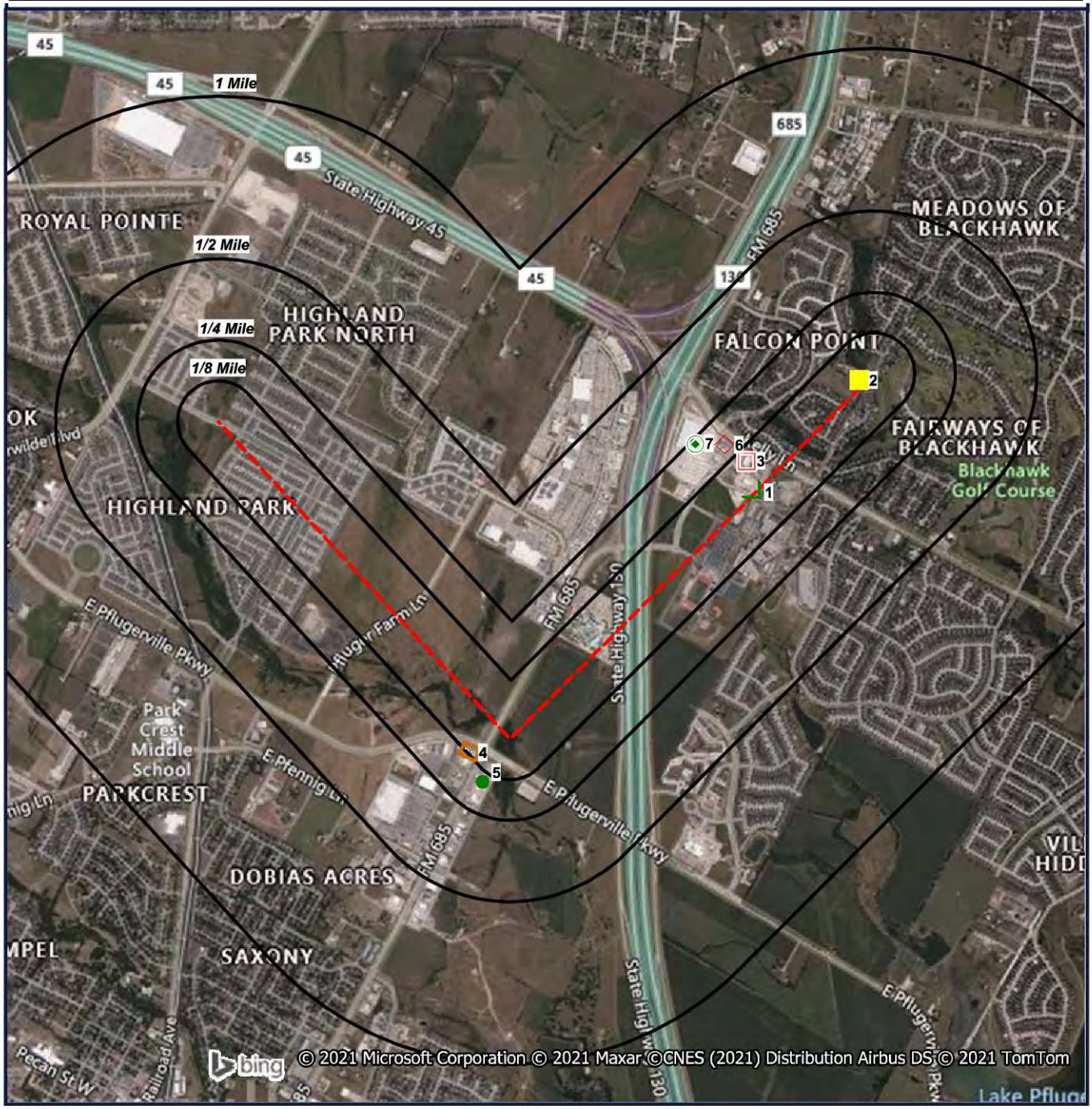
Target Property (TP)
FRSTX
ECHOR06
RCRAGR06
PST
ALTFUELS
PST
IHW

Wilbarger Creek Watershed Study
Pflugerville, Texas

N
W E
S

0' 1250' 2500' 3750'
SCALE: 1" = 2500'

Ortho Map



- Target Property (TP)
- FRSTX
- ECHOR06
- RCRAGR06
- PST
- ALTFUELS
- PST
- IHW

Quadrangle(s):
Pflugerville
East
Wilbarger Creek
Watershed
Study
Pflugerville, Texas

N
W E
S

0' 1250' 2500' 3750'
SCALE: 1" = 2500'

Topographic Map

Target Property (TP)

Quadrangle(s):
Pflugerville
East
Source: USGS,
01/08/2013
Wilbarger Creek
Watershed
Study
Pflugerville, Texas

N
W E
S

0' 1600' 3200' 4800'
SCALE: 1" = 3200'

Located Sites Summary

*NOTE: Standard environmental records are displayed in **bold**.*

Map ID#	Database Name	Site ID#	Elevation	Distance From Site	Site Name	Address	PAGE #
1	ECHOR06	110070198644	701 ft.	0.004 mi. NW (21 ft.)	KEYSTONE 1916-1 FORMERLY KNOWN AS 3M KELLY 1	2100 AUTUMN SLATE BUILDING 1, PFLUGERVILLE, TX 78660	19
1	FRSTX	110070198644	701 ft.	0.004 mi. NW (21 ft.)	KEYSTONE 1916-1 FORMERLY KNOWN AS 3M KELLY 1	2100 AUTUMN SLATE BUILDING 1, PFLUGERVILLE, TX 78660	20
2	ECHOR06	110009774761	681 ft.	0.019 mi. NW (100 ft.)	KELLY LANE WWTP	2500' E OF FM 685 AND 1600' N OF KELLY LANE, AUSTIN, TX 78751	21
3	IHW	95650	706 ft.	0.090 mi. NW (475 ft.)	CVS PHARMACY 10106	2013 KELLY LN, PFLUGERVILLE, TX 78660	22
3	***RCRAGR06***	***TXR000081457***	***706 ft.***	***0.090 mi. NW (475 ft.)***	***CVS PHARMACY 10106***	***2013 KELLY LN, PFLUGERVILLE, TX 78660***	***24***
4	***PST***	***85220***	***688 ft.***	***0.091 mi. SW (480 ft.)***	***7-ELEVEN 35624***	***1717 E PFLUGERVILLE PKWY, PFLUGERVILLE, TX 78660***	***26***
5	ALTFUELS	116891	688 ft.	0.130 mi. SW (686 ft.)	CARCHARGING	1821 FARM TO MARKET 685, PFLUGERVILLE, TX 78660	31
5	ALTFUELS	162788	688 ft.	0.130 mi. SW (686 ft.)	CARCHARGING	1821 FARM TO MARKET 685, PFLUGERVILLE, TX 78660	32
5	ALTFUELS	47403	688 ft.	0.130 mi. SW (686 ft.)	CARCHARGING	FARM TO MARKET 685, PFLUGERVILLE, TX 78660	33
6	***PST***	***83937***	***716 ft.***	***0.171 mi. NW (903 ft.)***	***TPG 184 05***	***1909 KELLY LN, PFLUGERVILLE, TX 78660***	***34***
6	***PST***	***89630***	***716 ft.***	***0.171 mi. NW (903 ft.)***	***COSTCO GASOLINE LOC NO 1322***	***1901 KELLY LN, PFLUGERVILLE, TX 78660***	***42***
7	IHW	97203	721 ft.	0.239 mi. NW (1262 ft.)	COSTCO WHOLESALE 1322	1901 KELLY LN, PFLUGERVILLE, TX 78660	48

Site Summary By Database

*NOTE: Standard environmental records are displayed in **bold**.*

Map ID#	Database Name	Site ID#	Elevation	Distance From Site	Site Name	Address
5	ALTFUELS	116891	688 ft.	0.130 mi. SW (686 ft.)	CARCHARGING	1821 FARM TO MARKET 685, PFLUGERVILLE, TX 78660
5	ALTFUELS	162788	688 ft.	0.130 mi. SW (686 ft.)	CARCHARGING	1821 FARM TO MARKET 685, PFLUGERVILLE, TX 78660
5	ALTFUELS	47403	688 ft.	0.130 mi. SW (686 ft.)	CARCHARGING	FARM TO MARKET 685, PFLUGERVILLE, TX 78660
1	ECHOR06	110070198644	701 ft.	0.004 mi. NW (21 ft.)	KEYSTONE 1916-1 FORMERLY KNOWN AS 3M KELLY 1	2100 AUTUMN SLATE BUILDING 1, PFLUGERVILLE, TX 78660
2	ECHOR06	110009774761	681 ft.	0.019 mi. NW (100 ft.)	KELLY LANE WWTP	2500' E OF FM 685 AND 1600' N OF KELLY LANE, AUSTIN, TX 78751
1	FRSTX	110070198644	701 ft.	0.004 mi. NW (21 ft.)	KEYSTONE 1916-1 FORMERLY KNOWN AS 3M KELLY 1	2100 AUTUMN SLATE BUILDING 1, PFLUGERVILLE, TX 78660
3	IHW	95650	706 ft.	0.090 mi. NW (475 ft.)	CVS PHARMACY 10106	2013 KELLY LN, PFLUGERVILLE, TX 78660
7	IHW	97203	721 ft.	0.239 mi. NW (1262 ft.)	COSTCO WHOLESALE 1322	1901 KELLY LN, PFLUGERVILLE, TX 78660
4	***PST***	***85220***	***688 ft.***	***0.091 mi. SW (480 ft.)***	***7-ELEVEN 35624***	***1717 E PFLUGERVILLE PKWY, PFLUGERVILLE, TX 78660***
6	***PST***	***83937***	***716 ft.***	***0.171 mi. NW (903 ft.)***	***TPG 184 05***	***1909 KELLY LN, PFLUGERVILLE, TX 78660***
6	***PST***	***89630***	***716 ft.***	***0.171 mi. NW (903 ft.)***	***COSTCO GASOLINE LOC NO 1322***	***1901 KELLY LN, PFLUGERVILLE, TX 78660***
3	***RCRAGR06***	***TXR000081457***	***706 ft.***	***0.090 mi. NW (475 ft.)***	***CVS PHARMACY 10106***	***2013 KELLY LN, PFLUGERVILLE, TX 78660***

Enforcement and Compliance History Information (ECHOR06)

MAP ID# 1

Distance from Property: 0.004 mi. (21 ft.) NW
Elevation: 701 ft.

FACILITY INFORMATION

UNIQUE ID: **110070198644**
REGISTRY ID: **110070198644**
NAME: **KEYSTONE 1916-1 FORMERLY KNOWN AS 3M KELLY 1**
ADDRESS: **2100 AUTUMN SLATE BUILDING 1**
PFLUGERVILLE, TX 78660
COUNTY: **TRAVIS**
FACILITY LINK: *Facility Detail Report*

Back to Report Summary

Facility Registry System (FRSTX)

MAP ID# 1

Distance from Property: 0.004 mi. (21 ft.) NW
Elevation: 701 ft.

FACILITY INFORMATION

REGISTRY ID: **110070198644**

NAME: **KEYSTONE 1916-1 FORMERLY KNOWN AS 3M KELLY 1**

LOCATION ADDRESS: **2100 AUTUMN SLATE BUILDING 1**
PFLUGERVILLE, TX 78660

COUNTY: **TRAVIS**

EPA REGION: **06**

FEDERAL FACILITY: **NOT REPORTED**

TRIBAL LAND: **NOT REPORTED**

ALTERNATIVE NAME/S:

NO ALTERNATIVE NAME(S) LISTED FOR THIS FACILITY

PROGRAM/S LISTED FOR THIS FACILITY

NPDES - NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

TX-TCEQ ACR - TEXAS COMMISSION ON EVIRONMENTAL QUALITY - AGENCY CENTRAL REGISTRY

STANDARD INDUSTRIAL CLASSIFICATION/S (SIC)

1542 - GENERAL CONTRACTORS-NONRESIDENTIAL BUILDINGS, OTHER THAN INDUSTRIAL BUILDINGS AND WAREHOUSES

NORTH AMERICAN INDUSTRY CLASSIFICATION/S (NAICS)

NO NAICS DATA REPORTED

Back to Report Summary

Enforcement and Compliance History Information (ECHOR06)

MAP ID# 2

Distance from Property: 0.019 mi. (100 ft.) NW
Elevation: 681 ft.

FACILITY INFORMATION

UNIQUE ID: **110009774761**
REGISTRY ID: **110009774761**
NAME: **KELLY LANE WWTP**
ADDRESS: **2500' E OF FM 685 AND 1600' N OF KELLY LANE**
AUSTIN, TX 78751
COUNTY: **TRAVIS**
FACILITY LINK: *Facility Detail Report*

Back to Report Summary

MAP ID# 3

Distance from Property: 0.090 mi. (475 ft.) NW
Elevation: 706 ft.

FACILITY INFORMATION

SWR#: **95650** EPA ID: **TXR000081457**
TCEQ#: **130995**
NAME: **CVS PHARMACY 10106**
ADDRESS: **2013 KELLY LN**
PFLUGERVILLE, TX 78660

CONTACT: **WENDY BRANT**
PHONE: **401-7651500**
BUSINESS DESCRIPTION: **NOT REPORTED**
INDUSTRIAL WASTE PERMIT #: **NOT REPORTED**
MUNICIPAL WASTE PERMIT #: **NOT REPORTED**
SIC CODE: **NOT REPORTED**
WASTE GENERATOR: **YES**
WASTE RECEIVER: **NO**
WASTE TRANSPORTER: **NO**
TRANSFER FACILITY: **NO**
MAQUILADORA (MEXICAN FACILITY): **NO**
STATUS: **ACTIVE**
AMOUNT OF WASTE GENERATED: **CONDITIONALLY EXEMPT SMALL QUANTITY GENERATOR**
GENERATOR TYPE: **NON-INDUSTRIAL AND/OR MUNICIPAL**
THIS FACILITY IS A NOTIFIER
THIS FACILITY IS A STEERS REPORTER - (STATE OF TEXAS ENVIRONMENTAL ELECTRONIC REPORTING SYSTEM)
THIS FACILITY IS REQUIRED TO SUBMIT AN ANNUAL WASTE REPORT
THIS FACILITY IS NOT INVOLVED IN RECYCLING ACTIVITIES
LAST UPDATE TO TRACS (TCEQ REGULATORY ACTIVITIES AND COMPLIANCE SYSTEM): **12/15/2019**

OWNER INFORMATION

NAME: **CVS PHARMACY INC**
ADDRESS: **1 CVS DR**
WOONSOCKET, RI 02895
PHONE: **1-401-7651500**

ACTIVITIES

ACTIVITY TYPE: **UNKNOWN**
ACTIVITY DESCRIPTION: **NOT REPORTED**

WASTE

WASTE ID: **398503**
WASTE CODE STATUS: **ACTIVE**
WASTE IS RADIOACTIVE: **NO**
WASTE IS TREATED OFF SITE: **NO**
GENERATOR'S DESCRIPTION OF WASTE: **OXIDIZING LIQUID, N.O.S., HYDROGEN PEROXIDE, SODIUM HYPOCHLORITE**

WASTE ID: **379652**
WASTE CODE STATUS: **ACTIVE**
WASTE IS RADIOACTIVE: **NO**
WASTE IS TREATED OFF SITE: **NO**
GENERATOR'S DESCRIPTION OF WASTE: **COMPRESSED GAS, FLAMMABLE, N.O.S.,LIGHTERS, PETROLEUM GASES, LIQUEFIED, BUTANE,**

WASTE ID: **362342**
WASTE CODE STATUS: **INACTIVE**
WASTE IS RADIOACTIVE: **NO**

WASTE IS TREATED OFF SITE: **NO**
GENERATOR'S DESCRIPTION OF WASTE: **AEROSOLS, [FLAMMABLE, (EACH NOT EXCEEDING 1 L CAPACITY)]; A NEW HAZARDOUS WASTE**

WASTE ID: **379655**
WASTE CODE STATUS: **ACTIVE**
WASTE IS RADIOACTIVE: **NO**
WASTE IS TREATED OFF SITE: **NO**
GENERATOR'S DESCRIPTION OF WASTE: **FLAMMABLE SOLID, INORGANIC, N.O.S. & FLAMMABLE SOLIDS, ORGANIC, N.O.S., SULFUR,**

WASTE ID: **362345**
WASTE CODE STATUS: **INACTIVE**
WASTE IS RADIOACTIVE: **NO**
WASTE IS TREATED OFF SITE: **NO**
GENERATOR'S DESCRIPTION OF WASTE: **TOXIC, LIQUIDS, ORGANIC, N.O.S.; DUE TO WASTE MINIMIZATION, INGREDIENT CHANGES O**

WASTE ID: **362343**
WASTE CODE STATUS: **ACTIVE**
WASTE IS RADIOACTIVE: **NO**
WASTE IS TREATED OFF SITE: **YES**
GENERATOR'S DESCRIPTION OF WASTE: **CORROSIVE LIQUIDS, BASIC, N.O.S.**

WASTE ID: **362344**
WASTE CODE STATUS: **ACTIVE**
WASTE IS RADIOACTIVE: **NO**
WASTE IS TREATED OFF SITE: **YES**
GENERATOR'S DESCRIPTION OF WASTE: **OXIDIZING LIQUID, N.O.S.**

WASTE ID: **362346**
WASTE CODE STATUS: **ACTIVE**
WASTE IS RADIOACTIVE: **NO**
WASTE IS TREATED OFF SITE: **NO**
GENERATOR'S DESCRIPTION OF WASTE: **TOXIC SOLIDS, ORGANIC, N.O.S., RX TOXIC SOLIDS , AMMONIATED MERCURY, PESTICIDES,**

WASTE ID: **362341**
WASTE CODE STATUS: **ACTIVE**
WASTE IS RADIOACTIVE: **NO**
WASTE IS TREATED OFF SITE: **NO**
GENERATOR'S DESCRIPTION OF WASTE: **TOXIC SOLIDS, ORGANIC, N.O.S. , RESIDUE LAST CONTAINED, MEDICINE, SOLID, TOXIC,**

WASTE ID: **361251**
WASTE CODE STATUS: **ACTIVE**
WASTE IS RADIOACTIVE: **NO**
WASTE IS TREATED OFF SITE: **NO**
GENERATOR'S DESCRIPTION OF WASTE: **FLAMMABLE LIQUIDS, N.O.S., RX FLAMMABLE LIQUIDS, ISOPROPYL ALCOHOL, ETHANOL, COM**

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MAP ID# 3

Distance from Property: 0.090 mi. (475 ft.) NW
Elevation: 706 ft.

FACILITY INFORMATION

EPA ID#: **TXR000081457**
NAME: **CVS PHARMACY 10106**
ADDRESS: **2013 KELLY LN**
PFLUGERVILLE, TX 78660
CONTACT NAME: **WENDY BRANT**
CONTACT ADDRESS: **1 CVS DR**
WOONSOCKET RI 02895-6146
CONTACT PHONE: **401-765-1500**
NON-NOTIFIER: **NOT A NON-NOTIFIER**
DATE RECEIVED BY AGENCY: **03/01/2020**

OWNER TYPE: **PRIVATE**
OWNER NAME: **CVS PHARMACY INC**
OPERATOR TYPE: **PRIVATE**
OPERATOR NAME: **CVS PHARMACY INC**

CERTIFICATION

CERTIFICATION NAME:	CERTIFICATION TITLE:	CERTIFICATION SIGNED DATE:
WENDY BRANT	**AUTHORIZED COMPANY AGENT**	**03/01/2014**
CHARLES SAVAGE	**CVS AGENT**	**05/20/2013**
WENDY BRANT	**AUTHORIZED COMPANY AGENT**	**03/01/2016**
WENDY BRANT	**CVS CORPORATE ENVIRONMENTAL MANAGER**	**05/01/2013**
WENDY BRANT	**AUTHORIZED COMPANY AGENT**	**03/01/2018**
WENDY BRANT	**CVS CORPORATE ENVIRONMENTAL MANAGER**	**04/11/2014**
WENDY BRANT	**AUTHORIZED COMPANY AGENT**	**03/01/2020**
WENDY BRANT	**CVS CORPORATE ENVIRONMENTAL MANAGER**	**02/27/2015**
WENDY BRANT	**CVS CORPORATE ENVIRONMENTAL MANAGER**	**02/15/2018**
WENDY BRANT	**CVS CORPORATE ENVIRONMENTAL MANAGER**	**02/14/2019**
WENDY BRANT	**CVS CORPORATE ENVIRONMENTAL MANAGER**	**12/15/2019**

INDUSTRY CLASSIFICATION (NAICS)

44611 - PHARMACIES AND DRUG STORES
446110 - PHARMACIES AND DRUG STORES

CURRENT ACTIVITY INFORMATION

GENERATOR STATUS: **VSG** LAST UPDATED DATE: **12/08/2020**
SUBJECT TO CORRECTIVE ACTION UNIVERSE: **NO**
TDSFs POTENTIALLY SUBJECT TO CORRECTIVE ACTION UNDER 3004 (u)/(v) UNIVERSE: **NO**
TDSFs ONLY SUBJECT TO CORRECTIVE ACTION UNDER DISCRETIONARY AUTHORITIES UNIVERSE: **NO**
NON TSDFs WHERE RCRA CORRECTIVE ACTION HAS BEEN IMPOSED UNIVERSE: **NO**
CORRECTIVE ACTION WORKLOAD UNIVERSE: **NO**

IMPORTER: **NO**
MIXED WASTE GENERATOR: **NOT REPORTED**
RECYCLER: **NO**
TRANSPORTER: **NO**
ONSITE BURNER EXEMPTION: **NO**
FURNACE EXEMPTION: **NO**
USED OIL REFINER: **NO**
USED OIL TRANSFER FACILITY: **NO**
UNDERGROUND INJECTION: **NO**
UNIVERSAL WASTE DESTINATION FACILITY: **NO**
TRANSFER FACILITY: **NO**
USED OIL FUEL BURNER: **NO**
USED OIL PROCESSOR: **NO**
USED OIL FUEL MARKETER TO BURNER: **NO**
SPECIFICATION USED OIL MARKETER: **NO**
USED OIL TRANSPORTER: **NO**

COMPLIANCE, MONITORING AND ENFORCEMENT INFORMATION

EVALUATIONS **- NO EVALUATIONS REPORTED -**

VIOLATIONS **- NO VIOLATIONS REPORTED -**

ENFORCEMENTS **- NO ENFORCEMENTS REPORTED -**

HAZARDOUS WASTE

D001	**IGNITABLE WASTE**
D002	**CORROSIVE WASTE**
D007	**CHROMIUM**
D009	**MERCURY**
D010	**SELENIUM**
D011	**SILVER**
D024	**M-CRESOL**
P001	**2H-1-BENZOPYRAN-2-ONE, 4-HYDROXY-3-(3-OXO-1-PHENYLBUTYL)-, & SALTS, WHEN PRESENT AT CONCENTRATIONS GREATER THAN 0.3%**
P001	**WARFARIN, & SALTS, WHEN PRESENT AT CONCENTRATIONS GREATER THAN 0.3%**
P042	**1,2-BENZENEDIOL, 4-[1-HYDROXY-2-(METHYLAMINO)ETHYL]-, (R)-**
P042	**EPINEPHRINE**
P075	**NICOTINE, & SALTS**
P075	**PYRIDINE, 3-(1-METHYL-2-PYRROLIDINYL)-,(S)-, & SALTS**
P081	**1,2,3-PROPANETRIOL, TRINITRATE (R)**
P081	**NITROGLYCERINE (R)**
P188	**BENZOIC ACID, 2-HYDROXY-,COMPD. WITH (3AS-CIS)-1,2,3,3A,8,8A-HEXAHYDRO-1,3A,8-TRIMETHYLPYRROLO [2,3-B]INDOL-5-YL METHYLCARBAMATE ESTER (1:1)**
P188	**PHYSOSTIGMINE SALICYLATE**
U002	**2-PROPANONE (I)**
U002	**ACETONE (I)**
U188	**PHENOL**

UNIVERSAL WASTE **- NO UNIVERSAL WASTE REPORTED -**

CORRECTIVE ACTION AREA **- NO CORRECTIVE ACTION AREA INFORMATION REPORTED -**

CORRECTIVE ACTION EVENT

NO CORRECTIVE ACTION EVENT(S) REPORTED

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Petroleum Storage Tanks (PST)

MAP ID# 4

Distance from Property: 0.091 mi. (480 ft.) SW
Elevation: 688 ft.

FACILITY INFORMATION

ID#: **85220**
NAME: **7-ELEVEN 35624**
ADDRESS: **1717 E PFLUGERVILLE PKWY**
PFLUGERVILLE, TX 78660
COUNTY: **TRAVIS**
REGION: **11**
TYPE: **RETAIL**
BEGIN DATE: **01/23/2013**
STATUS: **ACTIVE**
EXEMPT STATUS: **NO**
RECORDS OFF-SITE: **YES**
NUMBER OF ACTIVE UNDERGROUND TANKS: **2**
NUMBER OF ACTIVE ABOVEGROUND TANKS: **0**

CONTACT INFORMATION

NAME: **PEGGIE BETZ**
TITLE: **NOT REPORTED**
ORGANIZATION: **7-ELEVEN 36295**
MAIL ADDRESS: **1717 E PFLUGERVILLE PKWY**
PFLUGERVILLE TX 78660
PHONE: **(972) 8287805 0**

APPLICATION INFORMATION:

RECEIVED DATE ON EARLIEST REGISTRATION FORM: **03/14/2013**
SIGNATURE DATE ON EARLIEST REGISTRATION FORM: **03/08/2013**
SIGNATURE NAME & TITLE: **RAY MCNIECE, GAS ENV COMP MGR**
ENFORCEMENT ACTION DATE: **NOT REPORTED**

OWNER

OWNER NUMBER: **CN600240329**
NAME: **7-ELEVEN INC**
CONTACT ADDRESS: **3200 HACKBERRY RD**
IRVING TX 75063
TYPE: **CORPORATION/COMPANY**
BEGIN DATE: **01/23/2013**
CONTACT ROLE: **OWNCON**
CONTACT NAME: **RAY MCNIECE**
CONTACT TITLE: **NOT REPORTED**
ORGANIZATION: **7-ELEVEN INC**
PHONE: **(972) 8267450 0**
FAX: **NOT REPORTED**
EMAIL: **NOT REPORTED**

OPERATOR

OPERATOR NUMBER: **CN600240329**
NAME: **7-ELEVEN INC**
CONTACT ADDRESS: **PO BOX 711**
DALLAS TX 75221
TYPE: **CORPORATION/COMPANY**
BEGIN DATE: **01/23/2013**
CONTACT ROLE: **OWNOPRCON**
CONTACT NAME: **RAYMOND MCNIECE**

CONTACT TITLE: **NOT REPORTED**
ORGANIZATION: **7-ELEVEN INC**
PHONE: **(847) 6081136 0**
FAX: **(972) 8286896**
EMAIL: **RAYMOND.MCNIECE@7-11.COM**

SELF-CERTIFICATION

SELF-CERTIFICATION ID: **330559**
SIGNATURE DATE: **01/09/2020**
SIGNATURE NAME & TITLE: **RAYMOND MCNIECE, ENV.MGR.**
FILING STATUS: **RENEWAL**
REGISTRATION FLAG: **YES**

SELF-CERTIFICATION ID: **314545**
SIGNATURE DATE: **01/23/2019**
SIGNATURE NAME & TITLE: **RAYMOND MCNIECE, ENV. MGR.**
FILING STATUS: **RENEWAL**
REGISTRATION FLAG: **YES**

SELF-CERTIFICATION ID: **296020**
SIGNATURE DATE: **12/20/2017**
SIGNATURE NAME & TITLE: **RAYMOND MCNIECE, ENV.MGR**
FILING STATUS: **RENEWAL**
REGISTRATION FLAG: **YES**

SELF-CERTIFICATION ID: **280840**
SIGNATURE DATE: **01/19/2017**
SIGNATURE NAME & TITLE: **RAYMOND MCNIECE, ENVIRONMENTAL MANAGE**
FILING STATUS: **RENEWAL**
REGISTRATION FLAG: **YES**

SELF-CERTIFICATION ID: **263338**
SIGNATURE DATE: **01/15/2016**
SIGNATURE NAME & TITLE: **RAYMOND MCNIECE, ENVIRONMENTAL MGR**
FILING STATUS: **RENEWAL**
REGISTRATION FLAG: **YES**

SELF-CERTIFICATION ID: **247367**
SIGNATURE DATE: **01/19/2015**
SIGNATURE NAME & TITLE: **RAYMOND MCNIECE, ENVIRONMENTAL MGR**
FILING STATUS: **RENEWAL**
REGISTRATION FLAG: **YES**

SELF-CERTIFICATION ID: **230928**
SIGNATURE DATE: **01/23/2014**
SIGNATURE NAME & TITLE: **RAYMOND MCNIECE, ENVIRONMENTAL MGR**
FILING STATUS: **RENEWAL**
REGISTRATION FLAG: **YES**

SELF-CERTIFICATION ID: **218151**
SIGNATURE DATE: **03/08/2013**
SIGNATURE NAME & TITLE: **RAY MCNIECE, GAS ENV COMP MGR**
FILING STATUS: **RENEWAL**
REGISTRATION FLAG: **YES**

CONSTRUCTION NOTIFICATION

NOTIFICATION CONSTRUCTION ID: **22896**
APPLICATION RECEIVED DATE: **07/05/2012**
SCHEDULE CONSTRUCTION DATE: **11/19/2012**
GENERAL DESCRIPTION OF PROPOSED CONSTRUCTION:
INSTALL 2 NEW USTS 20,000 GAL EACH TANK 1-20K UNLD, TANK 2(SPLIT)-12K DIESEL/8K PREMIUM UNLDREVISED 12/27/12 - PROPOSED CONSTRUCTION DATE FROM 8/20/12 TO 11/19 /12.

UNDERGROUND STORAGE TANK

TANK ID: **1**
NUMBER OF COMPARTMENTS: **1**
INSTALLATION DATE: **01/23/2013**
REGISTRATION DATE: **03/18/2013**
TANK CAPACITY (GAL): **20000**
EMPTY TANK: **NOT EMPTY**
STATUS: **IN USE**
STATUS BEGIN DATE: **01/23/2013**
INTERNAL PROTECTION DATE: **NOT REPORTED**
REGULATORY STATUS: **FULLY REGULATED**
TANK DESIGN SINGLE WALL: **NO**
TANK DESIGN DOUBLE WALL: **YES**
PIPE DESIGN SINGLE WALL: **NO**
PIPE DESIGN DOUBLE WALL: **YES**

TANK DETAILS

MATERIAL:
FRP
CORROSION PROTECTION:
FRP TANK OR PIPING (NONCORRODIBLE)
EXTERNAL CONTAINMENT:
NOT REPORTED
TANK COMPLIANCE FLAG
CORROSION PROTECTION COMPLIANCE FLAG: **YES**
CORROSION PROTECTION VARIANCE: **NO VARIANCE**

COMPARTMENT DETAILS

UST COMPARTMENT ID: **182467**
TANK ID: **1**
COMPARTMENT LETTER: **A**
SUBSTANCES: **GASOLINE**
OTHER SUBSTANCES: **NOT REPORTED**
CAPACITY (GAL): **20000**
COMPARTMENT RELEASE DETECTION: **INTERSTITIAL MONITORING WITHIN SECONDARY WALL/JACKET**
SPILL CONTAINMENT AND OVERFILL PREVENTION: **TIGHT-FILL FITTING CONTAINER/BUCKET/SUMP,FACTORY - BUILT SPILL CONTAINER/BUCKET/SUMP,DELIVERY SHUT-OFF VALVE,ALARM (SET@<=90%) W3A OR 3B**

PIPING SYSTEMS

MATERIAL: **FRP**
CORROSION PROTECTION: **FRP TANK OR PIPING (NONCORRODIBLE)**
EXTERNAL CONTAINMENT: **NOT REPORTED**
CONNECTORS & VALVES:

NOT REPORTED

PIPING RELEASE DETECTION:

INTERSTITIAL MONITORING WITHIN SECONDARY WALL/JACKET,AUTO. LINE LEAK DETECTOR (3.0 GPH FOR PRESSURE PIPING)

PIPE COMPLIANCE FLAG

CORROSION PROTECTION COMPLIANCE FLAG: **YES**

CORROSION PROTECTION VARIANCE: **NO VARIANCE**

TANK ID: **2**
NUMBER OF COMPARTMENTS: **2**
INSTALLATION DATE: **01/23/2013**
REGISTRATION DATE: **03/18/2013**
TANK CAPACITY (GAL): **20000**
EMPTY TANK: **NOT EMPTY**
STATUS: **IN USE**
STATUS BEGIN DATE: **01/23/2013**
INTERNAL PROTECTION DATE: **NOT REPORTED**
REGULATORY STATUS: **FULLY REGULATED**
TANK DESIGN SINGLE WALL: **NO**
TANK DESIGN DOUBLE WALL: **YES**
PIPE DESIGN SINGLE WALL: **NO**
PIPE DESIGN DOUBLE WALL: **YES**

TANK DETAILS

MATERIAL:

FRP

CORROSION PROTECTION:

FRP TANK OR PIPING (NONCORRODIBLE)

EXTERNAL CONTAINMENT:

NOT REPORTED

TANK COMPLIANCE FLAG

CORROSION PROTECTION COMPLIANCE FLAG: **YES**

CORROSION PROTECTION VARIANCE: **NO VARIANCE**

COMPARTMENT DETAILS

UST COMPARTMENT ID: **182468**

TANK ID: **2**

COMPARTMENT LETTER: **A**

SUBSTANCES: **GASOLINE**

OTHER SUBSTANCES: **NOT REPORTED**

CAPACITY (GAL): **8000**

COMPARTMENT RELEASE DETECTION: **INTERSTITIAL MONITORING WITHIN SECONDARY WALL/JACKET**

SPILL CONTAINMENT AND OVERFILL PREVENTION: **TIGHT-FILL FITTING CONTAINER/BUCKET/SUMP,FACTORY - BUILT SPILL CONTAINER/BUCKET/SUMP,DELIVERY SHUT-OFF VALVE,ALARM (SET@<=90%) W3A OR 3B**

PIPING SYSTEMS

MATERIAL: **FRP**

CORROSION PROTECTION: **FRP TANK OR PIPING (NONCORRODIBLE)**

EXTERNAL CONTAINMENT: **NOT REPORTED**

CONNECTORS & VALVES:

NOT REPORTED

PIPING RELEASE DETECTION:

INTERSTITIAL MONITORING WITHIN SECONDARY WALL/JACKET,AUTO. LINE LEAK DETECTOR (3.0 GPH FOR PRESSURE PIPING)

PIPE COMPLIANCE FLAG

CORROSION PROTECTION COMPLIANCE FLAG: **YES**

CORROSION PROTECTION VARIANCE: **NO VARIANCE**

TANK ID: **2**
NUMBER OF COMPARTMENTS: **2**
INSTALLATION DATE: **01/23/2013**
REGISTRATION DATE: **03/18/2013**
TANK CAPACITY (GAL): **20000**
EMPTY TANK: **NOT EMPTY**
STATUS: **IN USE**
STATUS BEGIN DATE: **01/23/2013**
INTERNAL PROTECTION DATE: **NOT REPORTED**
REGULATORY STATUS: **FULLY REGULATED**
TANK DESIGN SINGLE WALL: **NO**
TANK DESIGN DOUBLE WALL: **YES**
PIPE DESIGN SINGLE WALL: **NO**
PIPE DESIGN DOUBLE WALL: **YES**

TANK DETAILS

MATERIAL:
FRP
CORROSION PROTECTION:
FRP TANK OR PIPING (NONCORRODIBLE)
EXTERNAL CONTAINMENT:
NOT REPORTED
TANK COMPLIANCE FLAG
CORROSION PROTECTION COMPLIANCE FLAG: **YES**
CORROSION PROTECTION VARIANCE: **NO VARIANCE**

COMPARTMENT DETAILS

UST COMPARTMENT ID: **182469**
TANK ID: **2**
COMPARTMENT LETTER: **B**
SUBSTANCES: **DIESEL**
OTHER SUBSTANCES: **NOT REPORTED**
CAPACITY (GAL): **12000**
COMPARTMENT RELEASE DETECTION: **INTERSTITIAL MONITORING WITHIN SECONDARY WALL/JACKET**
SPILL CONTAINMENT AND OVERFILL PREVENTION: **TIGHT-FILL FITTING CONTAINER/BUCKET/SUMP,FACTORY - BUILT SPILL CONTAINER/BUCKET/SUMP,DELIVERY SHUT-OFF VALVE,ALARM (SET@<=90%) W3A OR 3B**

PIPING SYSTEMS

MATERIAL: **FRP**
CORROSION PROTECTION: **FRP TANK OR PIPING (NONCORRODIBLE)**
EXTERNAL CONTAINMENT: **NOT REPORTED**
CONNECTORS & VALVES:
NOT REPORTED
PIPING RELEASE DETECTION:
INTERSTITIAL MONITORING WITHIN SECONDARY WALL/JACKET,AUTO. LINE LEAK DETECTOR (3.0 GPH FOR PRESSURE PIPING)
PIPE COMPLIANCE FLAG
CORROSION PROTECTION COMPLIANCE FLAG: **YES**
CORROSION PROTECTION VARIANCE: **NO VARIANCE**

ABOVEGROUND STORAGE TANK INFORMATION

NO ABOVEGROUND STORAGE TANK DATA REPORTED FOR THIS FACILITY

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Alternative Fueling Stations (ALTFUELS)

MAP ID# 5

Distance from Property: 0.130 mi. (686 ft.) SW
Elevation: 688 ft.

FACILITY INFORMATION

GEOSEARCH ID: **116891**
UNIQUE IDENTIFIER FOR THIS SPECIFIC STATION: **116891**
STATION NAME: **CARCHARGING**
ADDRESS: **1821 FARM TO MARKET 685**
PFLUGERVILLE, TX 78660
INTERSECTION DIRECTIONS: **WALGREENS#11568; CHARGING STATION ON RIGHT SIDE OF MAIN ENTRANCE TO THE STORE**
STATION PHONE: **888-758-4389**
STATION CURRENT STATUS: **OPEN: THE STATION IS OPEN.**
TYPE OF ALTERNATIVE FUEL THE STATION PROVIDES: **ELECTRIC**
OWNER TYPE: **NOT REPORTED**
FEDERAL AGANCY ID: **NOT REPORTED**
FEDERAL AGENCY NAME: **NOT REPORTED**
DATE THAT THE STATION BEGAN OFFERING THE FUEL: **NOT REPORTED**
DATE THE STATION'S DETAILS WERE LAST CONFIRMED: **5/5/2020**
TIME THE STATION'S DETAILS WERE LAST UPDATED (ISO 8601 FORMAT).: **2020-05-05 09:19:59 UTC**

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MAP ID# 5

Distance from Property: 0.130 mi. (686 ft.) SW
Elevation: 688 ft.

FACILITY INFORMATION

GEOSEARCH ID: **162788**
UNIQUE IDENTIFIER FOR THIS SPECIFIC STATION: **162788**
STATION NAME: **CARCHARGING**
ADDRESS: **1821 FARM TO MARKET 685**
PFLUGERVILLE, TX 78660
INTERSECTION DIRECTIONS: **WALGREENS#11568; CHARGING STATION ON RIGHT SIDE OF MAIN ENTRANCE TO THE STORE**
STATION PHONE: **888-758-4389**
STATION CURRENT STATUS: **OPEN: THE STATION IS OPEN.**
TYPE OF ALTERNATIVE FUEL THE STATION PROVIDES: **ELECTRIC**
OWNER TYPE: **NOT REPORTED**
FEDERAL AGANCY ID: **NOT REPORTED**
FEDERAL AGENCY NAME: **NOT REPORTED**
DATE THAT THE STATION BEGAN OFFERING THE FUEL: **NOT REPORTED**
DATE THE STATION'S DETAILS WERE LAST CONFIRMED: **10/28/2020**
TIME THE STATION'S DETAILS WERE LAST UPDATED (ISO 8601 FORMAT).: **2020-10-28 09:27:48 UTC**

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MAP ID# 5

Distance from Property: 0.130 mi. (686 ft.) SW
Elevation: 688 ft.

FACILITY INFORMATION

GEOSEARCH ID: **47403**
UNIQUE IDENTIFIER FOR THIS SPECIFIC STATION: **47403**
STATION NAME: **CARCHARGING**
ADDRESS: **FARM TO MARKET 685**
PFLUGERVILLE, TX 78660
INTERSECTION DIRECTIONS: **WALGREENS#11568; CHARGING STATION ON RIGHT SIDE OF MAIN ENTRANCE TO THE STORE**
STATION PHONE: **888-758-4389**
STATION CURRENT STATUS: **OPEN: THE STATION IS OPEN.**
TYPE OF ALTERNATIVE FUEL THE STATION PROVIDES: **NOT REPORTED**
OWNER TYPE: **NOT REPORTED**
FEDERAL AGANCY ID: **NOT REPORTED**
FEDERAL AGENCY NAME: **NOT REPORTED**
DATE THAT THE STATION BEGAN OFFERING THE FUEL: **NOT REPORTED**
DATE THE STATION'S DETAILS WERE LAST CONFIRMED: **5/16/2017**
TIME THE STATION'S DETAILS WERE LAST UPDATED (ISO 8601 FORMAT).: **2017-05-16 09:26:56 UTC**

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MAP ID# 6

Distance from Property: 0.171 mi. (903 ft.) NW
Elevation: 716 ft.

FACILITY INFORMATION

ID#: **83937**
NAME: **TPG 184 05**
ADDRESS: **1909 KELLY LN**
PFLUGERVILLE, TX 78660
COUNTY: **TRAVIS**
REGION: **11**
TYPE: **RETAIL**
BEGIN DATE: **10/27/2010**
STATUS: **ACTIVE**
EXEMPT STATUS: **NO**
RECORDS OFF-SITE: **YES**
NUMBER OF ACTIVE UNDERGROUND TANKS: **2**
NUMBER OF ACTIVE ABOVEGROUND TANKS: **0**

CONTACT INFORMATION

NAME: **JEFFREY CURTIS**
TITLE: **NOT REPORTED**
ORGANIZATION: **TPG 184 05**
MAIL ADDRESS: **MAILING ADDRESS NOT REPORTED**
CITY NOT REPORTED
PHONE: **(713) 7390310 0**

APPLICATION INFORMATION:

RECEIVED DATE ON EARLIEST REGISTRATION FORM: **02/26/2019**
SIGNATURE DATE ON EARLIEST REGISTRATION FORM: **02/22/2019**
SIGNATURE NAME & TITLE: **JEFFREY CURTIS, FUEL COMP COOR**
ENFORCEMENT ACTION DATE: **NOT REPORTED**

OWNER

OWNER NUMBER: **CN603438003**
NAME: **TEXAS PETROLEUM GROUP LLC**
CONTACT ADDRESS: **11111 WILCREST GREEN DR STE 100**
HOUSTON TX 77042
TYPE: **CORPORATION/COMPANY**
BEGIN DATE: **02/22/2019**
CONTACT ROLE: **OWNOPRCON**
CONTACT NAME: **JEFFREY CURTIS**
CONTACT TITLE: **NOT REPORTED**
ORGANIZATION: **TEXAS PETROLEUM GROUP LLC**
PHONE: **(713) 7890310 0**
FAX: **NOT REPORTED**
EMAIL: **NOT REPORTED**
OWNER NUMBER: **CN605302082**
NAME: **LANDMARK INDUSTRIES**
CONTACT ADDRESS: **11111 WILCREST GREEN DR STE 100**
HOUSTON TX 77042
TYPE: **GENERAL PARTNERSHIP**
BEGIN DATE: **02/01/2017**
CONTACT ROLE: **OWNOPRCON**
CONTACT NAME: **LOGAN KELLY**
CONTACT TITLE: **NOT REPORTED**

ORGANIZATION: **LANDMARK INDUSTRIES**
PHONE: **7137892018 0**
FAX: **NOT REPORTED**
EMAIL: **LOGAN@LANDMARKINDUSTRIES.COM**
OWNER NUMBER: **CN603960865**
NAME: **LANDMARK INDUSTRIES INC**
CONTACT ADDRESS: **11111 WILCREST GREEN DR STE 100**
HOUSTON TX 77042
TYPE: **CORPORATION/COMPANY**
BEGIN DATE: **10/27/2010**
CONTACT ROLE: **OWNCON**
CONTACT NAME: **J BRANDON DUJKA**
CONTACT TITLE: **ENV COORDINATOR**
ORGANIZATION: **LANDMARK INDUSTRIES**
PHONE: **7132433486 0**
FAX: **NOT REPORTED**
EMAIL: **NOT REPORTED**

OPERATOR

OPERATOR NUMBER: **CN603438003**
NAME: **TEXAS PETROLEUM GROUP LLC**
CONTACT ADDRESS: **11111 WILCREST GREEN DR STE 100**
HOUSTON TX 77042
TYPE: **CORPORATION/COMPANY**
BEGIN DATE: **02/22/2019**
CONTACT ROLE: **OWNOPRCON**
CONTACT NAME: **JEFFREY CURTIS**
CONTACT TITLE: **NOT REPORTED**
ORGANIZATION: **TEXAS PETROLEUM GROUP LLC**
PHONE: **(713) 7890310 0**
FAX: **NOT REPORTED**
EMAIL: **NOT REPORTED**
OPERATOR NUMBER: **CN605302082**
NAME: **LANDMARK INDUSTRIES**
CONTACT ADDRESS: **11111 WILCREST GREEN DR STE 100**
HOUSTON TX 77042
TYPE: **GENERAL PARTNERSHIP**
BEGIN DATE: **02/01/2017**
CONTACT ROLE: **OWNOPRCON**
CONTACT NAME: **LOGAN KELLY**
CONTACT TITLE: **NOT REPORTED**
ORGANIZATION: **LANDMARK INDUSTRIES**
PHONE: **(713) 7892018 0**
FAX: **NOT REPORTED**
EMAIL: **LOGAN@LANDMARKINDUSTRIES.COM**
OPERATOR NUMBER: **CN603960865**
NAME: **LANDMARK INDUSTRIES INC**
CONTACT ADDRESS: **11111 WILCREST GREEN DR STE 100**

HOUSTON TX 77042

TYPE: **CORPORATION/COMPANY**
BEGIN DATE: **10/27/2010**
CONTACT ROLE: **OPRCON**
CONTACT NAME: **J BRANDON DUJKA**
CONTACT TITLE: **ENV COORD**
ORGANIZATION: **LANDMARK INDUSTRIES**
PHONE: **(713) 2433486 0**
FAX: **NOT REPORTED**
EMAIL: **NOT REPORTED**

SELF-CERTIFICATION

SELF-CERTIFICATION ID: **334033**
SIGNATURE DATE: **03/03/2020**
SIGNATURE NAME & TITLE: **JEFFREY S CURTIS, COMPLIANCE COORDINAT**
FILING STATUS: **RENEWAL**
REGISTRATION FLAG: **YES**

SELF-CERTIFICATION ID: **317437**
SIGNATURE DATE: **02/22/2019**
SIGNATURE NAME & TITLE: **JEFFREY CURTIS, FUEL COMP COOR**
FILING STATUS: **INITIAL**
REGISTRATION FLAG: **YES**

SELF-CERTIFICATION ID: **315869**
SIGNATURE DATE: **02/01/2019**
SIGNATURE NAME & TITLE: **JEFFREY S CURTIS, COMPLIANCE COORDINAT**
FILING STATUS: **RENEWAL**
REGISTRATION FLAG: **YES**

SELF-CERTIFICATION ID: **297025**
SIGNATURE DATE: **01/08/2018**
SIGNATURE NAME & TITLE: **JEFFREY S CURTIS, COMPLIANCE COORD.**
FILING STATUS: **RENEWAL**
REGISTRATION FLAG: **YES**

SELF-CERTIFICATION ID: **283872**
SIGNATURE DATE: **02/01/2017**
SIGNATURE NAME & TITLE: **LOGAN KELLY, COOMP COORD**
FILING STATUS: **INITIAL**
REGISTRATION FLAG: **YES**

SELF-CERTIFICATION ID: **266920**
SIGNATURE DATE: **03/16/2016**
SIGNATURE NAME & TITLE: **MICHAEL ZUBEL, PROJECT MANAGER**
FILING STATUS: **RENEWAL**
REGISTRATION FLAG: **YES**

SELF-CERTIFICATION ID: **252486**
SIGNATURE DATE: **05/05/2015**
SIGNATURE NAME & TITLE: **MICHAEL D SPURGEON, ENVIRONMENTAL COORDI**
FILING STATUS: **RENEWAL**
REGISTRATION FLAG: **YES**

SELF-CERTIFICATION ID: **235240**
SIGNATURE DATE: **04/18/2014**
SIGNATURE NAME & TITLE: **JOHN B DUJKA, ENV COORD**
FILING STATUS: **RENEWAL**
REGISTRATION FLAG: **YES**

SELF-CERTIFICATION ID: **215471**
SIGNATURE DATE: **04/09/2013**
SIGNATURE NAME & TITLE: **JOHN B DUJKA, ENV COORD**
FILING STATUS: **RENEWAL**
REGISTRATION FLAG: **YES**

SELF-CERTIFICATION ID: **215470**
SIGNATURE DATE: **03/05/2012**
SIGNATURE NAME & TITLE: **JOHN B DUJKA, ENV COORD**
FILING STATUS: **RENEWAL**
REGISTRATION FLAG: **YES**

SELF-CERTIFICATION ID: **215469**
SIGNATURE DATE: **03/02/2011**
SIGNATURE NAME & TITLE: **JOHN B DUJKA, ENV COORD**
FILING STATUS: **RENEWAL**
REGISTRATION FLAG: **YES**

SELF-CERTIFICATION ID: **215468**
SIGNATURE DATE: **01/10/2011**
SIGNATURE NAME & TITLE: **J BRANDON DUJKA, ENV COORD**
FILING STATUS: **INITIAL**
REGISTRATION FLAG: **YES**

CONSTRUCTION NOTIFICATION

NOTIFICATION CONSTRUCTION ID: **23119**
APPLICATION RECEIVED DATE: **08/03/2010**
SCHEDULE CONSTRUCTION DATE: **08/03/2010**
GENERAL DESCRIPTION OF PROPOSED CONSTRUCTION:
INSTALL (1) 25,000 AND (1) 20,000 DOUBLE-WALL FIBERGLASS TANKS WITH 6 DISPENSERS .

UNDERGROUND STORAGE TANK

TANK ID: **1**
INSTALLATION DATE: **10/27/2010**
TANK CAPACITY (GAL): **25000**
STATUS: **IN USE**
NUMBER OF COMPARTMENTS: **1**
REGISTRATION DATE: **01/11/2011**
EMPTY TANK: **NOT EMPTY**
STATUS BEGIN DATE: **10/27/2010**

INTERNAL PROTECTION DATE: **NOT REPORTED** REGULATORY STATUS: **FULLY REGULATED**
TANK DESIGN SINGLE WALL: **NO** TANK DESIGN DOUBLE WALL: **YES**
PIPE DESIGN SINGLE WALL: **NO** PIPE DESIGN DOUBLE WALL: **YES**

TANK DETAILS

MATERIAL:
FRP
CORROSION PROTECTION:
FRP TANK OR PIPING (NONCORRODIBLE)
EXTERNAL CONTAINMENT:
NOT REPORTED
TANK COMPLIANCE FLAG
CORROSION PROTECTION COMPLIANCE FLAG: **YES**
CORROSION PROTECTION VARIANCE: **NO VARIANCE**

COMPARTMENT DETAILS

UST COMPARTMENT ID: **179396**
TANK ID: **1**
COMPARTMENT LETTER: **A**
SUBSTANCES: **GASOLINE**
OTHER SUBSTANCES: **NOT REPORTED**
CAPACITY (GAL): **25000**
COMPARTMENT RELEASE DETECTION: **AUTOMATIC TANK GAUGE TEST & INVENTORY CONTROL,INTERSTITIAL MONITORING WITHIN SECONDARY WALL/JACKET**
SPILL CONTAINMENT AND OVERFILL PREVENTION: **TIGHT-FILL FITTING CONTAINER/BUCKET/SUMP,FACTORY - BUILT SPILL CONTAINER/BUCKET/SUMP,DELIVERY SHUT-OFF VALVE**

PIPING SYSTEMS

MATERIAL: **NONMETALLIC FLEXIBLE PIPING**
CORROSION PROTECTION: **NONMETALLIC FLEXIBLE PIPING (NONCORRODIBLE)**
EXTERNAL CONTAINMENT: **NOT REPORTED**
CONNECTORS & VALVES:
NOT REPORTED
PIPING RELEASE DETECTION:
INTERSTITIAL MONITORING WITHIN SECONDARY WALL/JACKET,ANNUAL PIPING TIGHTNESS TEST / ANNUAL ELECTRONIC MONITORING (@ 0.1 GPH)
PIPE COMPLIANCE FLAG
CORROSION PROTECTION COMPLIANCE FLAG: **YES**
CORROSION PROTECTION VARIANCE: **NO VARIANCE**

TANK ID: **2** NUMBER OF COMPARTMENTS: **2**
INSTALLATION DATE: **10/27/2010** REGISTRATION DATE: **01/11/2011**
TANK CAPACITY (GAL): **20000** EMPTY TANK: **NOT EMPTY**
STATUS: **IN USE** STATUS BEGIN DATE: **10/27/2010**
INTERNAL PROTECTION DATE: **NOT REPORTED** REGULATORY STATUS: **FULLY REGULATED**
TANK DESIGN SINGLE WALL: **NO** TANK DESIGN DOUBLE WALL: **YES**
PIPE DESIGN SINGLE WALL: **NO** PIPE DESIGN DOUBLE WALL: **YES**

TANK DETAILS

MATERIAL:

FRP

CORROSION PROTECTION:

FRP TANK OR PIPING (NONCORRODIBLE)

EXTERNAL CONTAINMENT:

NOT REPORTED

TANK COMPLIANCE FLAG

CORROSION PROTECTION COMPLIANCE FLAG: **YES**

CORROSION PROTECTION VARIANCE: **NO VARIANCE**

COMPARTMENT DETAILS

UST COMPARTMENT ID: **179397**

TANK ID: **2**

COMPARTMENT LETTER: **A**

SUBSTANCES: **GASOLINE**

OTHER SUBSTANCES: **NOT REPORTED**

CAPACITY (GAL): **8000**

COMPARTMENT RELEASE DETECTION: **AUTOMATIC TANK GAUGE TEST & INVENTORY CONTROL,INTERSTITIAL MONITORING WITHIN SECONDARY WALL/JACKET**

SPILL CONTAINMENT AND OVERFILL PREVENTION: **TIGHT-FILL FITTING CONTAINER/BUCKET/SUMP,FACTORY - BUILT SPILL CONTAINER/BUCKET/SUMP,DELIVERY SHUT-OFF VALVE**

PIPING SYSTEMS

MATERIAL: **NONMETALLIC FLEXIBLE PIPING**

CORROSION PROTECTION: **NONMETALLIC FLEXIBLE PIPING (NONCORRODIBLE)**

EXTERNAL CONTAINMENT: **NOT REPORTED**

CONNECTORS & VALVES:

NOT REPORTED

PIPING RELEASE DETECTION:

INTERSTITIAL MONITORING WITHIN SECONDARY WALL/JACKET,ANNUAL PIPING TIGHTNESS TEST / ANNUAL ELECTRONIC MONITORING (@ 0.1 GPH)

PIPE COMPLIANCE FLAG

CORROSION PROTECTION COMPLIANCE FLAG: **YES**

CORROSION PROTECTION VARIANCE: **NO VARIANCE**

TANK ID: **2**

NUMBER OF COMPARTMENTS: **2**

INSTALLATION DATE: **10/27/2010**

REGISTRATION DATE: **01/11/2011**

TANK CAPACITY (GAL): **20000**

EMPTY TANK: **NOT EMPTY**

STATUS: **IN USE**

STATUS BEGIN DATE: **10/27/2010**

INTERNAL PROTECTION DATE: **NOT REPORTED**

REGULATORY STATUS: **FULLY REGULATED**

TANK DESIGN SINGLE WALL: **NO**

TANK DESIGN DOUBLE WALL: **YES**

PIPE DESIGN SINGLE WALL: **NO**

PIPE DESIGN DOUBLE WALL: **YES**

TANK DETAILS

MATERIAL:

FRP

CORROSION PROTECTION:

FRP TANK OR PIPING (NONCORRODIBLE)

EXTERNAL CONTAINMENT:

NOT REPORTED

TANK COMPLIANCE FLAG

CORROSION PROTECTION COMPLIANCE FLAG: **YES**
CORROSION PROTECTION VARIANCE: **NO VARIANCE**

COMPARTMENT DETAILS

UST COMPARTMENT ID: **194064**
TANK ID: **2**
COMPARTMENT LETTER: **B**
SUBSTANCES: **DIESEL**
OTHER SUBSTANCES: **NOT REPORTED**
CAPACITY (GAL): **12000**
COMPARTMENT RELEASE DETECTION: **AUTOMATIC TANK GAUGE TEST & INVENTORY CONTROL,INTERSTITIAL MONITORING WITHIN SECONDARY WALL/JACKET**
SPILL CONTAINMENT AND OVERFILL PREVENTION: **TIGHT-FILL FITTING CONTAINER/BUCKET/SUMP,FACTORY - BUILT SPILL CONTAINER/BUCKET/SUMP,DELIVERY SHUT-OFF VALVE**

PIPING SYSTEMS

MATERIAL: **NONMETALLIC FLEXIBLE PIPING**
CORROSION PROTECTION: **NONMETALLIC FLEXIBLE PIPING (NONCORRODIBLE)**
EXTERNAL CONTAINMENT: **NOT REPORTED**
CONNECTORS & VALVES:
NOT REPORTED
PIPING RELEASE DETECTION:
INTERSTITIAL MONITORING WITHIN SECONDARY WALL/JACKET,ANNUAL PIPING TIGHTNESS TEST / ANNUAL ELECTRONIC MONITORING (@ 0.1 GPH)
PIPE COMPLIANCE FLAG
CORROSION PROTECTION COMPLIANCE FLAG: **YES**
CORROSION PROTECTION VARIANCE: **NO VARIANCE**

TANK ID: **3**
NUMBER OF COMPARTMENTS: **1**
INSTALLATION DATE: **10/27/2010**
REGISTRATION DATE: **01/11/2011**
TANK CAPACITY (GAL): **12000**
EMPTY TANK: **NOT EMPTY**
STATUS: **IN USE**
STATUS BEGIN DATE: **10/27/2010**
INTERNAL PROTECTION DATE: **NOT REPORTED**
REGULATORY STATUS: **FULLY REGULATED**
TANK DESIGN SINGLE WALL: **NO**
TANK DESIGN DOUBLE WALL: **YES**
PIPE DESIGN SINGLE WALL: **NO**
PIPE DESIGN DOUBLE WALL: **YES**

TANK DETAILS

MATERIAL:
FRP
CORROSION PROTECTION:
FRP TANK OR PIPING (NONCORRODIBLE)
EXTERNAL CONTAINMENT:
NOT REPORTED
TANK COMPLIANCE FLAG
CORROSION PROTECTION COMPLIANCE FLAG: **YES**
CORROSION PROTECTION VARIANCE: **NO VARIANCE**

COMPARTMENT DETAILS

UST COMPARTMENT ID: **179398**
TANK ID: **3**
COMPARTMENT LETTER: **A**

SUBSTANCES: **DIESEL**
OTHER SUBSTANCES: **NOT REPORTED**
CAPACITY (GAL): **12000**
COMPARTMENT RELEASE DETECTION: **MONITORING OF SECONDARY CONTAINMENT BARRIER,AUTOMATIC TANK GAUGE TEST & INVENTORY CONTROL,INTERSTITIAL MONITORING WITHIN SECONDARY WALL/JACKET**
SPILL CONTAINMENT AND OVERFILL PREVENTION: **TIGHT-FILL FITTING CONTAINER/BUCKET/SUMP,FACTORY - BUILT SPILL CONTAINER/BUCKET/SUMP,DELIVERY SHUT-OFF VALVE**

PIPING SYSTEMS

MATERIAL: **NONMETALLIC FLEXIBLE PIPING**
CORROSION PROTECTION: **NONMETALLIC FLEXIBLE PIPING (NONCORRODIBLE)**
EXTERNAL CONTAINMENT: **NOT REPORTED**
CONNECTORS & VALVES:
NOT REPORTED
PIPING RELEASE DETECTION:
MONITORING OF SECONDARY CONTAINMENT BARRIER,MONTHLY PIPING TIGHTNESS TEST (@ 0.2 GPH),AUTO. LINE LEAK DETECTOR (3.0 GPH FOR PRESSURE PIPING)
PIPE COMPLIANCE FLAG
CORROSION PROTECTION COMPLIANCE FLAG: **YES**
CORROSION PROTECTION VARIANCE: **NO VARIANCE**

ABOVEGROUND STORAGE TANK INFORMATION

NO ABOVEGROUND STORAGE TANK DATA REPORTED FOR THIS FACILITY

Back to Report Summary

Petroleum Storage Tanks (PST)

MAP ID# 6

Distance from Property: 0.171 mi. (903 ft.) NW
Elevation: 716 ft.

FACILITY INFORMATION

ID#: **89630**
NAME: **COSTCO GASOLINE LOC NO 1322**
ADDRESS: **1901 KELLY LN**
PFLUGERVILLE, TX 78660
COUNTY: **TRAVIS**
REGION: **11**
TYPE: **RETAIL**
BEGIN DATE: **05/10/2018**
STATUS: **ACTIVE**
EXEMPT STATUS: **NO**
RECORDS OFF-SITE: **NO**
NUMBER OF ACTIVE UNDERGROUND TANKS: **4**
NUMBER OF ACTIVE ABOVEGROUND TANKS: **NOT REPORTED**

CONTACT INFORMATION

NAME: **NOT REPORTED**
TITLE: **NOT REPORTED**
ORGANIZATION: **NOT REPORTED**
MAIL ADDRESS: **MAILING ADDRESS NOT REPORTED**
CITY NOT REPORTED
PHONE: **NOT REPORTED**

APPLICATION INFORMATION:

RECEIVED DATE ON EARLIEST REGISTRATION FORM: **12/20/2019**
SIGNATURE DATE ON EARLIEST REGISTRATION FORM: **12/18/2019**
SIGNATURE NAME & TITLE: **M ALEXIA INIGUES, AUTH AGENT**
ENFORCEMENT ACTION DATE: **NOT REPORTED**

OWNER

OWNER NUMBER: **CN600259410**
NAME: **COSTCO WHOLESALE CORPORATION**
CONTACT ADDRESS: **999 LAKE DR SUITE 200 ATT LICENSING**
ISSAQUAH WA 98027
TYPE: **CORPORATION/COMPANY**
BEGIN DATE: **05/10/2018**
CONTACT ROLE: **OWNCON**
CONTACT NAME: **NOT REPORTED**
CONTACT TITLE: **NOT REPORTED**
ORGANIZATION: **COSTCO WHOLESALE CORPORATION**
PHONE: **(425) 3136275 0**
FAX: **NOT REPORTED**
EMAIL: **NOT REPORTED**
OWNER NUMBER: **CN600259410**
NAME: **COSTCO WHOLESALE CORPORATION**
CONTACT ADDRESS: **18215 72ND AVE S**
KENT WA 98032
TYPE: **CORPORATION/COMPANY**
BEGIN DATE: **12/14/2017**
CONTACT ROLE: **OWNOPRCON**
CONTACT NAME: **JAY GRUBB**
CONTACT TITLE: **NOT REPORTED**

ORGANIZATION: **COSTCO WHOLESALE CORPORATION**
PHONE: **4252516222 0**
FAX: **NOT REPORTED**
EMAIL: **NOT REPORTED**

OPERATOR

OPERATOR NUMBER: **CN600259410**
NAME: **COSTCO WHOLESALE CORPORATION**
CONTACT ADDRESS: **999 LAKE DR**
ISSAQUAH WA 98027
TYPE: **CORPORATION/COMPANY**
BEGIN DATE: **05/10/2018**
CONTACT ROLE: **OPRCON**
CONTACT NAME: **JACKIE FRANK**
CONTACT TITLE: **NOT REPORTED**
ORGANIZATION: **COSTCO WHOLESALE CORPORATION**
PHONE: **(425) 3136280 0**
FAX: **(425) 3138105**
EMAIL: **NOT REPORTED**
OPERATOR NUMBER: **CN600259410**
NAME: **COSTCO WHOLESALE CORPORATION**
CONTACT ADDRESS: **45940 HORSESHOE DR**
STERLING VA 20166
TYPE: **CORPORATION/COMPANY**
BEGIN DATE: **12/14/2017**
CONTACT ROLE: **OPRCON**
CONTACT NAME: **LARRY R HARDER**
CONTACT TITLE: **NOT REPORTED**
ORGANIZATION: **COSTCO WHOLESALE CORPORATION**
PHONE: **(703) 4066882 0**
FAX: **(703) 4066835**
EMAIL: **NOT REPORTED**

SELF-CERTIFICATION

SELF-CERTIFICATION ID: **329779**
SIGNATURE DATE: **12/18/2019**
SIGNATURE NAME & TITLE: **M ALEXIA INIGUES, AUTH AGENT**
FILING STATUS: **RENEWAL**
REGISTRATION FLAG: **YES**

SELF-CERTIFICATION ID: **315357**
SIGNATURE DATE: **01/10/2019**
SIGNATURE NAME & TITLE: **JAY GRUBB, AUTH AGENT**
FILING STATUS: **RENEWAL**
REGISTRATION FLAG: **YES**

SELF-CERTIFICATION ID: **307803**
SIGNATURE DATE: **07/25/2018**
SIGNATURE NAME & TITLE: **JAY GRUBB, AUTH AGENT**

FILING STATUS: **INITIAL**
REGISTRATION FLAG: **YES**

CONSTRUCTION NOTIFICATION

NOTIFICATION CONSTRUCTION ID: **32332**
APPLICATION RECEIVED DATE: **12/15/2017**
SCHEDULE CONSTRUCTION DATE: **04/23/2018**
GENERAL DESCRIPTION OF PROPOSED CONSTRUCTION:
INSTALL TWO (2) 40,000 GALLON UST AND ONE (1) 1500 GALLON UST FOR FUEL ADDITIVE

UNDERGROUND STORAGE TANK

TANK ID: **1**
NUMBER OF COMPARTMENTS: **1**
INSTALLATION DATE: **05/10/2018**
REGISTRATION DATE: **08/08/2018**
TANK CAPACITY (GAL): **40000**
EMPTY TANK: **NOT EMPTY**
STATUS: **IN USE**
STATUS BEGIN DATE: **05/10/2018**
INTERNAL PROTECTION DATE: **NOT REPORTED**
REGULATORY STATUS: **FULLY REGULATED**
TANK DESIGN SINGLE WALL: **NO**
TANK DESIGN DOUBLE WALL: **YES**
PIPE DESIGN SINGLE WALL: **NO**
PIPE DESIGN DOUBLE WALL: **YES**

TANK DETAILS

MATERIAL:
FRP
CORROSION PROTECTION:
FRP TANK OR PIPING (NONCORRODIBLE)
EXTERNAL CONTAINMENT:
TANK SYNTHETIC TANK-PIT/PIPING-TRENCH LINER
TANK COMPLIANCE FLAG
CORROSION PROTECTION COMPLIANCE FLAG: **YES**
CORROSION PROTECTION VARIANCE: **NO VARIANCE**

COMPARTMENT DETAILS

UST COMPARTMENT ID: **193376**
TANK ID: **1**
COMPARTMENT LETTER: **A**
SUBSTANCES: **GASOLINE**
OTHER SUBSTANCES: **NOT REPORTED**
CAPACITY (GAL): **40000**
COMPARTMENT RELEASE DETECTION: **AUTOMATIC TANK GAUGE TEST & INVENTORY CONTROL,INTERSTITIAL MONITORING WITHIN SECONDARY WALL/JACKET**
SPILL CONTAINMENT AND OVERFILL PREVENTION: **TIGHT-FILL FITTING CONTAINER/BUCKET/SUMP,FACTORY - BUILT SPILL CONTAINER/BUCKET/SUMP,DELIVERY SHUT-OFF VALVE**

PIPING SYSTEMS

MATERIAL: **NONMETALLIC FLEXIBLE PIPING**
CORROSION PROTECTION: **NONMETALLIC FLEXIBLE PIPING (NONCORRODIBLE),ISOLATED IN OPEN AREA/2ND CONTAINMENT**
EXTERNAL CONTAINMENT: **PIPE SYNTHETIC TANK-PIT/PIPING-TRENCH LINER**
CONNECTORS & VALVES:
NOT REPORTED
PIPING RELEASE DETECTION:
NOT REPORTED

PIPE COMPLIANCE FLAG
CORROSION PROTECTION COMPLIANCE FLAG: **YES**
CORROSION PROTECTION VARIANCE: **NO VARIANCE**

TANK ID: **2**
NUMBER OF COMPARTMENTS: **1**
INSTALLATION DATE: **05/10/2018**
REGISTRATION DATE: **08/08/2018**
TANK CAPACITY (GAL): **40000**
EMPTY TANK: **NOT EMPTY**
STATUS: **IN USE**
STATUS BEGIN DATE: **05/10/2018**
INTERNAL PROTECTION DATE: **NOT REPORTED**
REGULATORY STATUS: **FULLY REGULATED**
TANK DESIGN SINGLE WALL: **NO**
TANK DESIGN DOUBLE WALL: **YES**
PIPE DESIGN SINGLE WALL: **NO**
PIPE DESIGN DOUBLE WALL: **YES**

TANK DETAILS
MATERIAL:
FRP
CORROSION PROTECTION:
FRP TANK OR PIPING (NONCORRODIBLE)
EXTERNAL CONTAINMENT:
TANK SYNTHETIC TANK-PIT/PIPING-TRENCH LINER
TANK COMPLIANCE FLAG
CORROSION PROTECTION COMPLIANCE FLAG: **YES**
CORROSION PROTECTION VARIANCE: **NO VARIANCE**
COMPARTMENT DETAILS
UST COMPARTMENT ID: **193377**
TANK ID: **2**
COMPARTMENT LETTER: **A**
SUBSTANCES: **GASOLINE**
OTHER SUBSTANCES: **NOT REPORTED**
CAPACITY (GAL): **40000**
COMPARTMENT RELEASE DETECTION: **AUTOMATIC TANK GAUGE TEST & INVENTORY CONTROL,INTERSTITIAL MONITORING WITHIN SECONDARY WALL/JACKET**
SPILL CONTAINMENT AND OVERFILL PREVENTION: **TIGHT-FILL FITTING CONTAINER/BUCKET/SUMP,FACTORY - BUILT SPILL CONTAINER/BUCKET/SUMP,DELIVERY SHUT-OFF VALVE**
PIPING SYSTEMS
MATERIAL: **NONMETALLIC FLEXIBLE PIPING**
CORROSION PROTECTION: **NONMETALLIC FLEXIBLE PIPING (NONCORRODIBLE),ISOLATED IN OPEN AREA/2ND CONTAINMENT**
EXTERNAL CONTAINMENT: **PIPE SYNTHETIC TANK-PIT/PIPING-TRENCH LINER**
CONNECTORS & VALVES:
NOT REPORTED
PIPING RELEASE DETECTION:
NOT REPORTED
PIPE COMPLIANCE FLAG
CORROSION PROTECTION COMPLIANCE FLAG: **YES**
CORROSION PROTECTION VARIANCE: **NO VARIANCE**

TANK ID: **3**
NUMBER OF COMPARTMENTS: **1**
INSTALLATION DATE: **05/10/2018**
REGISTRATION DATE: **08/08/2018**
TANK CAPACITY (GAL): **30000**
EMPTY TANK: **NOT EMPTY**

STATUS: **IN USE**
STATUS BEGIN DATE: **05/10/2018**
INTERNAL PROTECTION DATE: **NOT REPORTED**
REGULATORY STATUS: **FULLY REGULATED**
TANK DESIGN SINGLE WALL: **NO**
TANK DESIGN DOUBLE WALL: **YES**
PIPE DESIGN SINGLE WALL: **NO**
PIPE DESIGN DOUBLE WALL: **YES**

TANK DETAILS

MATERIAL:
FRP
CORROSION PROTECTION:
FRP TANK OR PIPING (NONCORRODIBLE)
EXTERNAL CONTAINMENT:
TANK SYNTHETIC TANK-PIT/PIPING-TRENCH LINER
TANK COMPLIANCE FLAG
CORROSION PROTECTION COMPLIANCE FLAG: **YES**
CORROSION PROTECTION VARIANCE: **NO VARIANCE**

COMPARTMENT DETAILS

UST COMPARTMENT ID: **193378**
TANK ID: **3**
COMPARTMENT LETTER: **A**
SUBSTANCES: **GASOLINE**
OTHER SUBSTANCES: **NOT REPORTED**
CAPACITY (GAL): **30000**
COMPARTMENT RELEASE DETECTION: **AUTOMATIC TANK GAUGE TEST & INVENTORY CONTROL,INTERSTITIAL MONITORING WITHIN SECONDARY WALL/JACKET**
SPILL CONTAINMENT AND OVERFILL PREVENTION: **TIGHT-FILL FITTING CONTAINER/BUCKET/SUMP,FACTORY - BUILT SPILL CONTAINER/BUCKET/SUMP,DELIVERY SHUT-OFF VALVE**

PIPING SYSTEMS

MATERIAL: **NONMETALLIC FLEXIBLE PIPING**
CORROSION PROTECTION: **NONMETALLIC FLEXIBLE PIPING (NONCORRODIBLE),ISOLATED IN OPEN AREA/2ND CONTAINMENT**
EXTERNAL CONTAINMENT: **PIPE SYNTHETIC TANK-PIT/PIPING-TRENCH LINER**
CONNECTORS & VALVES:
NOT REPORTED
PIPING RELEASE DETECTION:
NOT REPORTED
PIPE COMPLIANCE FLAG
CORROSION PROTECTION COMPLIANCE FLAG: **YES**
CORROSION PROTECTION VARIANCE: **NO VARIANCE**

TANK ID: **4**
NUMBER OF COMPARTMENTS: **1**
INSTALLATION DATE: **05/10/2018**
REGISTRATION DATE: **08/08/2018**
TANK CAPACITY (GAL): **1500**
EMPTY TANK: **NOT EMPTY**
STATUS: **IN USE**
STATUS BEGIN DATE: **05/10/2018**
INTERNAL PROTECTION DATE: **NOT REPORTED**
REGULATORY STATUS: **FULLY REGULATED**
TANK DESIGN SINGLE WALL: **NO**
TANK DESIGN DOUBLE WALL: **YES**
PIPE DESIGN SINGLE WALL: **NO**
PIPE DESIGN DOUBLE WALL: **YES**

TANK DETAILS

MATERIAL:
FRP
CORROSION PROTECTION:
FRP TANK OR PIPING (NONCORRODIBLE)
EXTERNAL CONTAINMENT:
NOT REPORTED
TANK COMPLIANCE FLAG
CORROSION PROTECTION COMPLIANCE FLAG: **YES**
CORROSION PROTECTION VARIANCE: **NO VARIANCE**
COMPARTMENT DETAILS
UST COMPARTMENT ID: **193379**
TANK ID: **4**
COMPARTMENT LETTER: **A**
SUBSTANCES: **LUBRIZOL 9888**
OTHER SUBSTANCES: **NOT REPORTED**
CAPACITY (GAL): **1500**
COMPARTMENT RELEASE DETECTION: **AUTOMATIC TANK GAUGE TEST & INVENTORY CONTROL,INTERSTITIAL MONITORING WITHIN SECONDARY WALL/JACKET**
SPILL CONTAINMENT AND OVERFILL PREVENTION: **TIGHT-FILL FITTING CONTAINER/BUCKET/SUMP,FACTORY - BUILT SPILL CONTAINER/BUCKET/SUMP,DELIVERY SHUT-OFF VALVE**
PIPING SYSTEMS
MATERIAL: **NONMETALLIC FLEXIBLE PIPING**
CORROSION PROTECTION: **NONMETALLIC FLEXIBLE PIPING (NONCORRODIBLE),ISOLATED IN OPEN AREA/2ND CONTAINMENT**
EXTERNAL CONTAINMENT: **NOT REPORTED**
CONNECTORS & VALVES:
NOT REPORTED
PIPING RELEASE DETECTION:
NOT REPORTED
PIPE COMPLIANCE FLAG
CORROSION PROTECTION COMPLIANCE FLAG: **YES**
CORROSION PROTECTION VARIANCE: **NO VARIANCE**

ABOVEGROUND STORAGE TANK INFORMATION

NO ABOVEGROUND STORAGE TANK DATA REPORTED FOR THIS FACILITY

Back to Report Summary

MAP ID# 7

Distance from Property: 0.239 mi. (1,262 ft.) NW
Elevation: 721 ft.

FACILITY INFORMATION

SWR#: **97203** EPA ID: **TXR000084669**
TCEQ#: **132542**
NAME: **COSTCO WHOLESALE 1322**
ADDRESS: **1901 KELLY LN**
PFLUGERVILLE, TX 78660

CONTACT: **BEV LAUERMAN**
PHONE: **425-3132916**
BUSINESS DESCRIPTION: **NOT REPORTED**
INDUSTRIAL WASTE PERMIT #: **NOT REPORTED**
MUNICIPAL WASTE PERMIT #: **NOT REPORTED**
SIC CODE: **NOT REPORTED**
WASTE GENERATOR: **YES**
WASTE RECEIVER: **NO**
WASTE TRANSPORTER: **NO**
TRANSFER FACILITY: **NO**
MAQUILADORA (MEXICAN FACILITY): **NO**
STATUS: **ACTIVE**
AMOUNT OF WASTE GENERATED: **SMALL QUANTITY GENERATOR**
GENERATOR TYPE: **NON-INDUSTRIAL AND/OR MUNICIPAL**
THIS FACILITY IS A NOTIFIER
THIS FACILITY IS NOT A STEERS REPORTER - (STATE OF TEXAS ENVIRONMENTAL ELECTRONIC REPORTING SYSTEM)
THIS FACILITY IS REQUIRED TO SUBMIT AN ANNUAL WASTE REPORT
THIS FACILITY IS NOT INVOLVED IN RECYCLING ACTIVITIES
LAST UPDATE TO TRACS (TCEQ REGULATORY ACTIVITIES AND COMPLIANCE SYSTEM): **04/01/2020**

OWNER INFORMATION

NAME: **COSTCO WHOLESALE CORPORATION**
ADDRESS: **3207 GREY HAWK CT STE 200**
CARLSBAD, CA 92010
PHONE: **1-425-3136275**

ACTIVITIES

ACTIVITY TYPE: **UNKNOWN**
ACTIVITY DESCRIPTION: **NOT REPORTED**

WASTE

WASTE ID: **417410**
WASTE CODE STATUS: **ACTIVE**
WASTE IS RADIOACTIVE: **NO**
WASTE IS TREATED OFF SITE: **NO**
GENERATOR'S DESCRIPTION OF WASTE: **AEROSOLS, COMPRESSED GAS, FLAMMABLE, N.O.S., LIGHTERS, PETROLEUM GASES, LIQUEFIE**

WASTE ID: **417419**
WASTE CODE STATUS: **ACTIVE**
WASTE IS RADIOACTIVE: **NO**
WASTE IS TREATED OFF SITE: **NO**
GENERATOR'S DESCRIPTION OF WASTE: **ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S. (MERCURY)**

WASTE ID: **417417**
WASTE CODE STATUS: **ACTIVE**
WASTE IS RADIOACTIVE: **NO**

WASTE IS TREATED OFF SITE: **NO**
GENERATOR'S DESCRIPTION OF WASTE: **TOXIC SOLIDS, ORGANIC, N.O.S. , RESIDUE LAST CONTAINED, MEDICINE, SOLID, TOXIC,**

WASTE ID: **417413**
WASTE CODE STATUS: **ACTIVE**
WASTE IS RADIOACTIVE: **NO**
WASTE IS TREATED OFF SITE: **NO**
GENERATOR'S DESCRIPTION OF WASTE: **TRICHLOROISOCYANURIC ACID**

WASTE ID: **417421**
WASTE CODE STATUS: **ACTIVE**
WASTE IS RADIOACTIVE: **NO**
WASTE IS TREATED OFF SITE: **NO**
GENERATOR'S DESCRIPTION OF WASTE: **WASTE NICOTINE AND LITHIUM BATTERIES**

WASTE ID: **417415**
WASTE CODE STATUS: **ACTIVE**
WASTE IS RADIOACTIVE: **NO**
WASTE IS TREATED OFF SITE: **NO**
GENERATOR'S DESCRIPTION OF WASTE: **ORGANIC PEROXIDE TYPE F, LIQUID PEROXYACETIC ACID, TYPE F, STABILIZED 5.2**

WASTE ID: **417411**
WASTE CODE STATUS: **ACTIVE**
WASTE IS RADIOACTIVE: **NO**
WASTE IS TREATED OFF SITE: **NO**
GENERATOR'S DESCRIPTION OF WASTE: **FLAMMABLE LIQUIDS, N.O.S., ISOPROPYL ALCOHOL, ETHANOL, ETHYL ALCOHOL. LIQUOR**

WASTE ID: **417412**
WASTE CODE STATUS: **ACTIVE**
WASTE IS RADIOACTIVE: **NO**
WASTE IS TREATED OFF SITE: **NO**
GENERATOR'S DESCRIPTION OF WASTE: **FLAMMABLE SOLID, INORGANIC, N.O.S. & FLAMMABLE SOLIDS, ORGANIC, N.O.S., SULFUR,**

WASTE ID: **417414**
WASTE CODE STATUS: **ACTIVE**
WASTE IS RADIOACTIVE: **NO**
WASTE IS TREATED OFF SITE: **NO**
GENERATOR'S DESCRIPTION OF WASTE: **OXIDIZING LIQUID, N.O.S., HYDROGEN PEROXIDE, SODIUM HYPOCHLORITE**

WASTE ID: **417418**
WASTE CODE STATUS: **ACTIVE**
WASTE IS RADIOACTIVE: **NO**
WASTE IS TREATED OFF SITE: **NO**
GENERATOR'S DESCRIPTION OF WASTE: **TOXIC, LIQUIDS, ORGANIC, N.O.S., PESTICIDES, HERBICIDES, FERTILIZERS**

WASTE ID: **417420**
WASTE CODE STATUS: **ACTIVE**
WASTE IS RADIOACTIVE: **NO**
WASTE IS TREATED OFF SITE: **NO**
GENERATOR'S DESCRIPTION OF WASTE: **CORROSIVE LIQUIDS ACID, PHOSPHORIC ACID, ACETIC ACID, BATTERY ACID**

WASTE ID: **417422**
WASTE CODE STATUS: **ACTIVE**
WASTE IS RADIOACTIVE: **NO**
WASTE IS TREATED OFF SITE: **NO**
GENERATOR'S DESCRIPTION OF WASTE: **WASTE MEDICINE, LIQUID, FLAMMABLE, TOXIC; WASTE MEDICINE, LIQUID, TOXIC, N.O.S.,**

WASTE ID: **417423**
WASTE CODE STATUS: **ACTIVE**
WASTE IS RADIOACTIVE: **NO**
WASTE IS TREATED OFF SITE: **NO**
GENERATOR'S DESCRIPTION OF WASTE: **SOLIDS CONTAINING CORROSIVE LIQUIDS, N.O.S. AMMONIUM HYDORXIDE, CORROSIVE LIQUID**

WASTE ID: **417416**
WASTE CODE STATUS: **ACTIVE**
WASTE IS RADIOACTIVE: **NO**
WASTE IS TREATED OFF SITE: **NO**
GENERATOR'S DESCRIPTION OF WASTE: **TOXIC, SOLIDS, ORGANIC, N.O.S., PESTICIDES, HERBICIDES, FERTILIZERS**

WASTE ID: **402717**
WASTE CODE STATUS: **ACTIVE**
WASTE IS RADIOACTIVE: **NO**
WASTE IS TREATED OFF SITE: **NO**
GENERATOR'S DESCRIPTION OF WASTE: **FLAMMABLE LIQUIDS DAMAGED EXPIRED OR RETURN GOODS**

Back to Report Summary

GeoSearch
On time. On target. In touch.™

Radius Report

GeoLens by GeoSearch

Target Property:

Wilbarger Creek Watershed Study
Pflugerville, Travis County, Texas

Prepared For:

Halff-Austin

Order #: 162492
Job #: 401104
Project #: AVO 35837
Date: 03/11/2021

Database Summary

FEDERAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
EMERGENCY RESPONSE NOTIFICATION SYSTEM	ERNSTX	0	0	TP/AP
FEDERAL ENGINEERING INSTITUTIONAL CONTROL SITES	EC	0	0	TP/AP
LAND USE CONTROL INFORMATION SYSTEM	LUCIS	0	0	TP/AP
RCRA SITES WITH CONTROLS	RCRASC	0	0	TP/AP
RESOURCE CONSERVATION & RECOVERY ACT - GENERATOR	RCRAGR06	0	0	0.1250
RESOURCE CONSERVATION & RECOVERY ACT - NON-GENERATOR	RCRANGR06	0	0	0.1250
BROWNFIELDS MANAGEMENT SYSTEM	BF	0	0	0.5000
DELISTED NATIONAL PRIORITIES LIST	DNPL	0	0	0.5000
NO LONGER REGULATED RCRA NON-CORRACTS TSD FACILITIES	NLRRCRAT	0	0	0.5000
RESOURCE CONSERVATION & RECOVERY ACT - NON-CORRACTS TREATMENT, STORAGE & DISPOSAL FACILITIES	RCRAT	0	0	0.5000
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM	SEMS	0	0	0.5000
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM ARCHIVED SITE INVENTORY	SEMSARCH	0	0	0.5000
NATIONAL PRIORITIES LIST	NPL	0	0	1.0000
NO LONGER REGULATED RCRA CORRECTIVE ACTION FACILITIES	NLRRCRAC	0	0	1.0000
PROPOSED NATIONAL PRIORITIES LIST	PNPL	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - CORRECTIVE ACTION FACILITIES	RCRAC	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - SUBJECT TO CORRECTIVE ACTION FACILITIES	RCRASUBC	0	0	1.0000

SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
AEROMETRIC INFORMATION RETRIEVAL SYSTEM / AIR FACILITY SUBSYSTEM	AIRSAFS	0	0	TP/AP
BIENNIAL REPORTING SYSTEM	BRS	0	0	TP/AP
CERCLIS LIENS	SFLIENS	0	0	TP/AP
CLANDESTINE DRUG LABORATORY LOCATIONS	CDL	0	0	TP/AP
EPA DOCKET DATA	DOCKETS	0	0	TP/AP
ENFORCEMENT AND COMPLIANCE HISTORY INFORMATION	ECHOR06	0	0	TP/AP
FACILITY REGISTRY SYSTEM	FRSTX	0	0	TP/AP

Database Summary

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
HAZARDOUS MATERIALS INCIDENT REPORTING SYSTEM	HMIRSR06	0	0	TP/AP
HAZARDOUS WASTE COMPLIANCE DOCKET FACILITIES	HWCD	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM (FORMERLY DOCKETS)	ICIS	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	ICISNPDES	0	0	TP/AP
MATERIAL LICENSING TRACKING SYSTEM	MLTS	0	0	TP/AP
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	NPDESR06	0	0	TP/AP
PCB ACTIVITY DATABASE SYSTEM	PADS	0	0	TP/AP
PERMIT COMPLIANCE SYSTEM	PCSR06	0	0	TP/AP
SEMS LIEN ON PROPERTY	SEMSLIENS	0	0	TP/AP
SSEHRI PFAS CONTAMINATION SITES	SSEHRIPFAS	0	0	TP/AP
SECTION SEVEN TRACKING SYSTEM	SSTS	0	0	TP/AP
TOXIC SUBSTANCE CONTROL ACT INVENTORY	TSCA	0	0	TP/AP
TOXICS RELEASE INVENTORY	TRI	0	0	TP/AP
ALTERNATIVE FUELING STATIONS	ALTFUELS	0	0	0.2500
FEMA OWNED STORAGE TANKS	FEMAUST	0	0	0.2500
HISTORICAL GAS STATIONS	HISTPST	0	0	0.2500
INTEGRATED COMPLIANCE INFORMATION SYSTEM DRYCLEANERS	ICISCLEANERS	0	0	0.2500
MINE SAFETY AND HEALTH ADMINISTRATION MASTER INDEX FILE	MSHA	0	0	0.2500
MINERAL RESOURCE DATA SYSTEM	MRDS	0	0	0.2500
OPEN DUMP INVENTORY	ODI	0	0	0.5000
SURFACE MINING CONTROL AND RECLAMATION ACT SITES	SMCRA	0	0	0.5000
URANIUM MILL TAILINGS RADIATION CONTROL ACT SITES	USUMTRCA	0	0	0.5000
DEPARTMENT OF DEFENSE SITES	DOD	0	0	1.0000
FORMER MILITARY NIKE MISSILE SITES	NMS	0	0	1.0000
FORMERLY USED DEFENSE SITES	FUDS	0	0	1.0000
FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM	FUSRAP	0	0	1.0000
RECORD OF DECISION SYSTEM	RODS	0	0	1.0000
SUB-TOTAL		0	0	

Database Summary

STATE (TX) LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
STATE INSTITUTIONAL/ENGINEERING CONTROL SITES	SIEC01	0	0	TP/AP
PETROLEUM STORAGE TANKS	PST	0	0	0.2500
BROWNFIELDS SITE ASSESSMENTS	BSA	0	0	0.5000
CLOSED & ABANDONED LANDFILL INVENTORY	CALF	0	0	0.5000
COMMERCIAL MANAGEMENT FACILITIES FOR HAZARDOUS WASTE AND INDUSTRIAL SOLID WASTES	WSTMGMT	0	0	0.5000
LEAKING PETROLEUM STORAGE TANKS	LPST	0	0	0.5000
MUNICIPAL SOLID WASTE LANDFILL SITES	MSWLF	0	0	0.5000
OPERATOR CLEANUP PROGRAM SITES	OCP	0	0	0.5000
RAILROAD COMMISSION VCP AND BROWNFIELD SITES	RRCVCP	0	0	0.5000
VOLUNTARY CLEANUP PROGRAM SITES	VCP	0	0	0.5000
STATE SUPERFUND SITES	SF	0	0	1.0000

SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
GROUNDWATER CONTAMINATION CASES	GWCC	0	0	TP/AP
HISTORIC GROUNDWATER CONTAMINATION CASES	HISTGWCC	0	0	TP/AP
LAND APPLICATION PERMITS	LANDAPP	0	0	TP/AP
MUNICIPAL SETTING DESIGNATIONS	MSD	0	0	TP/AP
NOTICE OF VIOLATIONS	NOV	0	0	TP/AP
SPILLS LISTING	SPILLS	0	0	TP/AP
TCEQ LIENS	LIENS	0	0	TP/AP
TIER I I CHEMICAL REPORTING PROGRAM FACILITIES	TIERII	0	0	TP/AP
DRY CLEANER REGISTRATION DATABASE	DCR	0	0	0.2500
INDUSTRIAL AND HAZARDOUS WASTE SITES	IHW	0	0	0.2500
PERMITTED INDUSTRIAL HAZARDOUS WASTE SITES	PIHW	0	0	0.2500
AFFECTED PROPERTY ASSESSMENT REPORTS	APAR	0	0	0.5000
DRY CLEANER REMEDIATION PROGRAM SITES	DCRPS	0	0	0.5000
INNOCENT OWNER / OPERATOR DATABASE	IOP	0	0	0.5000
RADIOACTIVE WASTE SITES	RWS	0	0	0.5000
RECYCLING FACILITIES	WMRF	0	0	0.5000
SALT CAVERNS FOR PETROLEUM STORAGE	STCV	0	0	0.5000

Database Summary

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
INDUSTRIAL AND HAZARDOUS WASTE CORRECTIVE ACTION SITES	IHWCA	1	0	1.0000

SUB-TOTAL		1	0	

Database Summary

LOCAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
CITY OF AUSTIN UNDERGROUND STORAGE TANKS	AUSTINUST	0	0	0.2500
SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
EDWARDS AQUIFER PERMITS	EAP	0	0	TP/AP
CITY OF AUSTIN HISTORICAL UNDERGROUND STORAGE TANKS	AUSTINHISTUST	0	0	0.2500
SUB-TOTAL		0	0	

Database Summary

TRIBAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	USTR06	0	0	0.2500
LEAKING UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	LUSTR06	0	0	0.5000
OPEN DUMP INVENTORY ON TRIBAL LANDS	ODINDIAN	0	0	0.5000
SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
INDIAN RESERVATIONS	INDIANRES	0	0	1.0000
SUB-TOTAL		0	0	
TOTAL		1	0	

Database Radius Summary

FEDERAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
AIRSAFS	0.0200	0	NS	NS	NS	NS	NS	0
BRS	0.0200	0	NS	NS	NS	NS	NS	0
CDL	0.0200	0	NS	NS	NS	NS	NS	0
DOCKETS	0.0200	0	NS	NS	NS	NS	NS	0
EC	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
ECHOR06	0.0200	0	NS	NS	NS	NS	NS	0
ERNSTX	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
FRSTX	0.0200	0	NS	NS	NS	NS	NS	0
HMIRSR06	0.0200	0	NS	NS	NS	NS	NS	0
HWCD	0.0200	0	NS	NS	NS	NS	NS	0
ICIS	0.0200	0	NS	NS	NS	NS	NS	0
ICISNPDES	0.0200	0	NS	NS	NS	NS	NS	0
LUCIS	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
MLTS	0.0200	0	NS	NS	NS	NS	NS	0
NPDESR06	0.0200	0	NS	NS	NS	NS	NS	0
PADS	0.0200	0	NS	NS	NS	NS	NS	0
PCSR06	0.0200	0	NS	NS	NS	NS	NS	0
RCRASC	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
SEMSLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SFLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SSEHRIPFAS	0.0200	0	NS	NS	NS	NS	NS	0
SSTS	0.0200	0	NS	NS	NS	NS	NS	0
TRI	0.0200	0	NS	NS	NS	NS	NS	0
TSCA	0.0200	0	NS	NS	NS	NS	NS	0
RCRAGR06	**0.1250**	**0**	**0**	**NS**	**NS**	**NS**	**NS**	**0**
RCRANGR06	**0.1250**	**0**	**0**	**NS**	**NS**	**NS**	**NS**	**0**
ALTFUELS	0.2500	0	0	0	NS	NS	NS	0
FEMAUST	0.2500	0	0	0	NS	NS	NS	0
HISTPST	0.2500	0	0	0	NS	NS	NS	0
ICISCLEANERS	0.2500	0	0	0	NS	NS	NS	0
MRDS	0.2500	0	0	0	NS	NS	NS	0
MSHA	0.2500	0	0	0	NS	NS	NS	0
BF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
DNPL	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
NLRRCRAT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**

Database Radius Summary

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
ODI	0.5000	0	0	0	0	NS	NS	0
RCRAT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SEMS	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SEMSARCH	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SMCRA	0.5000	0	0	0	0	NS	NS	0
USUMTRCA	0.5000	0	0	0	0	NS	NS	0
DOD	1.0000	0	0	0	0	0	NS	0
FUDS	1.0000	0	0	0	0	0	NS	0
FUSRAP	1.0000	0	0	0	0	0	NS	0
NLRRCRAC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
NMS	1.0000	0	0	0	0	0	NS	0
NPL	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
PNPL	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RCRAC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RCRASUBC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RODS	1.0000	0	0	0	0	0	NS	0

SUB-TOTAL		0	0	0	0	0	0	0

Database Radius Summary

STATE (TX) LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
GWCC	0.0200	0	NS	NS	NS	NS	NS	0
HISTGWCC	0.0200	0	NS	NS	NS	NS	NS	0
LANDAPP	0.0200	0	NS	NS	NS	NS	NS	0
LIENS	0.0200	0	NS	NS	NS	NS	NS	0
MSD	0.0200	0	NS	NS	NS	NS	NS	0
NOV	0.0200	0	NS	NS	NS	NS	NS	0
SIEC01	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
SPILLS	0.0200	0	NS	NS	NS	NS	NS	0
TIERII	0.0200	0	NS	NS	NS	NS	NS	0
DCR	0.2500	0	0	0	NS	NS	NS	0
IHW	0.2500	0	0	0	NS	NS	NS	0
PIHW	0.2500	0	0	0	NS	NS	NS	0
PST	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**
APAR	0.5000	0	0	0	0	NS	NS	0
BSA	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
CALF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
DCRPS	0.5000	0	0	0	0	NS	NS	0
IOP	0.5000	0	0	0	0	NS	NS	0
LPST	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
MSWLF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
OCP	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
RRCVCP	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
RWS	0.5000	0	0	0	0	NS	NS	0
STCV	0.5000	0	0	0	0	NS	NS	0
VCP	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
WMRF	0.5000	0	0	0	0	NS	NS	0
WSTMGMT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
IHWCA	1.0000	0	0	0	1	0	NS	1
SF	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**

SUB-TOTAL		0	0	0	1	0	0	1

Database Radius Summary

LOCAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
EAP	0.0200	0	NS	NS	NS	NS	NS	0
AUSTINHISTUST	0.2500	0	0	0	NS	NS	NS	0
AUSTINUST	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**

SUB-TOTAL		0	0	0	0	0	0	0

Database Radius Summary

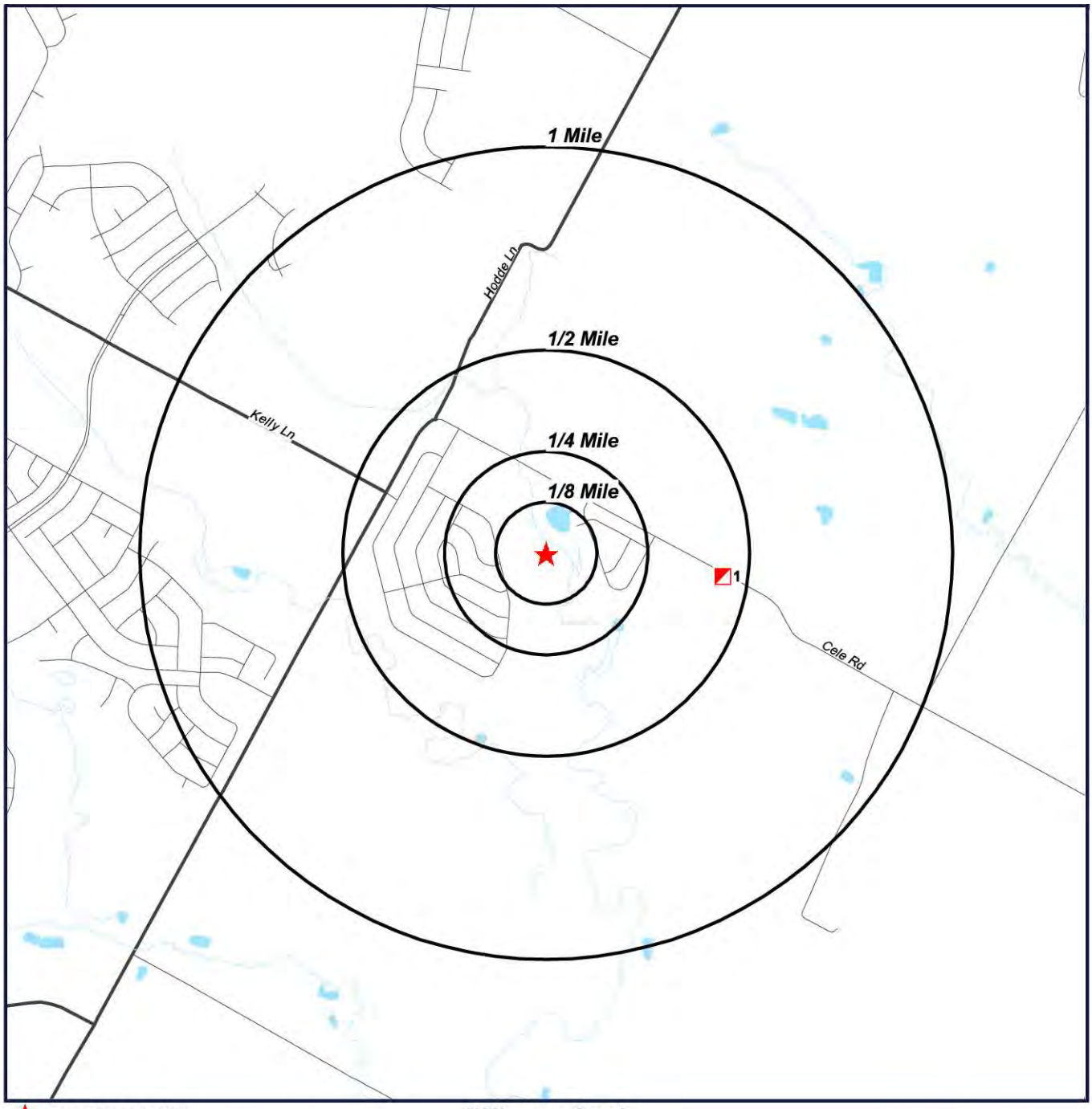
TRIBAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
USTR06	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**
LUSTR06	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
ODINDIAN	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
INDIANRES	1.0000	0	0	0	0	0	NS	0
SUB-TOTAL		0	0	0	0	0	0	0
TOTAL		0	0	0	1	0	0	1

NOTES:
NS = NOT SEARCHED
TP/AP = TARGET PROPERTY/ADJACENT PROPERTY

Radius Map 1



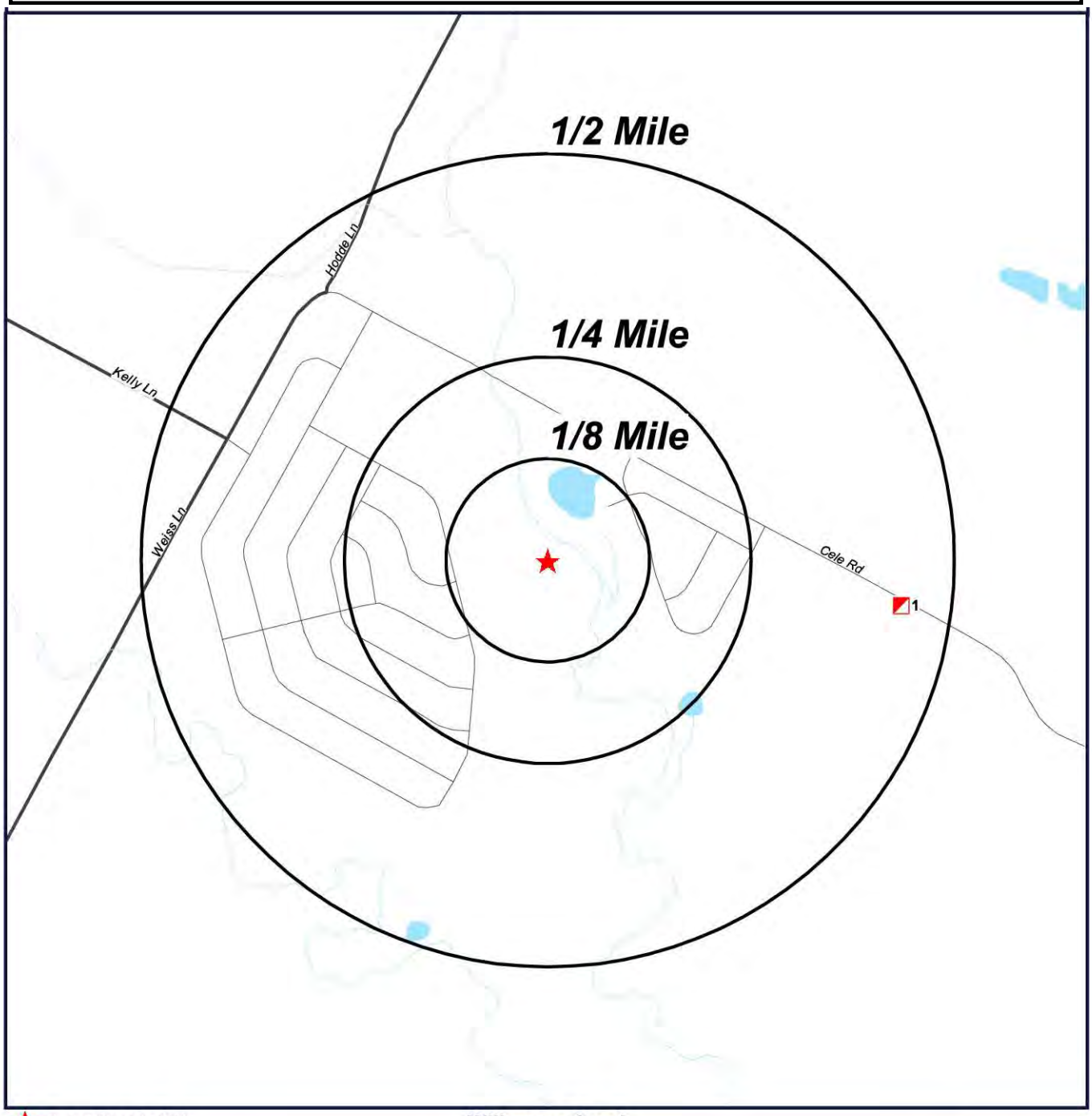
Target Property (TP)
IHWCA

Wilbarger Creek Watershed Study
Pflugerville, Texas

N
W E
S

0' 1000' 2000' 3000'
SCALE: 1" = 2000'

Radius Map 2



Target Property (TP)
IHWCA

Wilbarger Creek Watershed Study
Pflugerville, Texas

N
W E
S

0' 500' 1000' 1500'
SCALE: 1" = 1000'

Ortho Map

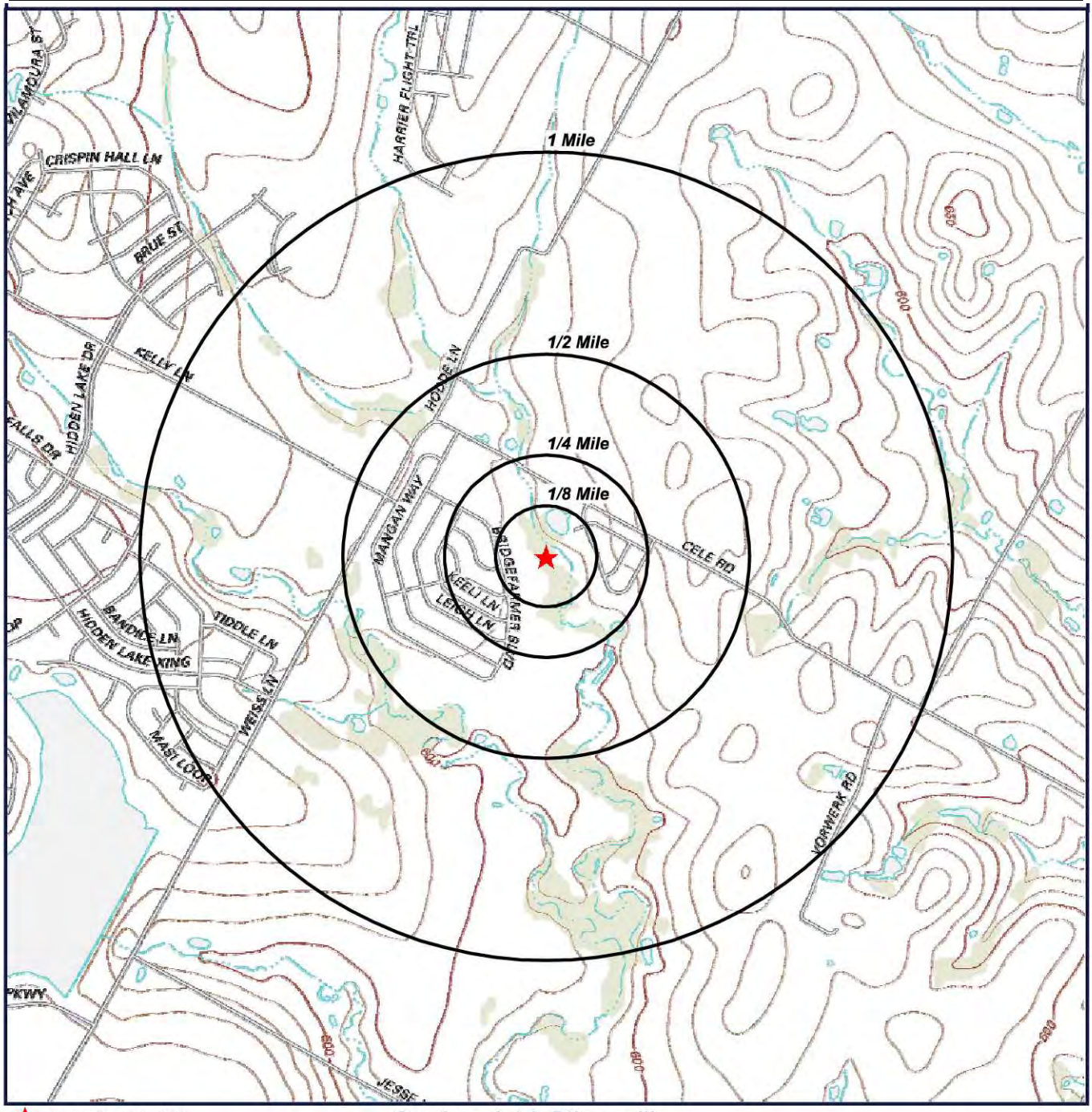
Target Property (TP)
IHWCA

Quadrangle(s):
Pflugerville
East
Wilbarger Creek
Watershed
Study
Pflugerville, Texas

N
W E
S

0' 500' 1000' 1500'
SCALE: 1" = 1000'

Topographic Map



Target Property (TP)

Quadrangle(s): Pflugerville East
Source: USGS, 01/08/2013
Wilbarger Creek Watershed Study
Pflugerville, Texas

N
W E
S

0' 1000' 2000' 3000'
SCALE: 1" = 2000'

Located Sites Summary

*NOTE: Standard environmental records are displayed in **bold**.*

Map ID#	Database Name	Site ID#	Relative Elevation	Distance From Site	Site Name	Address	PAGE #
1	IHWCA	T3243	Higher (633 ft.)	0.438 mi. E (2313 ft.)	VERONA SECTION 1	PFLUGERVILLE, TX	20

Site Summary By Database

*NOTE: Standard environmental records are displayed in **bold**.*

Map ID#	Database Name	Site ID#	Relative Elevation	Distance From Site	Site Name	Address
1	IHWCA	T3243	Higher (633 ft.)	0.438 mi. E (2313 ft.)	VERONA SECTION 1	PFLUGERVILLE, TX

Elevation Summary

Elevations are collected from the USGS 3D Elevation Program 1/3 arc-second (approximately 10 meters) layer hosted at the NGTOC. .

Target Property Elevation: 606 ft.

*NOTE: Standard environmental records are displayed in **bold**.*

EQUAL/HIGHER ELEVATION

Map ID#	Database Name	Elevation	Site Name	Address	Page #
1	IHWCA	633 ft.	VERONA SECTION 1	PFLUGERVILLE, TX	20

LOWER ELEVATION

No Records Found

MAP ID# 1

Distance from Property: 0.438 mi. (2,313 ft.) E
Elevation: 633 ft. (Higher than TP)

PROGRAM ID: **T3243**
RN NUMBER: **RN107933947**
NAME: **VERONA SECTION 1**
ADDRESS: **NOT REPORTED**
PFLUGERVILLE, TX
STATUS: **INACTIVE**
STATUS DATE: **10/23/2015**
PHASE: **COMPLETED WORKLOAD**
LOCATION DESCRIPTION: **LOCATED IN PFLUGERVILLE TRAVIS COUNTY TX JUST EAST OF THE INTERSECTION OF WEISS LANE AND IMMEDIATELY SOUTH OF CELE ROAD**
PHASE STATUS DATE: **10/23/2015**
SOIL CHEMICAL OF CONCERN CLASS: **NOT REPORTED**
SOIL REMEMDIATION: **NOT REPORTED**
GROUNDWATER CHEMICAL OF CONCERN CLASS: **NOT REPORTED**
GROUNDWATER REMEDIATION: **NOT REPORTED**

Back to Report Summary

Radius Report

GeoLens by GeoSearch

Target Property:

Wilbarger Creek Watershed Study
Pflugerville, Travis County, Texas

Prepared For:

Halff-Austin

Order #: 162493
Job #: 401108
Project #: AVO 35837
Date: 03/11/2021

Database Summary

FEDERAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
EMERGENCY RESPONSE NOTIFICATION SYSTEM	ERNSTX	0	0	TP/AP
FEDERAL ENGINEERING INSTITUTIONAL CONTROL SITES	EC	0	0	TP/AP
LAND USE CONTROL INFORMATION SYSTEM	LUCIS	0	0	TP/AP
RCRA SITES WITH CONTROLS	RCRASC	0	0	TP/AP
RESOURCE CONSERVATION & RECOVERY ACT - GENERATOR	RCRAGR06	0	0	0.1250
RESOURCE CONSERVATION & RECOVERY ACT - NON-GENERATOR	RCRANGR06	0	0	0.1250
BROWNFIELDS MANAGEMENT SYSTEM	BF	0	0	0.5000
DELISTED NATIONAL PRIORITIES LIST	DNPL	0	0	0.5000
NO LONGER REGULATED RCRA NON-CORRACTS TSD FACILITIES	NLRRCRAT	0	0	0.5000
RESOURCE CONSERVATION & RECOVERY ACT - NON-CORRACTS TREATMENT, STORAGE & DISPOSAL FACILITIES	RCRAT	0	0	0.5000
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM	SEMS	0	0	0.5000
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM ARCHIVED SITE INVENTORY	SEMSARCH	0	0	0.5000
NATIONAL PRIORITIES LIST	NPL	0	0	1.0000
NO LONGER REGULATED RCRA CORRECTIVE ACTION FACILITIES	NLRRCRAC	0	0	1.0000
PROPOSED NATIONAL PRIORITIES LIST	PNPL	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - CORRECTIVE ACTION FACILITIES	RCRAC	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - SUBJECT TO CORRECTIVE ACTION FACILITIES	RCRASUBC	0	0	1.0000

SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
AEROMETRIC INFORMATION RETRIEVAL SYSTEM / AIR FACILITY SUBSYSTEM	AIRSAFS	0	0	TP/AP
BIENNIAL REPORTING SYSTEM	BRS	0	0	TP/AP
CERCLIS LIENS	SFLIENS	0	0	TP/AP
CLANDESTINE DRUG LABORATORY LOCATIONS	CDL	0	0	TP/AP
EPA DOCKET DATA	DOCKETS	0	0	TP/AP
ENFORCEMENT AND COMPLIANCE HISTORY INFORMATION	ECHOR06	0	0	TP/AP
FACILITY REGISTRY SYSTEM	FRSTX	0	0	TP/AP

Database Summary

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
HAZARDOUS MATERIALS INCIDENT REPORTING SYSTEM	HMIRSR06	0	0	TP/AP
HAZARDOUS WASTE COMPLIANCE DOCKET FACILITIES	HWCD	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM (FORMERLY DOCKETS)	ICIS	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	ICISNPDES	0	0	TP/AP
MATERIAL LICENSING TRACKING SYSTEM	MLTS	0	0	TP/AP
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	NPDESR06	0	0	TP/AP
PCB ACTIVITY DATABASE SYSTEM	PADS	0	0	TP/AP
PERMIT COMPLIANCE SYSTEM	PCSR06	0	0	TP/AP
SEMS LIEN ON PROPERTY	SEMSLIENS	0	0	TP/AP
SSEHRI PFAS CONTAMINATION SITES	SSEHRIPFAS	0	0	TP/AP
SECTION SEVEN TRACKING SYSTEM	SSTS	0	0	TP/AP
TOXIC SUBSTANCE CONTROL ACT INVENTORY	TSCA	0	0	TP/AP
TOXICS RELEASE INVENTORY	TRI	0	0	TP/AP
ALTERNATIVE FUELING STATIONS	ALTFUELS	0	0	0.2500
FEMA OWNED STORAGE TANKS	FEMAUST	0	0	0.2500
HISTORICAL GAS STATIONS	HISTPST	0	0	0.2500
INTEGRATED COMPLIANCE INFORMATION SYSTEM DRYCLEANERS	ICISCLEANERS	0	0	0.2500
MINE SAFETY AND HEALTH ADMINISTRATION MASTER INDEX FILE	MSHA	0	0	0.2500
MINERAL RESOURCE DATA SYSTEM	MRDS	0	0	0.2500
OPEN DUMP INVENTORY	ODI	0	0	0.5000
SURFACE MINING CONTROL AND RECLAMATION ACT SITES	SMCRA	0	0	0.5000
URANIUM MILL TAILINGS RADIATION CONTROL ACT SITES	USUMTRCA	0	0	0.5000
DEPARTMENT OF DEFENSE SITES	DOD	0	0	1.0000
FORMER MILITARY NIKE MISSILE SITES	NMS	0	0	1.0000
FORMERLY USED DEFENSE SITES	FUDS	0	0	1.0000
FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM	FUSRAP	0	0	1.0000
RECORD OF DECISION SYSTEM	RODS	0	0	1.0000

SUB-TOTAL		0	0	

Database Summary

STATE (TX) LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
STATE INSTITUTIONAL/ENGINEERING CONTROL SITES	SIEC01	0	0	TP/AP
PETROLEUM STORAGE TANKS	PST	0	0	0.2500
BROWNFIELDS SITE ASSESSMENTS	BSA	0	0	0.5000
CLOSED & ABANDONED LANDFILL INVENTORY	CALF	0	0	0.5000
COMMERCIAL MANAGEMENT FACILITIES FOR HAZARDOUS WASTE AND INDUSTRIAL SOLID WASTES	WSTMGMT	0	0	0.5000
LEAKING PETROLEUM STORAGE TANKS	LPST	0	0	0.5000
MUNICIPAL SOLID WASTE LANDFILL SITES	MSWLF	0	0	0.5000
OPERATOR CLEANUP PROGRAM SITES	OCP	0	0	0.5000
RAILROAD COMMISSION VCP AND BROWNFIELD SITES	RRCVCP	0	0	0.5000
VOLUNTARY CLEANUP PROGRAM SITES	VCP	0	0	0.5000
STATE SUPERFUND SITES	SF	0	0	1.0000

SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
GROUNDWATER CONTAMINATION CASES	GWCC	0	0	TP/AP
HISTORIC GROUNDWATER CONTAMINATION CASES	HISTGWCC	0	0	TP/AP
LAND APPLICATION PERMITS	LANDAPP	0	0	TP/AP
MUNICIPAL SETTING DESIGNATIONS	MSD	0	0	TP/AP
NOTICE OF VIOLATIONS	NOV	0	0	TP/AP
SPILLS LISTING	SPILLS	0	0	TP/AP
TCEQ LIENS	LIENS	0	0	TP/AP
TIER I I CHEMICAL REPORTING PROGRAM FACILITIES	TIERII	0	0	TP/AP
DRY CLEANER REGISTRATION DATABASE	DCR	0	0	0.2500
INDUSTRIAL AND HAZARDOUS WASTE SITES	IHW	0	0	0.2500
PERMITTED INDUSTRIAL HAZARDOUS WASTE SITES	PIHW	0	0	0.2500
AFFECTED PROPERTY ASSESSMENT REPORTS	APAR	0	0	0.5000
DRY CLEANER REMEDIATION PROGRAM SITES	DCRPS	0	0	0.5000
INNOCENT OWNER / OPERATOR DATABASE	IOP	0	0	0.5000
RADIOACTIVE WASTE SITES	RWS	0	0	0.5000
RECYCLING FACILITIES	WMRF	0	0	0.5000
SALT CAVERNS FOR PETROLEUM STORAGE	STCV	0	0	0.5000

Database Summary

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
INDUSTRIAL AND HAZARDOUS WASTE CORRECTIVE ACTION SITES	IHWCA	0	0	1.0000

SUB-TOTAL		0	0	

Database Summary

LOCAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
CITY OF AUSTIN UNDERGROUND STORAGE TANKS	AUSTINUST	0	0	0.2500
SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
EDWARDS AQUIFER PERMITS	EAP	0	0	TP/AP
CITY OF AUSTIN HISTORICAL UNDERGROUND STORAGE TANKS	AUSTINHISTUST	0	0	0.2500
SUB-TOTAL		0	0	

TRIBAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	USTR06	0	0	0.2500
LEAKING UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	LUSTR06	0	0	0.5000
OPEN DUMP INVENTORY ON TRIBAL LANDS	ODINDIAN	0	0	0.5000
SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
INDIAN RESERVATIONS	INDIANRES	0	0	1.0000
SUB-TOTAL		0	0	
TOTAL		0	0	

Database Radius Summary

FEDERAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
AIRSAFS	0.0200	0	NS	NS	NS	NS	NS	0
BRS	0.0200	0	NS	NS	NS	NS	NS	0
CDL	0.0200	0	NS	NS	NS	NS	NS	0
DOCKETS	0.0200	0	NS	NS	NS	NS	NS	0
EC	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
ECHOR06	0.0200	0	NS	NS	NS	NS	NS	0
ERNSTX	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
FRSTX	0.0200	0	NS	NS	NS	NS	NS	0
HMIRSR06	0.0200	0	NS	NS	NS	NS	NS	0
HWCD	0.0200	0	NS	NS	NS	NS	NS	0
ICIS	0.0200	0	NS	NS	NS	NS	NS	0
ICISNPDES	0.0200	0	NS	NS	NS	NS	NS	0
LUCIS	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
MLTS	0.0200	0	NS	NS	NS	NS	NS	0
NPDESR06	0.0200	0	NS	NS	NS	NS	NS	0
PADS	0.0200	0	NS	NS	NS	NS	NS	0
PCSR06	0.0200	0	NS	NS	NS	NS	NS	0
RCRASC	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
SEMSLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SFLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SSEHRIPFAS	0.0200	0	NS	NS	NS	NS	NS	0
SSTS	0.0200	0	NS	NS	NS	NS	NS	0
TRI	0.0200	0	NS	NS	NS	NS	NS	0
TSCA	0.0200	0	NS	NS	NS	NS	NS	0
RCRAGR06	**0.1250**	**0**	**0**	**NS**	**NS**	**NS**	**NS**	**0**
RCRANGR06	**0.1250**	**0**	**0**	**NS**	**NS**	**NS**	**NS**	**0**
ALTFUELS	0.2500	0	0	0	NS	NS	NS	0
FEMAUST	0.2500	0	0	0	NS	NS	NS	0
HISTPST	0.2500	0	0	0	NS	NS	NS	0
ICISCLEANERS	0.2500	0	0	0	NS	NS	NS	0
MRDS	0.2500	0	0	0	NS	NS	NS	0
MSHA	0.2500	0	0	0	NS	NS	NS	0
BF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
DNPL	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
NLRRCRAT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**

Database Radius Summary

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
ODI	0.5000	0	0	0	0	NS	NS	0
RCRAT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SEMS	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SEMSARCH	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SMCRA	0.5000	0	0	0	0	NS	NS	0
USUMTRCA	0.5000	0	0	0	0	NS	NS	0
DOD	1.0000	0	0	0	0	0	NS	0
FUDS	1.0000	0	0	0	0	0	NS	0
FUSRAP	1.0000	0	0	0	0	0	NS	0
NLRRCRAC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
NMS	1.0000	0	0	0	0	0	NS	0
NPL	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
PNPL	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RCRAC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RCRASUBC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RODS	1.0000	0	0	0	0	0	NS	0

SUB-TOTAL		0	0	0	0	0	0	0

STATE (TX) LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
GWCC	0.0200	0	NS	NS	NS	NS	NS	0
HISTGWCC	0.0200	0	NS	NS	NS	NS	NS	0
LANDAPP	0.0200	0	NS	NS	NS	NS	NS	0
LIENS	0.0200	0	NS	NS	NS	NS	NS	0
MSD	0.0200	0	NS	NS	NS	NS	NS	0
NOV	0.0200	0	NS	NS	NS	NS	NS	0
SIEC01	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
SPILLS	0.0200	0	NS	NS	NS	NS	NS	0
TIERII	0.0200	0	NS	NS	NS	NS	NS	0
DCR	0.2500	0	0	0	NS	NS	NS	0
IHW	0.2500	0	0	0	NS	NS	NS	0
PIHW	0.2500	0	0	0	NS	NS	NS	0
PST	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**
APAR	0.5000	0	0	0	0	NS	NS	0
BSA	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
CALF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
DCRPS	0.5000	0	0	0	0	NS	NS	0
IOP	0.5000	0	0	0	0	NS	NS	0
LPST	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
MSWLF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
OCP	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
RRCVCP	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
RWS	0.5000	0	0	0	0	NS	NS	0
STCV	0.5000	0	0	0	0	NS	NS	0
VCP	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
WMRF	0.5000	0	0	0	0	NS	NS	0
WSTMGMT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
IHWCA	1.0000	0	0	0	0	0	NS	0
SF	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**

SUB-TOTAL		0	0	0	0	0	0	0

Database Radius Summary

LOCAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
EAP	0.0200	0	NS	NS	NS	NS	NS	0
AUSTINHISTUST	0.2500	0	0	0	NS	NS	NS	0
AUSTINUST	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**

SUB-TOTAL		0	0	0	0	0	0	0

Database Radius Summary

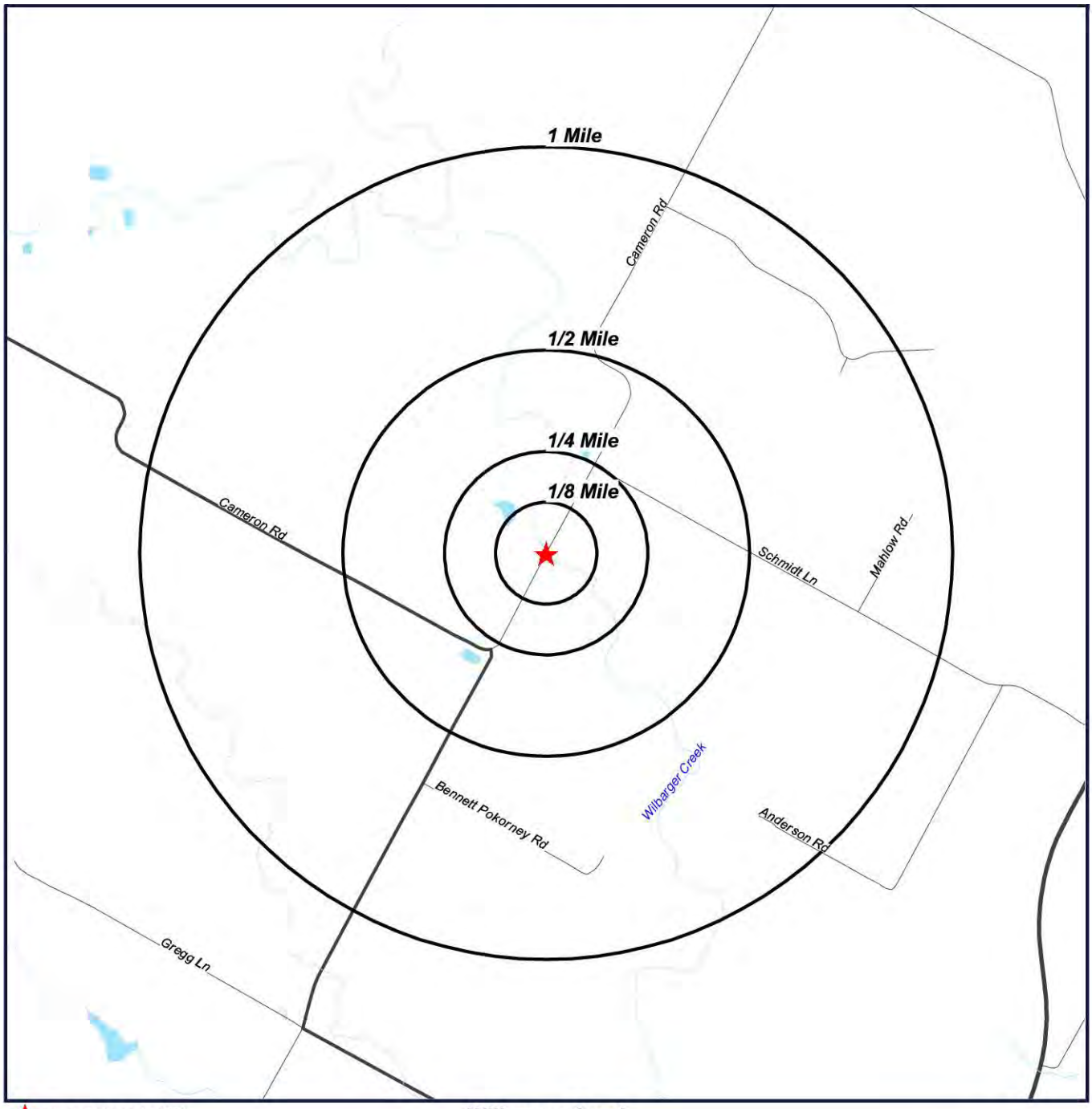
TRIBAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
USTR06	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**
LUSTR06	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
ODINDIAN	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
INDIANRES	1.0000	0	0	0	0	0	NS	0
SUB-TOTAL		0	0	0	0	0	0	0
TOTAL		0	0	0	0	0	0	0

NOTES:
NS = NOT SEARCHED
TP/AP = TARGET PROPERTY/ADJACENT PROPERTY

Radius Map 1



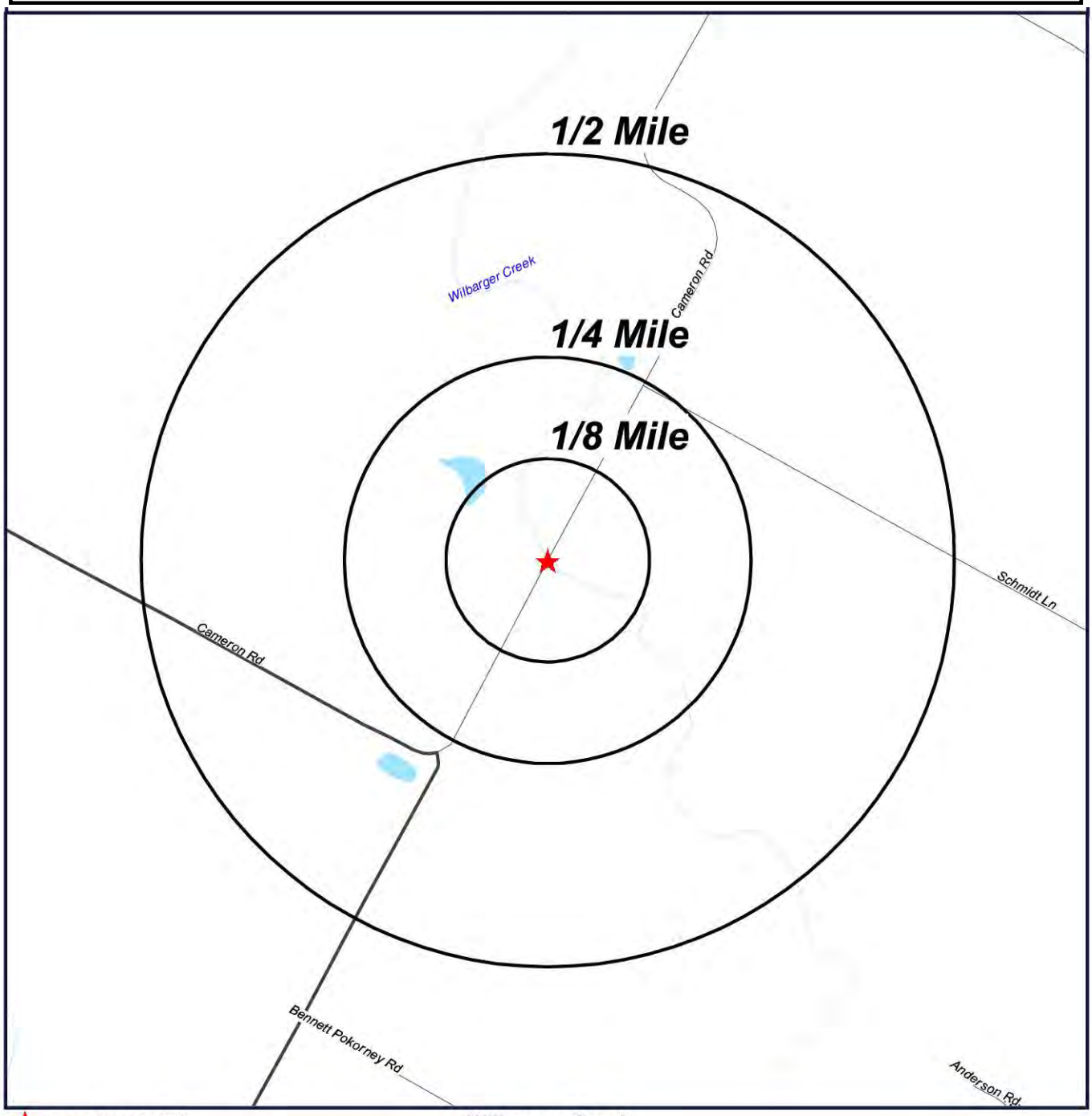
Target Property (TP)

Wilbarger Creek Watershed Study Pflugerville, Texas

N
W E
S

0' 1000' 2000' 3000'
SCALE: 1" = 2000'

Radius Map 2


1/2 Mile
1/4 Mile
1/8 Mile
Wilbarger Creek
Cameron Rd
Schmidt Ln
Cameron Rd
Bennett Pokorney Rd
Anderson Rd
Target Property (TP)
Wilbarger Creek
Watershed
Study
Pflugerville, Texas
N
W
E
S
0'
500'
1000'
1500'
SCALE: 1" = 1000'

Ortho Map

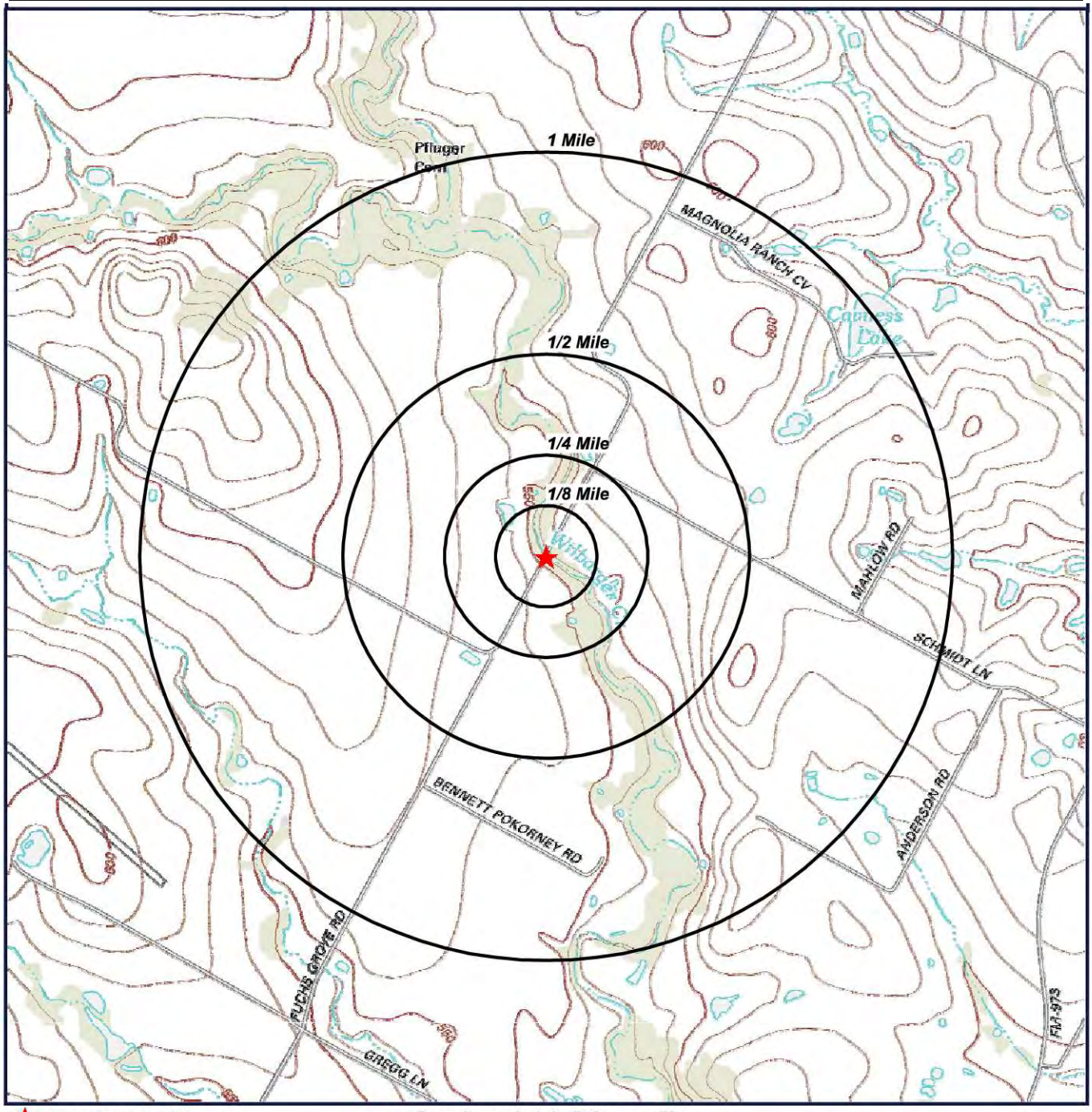
★ Target Property (TP)

Quadrangle(s):
Pflugerville
East
Wilbarger Creek
Watershed
Study
Pflugerville, Texas

N
W E
S

0' 500' 1000' 1500'
SCALE: 1" = 1000'

Topographic Map



Target Property (TP)

Quadrangle(s): Pflugerville East
Source: USGS, 01/08/2013
Wilbarger Creek Watershed Study
Pflugerville, Texas

N
W E
S

0' 1000' 2000' 3000'
SCALE: 1" = 2000'

Located Sites Summary

No Records Found.

Site Summary By Database

No Records Found.

Elevation Summary

Elevations are collected from the USGS 3D Elevation Program 1/3 arc-second (approximately 10 meters) layer hosted at the NGTOC. .

Target Property Elevation: 540 ft.

*NOTE: Standard environmental records are displayed in **bold**.*

No Records Found.

GeoSearch
On time. On target. In touch.™

Radius Report

GeoLens by GeoSearch

Target Property:

Wilbarger Creek Watershed Study
Pflugerville, Travis County, Texas

Prepared For:

Halff-Austin

Order #: 162494
Job #: 401112
Project #: AVO 35837
Date: 03/11/2021

Database Summary

FEDERAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
EMERGENCY RESPONSE NOTIFICATION SYSTEM	ERNSTX	0	0	TP/AP
FEDERAL ENGINEERING INSTITUTIONAL CONTROL SITES	EC	0	0	TP/AP
LAND USE CONTROL INFORMATION SYSTEM	LUCIS	0	0	TP/AP
RCRA SITES WITH CONTROLS	RCRASC	0	0	TP/AP
RESOURCE CONSERVATION & RECOVERY ACT - GENERATOR	RCRAGR06	0	0	0.1250
RESOURCE CONSERVATION & RECOVERY ACT - NON-GENERATOR	RCRANGR06	0	0	0.1250
BROWNFIELDS MANAGEMENT SYSTEM	BF	0	0	0.5000
DELISTED NATIONAL PRIORITIES LIST	DNPL	0	0	0.5000
NO LONGER REGULATED RCRA NON-CORRACTS TSD FACILITIES	NLRRCRAT	0	0	0.5000
RESOURCE CONSERVATION & RECOVERY ACT - NON-CORRACTS TREATMENT, STORAGE & DISPOSAL FACILITIES	RCRAT	0	0	0.5000
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM	SEMS	0	0	0.5000
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM ARCHIVED SITE INVENTORY	SEMSARCH	0	0	0.5000
NATIONAL PRIORITIES LIST	NPL	0	0	1.0000
NO LONGER REGULATED RCRA CORRECTIVE ACTION FACILITIES	NLRRCRAC	0	0	1.0000
PROPOSED NATIONAL PRIORITIES LIST	PNPL	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - CORRECTIVE ACTION FACILITIES	RCRAC	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - SUBJECT TO CORRECTIVE ACTION FACILITIES	RCRASUBC	0	0	1.0000

SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
AEROMETRIC INFORMATION RETRIEVAL SYSTEM / AIR FACILITY SUBSYSTEM	AIRSAFS	0	0	TP/AP
BIENNIAL REPORTING SYSTEM	BRS	0	0	TP/AP
CERCLIS LIENS	SFLIENS	0	0	TP/AP
CLANDESTINE DRUG LABORATORY LOCATIONS	CDL	0	0	TP/AP
EPA DOCKET DATA	DOCKETS	0	0	TP/AP
ENFORCEMENT AND COMPLIANCE HISTORY INFORMATION	ECHOR06	0	0	TP/AP
FACILITY REGISTRY SYSTEM	FRSTX	0	0	TP/AP

Database Summary

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
HAZARDOUS MATERIALS INCIDENT REPORTING SYSTEM	HMIRSR06	0	0	TP/AP
HAZARDOUS WASTE COMPLIANCE DOCKET FACILITIES	HWCD	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM (FORMERLY DOCKETS)	ICIS	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	ICISNPDES	0	0	TP/AP
MATERIAL LICENSING TRACKING SYSTEM	MLTS	0	0	TP/AP
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	NPDESR06	0	0	TP/AP
PCB ACTIVITY DATABASE SYSTEM	PADS	0	0	TP/AP
PERMIT COMPLIANCE SYSTEM	PCSR06	0	0	TP/AP
SEMS LIEN ON PROPERTY	SEMSLIENS	0	0	TP/AP
SSEHRI PFAS CONTAMINATION SITES	SSEHRIPFAS	0	0	TP/AP
SECTION SEVEN TRACKING SYSTEM	SSTS	0	0	TP/AP
TOXIC SUBSTANCE CONTROL ACT INVENTORY	TSCA	0	0	TP/AP
TOXICS RELEASE INVENTORY	TRI	0	0	TP/AP
ALTERNATIVE FUELING STATIONS	ALTFUELS	0	0	0.2500
FEMA OWNED STORAGE TANKS	FEMAUST	0	0	0.2500
HISTORICAL GAS STATIONS	HISTPST	0	0	0.2500
INTEGRATED COMPLIANCE INFORMATION SYSTEM DRYCLEANERS	ICISCLEANERS	0	0	0.2500
MINE SAFETY AND HEALTH ADMINISTRATION MASTER INDEX FILE	MSHA	0	0	0.2500
MINERAL RESOURCE DATA SYSTEM	MRDS	0	0	0.2500
OPEN DUMP INVENTORY	ODI	0	0	0.5000
SURFACE MINING CONTROL AND RECLAMATION ACT SITES	SMCRA	0	0	0.5000
URANIUM MILL TAILINGS RADIATION CONTROL ACT SITES	USUMTRCA	0	0	0.5000
DEPARTMENT OF DEFENSE SITES	DOD	0	0	1.0000
FORMER MILITARY NIKE MISSILE SITES	NMS	0	0	1.0000
FORMERLY USED DEFENSE SITES	FUDS	0	0	1.0000
FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM	FUSRAP	0	0	1.0000
RECORD OF DECISION SYSTEM	RODS	0	0	1.0000
SUB-TOTAL		0	0	

Database Summary

STATE (TX) LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
STATE INSTITUTIONAL/ENGINEERING CONTROL SITES	SIEC01	0	0	TP/AP
PETROLEUM STORAGE TANKS	PST	0	0	0.2500
BROWNFIELDS SITE ASSESSMENTS	BSA	0	0	0.5000
CLOSED & ABANDONED LANDFILL INVENTORY	CALF	0	0	0.5000
COMMERCIAL MANAGEMENT FACILITIES FOR HAZARDOUS WASTE AND INDUSTRIAL SOLID WASTES	WSTMGMT	0	0	0.5000
LEAKING PETROLEUM STORAGE TANKS	LPST	0	0	0.5000
MUNICIPAL SOLID WASTE LANDFILL SITES	MSWLF	0	0	0.5000
OPERATOR CLEANUP PROGRAM SITES	OCP	0	0	0.5000
RAILROAD COMMISSION VCP AND BROWNFIELD SITES	RRCVCP	0	0	0.5000
VOLUNTARY CLEANUP PROGRAM SITES	VCP	0	0	0.5000
STATE SUPERFUND SITES	SF	0	0	1.0000

SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
GROUNDWATER CONTAMINATION CASES	GWCC	0	0	TP/AP
HISTORIC GROUNDWATER CONTAMINATION CASES	HISTGWCC	0	0	TP/AP
LAND APPLICATION PERMITS	LANDAPP	0	0	TP/AP
MUNICIPAL SETTING DESIGNATIONS	MSD	0	0	TP/AP
NOTICE OF VIOLATIONS	NOV	0	0	TP/AP
SPILLS LISTING	SPILLS	0	0	TP/AP
TCEQ LIENS	LIENS	0	0	TP/AP
TIER I I CHEMICAL REPORTING PROGRAM FACILITIES	TIERII	0	0	TP/AP
DRY CLEANER REGISTRATION DATABASE	DCR	0	0	0.2500
INDUSTRIAL AND HAZARDOUS WASTE SITES	IHW	0	0	0.2500
PERMITTED INDUSTRIAL HAZARDOUS WASTE SITES	PIHW	0	0	0.2500
AFFECTED PROPERTY ASSESSMENT REPORTS	APAR	0	0	0.5000
DRY CLEANER REMEDIATION PROGRAM SITES	DCRPS	0	0	0.5000
INNOCENT OWNER / OPERATOR DATABASE	IOP	0	0	0.5000
RADIOACTIVE WASTE SITES	RWS	0	0	0.5000
RECYCLING FACILITIES	WMRF	0	0	0.5000
SALT CAVERNS FOR PETROLEUM STORAGE	STCV	0	0	0.5000

Database Summary

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
INDUSTRIAL AND HAZARDOUS WASTE CORRECTIVE ACTION SITES	IHWCA	0	0	1.0000
SUB-TOTAL		0	0	

Database Summary

LOCAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
CITY OF AUSTIN UNDERGROUND STORAGE TANKS	AUSTINUST	0	0	0.2500
SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
EDWARDS AQUIFER PERMITS	EAP	0	0	TP/AP
CITY OF AUSTIN HISTORICAL UNDERGROUND STORAGE TANKS	AUSTINHISTUST	0	0	0.2500
SUB-TOTAL		0	0	

TRIBAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	USTR06	0	0	0.2500
LEAKING UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	LUSTR06	0	0	0.5000
OPEN DUMP INVENTORY ON TRIBAL LANDS	ODINDIAN	0	0	0.5000
SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
INDIAN RESERVATIONS	INDIANRES	0	0	1.0000
SUB-TOTAL		0	0	
TOTAL		0	0	

Database Radius Summary

FEDERAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
AIRSAFS	0.0200	0	NS	NS	NS	NS	NS	0
BRS	0.0200	0	NS	NS	NS	NS	NS	0
CDL	0.0200	0	NS	NS	NS	NS	NS	0
DOCKETS	0.0200	0	NS	NS	NS	NS	NS	0
EC	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
ECHOR06	0.0200	0	NS	NS	NS	NS	NS	0
ERNSTX	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
FRSTX	0.0200	0	NS	NS	NS	NS	NS	0
HMIRSR06	0.0200	0	NS	NS	NS	NS	NS	0
HWCD	0.0200	0	NS	NS	NS	NS	NS	0
ICIS	0.0200	0	NS	NS	NS	NS	NS	0
ICISNPDES	0.0200	0	NS	NS	NS	NS	NS	0
LUCIS	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
MLTS	0.0200	0	NS	NS	NS	NS	NS	0
NPDESR06	0.0200	0	NS	NS	NS	NS	NS	0
PADS	0.0200	0	NS	NS	NS	NS	NS	0
PCSR06	0.0200	0	NS	NS	NS	NS	NS	0
RCRASC	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
SEMSLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SFLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SSEHRIPFAS	0.0200	0	NS	NS	NS	NS	NS	0
SSTS	0.0200	0	NS	NS	NS	NS	NS	0
TRI	0.0200	0	NS	NS	NS	NS	NS	0
TSCA	0.0200	0	NS	NS	NS	NS	NS	0
RCRAGR06	**0.1250**	**0**	**0**	**NS**	**NS**	**NS**	**NS**	**0**
RCRANGR06	**0.1250**	**0**	**0**	**NS**	**NS**	**NS**	**NS**	**0**
ALTFUELS	0.2500	0	0	0	NS	NS	NS	0
FEMAUST	0.2500	0	0	0	NS	NS	NS	0
HISTPST	0.2500	0	0	0	NS	NS	NS	0
ICISCLEANERS	0.2500	0	0	0	NS	NS	NS	0
MRDS	0.2500	0	0	0	NS	NS	NS	0
MSHA	0.2500	0	0	0	NS	NS	NS	0
BF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
DNPL	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
NLRRCRAT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**

Database Radius Summary

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
ODI	0.5000	0	0	0	0	NS	NS	0
RCRAT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SEMS	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SEMSARCH	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SMCRA	0.5000	0	0	0	0	NS	NS	0
USUMTRCA	0.5000	0	0	0	0	NS	NS	0
DOD	1.0000	0	0	0	0	0	NS	0
FUDS	1.0000	0	0	0	0	0	NS	0
FUSRAP	1.0000	0	0	0	0	0	NS	0
NLRRCRAC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
NMS	1.0000	0	0	0	0	0	NS	0
NPL	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
PNPL	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RCRAC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RCRASUBC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RODS	1.0000	0	0	0	0	0	NS	0
SUB-TOTAL		0	0	0	0	0	0	0

Database Radius Summary

STATE (TX) LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
GWCC	0.0200	0	NS	NS	NS	NS	NS	0
HISTGWCC	0.0200	0	NS	NS	NS	NS	NS	0
LANDAPP	0.0200	0	NS	NS	NS	NS	NS	0
LIENS	0.0200	0	NS	NS	NS	NS	NS	0
MSD	0.0200	0	NS	NS	NS	NS	NS	0
NOV	0.0200	0	NS	NS	NS	NS	NS	0
SIEC01	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
SPILLS	0.0200	0	NS	NS	NS	NS	NS	0
TIERII	0.0200	0	NS	NS	NS	NS	NS	0
DCR	0.2500	0	0	0	NS	NS	NS	0
IHW	0.2500	0	0	0	NS	NS	NS	0
PIHW	0.2500	0	0	0	NS	NS	NS	0
PST	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**
APAR	0.5000	0	0	0	0	NS	NS	0
BSA	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
CALF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
DCRPS	0.5000	0	0	0	0	NS	NS	0
IOP	0.5000	0	0	0	0	NS	NS	0
LPST	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
MSWLF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
OCP	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
RRCVCP	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
RWS	0.5000	0	0	0	0	NS	NS	0
STCV	0.5000	0	0	0	0	NS	NS	0
VCP	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
WMRF	0.5000	0	0	0	0	NS	NS	0
WSTMGMT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
IHWCA	1.0000	0	0	0	0	0	NS	0
SF	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**

SUB-TOTAL		0	0	0	0	0	0	0

Database Radius Summary

LOCAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
EAP	0.0200	0	NS	NS	NS	NS	NS	0
AUSTINHISTUST	0.2500	0	0	0	NS	NS	NS	0
AUSTINUST	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**

SUB-TOTAL		0	0	0	0	0	0	0

Database Radius Summary

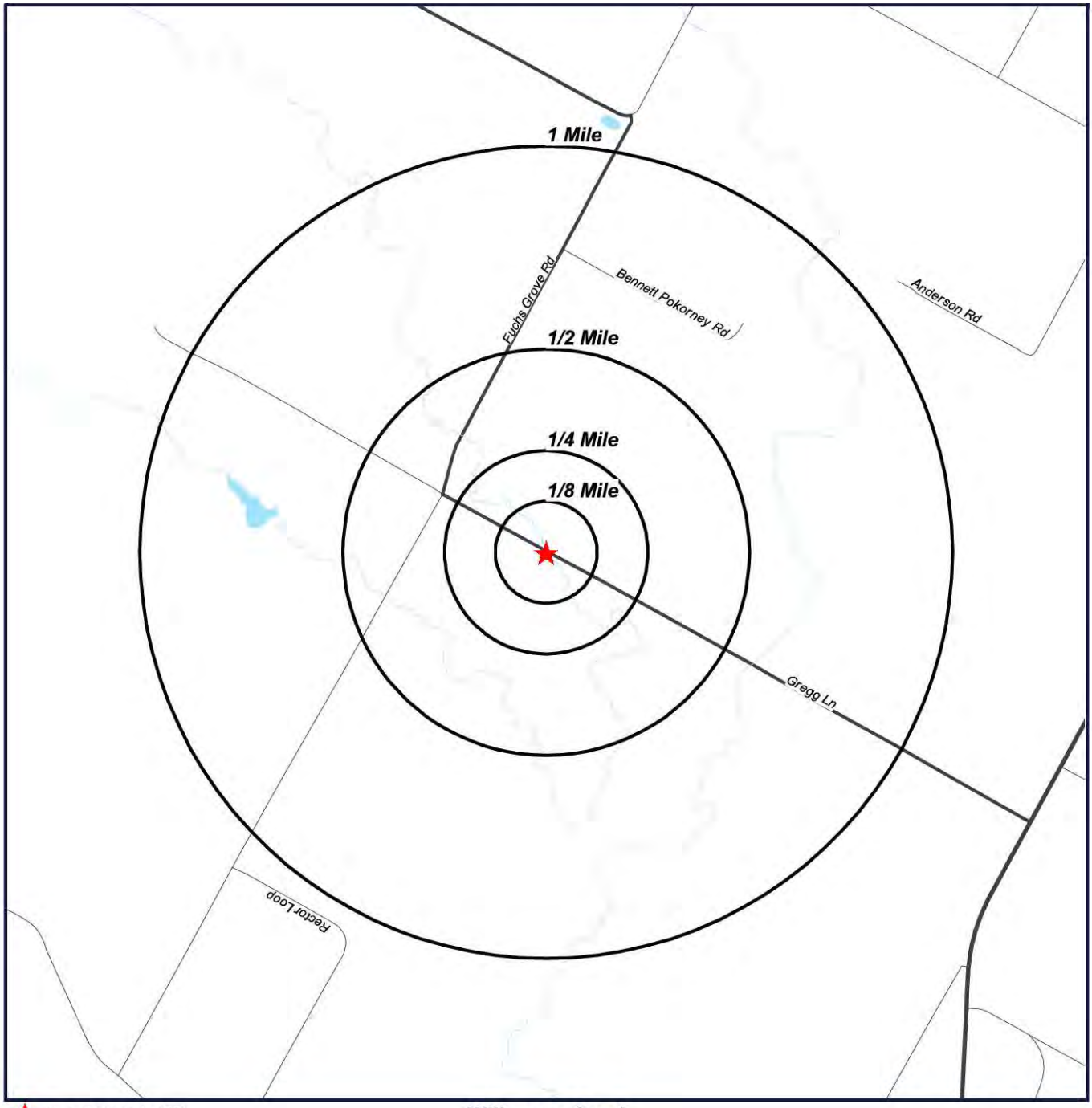
TRIBAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
USTR06	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**
LUSTR06	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
ODINDIAN	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
INDIANRES	1.0000	0	0	0	0	0	NS	0
SUB-TOTAL		0	0	0	0	0	0	0
TOTAL		0	0	0	0	0	0	0

NOTES:
NS = NOT SEARCHED
TP/AP = TARGET PROPERTY/ADJACENT PROPERTY

Radius Map 1



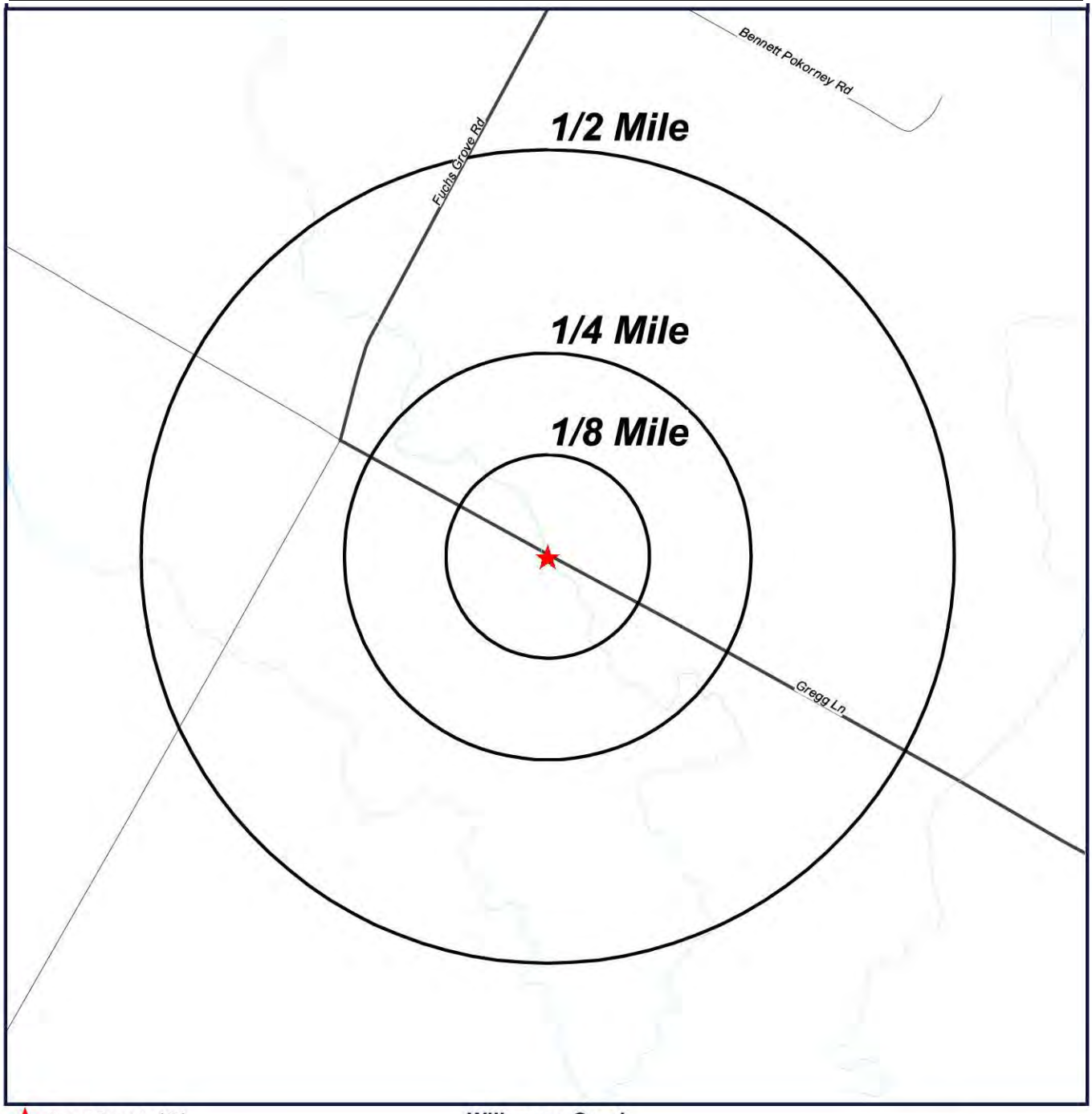
Target Property (TP)

Wilbarger Creek Watershed Study
Pflugerville, Texas

N
W E
S

0' 1000' 2000' 3000'
SCALE: 1" = 2000'

Radius Map 2



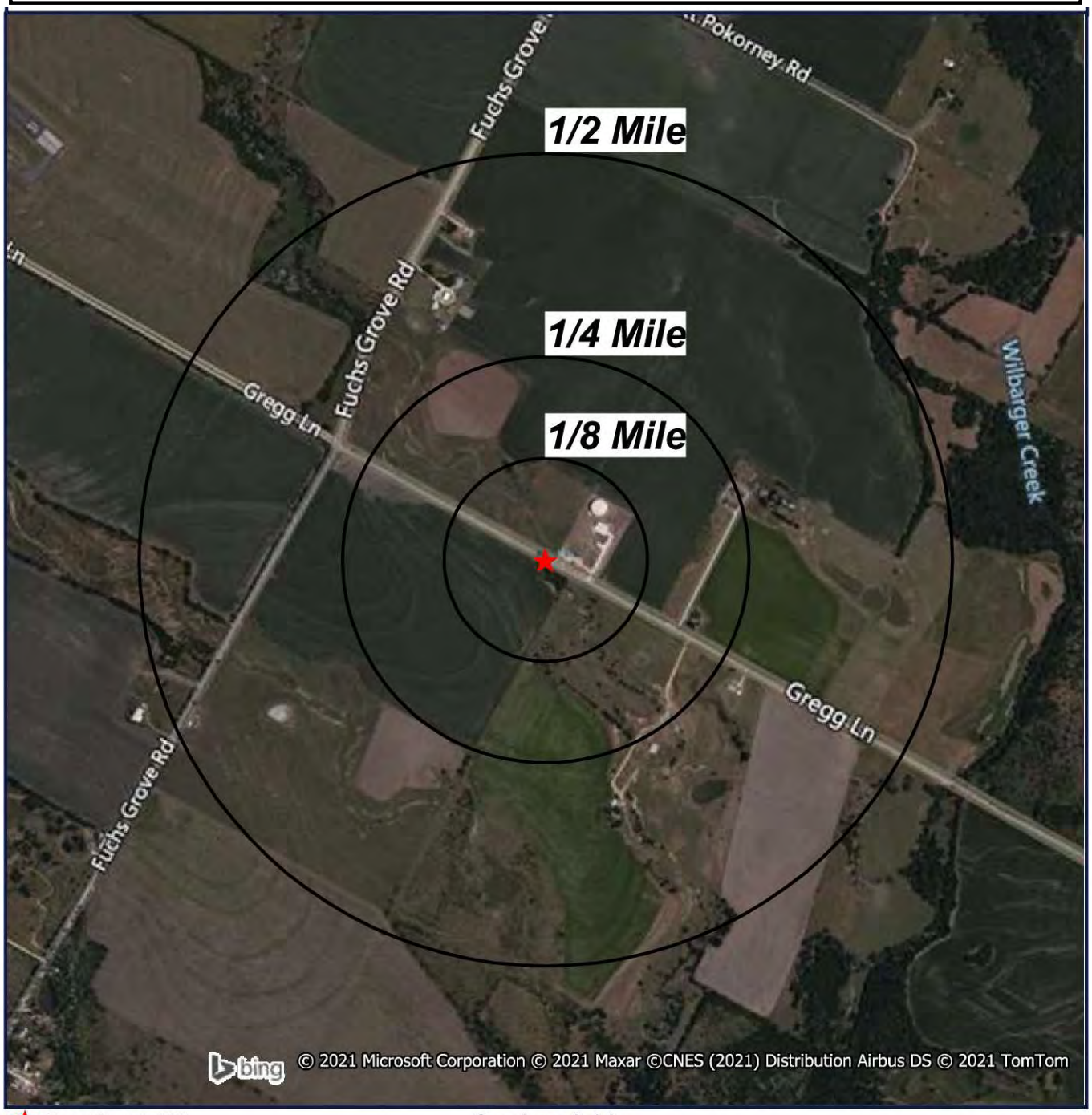
Target Property (TP)

Wilbarger Creek Watershed Study
Pflugerville, Texas

N
W E
S

0' 500' 1000' 1500'
SCALE: 1" = 1000'

Ortho Map



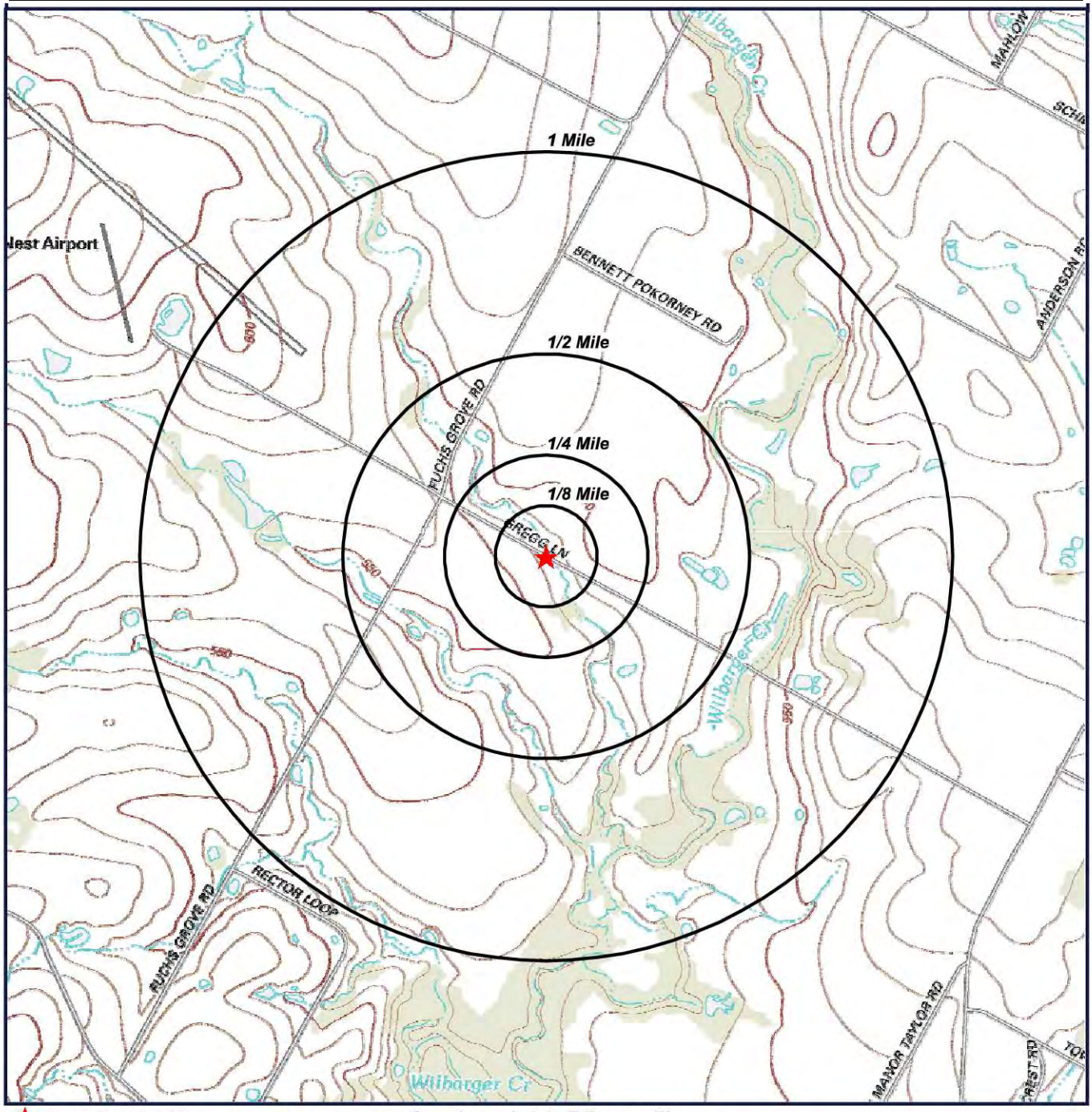
Target Property (TP)

Quadrangle(s):
Pflugerville
East
Wilbarger Creek
Watershed
Study
Pflugerville, Texas

N
W E
S

0' 500' 1000' 1500'
SCALE: 1" = 1000'

Topographic Map



★ Target Property (TP)

Quadrangle(s): Pflugerville East
Source: USGS, 01/08/2013
Wilbarger Creek Watershed Study
Pflugerville, Texas

N
W E
S

0' 1000' 2000' 3000'
SCALE: 1" = 2000'

Located Sites Summary

No Records Found.

Site Summary By Database

No Records Found.

Elevation Summary

Elevations are collected from the USGS 3D Elevation Program 1/3 arc-second (approximately 10 meters) layer hosted at the NGTOC. .

Target Property Elevation: 538 ft.

*NOTE: Standard environmental records are displayed in **bold**.*

No Records Found.

Unlocated Sites Summary

This list contains sites that could not be mapped due to limited or incomplete address information.

No Records Found

Radius Report

GeoLens by GeoSearch

Target Property:

Wilbarger Creek Watershed Study
Pflugerville, Travis County, Texas

Prepared For:

Halff-Austin

Order #: 162495
Job #: 401116
Project #: AVO 35837
Date: 03/11/2021

Database Summary

FEDERAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
EMERGENCY RESPONSE NOTIFICATION SYSTEM	ERNSTX	0	0	TP/AP
FEDERAL ENGINEERING INSTITUTIONAL CONTROL SITES	EC	0	0	TP/AP
LAND USE CONTROL INFORMATION SYSTEM	LUCIS	0	0	TP/AP
RCRA SITES WITH CONTROLS	RCRASC	0	0	TP/AP
RESOURCE CONSERVATION & RECOVERY ACT - GENERATOR	RCRAGR06	0	0	0.1250
RESOURCE CONSERVATION & RECOVERY ACT - NON-GENERATOR	RCRANGR06	0	0	0.1250
BROWNFIELDS MANAGEMENT SYSTEM	BF	0	0	0.5000
DELISTED NATIONAL PRIORITIES LIST	DNPL	0	0	0.5000
NO LONGER REGULATED RCRA NON-CORRACTS TSD FACILITIES	NLRRCRAT	0	0	0.5000
RESOURCE CONSERVATION & RECOVERY ACT - NON-CORRACTS TREATMENT, STORAGE & DISPOSAL FACILITIES	RCRAT	0	0	0.5000
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM	SEMS	0	0	0.5000
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM ARCHIVED SITE INVENTORY	SEMSARCH	0	0	0.5000
NATIONAL PRIORITIES LIST	NPL	0	0	1.0000
NO LONGER REGULATED RCRA CORRECTIVE ACTION FACILITIES	NLRRCRAC	0	0	1.0000
PROPOSED NATIONAL PRIORITIES LIST	PNPL	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - CORRECTIVE ACTION FACILITIES	RCRAC	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - SUBJECT TO CORRECTIVE ACTION FACILITIES	RCRASUBC	0	0	1.0000

SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
AEROMETRIC INFORMATION RETRIEVAL SYSTEM / AIR FACILITY SUBSYSTEM	AIRSAFS	0	0	TP/AP
BIENNIAL REPORTING SYSTEM	BRS	0	0	TP/AP
CERCLIS LIENS	SFLIENS	0	0	TP/AP
CLANDESTINE DRUG LABORATORY LOCATIONS	CDL	0	0	TP/AP
EPA DOCKET DATA	DOCKETS	0	0	TP/AP
ENFORCEMENT AND COMPLIANCE HISTORY INFORMATION	ECHOR06	0	0	TP/AP
FACILITY REGISTRY SYSTEM	FRSTX	0	0	TP/AP

Database Summary

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
HAZARDOUS MATERIALS INCIDENT REPORTING SYSTEM	HMIRSR06	0	0	TP/AP
HAZARDOUS WASTE COMPLIANCE DOCKET FACILITIES	HWCD	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM (FORMERLY DOCKETS)	ICIS	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	ICISNPDES	0	0	TP/AP
MATERIAL LICENSING TRACKING SYSTEM	MLTS	0	0	TP/AP
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	NPDESR06	0	0	TP/AP
PCB ACTIVITY DATABASE SYSTEM	PADS	0	0	TP/AP
PERMIT COMPLIANCE SYSTEM	PCSR06	0	0	TP/AP
SEMS LIEN ON PROPERTY	SEMSLIENS	0	0	TP/AP
SSEHRI PFAS CONTAMINATION SITES	SSEHRIPFAS	0	0	TP/AP
SECTION SEVEN TRACKING SYSTEM	SSTS	0	0	TP/AP
TOXIC SUBSTANCE CONTROL ACT INVENTORY	TSCA	0	0	TP/AP
TOXICS RELEASE INVENTORY	TRI	0	0	TP/AP
ALTERNATIVE FUELING STATIONS	ALTFUELS	0	0	0.2500
FEMA OWNED STORAGE TANKS	FEMAUST	0	0	0.2500
HISTORICAL GAS STATIONS	HISTPST	0	0	0.2500
INTEGRATED COMPLIANCE INFORMATION SYSTEM DRYCLEANERS	ICISCLEANERS	0	0	0.2500
MINE SAFETY AND HEALTH ADMINISTRATION MASTER INDEX FILE	MSHA	0	0	0.2500
MINERAL RESOURCE DATA SYSTEM	MRDS	0	0	0.2500
OPEN DUMP INVENTORY	ODI	0	0	0.5000
SURFACE MINING CONTROL AND RECLAMATION ACT SITES	SMCRA	0	0	0.5000
URANIUM MILL TAILINGS RADIATION CONTROL ACT SITES	USUMTRCA	0	0	0.5000
DEPARTMENT OF DEFENSE SITES	DOD	0	0	1.0000
FORMER MILITARY NIKE MISSILE SITES	NMS	0	0	1.0000
FORMERLY USED DEFENSE SITES	FUDS	0	0	1.0000
FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM	FUSRAP	0	0	1.0000
RECORD OF DECISION SYSTEM	RODS	0	0	1.0000

SUB-TOTAL		0	0	

Database Summary

STATE (TX) LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
STATE INSTITUTIONAL/ENGINEERING CONTROL SITES	SIEC01	0	0	TP/AP
PETROLEUM STORAGE TANKS	PST	0	0	0.2500
BROWNFIELDS SITE ASSESSMENTS	BSA	0	0	0.5000
CLOSED & ABANDONED LANDFILL INVENTORY	CALF	0	0	0.5000
COMMERCIAL MANAGEMENT FACILITIES FOR HAZARDOUS WASTE AND INDUSTRIAL SOLID WASTES	WSTMGMT	0	0	0.5000
LEAKING PETROLEUM STORAGE TANKS	LPST	0	0	0.5000
MUNICIPAL SOLID WASTE LANDFILL SITES	MSWLF	0	0	0.5000
OPERATOR CLEANUP PROGRAM SITES	OCP	0	0	0.5000
RAILROAD COMMISSION VCP AND BROWNFIELD SITES	RRCVCP	0	0	0.5000
VOLUNTARY CLEANUP PROGRAM SITES	VCP	0	0	0.5000
STATE SUPERFUND SITES	SF	0	0	1.0000

SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
GROUNDWATER CONTAMINATION CASES	GWCC	0	0	TP/AP
HISTORIC GROUNDWATER CONTAMINATION CASES	HISTGWCC	0	0	TP/AP
LAND APPLICATION PERMITS	LANDAPP	0	0	TP/AP
MUNICIPAL SETTING DESIGNATIONS	MSD	0	0	TP/AP
NOTICE OF VIOLATIONS	NOV	0	0	TP/AP
SPILLS LISTING	SPILLS	0	0	TP/AP
TCEQ LIENS	LIENS	0	0	TP/AP
TIER I I CHEMICAL REPORTING PROGRAM FACILITIES	TIERII	0	0	TP/AP
DRY CLEANER REGISTRATION DATABASE	DCR	0	0	0.2500
INDUSTRIAL AND HAZARDOUS WASTE SITES	IHW	0	0	0.2500
PERMITTED INDUSTRIAL HAZARDOUS WASTE SITES	PIHW	0	0	0.2500
AFFECTED PROPERTY ASSESSMENT REPORTS	APAR	0	0	0.5000
DRY CLEANER REMEDIATION PROGRAM SITES	DCRPS	0	0	0.5000
INNOCENT OWNER / OPERATOR DATABASE	IOP	0	0	0.5000
RADIOACTIVE WASTE SITES	RWS	0	0	0.5000
RECYCLING FACILITIES	WMRF	0	0	0.5000
SALT CAVERNS FOR PETROLEUM STORAGE	STCV	0	0	0.5000

Database Summary

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
INDUSTRIAL AND HAZARDOUS WASTE CORRECTIVE ACTION SITES	IHWCA	0	0	1.0000
SUB-TOTAL		0	0	

Database Summary

LOCAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
CITY OF AUSTIN UNDERGROUND STORAGE TANKS	AUSTINUST	0	0	0.2500
SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
EDWARDS AQUIFER PERMITS	EAP	0	0	TP/AP
CITY OF AUSTIN HISTORICAL UNDERGROUND STORAGE TANKS	AUSTINHISTUST	0	0	0.2500
SUB-TOTAL		0	0	

TRIBAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	USTR06	0	0	0.2500
LEAKING UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	LUSTR06	0	0	0.5000
OPEN DUMP INVENTORY ON TRIBAL LANDS	ODINDIAN	0	0	0.5000
SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
INDIAN RESERVATIONS	INDIANRES	0	0	1.0000
SUB-TOTAL		0	0	
TOTAL		0	0	

Database Radius Summary

FEDERAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
AIRSAFS	0.0200	0	NS	NS	NS	NS	NS	0
BRS	0.0200	0	NS	NS	NS	NS	NS	0
CDL	0.0200	0	NS	NS	NS	NS	NS	0
DOCKETS	0.0200	0	NS	NS	NS	NS	NS	0
EC	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
ECHOR06	0.0200	0	NS	NS	NS	NS	NS	0
ERNSTX	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
FRSTX	0.0200	0	NS	NS	NS	NS	NS	0
HMIRSR06	0.0200	0	NS	NS	NS	NS	NS	0
HWCD	0.0200	0	NS	NS	NS	NS	NS	0
ICIS	0.0200	0	NS	NS	NS	NS	NS	0
ICISNPDES	0.0200	0	NS	NS	NS	NS	NS	0
LUCIS	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
MLTS	0.0200	0	NS	NS	NS	NS	NS	0
NPDESR06	0.0200	0	NS	NS	NS	NS	NS	0
PADS	0.0200	0	NS	NS	NS	NS	NS	0
PCSR06	0.0200	0	NS	NS	NS	NS	NS	0
RCRASC	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
SEMSLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SFLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SSEHRIPFAS	0.0200	0	NS	NS	NS	NS	NS	0
SSTS	0.0200	0	NS	NS	NS	NS	NS	0
TRI	0.0200	0	NS	NS	NS	NS	NS	0
TSCA	0.0200	0	NS	NS	NS	NS	NS	0
RCRAGR06	**0.1250**	**0**	**0**	**NS**	**NS**	**NS**	**NS**	**0**
RCRANGR06	**0.1250**	**0**	**0**	**NS**	**NS**	**NS**	**NS**	**0**
ALTFUELS	0.2500	0	0	0	NS	NS	NS	0
FEMAUST	0.2500	0	0	0	NS	NS	NS	0
HISTPST	0.2500	0	0	0	NS	NS	NS	0
ICISCLEANERS	0.2500	0	0	0	NS	NS	NS	0
MRDS	0.2500	0	0	0	NS	NS	NS	0
MSHA	0.2500	0	0	0	NS	NS	NS	0
BF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
DNPL	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
NLRRCRAT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**

Database Radius Summary

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
ODI	0.5000	0	0	0	0	NS	NS	0
RCRAT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SEMS	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SEMSARCH	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SMCRA	0.5000	0	0	0	0	NS	NS	0
USUMTRCA	0.5000	0	0	0	0	NS	NS	0
DOD	1.0000	0	0	0	0	0	NS	0
FUDS	1.0000	0	0	0	0	0	NS	0
FUSRAP	1.0000	0	0	0	0	0	NS	0
NLRRCRAC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
NMS	1.0000	0	0	0	0	0	NS	0
NPL	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
PNPL	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RCRAC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RCRASUBC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RODS	1.0000	0	0	0	0	0	NS	0
SUB-TOTAL		0	0	0	0	0	0	0

Database Radius Summary

STATE (TX) LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
GWCC	0.0200	0	NS	NS	NS	NS	NS	0
HISTGWCC	0.0200	0	NS	NS	NS	NS	NS	0
LANDAPP	0.0200	0	NS	NS	NS	NS	NS	0
LIENS	0.0200	0	NS	NS	NS	NS	NS	0
MSD	0.0200	0	NS	NS	NS	NS	NS	0
NOV	0.0200	0	NS	NS	NS	NS	NS	0
SIEC01	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
SPILLS	0.0200	0	NS	NS	NS	NS	NS	0
TIERII	0.0200	0	NS	NS	NS	NS	NS	0
DCR	0.2500	0	0	0	NS	NS	NS	0
IHW	0.2500	0	0	0	NS	NS	NS	0
PIHW	0.2500	0	0	0	NS	NS	NS	0
PST	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**
APAR	0.5000	0	0	0	0	NS	NS	0
BSA	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
CALF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
DCRPS	0.5000	0	0	0	0	NS	NS	0
IOP	0.5000	0	0	0	0	NS	NS	0
LPST	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
MSWLF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
OCP	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
RRCVCP	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
RWS	0.5000	0	0	0	0	NS	NS	0
STCV	0.5000	0	0	0	0	NS	NS	0
VCP	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
WMRF	0.5000	0	0	0	0	NS	NS	0
WSTMGMT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
IHWCA	1.0000	0	0	0	0	0	NS	0
SF	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**

SUB-TOTAL		0	0	0	0	0	0	0

Database Radius Summary

LOCAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
EAP	0.0200	0	NS	NS	NS	NS	NS	0
AUSTINHISTUST	0.2500	0	0	0	NS	NS	NS	0
AUSTINUST	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**

SUB-TOTAL		0	0	0	0	0	0	0

Database Radius Summary

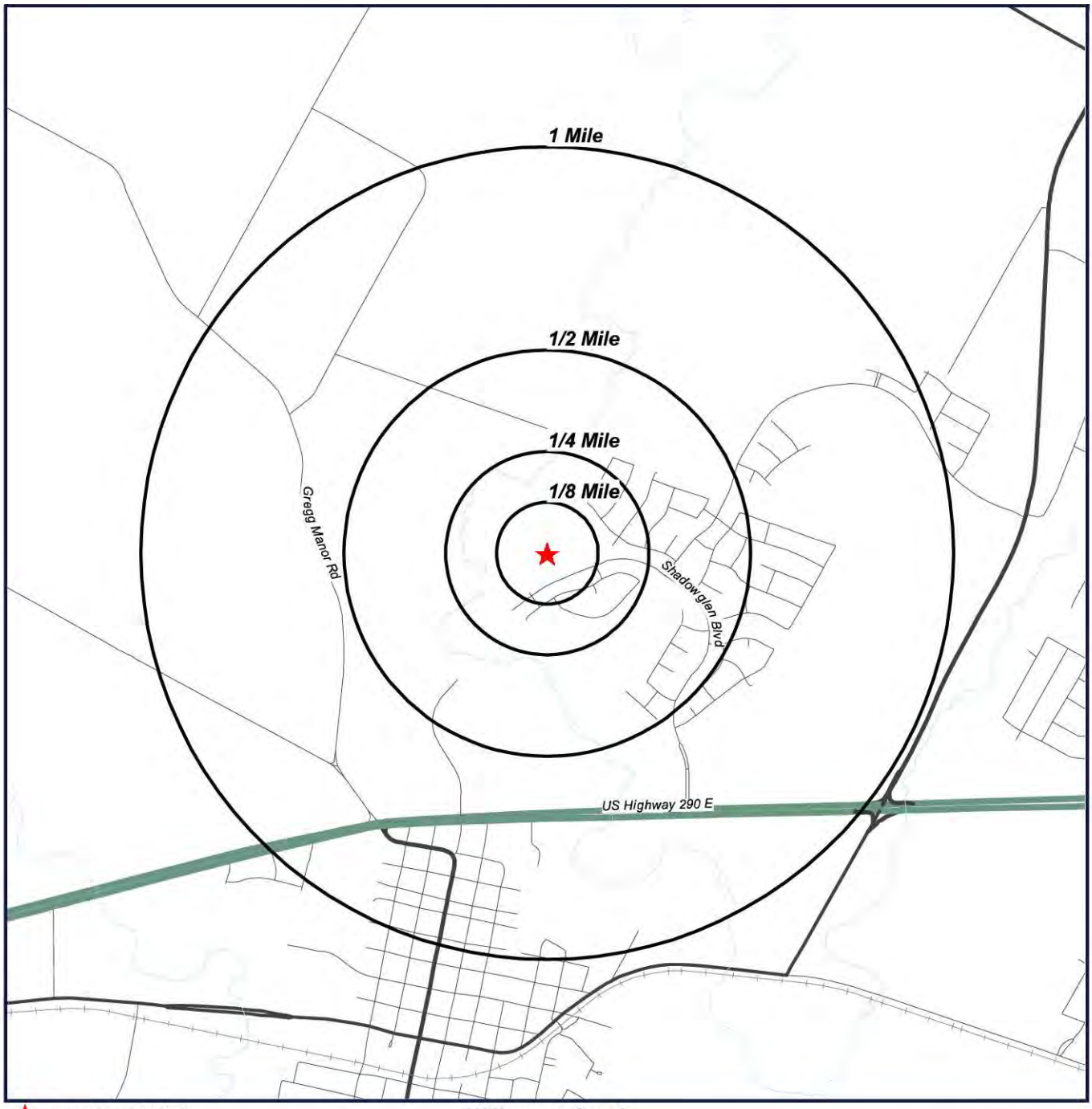
TRIBAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
USTR06	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**
LUSTR06	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
ODINDIAN	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
INDIANRES	1.0000	0	0	0	0	0	NS	0
SUB-TOTAL		0	0	0	0	0	0	0
TOTAL		0	0	0	0	0	0	0

NOTES:
NS = NOT SEARCHED
TP/AP = TARGET PROPERTY/ADJACENT PROPERTY

Radius Map 1



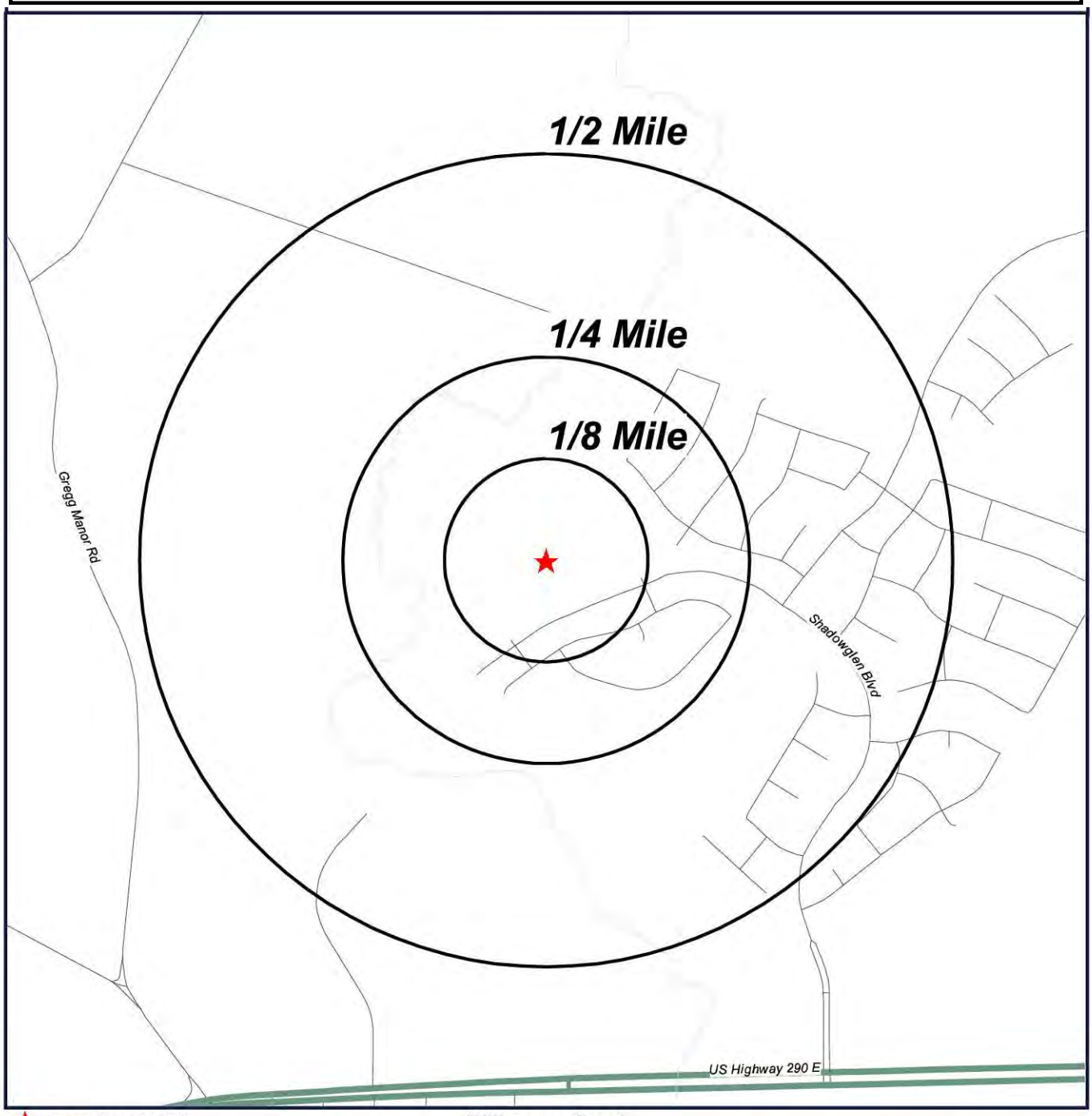
Target Property (TP)

Wilbarger Creek Watershed Study Pflugerville, Texas

N
W E
S

0' 1000' 2000' 3000'
SCALE: 1" = 2000'

Radius Map 2



Target Property (TP)

Wilbarger Creek Watershed Study
Pflugerville, Texas

N
W E
S

0' 500' 1000' 1500'
SCALE: 1" = 1000'

Ortho Map

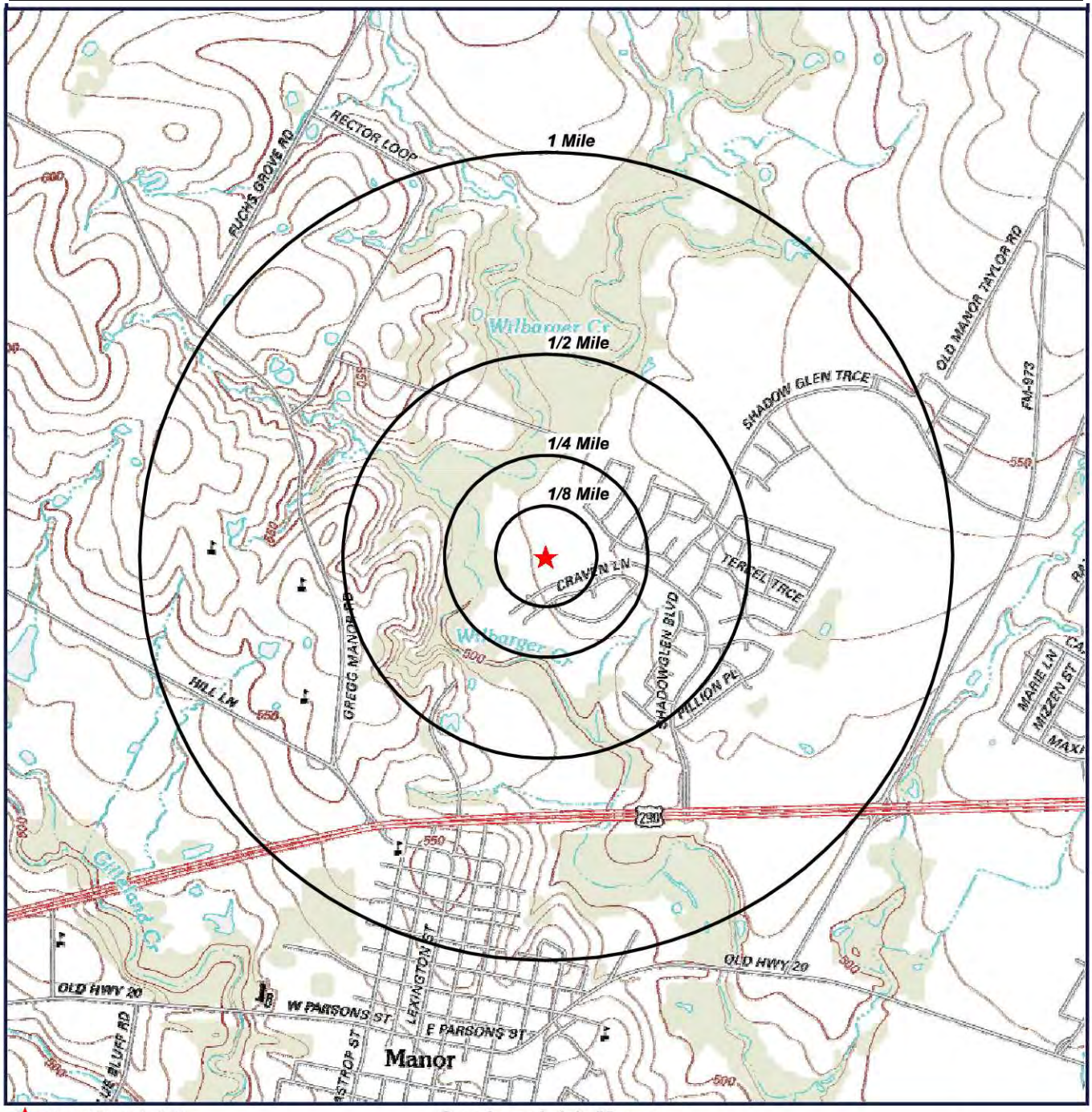
★ Target Property (TP)

Quadrangle(s): Manor
Wilbarger Creek
Watershed
Study
Pflugerville, Texas

N
W E
S

0' 500' 1000' 1500'
SCALE: 1" = 1000'

Topographic Map



★ Target Property (TP)

Quadrangle(s): Manor
Source: USGS,
01/08/2013
Wilbarger Creek
Watershed
Study
Pflugerville, Texas

N
W E
S

0' 1000' 2000' 3000'
SCALE: 1" = 2000'

Located Sites Summary

No Records Found.

Site Summary By Database

No Records Found.

Elevation Summary

Elevations are collected from the USGS 3D Elevation Program 1/3 arc-second (approximately 10 meters) layer hosted at the NGTOC. .

Target Property Elevation: 518 ft.

*NOTE: Standard environmental records are displayed in **bold**.*

No Records Found.

Unlocated Sites Summary

This list contains sites that could not be mapped due to limited or incomplete address information.

No Records Found

Radius Report

GeoLens by GeoSearch

Target Property:

Wilbarger Creek Watershed Study
Pflugerville, Travis County, Texas

Prepared For:

Halff-Austin

Order #: 162496
Job #: 401120
Project #: AVO 35837
Date: 03/11/2021

Database Summary

FEDERAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
EMERGENCY RESPONSE NOTIFICATION SYSTEM	ERNSTX	0	0	TP/AP
FEDERAL ENGINEERING INSTITUTIONAL CONTROL SITES	EC	0	0	TP/AP
LAND USE CONTROL INFORMATION SYSTEM	LUCIS	0	0	TP/AP
RCRA SITES WITH CONTROLS	RCRASC	0	0	TP/AP
RESOURCE CONSERVATION & RECOVERY ACT - GENERATOR	RCRAGR06	0	0	0.1250
RESOURCE CONSERVATION & RECOVERY ACT - NON-GENERATOR	RCRANGR06	0	0	0.1250
BROWNFIELDS MANAGEMENT SYSTEM	BF	0	0	0.5000
DELISTED NATIONAL PRIORITIES LIST	DNPL	0	0	0.5000
NO LONGER REGULATED RCRA NON-CORRACTS TSD FACILITIES	NLRRCRAT	0	0	0.5000
RESOURCE CONSERVATION & RECOVERY ACT - NON-CORRACTS TREATMENT, STORAGE & DISPOSAL FACILITIES	RCRAT	0	0	0.5000
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM	SEMS	0	0	0.5000
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM ARCHIVED SITE INVENTORY	SEMSARCH	0	0	0.5000
NATIONAL PRIORITIES LIST	NPL	0	0	1.0000
NO LONGER REGULATED RCRA CORRECTIVE ACTION FACILITIES	NLRRCRAC	0	0	1.0000
PROPOSED NATIONAL PRIORITIES LIST	PNPL	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - CORRECTIVE ACTION FACILITIES	RCRAC	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - SUBJECT TO CORRECTIVE ACTION FACILITIES	RCRASUBC	0	0	1.0000

SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
AEROMETRIC INFORMATION RETRIEVAL SYSTEM / AIR FACILITY SUBSYSTEM	AIRSAFS	0	0	TP/AP
BIENNIAL REPORTING SYSTEM	BRS	0	0	TP/AP
CERCLIS LIENS	SFLIENS	0	0	TP/AP
CLANDESTINE DRUG LABORATORY LOCATIONS	CDL	0	0	TP/AP
EPA DOCKET DATA	DOCKETS	0	0	TP/AP
ENFORCEMENT AND COMPLIANCE HISTORY INFORMATION	ECHOR06	0	0	TP/AP
FACILITY REGISTRY SYSTEM	FRSTX	0	0	TP/AP

Database Summary

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
HAZARDOUS MATERIALS INCIDENT REPORTING SYSTEM	HMIRSR06	0	0	TP/AP
HAZARDOUS WASTE COMPLIANCE DOCKET FACILITIES	HWCD	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM (FORMERLY DOCKETS)	ICIS	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	ICISNPDES	0	0	TP/AP
MATERIAL LICENSING TRACKING SYSTEM	MLTS	0	0	TP/AP
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	NPDESR06	0	0	TP/AP
PCB ACTIVITY DATABASE SYSTEM	PADS	0	0	TP/AP
PERMIT COMPLIANCE SYSTEM	PCSR06	0	0	TP/AP
SEMS LIEN ON PROPERTY	SEMSLIENS	0	0	TP/AP
SSEHRI PFAS CONTAMINATION SITES	SSEHRIPFAS	0	0	TP/AP
SECTION SEVEN TRACKING SYSTEM	SSTS	0	0	TP/AP
TOXIC SUBSTANCE CONTROL ACT INVENTORY	TSCA	0	0	TP/AP
TOXICS RELEASE INVENTORY	TRI	0	0	TP/AP
ALTERNATIVE FUELING STATIONS	ALTFUELS	0	0	0.2500
FEMA OWNED STORAGE TANKS	FEMAUST	0	0	0.2500
HISTORICAL GAS STATIONS	HISTPST	0	0	0.2500
INTEGRATED COMPLIANCE INFORMATION SYSTEM DRYCLEANERS	ICISCLEANERS	0	0	0.2500
MINE SAFETY AND HEALTH ADMINISTRATION MASTER INDEX FILE	MSHA	0	0	0.2500
MINERAL RESOURCE DATA SYSTEM	MRDS	0	0	0.2500
OPEN DUMP INVENTORY	ODI	0	0	0.5000
SURFACE MINING CONTROL AND RECLAMATION ACT SITES	SMCRA	0	0	0.5000
URANIUM MILL TAILINGS RADIATION CONTROL ACT SITES	USUMTRCA	0	0	0.5000
DEPARTMENT OF DEFENSE SITES	DOD	0	0	1.0000
FORMER MILITARY NIKE MISSILE SITES	NMS	0	0	1.0000
FORMERLY USED DEFENSE SITES	FUDS	0	0	1.0000
FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM	FUSRAP	0	0	1.0000
RECORD OF DECISION SYSTEM	RODS	0	0	1.0000

SUB-TOTAL		0	0	

Database Summary

STATE (TX) LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
STATE INSTITUTIONAL/ENGINEERING CONTROL SITES	SIEC01	0	0	TP/AP
PETROLEUM STORAGE TANKS	PST	0	0	0.2500
BROWNFIELDS SITE ASSESSMENTS	BSA	0	0	0.5000
CLOSED & ABANDONED LANDFILL INVENTORY	CALF	0	0	0.5000
COMMERCIAL MANAGEMENT FACILITIES FOR HAZARDOUS WASTE AND INDUSTRIAL SOLID WASTES	WSTMGMT	0	0	0.5000
LEAKING PETROLEUM STORAGE TANKS	LPST	0	0	0.5000
MUNICIPAL SOLID WASTE LANDFILL SITES	MSWLF	0	0	0.5000
OPERATOR CLEANUP PROGRAM SITES	OCP	0	0	0.5000
RAILROAD COMMISSION VCP AND BROWNFIELD SITES	RRCVCP	0	0	0.5000
VOLUNTARY CLEANUP PROGRAM SITES	VCP	0	0	0.5000
STATE SUPERFUND SITES	SF	0	0	1.0000

SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
GROUNDWATER CONTAMINATION CASES	GWCC	0	0	TP/AP
HISTORIC GROUNDWATER CONTAMINATION CASES	HISTGWCC	0	0	TP/AP
LAND APPLICATION PERMITS	LANDAPP	0	0	TP/AP
MUNICIPAL SETTING DESIGNATIONS	MSD	0	0	TP/AP
NOTICE OF VIOLATIONS	NOV	0	0	TP/AP
SPILLS LISTING	SPILLS	0	0	TP/AP
TCEQ LIENS	LIENS	0	0	TP/AP
TIER I I CHEMICAL REPORTING PROGRAM FACILITIES	TIERII	0	0	TP/AP
DRY CLEANER REGISTRATION DATABASE	DCR	0	0	0.2500
INDUSTRIAL AND HAZARDOUS WASTE SITES	IHW	0	0	0.2500
PERMITTED INDUSTRIAL HAZARDOUS WASTE SITES	PIHW	0	0	0.2500
AFFECTED PROPERTY ASSESSMENT REPORTS	APAR	0	0	0.5000
DRY CLEANER REMEDIATION PROGRAM SITES	DCRPS	0	0	0.5000
INNOCENT OWNER / OPERATOR DATABASE	IOP	0	0	0.5000
RADIOACTIVE WASTE SITES	RWS	0	0	0.5000
RECYCLING FACILITIES	WMRF	0	0	0.5000
SALT CAVERNS FOR PETROLEUM STORAGE	STCV	0	0	0.5000

Database Summary

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
INDUSTRIAL AND HAZARDOUS WASTE CORRECTIVE ACTION SITES	IHWCA	0	0	1.0000

SUB-TOTAL		0	0	

Database Summary

LOCAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
CITY OF AUSTIN UNDERGROUND STORAGE TANKS	AUSTINUST	0	0	0.2500
SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
EDWARDS AQUIFER PERMITS	EAP	0	0	TP/AP
CITY OF AUSTIN HISTORICAL UNDERGROUND STORAGE TANKS	AUSTINHISTUST	0	0	0.2500
SUB-TOTAL		0	0	

Database Summary

TRIBAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	USTR06	0	0	0.2500
LEAKING UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	LUSTR06	0	0	0.5000
OPEN DUMP INVENTORY ON TRIBAL LANDS	ODINDIAN	0	0	0.5000
SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
INDIAN RESERVATIONS	INDIANRES	0	0	1.0000
SUB-TOTAL		0	0	
TOTAL		0	0	

Database Radius Summary

FEDERAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
AIRSAFS	0.0200	0	NS	NS	NS	NS	NS	0
BRS	0.0200	0	NS	NS	NS	NS	NS	0
CDL	0.0200	0	NS	NS	NS	NS	NS	0
DOCKETS	0.0200	0	NS	NS	NS	NS	NS	0
EC	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
ECHOR06	0.0200	0	NS	NS	NS	NS	NS	0
ERNSTX	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
FRSTX	0.0200	0	NS	NS	NS	NS	NS	0
HMIRSR06	0.0200	0	NS	NS	NS	NS	NS	0
HWCD	0.0200	0	NS	NS	NS	NS	NS	0
ICIS	0.0200	0	NS	NS	NS	NS	NS	0
ICISNPDES	0.0200	0	NS	NS	NS	NS	NS	0
LUCIS	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
MLTS	0.0200	0	NS	NS	NS	NS	NS	0
NPDESR06	0.0200	0	NS	NS	NS	NS	NS	0
PADS	0.0200	0	NS	NS	NS	NS	NS	0
PCSR06	0.0200	0	NS	NS	NS	NS	NS	0
RCRASC	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
SEMSLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SFLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SSEHRIPFAS	0.0200	0	NS	NS	NS	NS	NS	0
SSTS	0.0200	0	NS	NS	NS	NS	NS	0
TRI	0.0200	0	NS	NS	NS	NS	NS	0
TSCA	0.0200	0	NS	NS	NS	NS	NS	0
RCRAGR06	**0.1250**	**0**	**0**	**NS**	**NS**	**NS**	**NS**	**0**
RCRANGR06	**0.1250**	**0**	**0**	**NS**	**NS**	**NS**	**NS**	**0**
ALTFUELS	0.2500	0	0	0	NS	NS	NS	0
FEMAUST	0.2500	0	0	0	NS	NS	NS	0
HISTPST	0.2500	0	0	0	NS	NS	NS	0
ICISCLEANERS	0.2500	0	0	0	NS	NS	NS	0
MRDS	0.2500	0	0	0	NS	NS	NS	0
MSHA	0.2500	0	0	0	NS	NS	NS	0
BF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
DNPL	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
NLRRCRAT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**

Database Radius Summary

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
ODI	0.5000	0	0	0	0	NS	NS	0
RCRAT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SEMS	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SEMSARCH	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SMCRA	0.5000	0	0	0	0	NS	NS	0
USUMTRCA	0.5000	0	0	0	0	NS	NS	0
DOD	1.0000	0	0	0	0	0	NS	0
FUDS	1.0000	0	0	0	0	0	NS	0
FUSRAP	1.0000	0	0	0	0	0	NS	0
NLRRCRAC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
NMS	1.0000	0	0	0	0	0	NS	0
NPL	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
PNPL	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RCRAC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RCRASUBC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RODS	1.0000	0	0	0	0	0	NS	0

SUB-TOTAL		0	0	0	0	0	0	0

Database Radius Summary

STATE (TX) LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
GWCC	0.0200	0	NS	NS	NS	NS	NS	0
HISTGWCC	0.0200	0	NS	NS	NS	NS	NS	0
LANDAPP	0.0200	0	NS	NS	NS	NS	NS	0
LIENS	0.0200	0	NS	NS	NS	NS	NS	0
MSD	0.0200	0	NS	NS	NS	NS	NS	0
NOV	0.0200	0	NS	NS	NS	NS	NS	0
SIEC01	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
SPILLS	0.0200	0	NS	NS	NS	NS	NS	0
TIERII	0.0200	0	NS	NS	NS	NS	NS	0
DCR	0.2500	0	0	0	NS	NS	NS	0
IHW	0.2500	0	0	0	NS	NS	NS	0
PIHW	0.2500	0	0	0	NS	NS	NS	0
PST	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**
APAR	0.5000	0	0	0	0	NS	NS	0
BSA	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
CALF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
DCRPS	0.5000	0	0	0	0	NS	NS	0
IOP	0.5000	0	0	0	0	NS	NS	0
LPST	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
MSWLF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
OCP	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
RRCVCP	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
RWS	0.5000	0	0	0	0	NS	NS	0
STCV	0.5000	0	0	0	0	NS	NS	0
VCP	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
WMRF	0.5000	0	0	0	0	NS	NS	0
WSTMGMT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
IHWCA	1.0000	0	0	0	0	0	NS	0
SF	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**

SUB-TOTAL		0	0	0	0	0	0	0

Database Radius Summary

LOCAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
EAP	0.0200	0	NS	NS	NS	NS	NS	0
AUSTINHISTUST	0.2500	0	0	0	NS	NS	NS	0
AUSTINUST	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**

SUB-TOTAL		0	0	0	0	0	0	0

Database Radius Summary

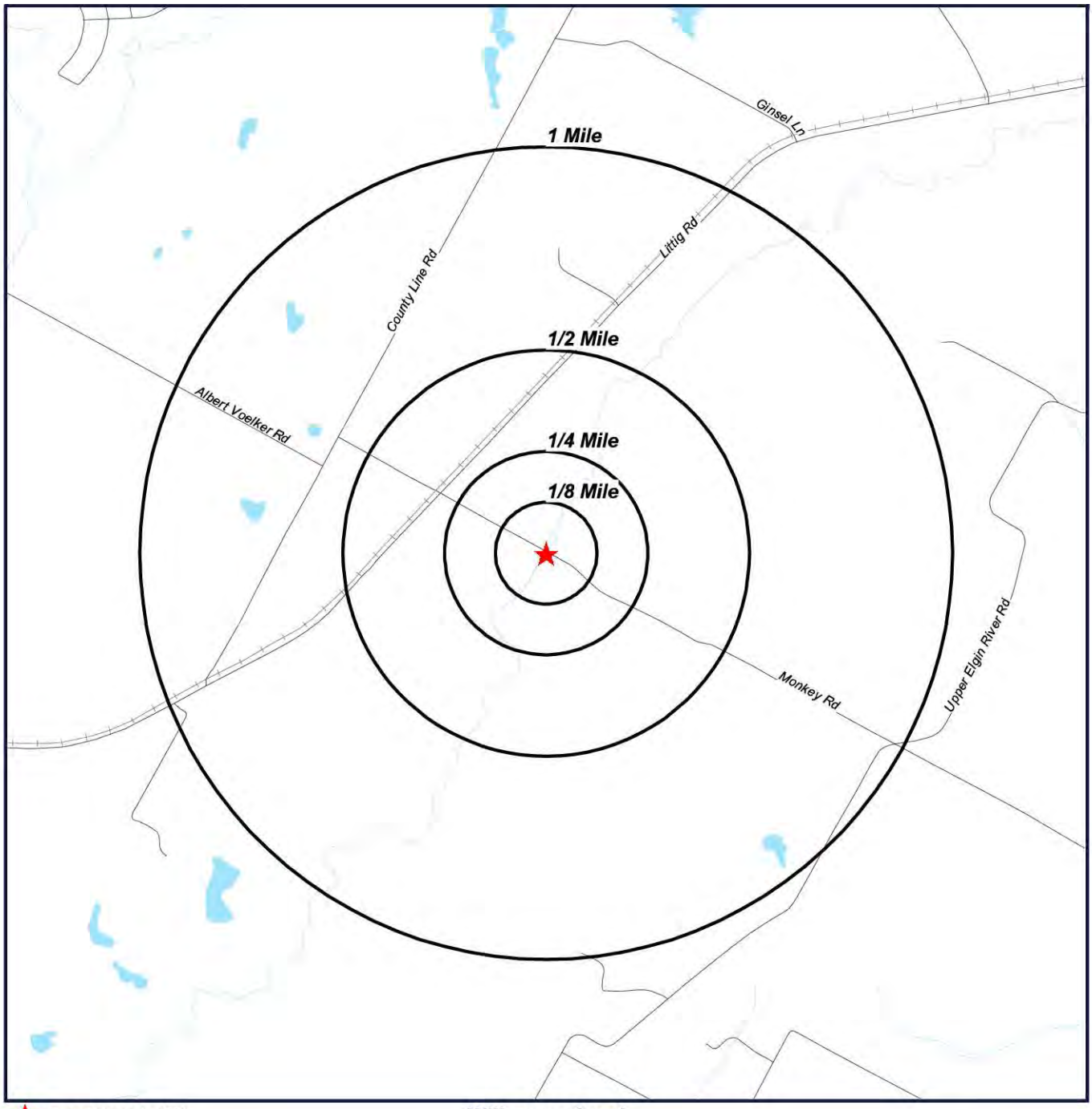
TRIBAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
USTR06	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**
LUSTR06	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
ODINDIAN	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
INDIANRES	1.0000	0	0	0	0	0	NS	0
SUB-TOTAL		0	0	0	0	0	0	0
TOTAL		0	0	0	0	0	0	0

NOTES:
NS = NOT SEARCHED
TP/AP = TARGET PROPERTY/ADJACENT PROPERTY

Radius Map 1



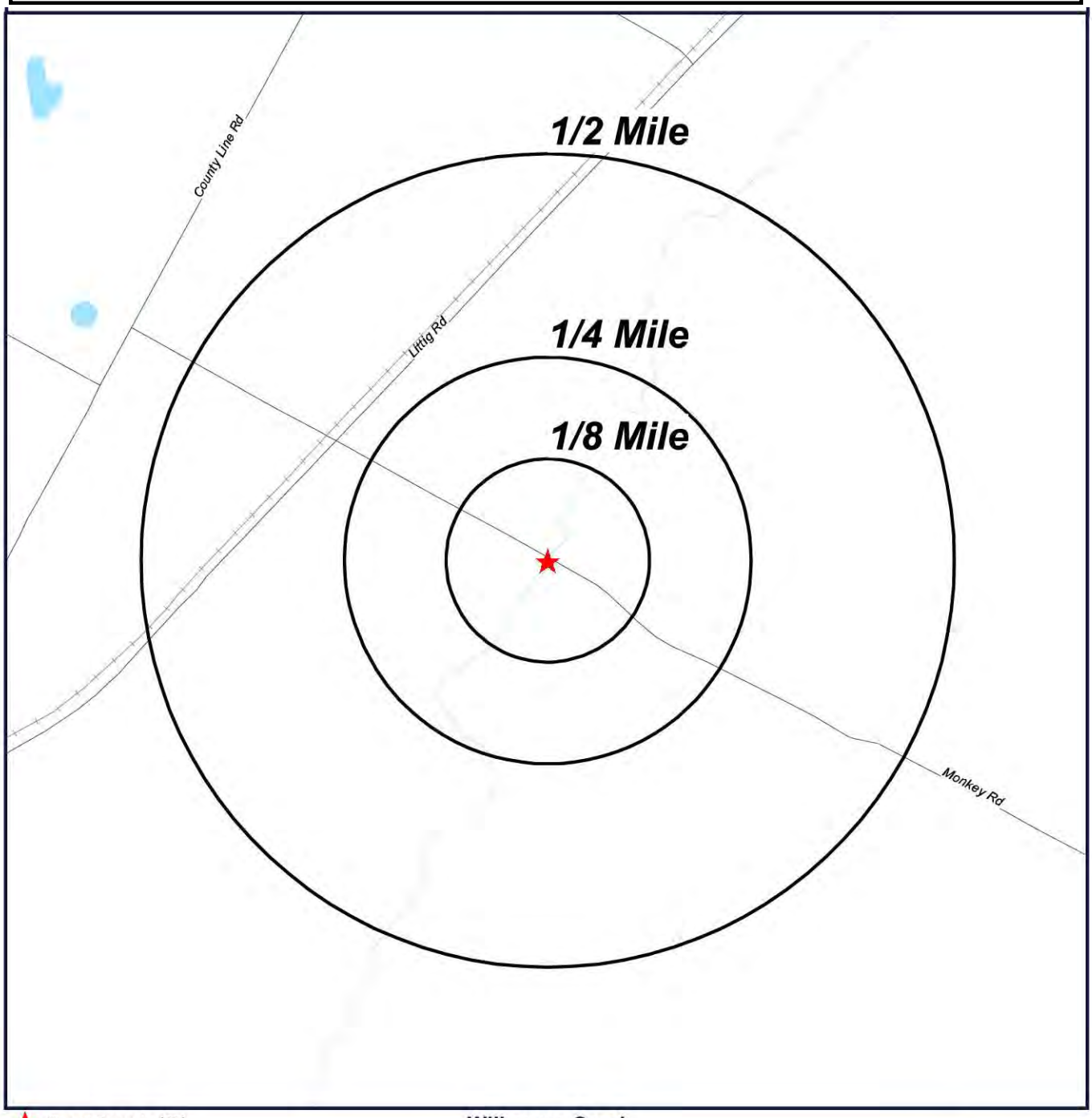
Target Property (TP)

Wilbarger Creek Watershed Study
Pflugerville, Texas

N
W E
S

0' 1000' 2000' 3000'
SCALE: 1" = 2000'

Radius Map 2



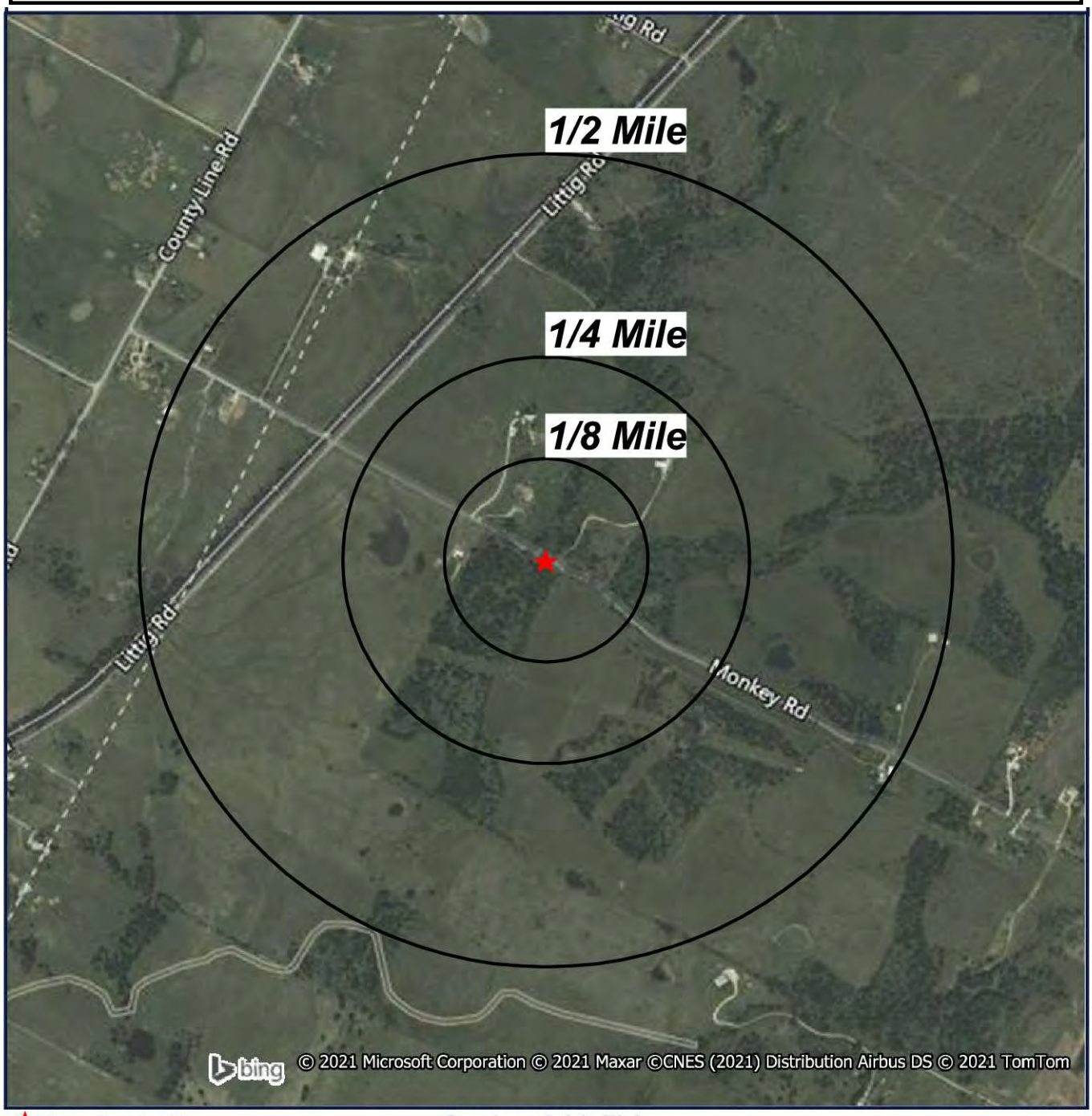
Target Property (TP)

Wilbarger Creek Watershed Study
Pflugerville, Texas

N
W E
S

0' 500' 1000' 1500'
SCALE: 1" = 1000'

Ortho Map



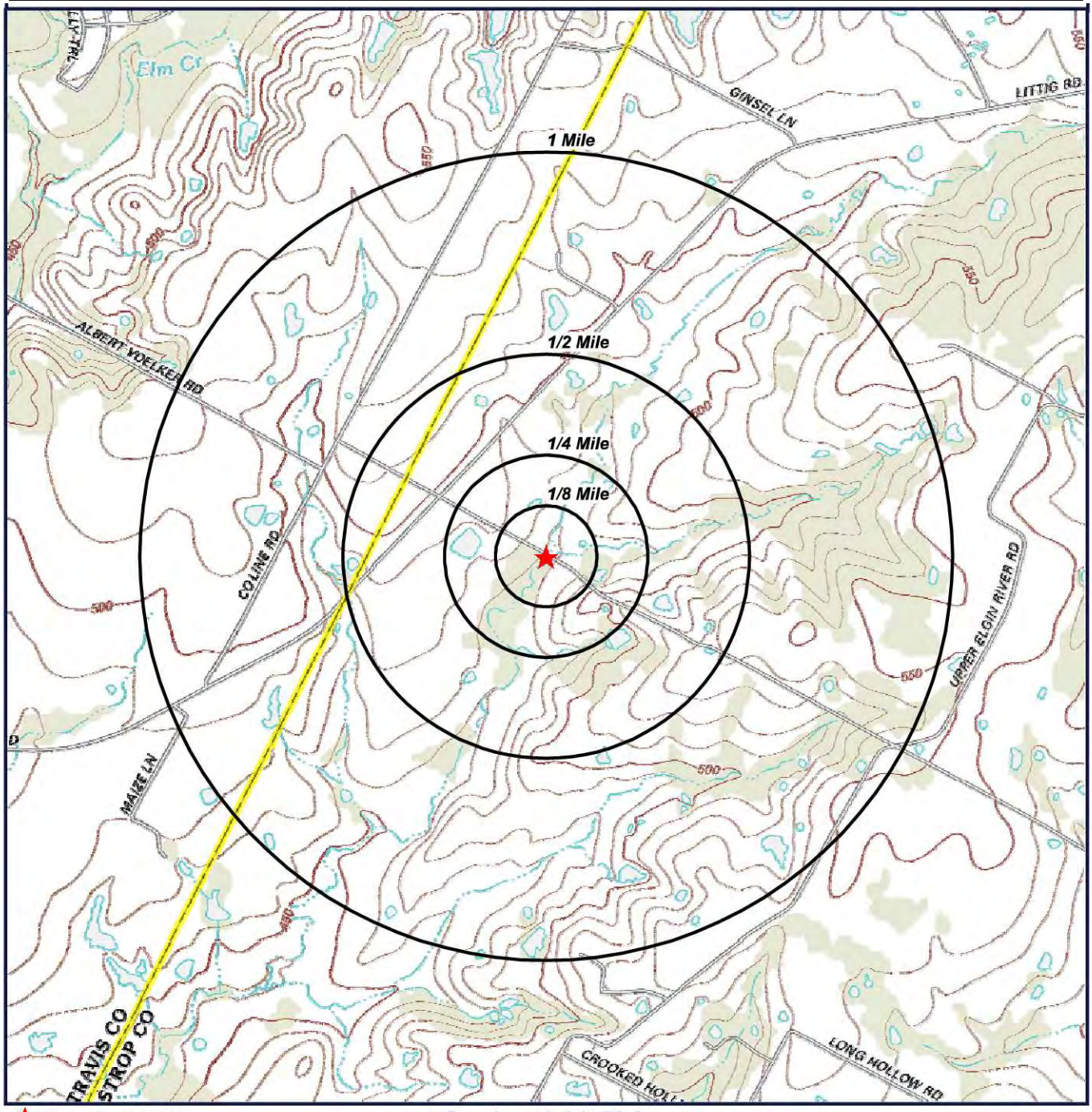
Target Property (TP)

Quadrangle(s): Elgin West Wilbarger Creek Watershed Study Pflugerville, Texas

N
W E
S

0' 500' 1000' 1500'
SCALE: 1" = 1000'

Topographic Map



★ Target Property (TP)

Quadrangle(s): Elgin West
Source: USGS, 12/20/2012
Wilbarger Creek Watershed Study
Pflugerville, Texas

N
W E
S

0' 1000' 2000' 3000'
SCALE: 1" = 2000'

Located Sites Summary

No Records Found.

Site Summary By Database

No Records Found.

Elevation Summary

Elevations are collected from the USGS 3D Elevation Program 1/3 arc-second (approximately 10 meters) layer hosted at the NGTOC. .

Target Property Elevation: 463 ft.

*NOTE: Standard environmental records are displayed in **bold**.*

No Records Found.

Unlocated Sites Summary

This list contains sites that could not be mapped due to limited or incomplete address information.

No Records Found

GeoSearch
On time. On target. In touch.™

Radius Report

GeoLens by GeoSearch

Target Property:

Wilbarger Creek Watershed Study
Pflugerville, Travis County, Texas

Prepared For:

Halff-Austin

Order #: 162497
Job #: 401124
Project #: AVO 35837
Date: 03/12/2021

Database Summary

FEDERAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
EMERGENCY RESPONSE NOTIFICATION SYSTEM	ERNSTX	0	0	TP/AP
FEDERAL ENGINEERING INSTITUTIONAL CONTROL SITES	EC	0	0	TP/AP
LAND USE CONTROL INFORMATION SYSTEM	LUCIS	0	0	TP/AP
RCRA SITES WITH CONTROLS	RCRASC	0	0	TP/AP
RESOURCE CONSERVATION & RECOVERY ACT - GENERATOR	RCRAGR06	0	0	0.1250
RESOURCE CONSERVATION & RECOVERY ACT - NON-GENERATOR	RCRANGR06	0	0	0.1250
BROWNFIELDS MANAGEMENT SYSTEM	BF	0	0	0.5000
DELISTED NATIONAL PRIORITIES LIST	DNPL	0	0	0.5000
NO LONGER REGULATED RCRA NON-CORRACTS TSD FACILITIES	NLRRCRAT	0	0	0.5000
RESOURCE CONSERVATION & RECOVERY ACT - NON-CORRACTS TREATMENT, STORAGE & DISPOSAL FACILITIES	RCRAT	0	0	0.5000
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM	SEMS	0	0	0.5000
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM ARCHIVED SITE INVENTORY	SEMSARCH	0	0	0.5000
NATIONAL PRIORITIES LIST	NPL	0	0	1.0000
NO LONGER REGULATED RCRA CORRECTIVE ACTION FACILITIES	NLRRCRAC	0	0	1.0000
PROPOSED NATIONAL PRIORITIES LIST	PNPL	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - CORRECTIVE ACTION FACILITIES	RCRAC	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - SUBJECT TO CORRECTIVE ACTION FACILITIES	RCRASUBC	0	0	1.0000

SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
AEROMETRIC INFORMATION RETRIEVAL SYSTEM / AIR FACILITY SUBSYSTEM	AIRSAFS	0	0	TP/AP
BIENNIAL REPORTING SYSTEM	BRS	0	0	TP/AP
CERCLIS LIENS	SFLIENS	0	0	TP/AP
CLANDESTINE DRUG LABORATORY LOCATIONS	CDL	0	0	TP/AP
EPA DOCKET DATA	DOCKETS	0	0	TP/AP
ENFORCEMENT AND COMPLIANCE HISTORY INFORMATION	ECHOR06	0	0	TP/AP
FACILITY REGISTRY SYSTEM	FRSTX	0	0	TP/AP

Database Summary

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
HAZARDOUS MATERIALS INCIDENT REPORTING SYSTEM	HMIRSR06	0	0	TP/AP
HAZARDOUS WASTE COMPLIANCE DOCKET FACILITIES	HWCD	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM (FORMERLY DOCKETS)	ICIS	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	ICISNPDES	0	0	TP/AP
MATERIAL LICENSING TRACKING SYSTEM	MLTS	0	0	TP/AP
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	NPDESR06	0	0	TP/AP
PCB ACTIVITY DATABASE SYSTEM	PADS	0	0	TP/AP
PERMIT COMPLIANCE SYSTEM	PCSR06	0	0	TP/AP
SEMS LIEN ON PROPERTY	SEMSLIENS	0	0	TP/AP
SSEHRI PFAS CONTAMINATION SITES	SSEHRIPFAS	0	0	TP/AP
SECTION SEVEN TRACKING SYSTEM	SSTS	0	0	TP/AP
TOXIC SUBSTANCE CONTROL ACT INVENTORY	TSCA	0	0	TP/AP
TOXICS RELEASE INVENTORY	TRI	0	0	TP/AP
ALTERNATIVE FUELING STATIONS	ALTFUELS	0	0	0.2500
FEMA OWNED STORAGE TANKS	FEMAUST	0	0	0.2500
HISTORICAL GAS STATIONS	HISTPST	0	0	0.2500
INTEGRATED COMPLIANCE INFORMATION SYSTEM DRYCLEANERS	ICISCLEANERS	0	0	0.2500
MINE SAFETY AND HEALTH ADMINISTRATION MASTER INDEX FILE	MSHA	0	0	0.2500
MINERAL RESOURCE DATA SYSTEM	MRDS	0	0	0.2500
OPEN DUMP INVENTORY	ODI	0	0	0.5000
SURFACE MINING CONTROL AND RECLAMATION ACT SITES	SMCRA	0	0	0.5000
URANIUM MILL TAILINGS RADIATION CONTROL ACT SITES	USUMTRCA	0	0	0.5000
DEPARTMENT OF DEFENSE SITES	DOD	0	0	1.0000
FORMER MILITARY NIKE MISSILE SITES	NMS	0	0	1.0000
FORMERLY USED DEFENSE SITES	FUDS	0	0	1.0000
FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM	FUSRAP	0	0	1.0000
RECORD OF DECISION SYSTEM	RODS	0	0	1.0000

SUB-TOTAL		0	0	

Database Summary

STATE (TX) LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
STATE INSTITUTIONAL/ENGINEERING CONTROL SITES	SIEC01	0	0	TP/AP
PETROLEUM STORAGE TANKS	PST	0	0	0.2500
BROWNFIELDS SITE ASSESSMENTS	BSA	0	0	0.5000
CLOSED & ABANDONED LANDFILL INVENTORY	CALF	0	0	0.5000
COMMERCIAL MANAGEMENT FACILITIES FOR HAZARDOUS WASTE AND INDUSTRIAL SOLID WASTES	WSTMGMT	0	0	0.5000
LEAKING PETROLEUM STORAGE TANKS	LPST	0	0	0.5000
MUNICIPAL SOLID WASTE LANDFILL SITES	MSWLF	0	0	0.5000
OPERATOR CLEANUP PROGRAM SITES	OCP	0	0	0.5000
RAILROAD COMMISSION VCP AND BROWNFIELD SITES	RRCVCP	0	0	0.5000
VOLUNTARY CLEANUP PROGRAM SITES	VCP	0	0	0.5000
STATE SUPERFUND SITES	SF	0	0	1.0000

SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
GROUNDWATER CONTAMINATION CASES	GWCC	0	0	TP/AP
HISTORIC GROUNDWATER CONTAMINATION CASES	HISTGWCC	0	0	TP/AP
LAND APPLICATION PERMITS	LANDAPP	0	0	TP/AP
MUNICIPAL SETTING DESIGNATIONS	MSD	0	0	TP/AP
NOTICE OF VIOLATIONS	NOV	0	0	TP/AP
SPILLS LISTING	SPILLS	0	0	TP/AP
TCEQ LIENS	LIENS	0	0	TP/AP
TIER I I CHEMICAL REPORTING PROGRAM FACILITIES	TIERII	0	0	TP/AP
DRY CLEANER REGISTRATION DATABASE	DCR	0	0	0.2500
INDUSTRIAL AND HAZARDOUS WASTE SITES	IHW	0	0	0.2500
PERMITTED INDUSTRIAL HAZARDOUS WASTE SITES	PIHW	0	0	0.2500
AFFECTED PROPERTY ASSESSMENT REPORTS	APAR	0	0	0.5000
DRY CLEANER REMEDIATION PROGRAM SITES	DCRPS	0	0	0.5000
INNOCENT OWNER / OPERATOR DATABASE	IOP	0	0	0.5000
RADIOACTIVE WASTE SITES	RWS	0	0	0.5000
RECYCLING FACILITIES	WMRF	0	0	0.5000
SALT CAVERNS FOR PETROLEUM STORAGE	STCV	0	0	0.5000

Database Summary

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
INDUSTRIAL AND HAZARDOUS WASTE CORRECTIVE ACTION SITES	IHWCA	0	0	1.0000
SUB-TOTAL		0	0	

Database Summary

LOCAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
CITY OF AUSTIN UNDERGROUND STORAGE TANKS	AUSTINUST	0	0	0.2500
SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
EDWARDS AQUIFER PERMITS	EAP	0	0	TP/AP
CITY OF AUSTIN HISTORICAL UNDERGROUND STORAGE TANKS	AUSTINHISTUST	0	0	0.2500
SUB-TOTAL		0	0	

TRIBAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	USTR06	0	0	0.2500
LEAKING UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	LUSTR06	0	0	0.5000
OPEN DUMP INVENTORY ON TRIBAL LANDS	ODINDIAN	0	0	0.5000
SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
INDIAN RESERVATIONS	INDIANRES	0	0	1.0000
SUB-TOTAL		0	0	
TOTAL		0	0	

Database Radius Summary

FEDERAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
AIRSAFS	0.0200	0	NS	NS	NS	NS	NS	0
BRS	0.0200	0	NS	NS	NS	NS	NS	0
CDL	0.0200	0	NS	NS	NS	NS	NS	0
DOCKETS	0.0200	0	NS	NS	NS	NS	NS	0
EC	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
ECHOR06	0.0200	0	NS	NS	NS	NS	NS	0
ERNSTX	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
FRSTX	0.0200	0	NS	NS	NS	NS	NS	0
HMIRSR06	0.0200	0	NS	NS	NS	NS	NS	0
HWCD	0.0200	0	NS	NS	NS	NS	NS	0
ICIS	0.0200	0	NS	NS	NS	NS	NS	0
ICISNPDES	0.0200	0	NS	NS	NS	NS	NS	0
LUCIS	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
MLTS	0.0200	0	NS	NS	NS	NS	NS	0
NPDESR06	0.0200	0	NS	NS	NS	NS	NS	0
PADS	0.0200	0	NS	NS	NS	NS	NS	0
PCSR06	0.0200	0	NS	NS	NS	NS	NS	0
RCRASC	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
SEMSLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SFLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SSEHRIPFAS	0.0200	0	NS	NS	NS	NS	NS	0
SSTS	0.0200	0	NS	NS	NS	NS	NS	0
TRI	0.0200	0	NS	NS	NS	NS	NS	0
TSCA	0.0200	0	NS	NS	NS	NS	NS	0
RCRAGR06	**0.1250**	**0**	**0**	**NS**	**NS**	**NS**	**NS**	**0**
RCRANGR06	**0.1250**	**0**	**0**	**NS**	**NS**	**NS**	**NS**	**0**
ALTFUELS	0.2500	0	0	0	NS	NS	NS	0
FEMAUST	0.2500	0	0	0	NS	NS	NS	0
HISTPST	0.2500	0	0	0	NS	NS	NS	0
ICISCLEANERS	0.2500	0	0	0	NS	NS	NS	0
MRDS	0.2500	0	0	0	NS	NS	NS	0
MSHA	0.2500	0	0	0	NS	NS	NS	0
BF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
DNPL	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
NLRRCRAT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**

Database Radius Summary

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
ODI	0.5000	0	0	0	0	NS	NS	0
RCRAT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SEMS	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SEMSARCH	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SMCRA	0.5000	0	0	0	0	NS	NS	0
USUMTRCA	0.5000	0	0	0	0	NS	NS	0
DOD	1.0000	0	0	0	0	0	NS	0
FUDS	1.0000	0	0	0	0	0	NS	0
FUSRAP	1.0000	0	0	0	0	0	NS	0
NLRRCRAC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
NMS	1.0000	0	0	0	0	0	NS	0
NPL	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
PNPL	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RCRAC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RCRASUBC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RODS	1.0000	0	0	0	0	0	NS	0
SUB-TOTAL		0	0	0	0	0	0	0

Database Radius Summary

STATE (TX) LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
GWCC	0.0200	0	NS	NS	NS	NS	NS	0
HISTGWCC	0.0200	0	NS	NS	NS	NS	NS	0
LANDAPP	0.0200	0	NS	NS	NS	NS	NS	0
LIENS	0.0200	0	NS	NS	NS	NS	NS	0
MSD	0.0200	0	NS	NS	NS	NS	NS	0
NOV	0.0200	0	NS	NS	NS	NS	NS	0
SIEC01	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
SPILLS	0.0200	0	NS	NS	NS	NS	NS	0
TIERII	0.0200	0	NS	NS	NS	NS	NS	0
DCR	0.2500	0	0	0	NS	NS	NS	0
IHW	0.2500	0	0	0	NS	NS	NS	0
PIHW	0.2500	0	0	0	NS	NS	NS	0
PST	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**
APAR	0.5000	0	0	0	0	NS	NS	0
BSA	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
CALF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
DCRPS	0.5000	0	0	0	0	NS	NS	0
IOP	0.5000	0	0	0	0	NS	NS	0
LPST	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
MSWLF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
OCP	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
RRCVCP	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
RWS	0.5000	0	0	0	0	NS	NS	0
STCV	0.5000	0	0	0	0	NS	NS	0
VCP	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
WMRF	0.5000	0	0	0	0	NS	NS	0
WSTMGMT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
IHWCA	1.0000	0	0	0	0	0	NS	0
SF	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**

SUB-TOTAL		0	0	0	0	0	0	0

Database Radius Summary

LOCAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
EAP	0.0200	0	NS	NS	NS	NS	NS	0
AUSTINHISTUST	0.2500	0	0	0	NS	NS	NS	0
AUSTINUST	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**

SUB-TOTAL		0	0	0	0	0	0	0

Database Radius Summary

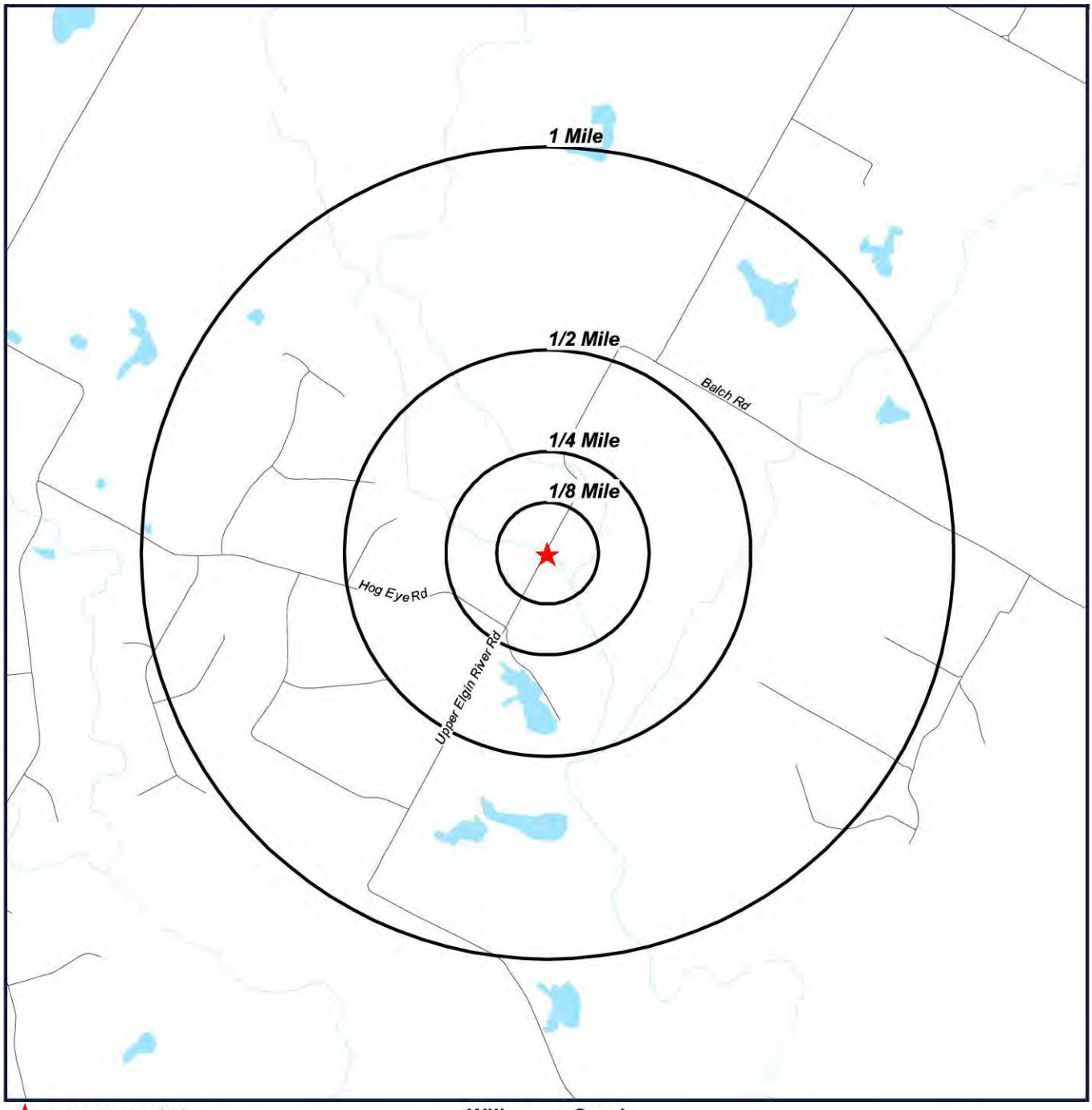
TRIBAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
USTR06	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**
LUSTR06	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
ODINDIAN	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
INDIANRES	1.0000	0	0	0	0	0	NS	0
SUB-TOTAL		0	0	0	0	0	0	0
TOTAL		0	0	0	0	0	0	0

NOTES:
NS = NOT SEARCHED
TP/AP = TARGET PROPERTY/ADJACENT PROPERTY

Radius Map 1



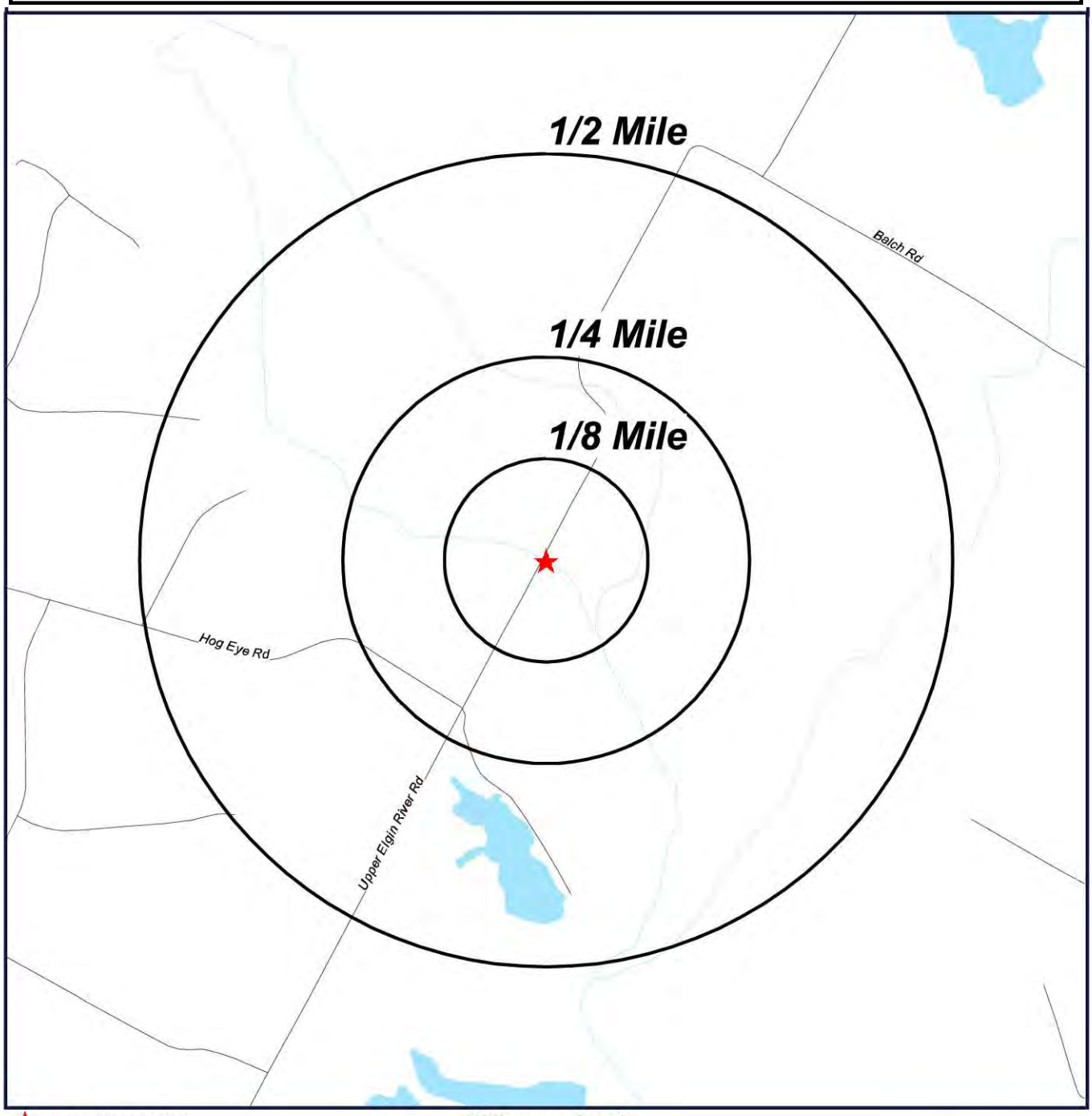
Target Property (TP)

Wilbarger Creek Watershed Study
Pflugerville, Texas

N
W E
S

0' 1000' 2000' 3000'
SCALE: 1" = 2000'

Radius Map 2



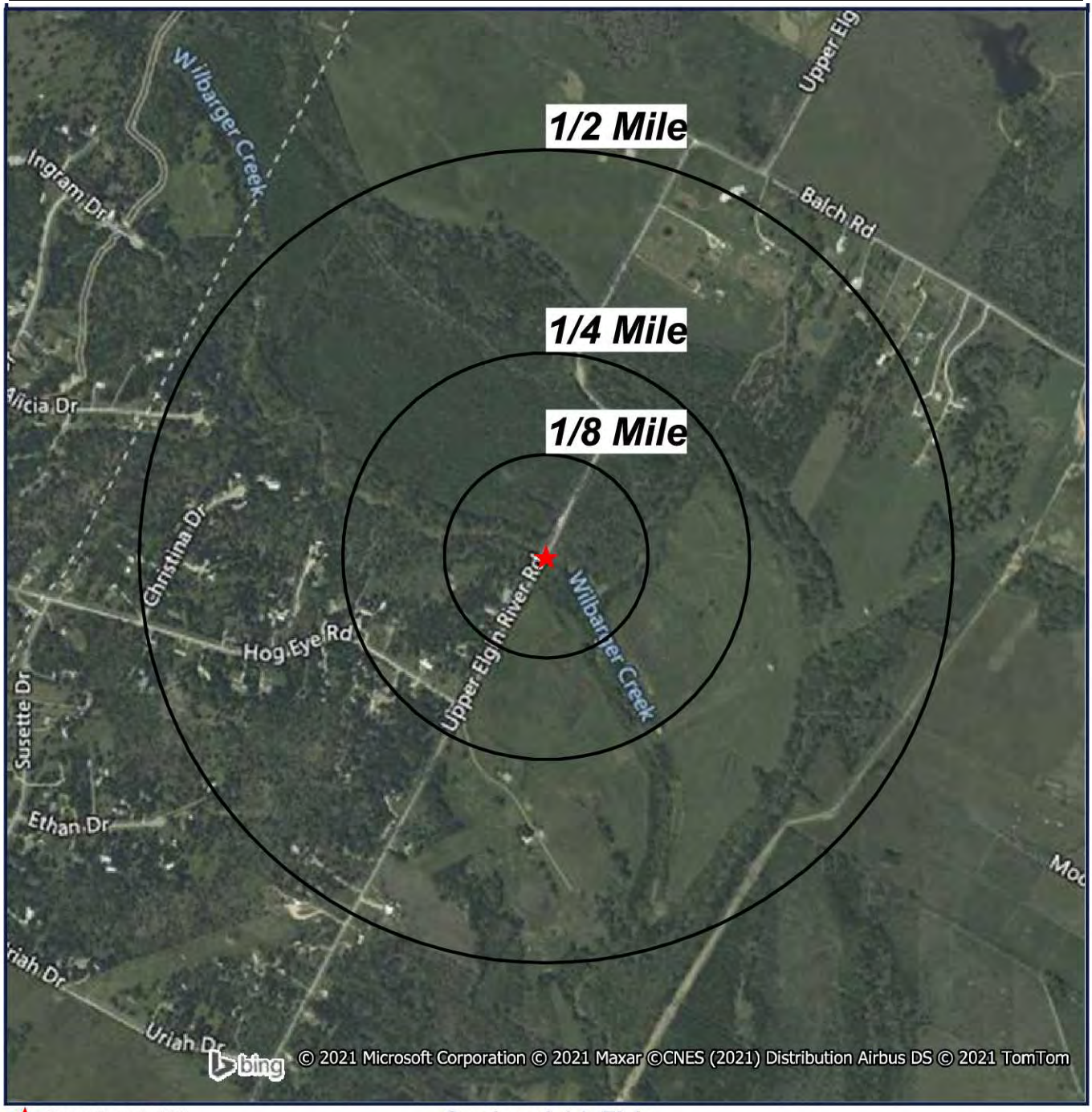
Target Property (TP)

Wilbarger Creek Watershed Study
Pflugerville, Texas

N
W E
S

0' 500' 1000' 1500'
SCALE: 1" = 1000'

Ortho Map



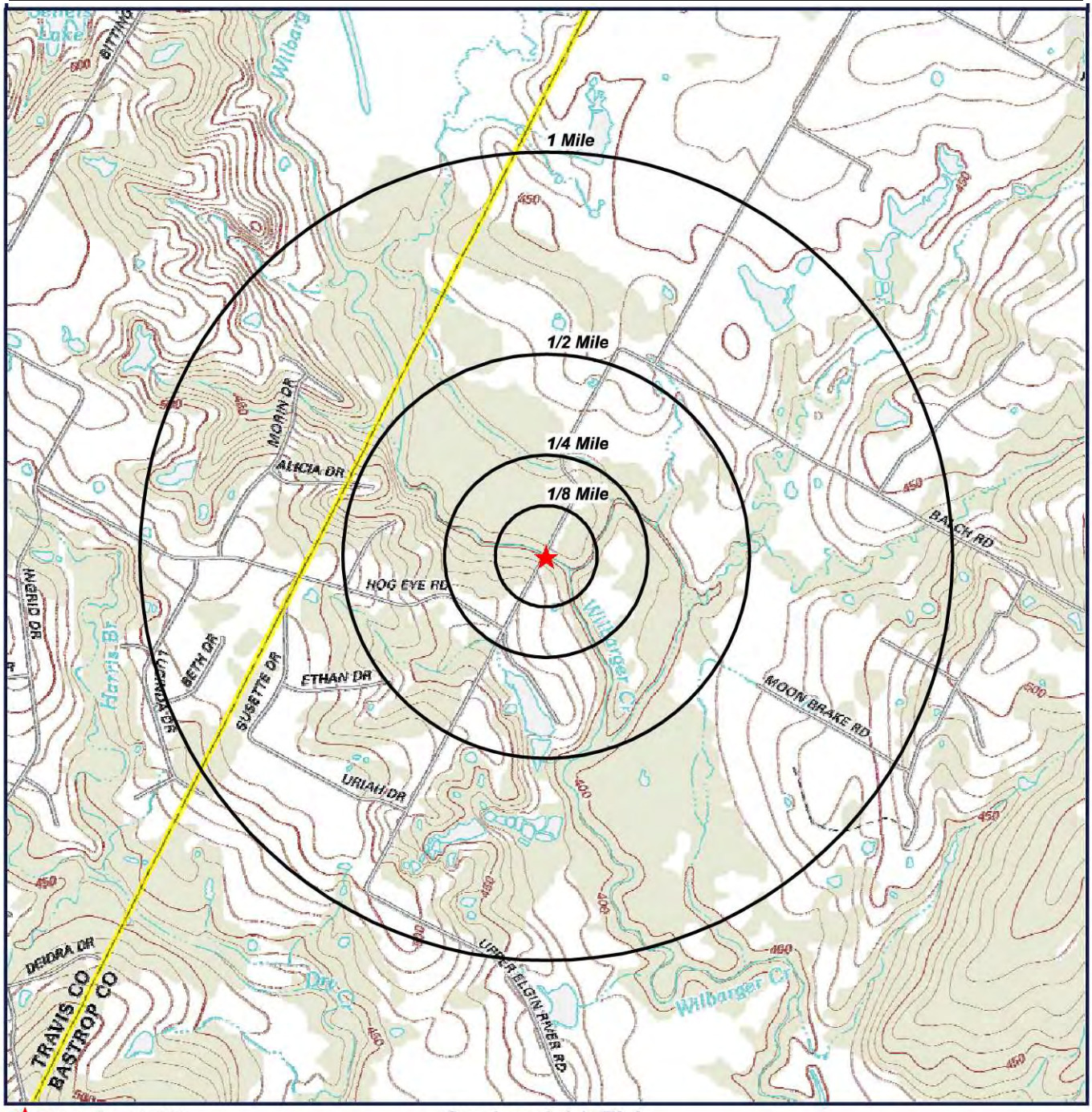
★ Target Property (TP)

Quadrangle(s): Elgin West
Wilbarger Creek Watershed Study
Pflugerville, Texas

N
W E
S

0' 500' 1000' 1500'
SCALE: 1" = 1000'

Topographic Map



★ Target Property (TP)

Quadrangle(s): Elgin West
Source: USGS, 12/20/2012
Wilbarger Creek Watershed Study
Pflugerville, Texas

N
W E
S

0' 1000' 2000' 3000'
SCALE: 1" = 2000'

Located Sites Summary

No Records Found.

Site Summary By Database

No Records Found.

Elevation Summary

Elevations are collected from the USGS 3D Elevation Program 1/3 arc-second (approximately 10 meters) layer hosted at the NGTOC. .

Target Property Elevation: 410 ft.

*NOTE: Standard environmental records are displayed in **bold**.*

No Records Found.

Unlocated Sites Summary

This list contains sites that could not be mapped due to limited or incomplete address information.

No Records Found

GeoSearch
On time. On target. In touch.™

Radius Report

GeoLens by GeoSearch

Target Property:

Wilbarger Creek Watershed Study
Pflugerville, Travis County, Texas

Prepared For:

Halff-Austin

Order #: 162502
Job #: 401142
Project #: AVO 35837
Date: 03/12/2021

Database Summary

FEDERAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
EMERGENCY RESPONSE NOTIFICATION SYSTEM	ERNSTX	0	0	TP/AP
FEDERAL ENGINEERING INSTITUTIONAL CONTROL SITES	EC	0	0	TP/AP
LAND USE CONTROL INFORMATION SYSTEM	LUCIS	0	0	TP/AP
RCRA SITES WITH CONTROLS	RCRASC	0	0	TP/AP
RESOURCE CONSERVATION & RECOVERY ACT - GENERATOR	RCRAGR06	0	0	0.1250
RESOURCE CONSERVATION & RECOVERY ACT - NON-GENERATOR	RCRANGR06	0	0	0.1250
BROWNFIELDS MANAGEMENT SYSTEM	BF	0	0	0.5000
DELISTED NATIONAL PRIORITIES LIST	DNPL	0	0	0.5000
NO LONGER REGULATED RCRA NON-CORRACTS TSD FACILITIES	NLRRCRAT	0	0	0.5000
RESOURCE CONSERVATION & RECOVERY ACT - NON-CORRACTS TREATMENT, STORAGE & DISPOSAL FACILITIES	RCRAT	0	0	0.5000
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM	SEMS	0	0	0.5000
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM ARCHIVED SITE INVENTORY	SEMSARCH	0	0	0.5000
NATIONAL PRIORITIES LIST	NPL	0	0	1.0000
NO LONGER REGULATED RCRA CORRECTIVE ACTION FACILITIES	NLRRCRAC	0	0	1.0000
PROPOSED NATIONAL PRIORITIES LIST	PNPL	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - CORRECTIVE ACTION FACILITIES	RCRAC	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - SUBJECT TO CORRECTIVE ACTION FACILITIES	RCRASUBC	0	0	1.0000

SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
AEROMETRIC INFORMATION RETRIEVAL SYSTEM / AIR FACILITY SUBSYSTEM	AIRSAFS	0	0	TP/AP
BIENNIAL REPORTING SYSTEM	BRS	0	0	TP/AP
CERCLIS LIENS	SFLIENS	0	0	TP/AP
CLANDESTINE DRUG LABORATORY LOCATIONS	CDL	0	0	TP/AP
EPA DOCKET DATA	DOCKETS	0	0	TP/AP
ENFORCEMENT AND COMPLIANCE HISTORY INFORMATION	ECHOR06	0	0	TP/AP
FACILITY REGISTRY SYSTEM	FRSTX	0	0	TP/AP

Database Summary

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
HAZARDOUS MATERIALS INCIDENT REPORTING SYSTEM	HMIRSR06	0	0	TP/AP
HAZARDOUS WASTE COMPLIANCE DOCKET FACILITIES	HWCD	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM (FORMERLY DOCKETS)	ICIS	0	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	ICISNPDES	0	0	TP/AP
MATERIAL LICENSING TRACKING SYSTEM	MLTS	0	0	TP/AP
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	NPDESR06	0	0	TP/AP
PCB ACTIVITY DATABASE SYSTEM	PADS	0	0	TP/AP
PERMIT COMPLIANCE SYSTEM	PCSR06	0	0	TP/AP
SEMS LIEN ON PROPERTY	SEMSLIENS	0	0	TP/AP
SSEHRI PFAS CONTAMINATION SITES	SSEHRIPFAS	0	0	TP/AP
SECTION SEVEN TRACKING SYSTEM	SSTS	0	0	TP/AP
TOXIC SUBSTANCE CONTROL ACT INVENTORY	TSCA	0	0	TP/AP
TOXICS RELEASE INVENTORY	TRI	0	0	TP/AP
ALTERNATIVE FUELING STATIONS	ALTFUELS	0	0	0.2500
FEMA OWNED STORAGE TANKS	FEMAUST	0	0	0.2500
HISTORICAL GAS STATIONS	HISTPST	0	0	0.2500
INTEGRATED COMPLIANCE INFORMATION SYSTEM DRYCLEANERS	ICISCLEANERS	0	0	0.2500
MINE SAFETY AND HEALTH ADMINISTRATION MASTER INDEX FILE	MSHA	0	0	0.2500
MINERAL RESOURCE DATA SYSTEM	MRDS	0	0	0.2500
OPEN DUMP INVENTORY	ODI	0	0	0.5000
SURFACE MINING CONTROL AND RECLAMATION ACT SITES	SMCRA	0	0	0.5000
URANIUM MILL TAILINGS RADIATION CONTROL ACT SITES	USUMTRCA	0	0	0.5000
DEPARTMENT OF DEFENSE SITES	DOD	0	0	1.0000
FORMER MILITARY NIKE MISSILE SITES	NMS	0	0	1.0000
FORMERLY USED DEFENSE SITES	FUDS	0	0	1.0000
FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM	FUSRAP	0	0	1.0000
RECORD OF DECISION SYSTEM	RODS	0	0	1.0000

SUB-TOTAL		0	0	

Database Summary

STATE (TX) LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
STATE INSTITUTIONAL/ENGINEERING CONTROL SITES	SIEC01	0	0	TP/AP
PETROLEUM STORAGE TANKS	PST	0	0	0.2500
BROWNFIELDS SITE ASSESSMENTS	BSA	0	0	0.5000
CLOSED & ABANDONED LANDFILL INVENTORY	CALF	0	0	0.5000
COMMERCIAL MANAGEMENT FACILITIES FOR HAZARDOUS WASTE AND INDUSTRIAL SOLID WASTES	WSTMGMT	0	0	0.5000
LEAKING PETROLEUM STORAGE TANKS	LPST	0	0	0.5000
MUNICIPAL SOLID WASTE LANDFILL SITES	MSWLF	0	0	0.5000
OPERATOR CLEANUP PROGRAM SITES	OCP	0	0	0.5000
RAILROAD COMMISSION VCP AND BROWNFIELD SITES	RRCVCP	0	0	0.5000
VOLUNTARY CLEANUP PROGRAM SITES	VCP	0	0	0.5000
STATE SUPERFUND SITES	SF	0	0	1.0000

SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
GROUNDWATER CONTAMINATION CASES	GWCC	0	0	TP/AP
HISTORIC GROUNDWATER CONTAMINATION CASES	HISTGWCC	0	0	TP/AP
LAND APPLICATION PERMITS	LANDAPP	0	0	TP/AP
MUNICIPAL SETTING DESIGNATIONS	MSD	0	0	TP/AP
NOTICE OF VIOLATIONS	NOV	0	0	TP/AP
SPILLS LISTING	SPILLS	0	0	TP/AP
TCEQ LIENS	LIENS	0	0	TP/AP
TIER I I CHEMICAL REPORTING PROGRAM FACILITIES	TIERII	0	0	TP/AP
DRY CLEANER REGISTRATION DATABASE	DCR	0	0	0.2500
INDUSTRIAL AND HAZARDOUS WASTE SITES	IHW	0	0	0.2500
PERMITTED INDUSTRIAL HAZARDOUS WASTE SITES	PIHW	0	0	0.2500
AFFECTED PROPERTY ASSESSMENT REPORTS	APAR	0	0	0.5000
DRY CLEANER REMEDIATION PROGRAM SITES	DCRPS	0	0	0.5000
INNOCENT OWNER / OPERATOR DATABASE	IOP	0	0	0.5000
RADIOACTIVE WASTE SITES	RWS	0	0	0.5000
RECYCLING FACILITIES	WMRF	0	0	0.5000
SALT CAVERNS FOR PETROLEUM STORAGE	STCV	0	0	0.5000

Database Summary

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
INDUSTRIAL AND HAZARDOUS WASTE CORRECTIVE ACTION SITES	IHWCA	0	0	1.0000

SUB-TOTAL		0	0	

TRIBAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	USTR06	0	0	0.2500
LEAKING UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	LUSTR06	0	0	0.5000
OPEN DUMP INVENTORY ON TRIBAL LANDS	ODINDIAN	0	0	0.5000
SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
INDIAN RESERVATIONS	INDIANRES	0	0	1.0000
SUB-TOTAL		0	0	
TOTAL		0	0	

Database Radius Summary

FEDERAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
AIRSAFS	0.0200	0	NS	NS	NS	NS	NS	0
BRS	0.0200	0	NS	NS	NS	NS	NS	0
CDL	0.0200	0	NS	NS	NS	NS	NS	0
DOCKETS	0.0200	0	NS	NS	NS	NS	NS	0
EC	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
ECHOR06	0.0200	0	NS	NS	NS	NS	NS	0
ERNSTX	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
FRSTX	0.0200	0	NS	NS	NS	NS	NS	0
HMIRSR06	0.0200	0	NS	NS	NS	NS	NS	0
HWCD	0.0200	0	NS	NS	NS	NS	NS	0
ICIS	0.0200	0	NS	NS	NS	NS	NS	0
ICISNPDES	0.0200	0	NS	NS	NS	NS	NS	0
LUCIS	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
MLTS	0.0200	0	NS	NS	NS	NS	NS	0
NPDESR06	0.0200	0	NS	NS	NS	NS	NS	0
PADS	0.0200	0	NS	NS	NS	NS	NS	0
PCSR06	0.0200	0	NS	NS	NS	NS	NS	0
RCRASC	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
SEMSLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SFLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SSEHRIPFAS	0.0200	0	NS	NS	NS	NS	NS	0
SSTS	0.0200	0	NS	NS	NS	NS	NS	0
TRI	0.0200	0	NS	NS	NS	NS	NS	0
TSCA	0.0200	0	NS	NS	NS	NS	NS	0
RCRAGR06	**0.1250**	**0**	**0**	**NS**	**NS**	**NS**	**NS**	**0**
RCRANGR06	**0.1250**	**0**	**0**	**NS**	**NS**	**NS**	**NS**	**0**
ALTFUELS	0.2500	0	0	0	NS	NS	NS	0
FEMAUST	0.2500	0	0	0	NS	NS	NS	0
HISTPST	0.2500	0	0	0	NS	NS	NS	0
ICISCLEANERS	0.2500	0	0	0	NS	NS	NS	0
MRDS	0.2500	0	0	0	NS	NS	NS	0
MSHA	0.2500	0	0	0	NS	NS	NS	0
BF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
DNPL	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
NLRRCRAT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**

Database Radius Summary

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
ODI	0.5000	0	0	0	0	NS	NS	0
RCRAT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SEMS	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SEMSARCH	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
SMCRA	0.5000	0	0	0	0	NS	NS	0
USUMTRCA	0.5000	0	0	0	0	NS	NS	0
DOD	1.0000	0	0	0	0	0	NS	0
FUDS	1.0000	0	0	0	0	0	NS	0
FUSRAP	1.0000	0	0	0	0	0	NS	0
NLRRCRAC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
NMS	1.0000	0	0	0	0	0	NS	0
NPL	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
PNPL	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RCRAC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RCRASUBC	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**
RODS	1.0000	0	0	0	0	0	NS	0
SUB-TOTAL		0	0	0	0	0	0	0

Database Radius Summary

STATE (TX) LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
GWCC	0.0200	0	NS	NS	NS	NS	NS	0
HISTGWCC	0.0200	0	NS	NS	NS	NS	NS	0
LANDAPP	0.0200	0	NS	NS	NS	NS	NS	0
LIENS	0.0200	0	NS	NS	NS	NS	NS	0
MSD	0.0200	0	NS	NS	NS	NS	NS	0
NOV	0.0200	0	NS	NS	NS	NS	NS	0
SIEC01	**0.0200**	**0**	**NS**	**NS**	**NS**	**NS**	**NS**	**0**
SPILLS	0.0200	0	NS	NS	NS	NS	NS	0
TIERII	0.0200	0	NS	NS	NS	NS	NS	0
DCR	0.2500	0	0	0	NS	NS	NS	0
IHW	0.2500	0	0	0	NS	NS	NS	0
PIHW	0.2500	0	0	0	NS	NS	NS	0
PST	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**
APAR	0.5000	0	0	0	0	NS	NS	0
BSA	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
CALF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
DCRPS	0.5000	0	0	0	0	NS	NS	0
IOP	0.5000	0	0	0	0	NS	NS	0
LPST	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
MSWLF	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
OCP	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
RRCVCP	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
RWS	0.5000	0	0	0	0	NS	NS	0
STCV	0.5000	0	0	0	0	NS	NS	0
VCP	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
WMRF	0.5000	0	0	0	0	NS	NS	0
WSTMGMT	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
IHWCA	1.0000	0	0	0	0	0	NS	0
SF	**1.0000**	**0**	**0**	**0**	**0**	**0**	**NS**	**0**

SUB-TOTAL		0	0	0	0	0	0	0

Database Radius Summary

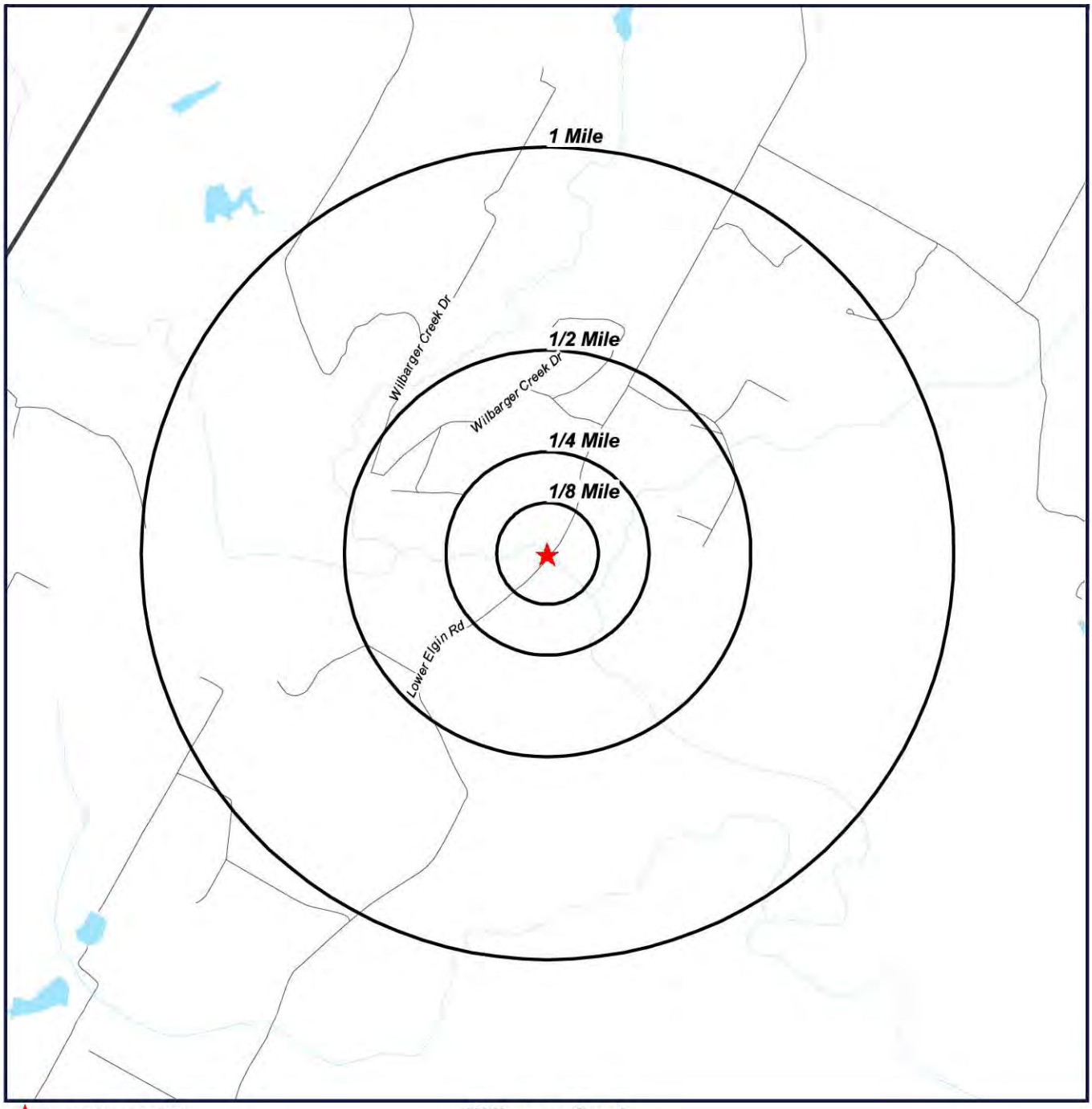
TRIBAL LISTING

*Standard environmental records are displayed in **bold**.*

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
USTR06	**0.2500**	**0**	**0**	**0**	**NS**	**NS**	**NS**	**0**
LUSTR06	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
ODINDIAN	**0.5000**	**0**	**0**	**0**	**0**	**NS**	**NS**	**0**
INDIANRES	1.0000	0	0	0	0	0	NS	0
SUB-TOTAL		0	0	0	0	0	0	0
TOTAL		0	0	0	0	0	0	0

NOTES:
NS = NOT SEARCHED
TP/AP = TARGET PROPERTY/ADJACENT PROPERTY

Radius Map 1



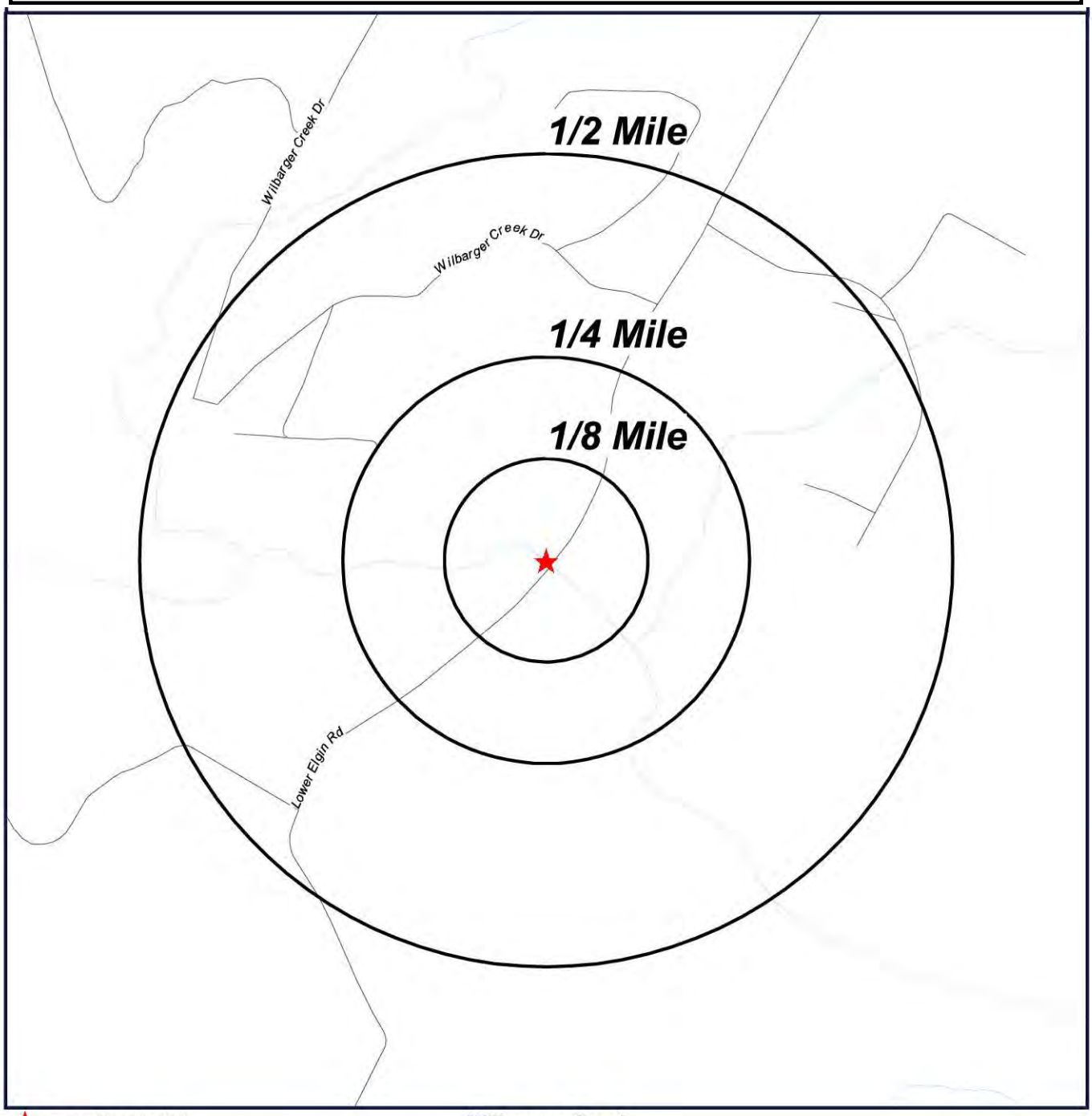
Target Property (TP)

Wilbarger Creek Watershed Study Pflugerville, Texas

N
W E
S

0' 1000' 2000' 3000'
SCALE: 1" = 2000'

Radius Map 2



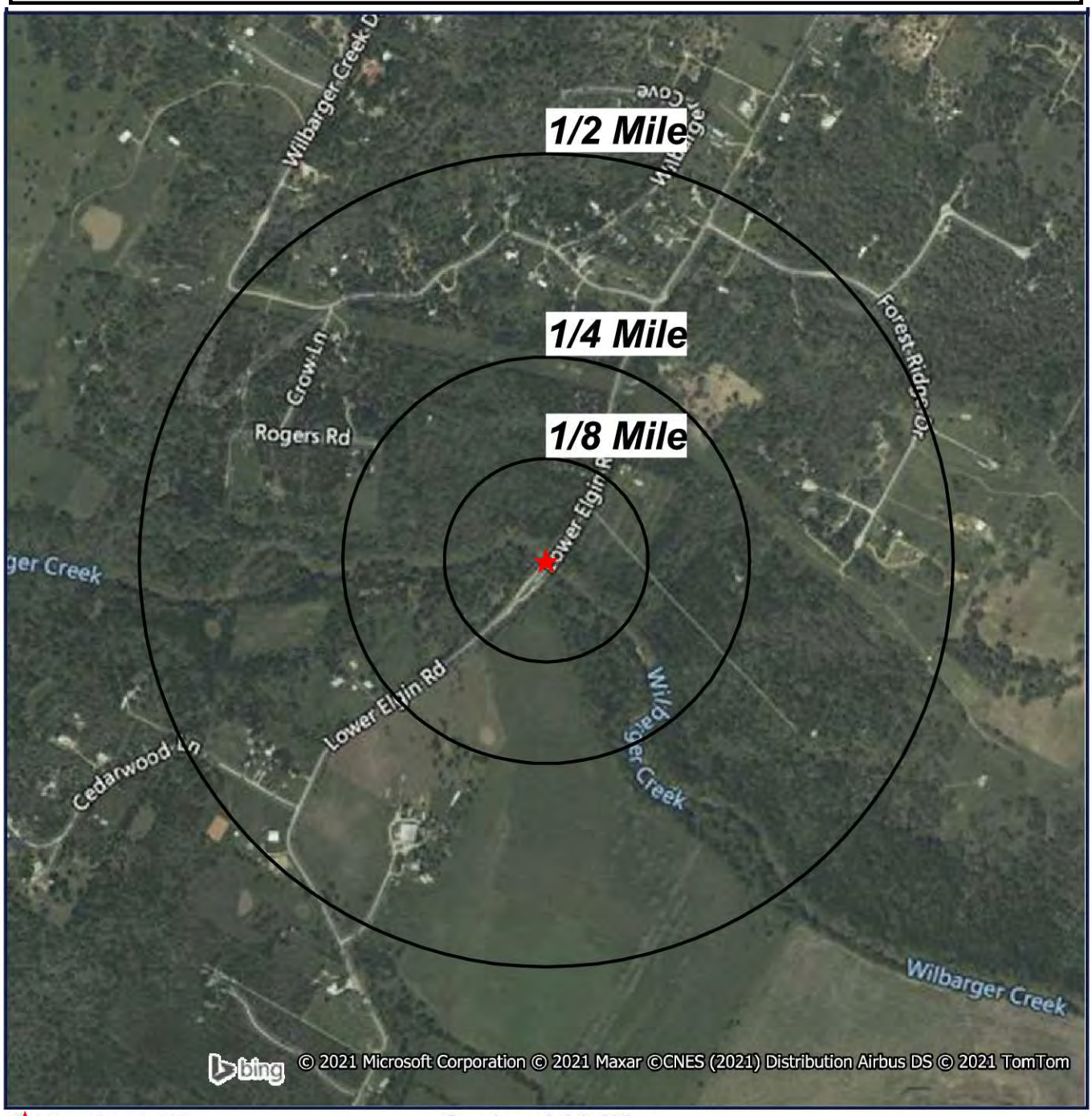
Target Property (TP)

Wilbarger Creek Watershed Study Pflugerville, Texas

N
W E
S

0' 500' 1000' 1500'
SCALE: 1" = 1000'

Ortho Map



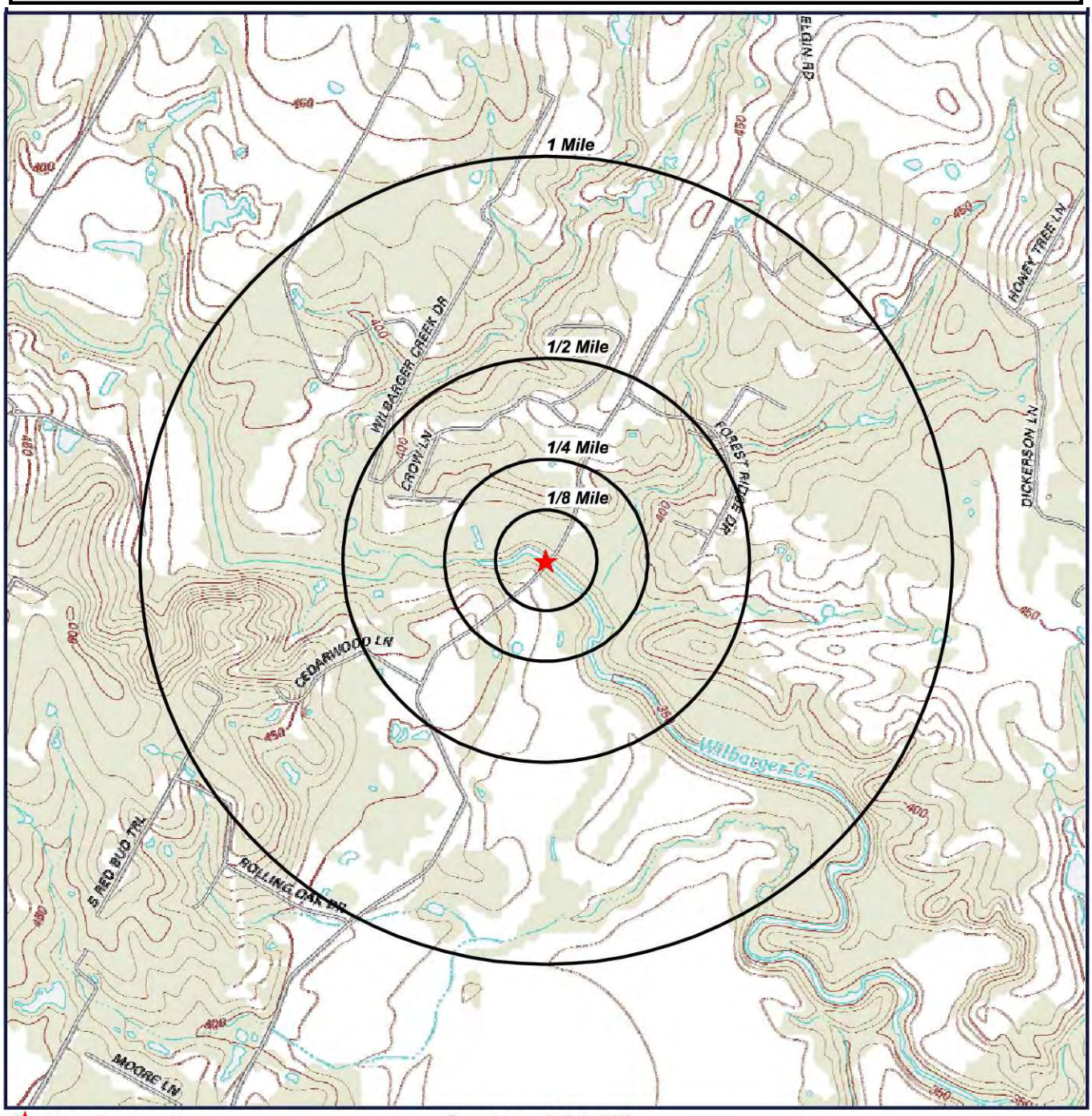
Target Property (TP)

Quadrangle(s): Utley
Wilbarger Creek
Watershed
Study
Pflugerville, Texas

N
W E
S

0' 500' 1000' 1500'
SCALE: 1" = 1000'

Topographic Map



Target Property (TP)

Quadrangle(s): Utley
Source: USGS,
01/22/2013
Wilbarger Creek
Watershed
Study
Pflugerville, Texas

N
W E
S

0' 1000' 2000' 3000'
SCALE: 1" = 2000'

Located Sites Summary

No Records Found.

Site Summary By Database

No Records Found.

Elevation Summary

Elevations are collected from the USGS 3D Elevation Program 1/3 arc-second (approximately 10 meters) layer hosted at the NGTOC. .

Target Property Elevation: 344 ft.

*NOTE: Standard environmental records are displayed in **bold**.*

No Records Found.

Unlocated Sites Summary

This list contains sites that could not be mapped due to limited or incomplete address information.

No Records Found

Appendix E: Hydrologic Model Analysis

E-1 Soil Type Table

Wilbarger Creek Watershed Pflugerville, Travis, & Bastrop, TX Soil Type								
Soil Name	Soil Series	Hydrologic Soil Type	Soil Name	Soil Series	Hydrologic Soil Type	Soil Name	Soil Series	Hydrologic Soil Type
Axtell	AfA	D	Chaney	ChB	C	Jedd	JeF	C
Edge	AfC	D		ChC2	C	Krum	KrA	C
	AfC2	D	Robco	DeC	A	Gad	Ls	A
	AfE2	D		Dm	A		Lw	A
	AtD	D	Dutek	DoB	B	Mabank	MaA	D
Altoga	AgB	B		DoD	A		MaB	D
	AgC2	B	Eddy	EdB	D	Weswood	Nd	B
Austin	AsB	D		EdC	D		No	B
	AsC2	D		EyB	D	Padina	PaE	A
Austin-Whitewright	AtC2	C		EyD	D	Rosanky	RoB	C
	AtD2	C	Ferris	FeF2	D		RoD	C
	AwD3	D		FhF2	D	Sayers	Sa	A
Bastrop	BaB	B		FhF3	D	Shep	SeD2	B
Behring	BeC2	C	Oakalla	Fo	B	Ships	Sg	D
	BeB	C		Fr	B	Silstid	SkC	B
	BeC3	C		OkA	B	Tabor	TfA	D
	BeD2	C	Gravel Pit	GP	D		TfB	D
Whitewright	BkC	D	Whitesboro	Gs	B	Tinn	Tr	D
Bosque	Bo	B	Heiden	HeB	D		Tw	D
Burleson	BsA	D		HeC2	D		Tv	D
	BsB	D		HedC2	D	Travis	TrC	C
	BtB	D		HeiD3	D	Uhland	Uh	C
	BtC	D		HeD2	D	Vernia	VeD	A
	BuB	D		HgF2	D	Water	W	D
Castephen	CaB	D	Behring	HfB	C	Whitewright	WhC	D
	StB	D		HfC	C	Wilson	WsA	D
	StC	D	Hornsby	HhC	C		WsB	D
	CaC	D	Houston Black	HnA	D		WgB	D
Crockett	CfB	D		HnB	D		WgC	D
	CsC2	D		HnC2	D		WlA	D
	CsD3	D		HoA	D		WlB	D
	CsE2	D		HoB	D			
	CgC	D		HoC2	D			
	ChE	D		HoD2	D			

Appendix E: Hydrologic Model Analysis

E-2 Curve Number

CN and Landuse Classification, City of Pflugerville					
City of Pflugerville Landuse Classification	Average Impervious Cover (%)	CN for Hydrologic Soil Type			
		A	B	C	D
Crops	0	74	83	88	90
Cemetery	5	49	69	79	84
Entertainment - Outdoor	5	49	69	79	84
Landscape Lot	5	49	69	79	84
Open Space	5	49	69	79	84
Park - Active	5	49	69	79	84
Park - Passive	5	49	69	79	84
Vacant & Unimproved	0	49	69	79	84
Livestock & Rangeland	3	49	69	79	84
Manufactured Home	45	61	75	83	87
Residential Inventory	45	61	75	83	87
Service - Day Care	45	61	75	83	87
Single Family Residential - Rural	45	61	75	83	87
Single Family Residential Attached	45	61	75	83	87
Single Family Residential Detached	45	61	75	83	87
Residential District - Lot Size 1 Acre	20	51	68	79	84
Auto & Recreational Vehicle Sales and Service	65	89	92	94	95
Construction Warehouse	65	89	92	94	95
Equipment Rental	65	89	92	94	95
General Contracting & Warehouse	65	89	92	94	95
Light Industrial - Warehouse Distribution Indoor	65	89	92	94	95
Light Industrial - Warehouse Distribution Outdoor	65	89	92	94	95
Office - Medical	90	89	92	94	95
Office - Professional	90	89	92	94	95
Public Facility	65	89	92	94	95
Public School	65	89	92	94	95
Public School Auxilary	65	89	92	94	95
Recreational Facility	45	89	92	94	95
Religious Facility	65	89	92	94	95
Religious Facility with Auxiliary	65	89	92	94	95
Retail	65	89	92	94	95
Service - Automotive	65	89	92	94	95
Service - Other	65	89	92	94	95
Service - Restaurant	65	89	92	94	95
Shopping Center	65	89	92	94	95
Storage Facility	65	89	92	94	95
Utilities	65	89	92	94	95
Industrial Manufacturing	65	81	88	91	93
Multi-Family Apartments & Condos	60	77	85	90	92
Ponds	100	100	100	100	100

CN and Landuse Classification, NLCD Fair Soil Condition						
NLCD Gridcode	NLCD Landuse Classification	Average Impervious Cover (%)	CN for Hydrologic Soil Type			
			A	B	C	D
11	Open Water	100	100	100	100	100
21	Developed, Open Space	12	39	61	74	80
22	Developed, Low Intensity	38	39	61	74	80
23	Developed, Medium Intensity	65	49	69	79	84
24	Developed, High Intensity	85	68	79	86	89
31	Barren Land (Rock/Sand/Clay)	0	77	86	91	94
41	Deciduous Forest	0	43	65	76	82
42	Evergreen Forest	0	43	65	76	82
43	Mixed Forest	0	43	65	76	82
52	Shrub/Scrub	0	35	56	70	77
71	Grassland/Herbaceous	0	49	69	79	84
81	Pasture/Hay	0	49	69	79	84
82	Cultivated Crops	0	74	83	88	90
90	Woody Wetlands	0	-	71	81	89
95	Emergent Herbaceous Wetlands	0	-	71	81	89
-	Roads	75	98	98	98	98

Wilbarger Creek Watershed Curve Number Loss								
Basin	Curve Number	Impervious (%)	Basin	Curve Number	Impervious (%)	Basin	Curve Number	Impervious (%)
CC_10	89	13.18	WCT003_20	78	6.39	WCT056_60	88	10.35
CC_20	87	7.26	WCT004_10	83	5.79	WCT056_70	85	3.11
CC_30	90	2.27	WCT004_20	72	3.62	WCT056_80	90	6.22
CC_40	90	1.5	WCT004_30	80	2.32	WCT056_90	87	2.37
CC_50	88	3.72	WCT004_40	76	0.52	WCT062_05	90	0.18
CC_60	86	4.52	WCT004_50	80	9.88	WCT062_10	90	3.16
CC_70	86	4.49	WCT004_60	81	6.54	WCT062_20	89	13.34
CC_80	86	5.04	WCT004_70	76	2.69	WCT070_10	90	0.16
CC_90	84	4.33	WCT006_10	83	4.76	WCT080_05	86	0.33
DCW_10	86	6	WCT006_20	80	3.83	WCT080_10	85	5.51
DCW_20	88	2.37	WCT006_30	85	0	WCT080_20	88	10.12
DCW_30	88	4.98	WCT009_10	83	21.81	WCT080_30	87	9.66
DCW_40	86	4.31	WCT009_20	80	8.52	WCT080_40	88	9.34
DCW_50	88	1.9	WCT009_30	81	3.27	WCT080_50	89	14.8
DCW_60	86	2.36	WCT009_40	79	2.45	WCT080_60	89	8.45
DCW_70	88	6.64	WCT009_50	86	5.23	WCT082_10	89	22.59
DCW_80	84	4.24	WCT009_60	81	1.59	WCT082_15	90	5.78
DCW_90	83	2.66	WCT009_70	83	1.28	WCT082_20	90	14.15
ECT001_10	80	17.76	WCT009_80	85	0	WCT085_10	87	16.43
ECT001_20	77	18.6	WCT018_10	75	2.13	WCT086_10	86	18.97
EC_10	83	3.88	WCT018_20	82	4.08	WCT086_20	89	10.24
EC_20	83	1.72	WCT019_10	83	5.52	WCT113_10	90	3.1
EC_30	85	5.82	WCT020_10	83	2.57	WCT113_20	87	7
EC_40	81	14.69	WCT021_10	81	0.21	WCT113_30	86	8.87
EC_50	84	7.87	WCT024_10	81	5.7	WCT113_40	84	7.98
EC_60	84	3.49	WCT024_20	80	3.73	WCT113_50	84	3.45
EC_70	85	6.59	WCT024_30	80	13.15	WCT138_10	90	3.53
EC_80	84	13.31	WCT024_40	82	3.78	WCT138_20	90	2.06
HBS_10	82	5.1	WCT025_10	82	1.77	WCT138_30	90	1.46
HBS_20	85	3.77	WCT026_10	84	11.06	WCT165_10	86	14.35
HBS_30	85	10.23	WCT027_10	84	7.25	WCT167_10	87	16.26
LC_10	82	5.02	WCT030_10	83	2.83	WCT167_20	86	24.15
LC_20	82	7.35	WCT030_20	82	5.15	WCT167_30	89	7.33
LC_30	82	3.16	WCT047_10	90	0.75	WCT167_40	85	0.26
LC_40	82	1.73	WCT047_20	88	20.3	WCT169_10	86	5.06
LWC_10	90	2.4	WCT047_30	88	7.46	WCT171_10	84	10.32
LWC_20	90	2.58	WCT047_40	86	9.63	WCT171_20	87	3.92
LWC_30	88	2.6	WCT049_10	88	15.77	WCT171_30	84	4.21
LWC_40	89	4.37	WCT056_10	89	10.78	WCT178_10	87	25.29
LWC_50	87	4.31	WCT056_20	89	6.69	WCT178_20	89	0.78
WCT001_10	73	1.79	WCT056_30	90	13.34	WCT183_10	88	30.68
WCT001_20	76	0.19	WCT056_40	90	4.65	WCT183_20	88	13.16
WCT003_10	60	2.61	WCT056_50	90	6.95	WCT185_10	90	40.13

Wilbarger Creek Watershed Curve Number Loss								
Basin	Curve Number	Impervious (%)	Basin	Curve Number	Impervious (%)	Basin	Curve Number	Impervious (%)
WCT185_20	88	43.1	WCT229_10	83	15.46	WC_260	81	7.92
WCT186_10	89	37.71	WCT260_10	87	3.41	WC_270	84	2.86
WCT186_20	89	12.33	WCT260_20	88	17.6	WC_280	88	4.78
WCT187_10	92	38.69	WCT286_10	83	8.74	WC_290	85	0
WCT187_20	90	0.51	WCT286_20	85	4.78	WC_300	82	1.58
WCT196_10	91	51.02	WCT298_10	83	5.18	WC_310	86	3.68
WCT196_15	87	14.64	WCT298_20	80	2	WC_320	82	1.54
WCT196_20	91	45.41	WCT304_10	82	2.19	WC_330	87	0
WCT196_30	87	6.66	WCT304_20	82	0	WC_340	86	0
WCT200_05	87	36.77	WCT305_10	83	4.77	WC_350	84	1.91
WCT200_10	87	21.48	WCT305_20	82	0.75	WC_360	85	3.06
WCT200_20	89	46.68	WCT307_10	77	2.78	WC_370	84	1.03
WCT200_30	88	37	WCT307_20	81	6.95	WC_380	85	4.75
WCT200_40	90	23.21	WCT326_10	81	2.64	WC_390	84	4.47
WCT200_45	87	25.3	WCT326_20	83	3.49	WC_400	83	0
WCT200_50	87	5.24	WCT328_10	83	4.52	WC_410	81	0.12
WCT206_10	93	45.1	WCT346_10	69	0	WC_420	85	3.1
WCT206_20	90	44.79	WCT346_20	59	0.06	WC_430	85	2.38
WCT207_10	89	46.17	WC_10	88	40.16	WC_440	83	2.15
WCT207_20	88	24.77	WC_20	89	41.82	WC_450	82	9.29
WCT208_10	88	45.99	WC_30	87	33.23	WC_460	68	1.59
WCT208_20	85	14.29	WC_40	90	39.33	WC_470	71	0.96
WCT208_30	91	7.51	WC_50	89	31.61	WC_480	81	2.43
WCT209_10	88	40.32	WC_60	91	23.56	WC_490	83	4.22
WCT209_20	88	47.55	WC_70	91	20.82	WC_500	78	0.17
WCT210_10	88	44.41	WC_80	91	9.85	WC_510	78	0
WCT210_20	88	29.86	WC_90	88	7.92	WC_520	85	0.26
WCT210_25	88	46.36	WC_100	90	8.97	WC_530	79	0
WCT210_30	87	40.09	WC_110	89	0.72	WLC_10	88	4.36
WCT210_40	88	43.9	WC_120	90	7.94	WLC_20	90	2.71
WCT210_50	89	11.21	WC_130	88	2.73	WLC_30	90	0.3
WCT210_60	89	1.64	WC_140	80	0	WLC_40	89	3.34
WCT210_70	88	0.95	WC_150	87	1.76	WLC_50	90	2.14
WCT216_10	87	37.15	WC_160	85	11.62	WLC_60	90	2.03
WCT216_20	89	35.58	WC_170	85	27.4	WLC_70	89	3.07
WCT216_30	87	41.02	WC_180	85	25.85	WLC_80	89	3.76
WCT220_10	92	32.51	WC_190	85	16.5	WLC_90	87	4.28
WCT220_20	88	9.55	WC_200	82	6.09	WLC_100	84	4.73
WCT220_30	88	4.07	WC_210	82	12.51			
WCT220_40	88	3.89	WC_220	80	9.3			
WCT227_10	87	17.9	WC_230	85	18.36			
WCT227_20	87	4.04	WC_240	80	0			
WCT227_30	86	1.4	WC_250	85	10.41			

Appendix E: Hydrologic Model Analysis

E-3 Lag Times

Wilbarger Creek Watershed, Time of Concentration													
Variable	Variable description	Unit	Subbasin WC_10	Subbasin WC_20	Subbasin WC_30	Subbasin WC_40	Subbasin WC_50	Subbasin WC_60	Subbasin WC_70	Subbasin WC_80	Subbasin WC_90	Subbasin WC_100	Subbasin WC_110
Sheet Flow [eq. 3-3]													
n	Manning's roughness coefficient (table 3-1)$_{2,3}$	n/a	0.15	0.011	0.011	0.011	0.15	0.011	0.15	0.15	0.011	0.011	0.24
L	flow length$_4$	ft	50.00	50.00	50.00	50.00	100.00	50.00	100.00	100.00	50.00	50.00	100.00
P_2	2-year, 24-hour rainfall$_5$	in	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
s	slope of hydraulic grade line (land slope)$_6$	ft/ft	0.025	0.021	0.010	0.018	0.012	0.017	0.005	0.007	0.027	0.061	0.010
V	velocity	ft/s	0.18	1.38	1.03	1.29	0.15	1.25	0.11	0.13	1.53	2.11	0.10
T_t	travel time$_7$	hr	0.08	0.01	0.01	0.01	0.18	0.01	0.26	0.22	0.01	0.01	0.28
Shallow Concentrated Flow [eq. 3-1]													
L	flow length$_8$	ft	2881.31	2769.12	1913.86	1657.68	2580.53	3080.11	420.77	817.61	360.37	2635.98	1008.18
s	slope of hydraulic grade line (watercourse slope)$_9$	ft/ft	0.017	0.013	0.018	0.027	0.017	0.015	0.076	0.014	0.022	0.007	0.017
n/a	surface (Unpaved, Paved)$_{10}$	n/a	paved	unpaved	paved	paved	paved	paved	unpaved	unpaved	paved	unpaved	unpaved
V	average velocity$_{11}$	ft/s	2.69	1.84	2.70	3.35	2.68	2.51	4.46	1.93	3.01	1.37	2.10
T_t	travel time$_{12}$	hr	0.30	0.42	0.20	0.14	0.27	0.34	0.03	0.12	0.03	0.53	0.13
Channel Flow [eq. 3-4 and eq. 3-1]													
L	flow length$_{13}$	ft	3365.28	2573.90	2303.06	2681.27	2772.91	14134.30	4293.56	16519.56	10250.17	5717.08	12962.45
a	cross sectional flow area$_{14}$	ft^2	236.85	64.28	32.09	236.54	100.72	96.33	81.46	119.28	80.51	13.12	191.91
p_w	wetted perimeter$_{15}$	ft	119.36	24.12	24.15	75.61	50.80	47.44	39.55	39.33	36.76	9.36	44.88
r	hydraulic radius = a/p_{w16}	ft	1.98	2.67	1.33	3.13	1.98	2.03	2.06	3.03	2.19	1.40	4.28
s	slope of hydraulic grade line$_{17}$	ft/ft	0.009	0.007	0.005	0.007	0.009	0.003	0.009	0.006	0.003	0.009	0.005
n	Manning's roughness coefficient for open channel flow$_{18}$	n/a	0.045	0.035	0.04	0.05	0.045	0.05	0.05	0.05	0.045	0.045	0.055
V	average velocity$_{19}$	ft/s	5.07	6.63	3.25	5.16	5.09	2.81	4.66	4.71	3.21	3.91	4.94
T_t	travel time$_{20}$	hr	0.18	0.11	0.20	0.14	0.15	1.40	0.26	0.97	0.89	0.41	0.73
Total Travel Time (Tt)$_{21}$		hr	0.56	0.54	0.41	0.29	0.60	1.75	0.54	1.31	0.93	0.95	1.14
Time of Concentration (TOC_min)		min	**33.51**	**32.21**	**24.44**	**17.55**	**35.94**	**104.99**	**32.34**	**78.73**	**55.81**	**56.74**	**68.54**
Lag Time$_{22}$		min	**20.10**	**19.33**	**14.66**	**10.53**	**21.56**	**63.00**	**19.40**	**47.24**	**33.49**	**34.05**	**41.12**

(1) Flowpaths hand-delineated. Source WC_longestflowpaths.shp

(2) n-Value was based on the land use

(3) Land use was estimated from aerial imagery and parcel data

(4)Overland flow was considered to occur at short distances with a maximum of 100 feet

(5) 2-YR 24-HR Rainfall - Based on Austin Drainage Criteria Manual Table = 4.06 inches

(6) Overland flow slope = (US elevation - DS elevation) / overland flow length

(7) Overland Flow Time of Concentration (hr) = (0.007*(nL)^0.8)/((P2)^0.5*s^0.4)

(8) Length of Shallow Concentrated Flow

(9) Ground Slope over Shallow Concentrated Flow Path

(10) From aerial imagery

(11) Channel Velocity: Paved Areas = 20.3282 * SQRT (Slope / 100) Unpaved Areas = 16.1345 * SQRT (Slope / 100)

(12) Channel Flow Tc (Shallow Concentrated) = L1 / V1

(13) Main channel length

(14) Average Bankfull Area

(15) Average Bankfull Wetted Perimeter

(16) Hydraulic Radius = Bankfull Area / Bankfull Wetted Perimeter

(17) Channel Slope

(18) Manning's n-Value for Channel

(19) Channel Velocity (Manning's Equation)

(20) Channel Time of Concentration (Channel Length/Channel Velocity)

(21) Total Tc = Overland Flow+Shallow Concentrated Flow+Channel Flow+Pipe Flow

(22) Lag Time (Tlag) = 0.6 * Final Tc (Soil Conservation Service)

Wilbarger Creek Watershed, Time of Concentration													
Variable	Variable description	Unit	Subbasin WC_120	Subbasin WC_130	Subbasin WC_140	Subbasin WC_150	Subbasin WC_160	Subbasin WC_170	Subbasin WC_180	Subbasin WC_190	Subbasin WC_200	Subbasin WC_210	Subbasin WC_220
Sheet Flow [eq. 3-3]													
n	Manning's roughness coefficient (table 3-1)$_{2,3}$	n/a	0.15	0.13	0.4	0.15	0.24	0.011	0.011	0.011	0.4	0.011	0.011
L	flow length$_4$	ft	100.00	100.00	100.00	100.00	100.00	100.00	50.00	50.00	100.00	50.00	50.00
P_2	2-year, 24-hour rainfall$_5$	in	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
s	slope of hydraulic grade line (land slope)$_6$	ft/ft	0.114	0.010	0.010	0.020	0.005	0.005	0.011	0.030	0.010	0.008	0.023
V	velocity	ft/s	0.38	0.16	0.07	0.19	0.08	0.87	1.06	1.58	0.07	0.95	1.43
T_t	travel time$_7$	hr	0.07	0.17	0.43	0.15	0.37	0.03	0.01	0.01	0.42	0.01	0.01
Shallow Concentrated Flow [eq. 3-1]													
L	flow length$_8$	ft	4185.50	3976.29	390.12	3128.61	1324.14	3446.59	1876.80	2836.36	1644.95	1015.37	835.98
s	slope of hydraulic grade line (watercourse slope)$_9$	ft/ft	0.011	0.011	0.015	0.016	0.004	0.013	0.014	0.011	0.022	0.026	0.043
n/a	surface (Unpaved, Paved)$_{10}$	n/a	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	paved	paved	unpaved	paved	unpaved
V	average velocity$_{11}$	ft/s	1.70	1.67	1.96	2.05	1.02	1.82	2.41	2.17	2.37	3.28	3.33
T_t	travel time$_{12}$	hr	0.69	0.66	0.06	0.42	0.36	0.53	0.22	0.36	0.19	0.09	0.07
Channel Flow [eq. 3-4 and eq. 3-1]													
L	flow length$_{13}$	ft	8444.71	16397.96	1005.36	8092.63	4387.47	7784.41	5939.42	3986.23	9761.98	8075.58	4087.35
a	cross sectional flow area$_{14}$	ft^2	72.31	46.51	158.30	57.58	64.90	143.27	44.42	61.17	26.39	89.75	17.94
p_w	wetted perimeter$_{15}$	ft	27.36	21.15	50.94	39.34	45.25	45.81	18.64	33.63	23.91	41.50	17.82
r	hydraulic radius = a/p_{w16}	ft	2.64	2.20	3.11	1.46	1.43	3.13	2.38	1.82	1.10	2.16	1.01
s	slope of hydraulic grade line$_{17}$	ft/ft	0.004	0.003	0.000	0.001	0.004	0.006	0.006	0.007	0.009	0.012	0.011
n	Manning's roughness coefficient for open channel flow$_{18}$	n/a	0.05	0.05	0.05	0.055	0.055	0.05	0.05	0.05	0.05	0.05	0.045
V	average velocity$_{19}$	ft/s	3.55	2.72	0.41	1.02	2.27	4.92	4.08	3.84	3.03	5.57	3.48
T_t	travel time$_{20}$	hr	0.66	1.67	0.69	2.21	0.54	0.44	0.40	0.29	0.90	0.40	0.33
Total Travel Time (Tt)$_{21}$		hr	1.42	2.51	1.17	2.78	1.27	1.00	0.63	0.66	1.51	0.50	0.41
Time of Concentration (TOC_min)		min	**85.08**	**150.53**	**70.13**	**166.88**	**75.93**	**59.88**	**37.98**	**39.65**	**90.48**	**30.19**	**24.37**
Lag Time$_{22}$		min	**51.05**	**90.32**	**42.08**	**100.13**	**45.56**	**35.93**	**22.79**	**23.79**	**54.29**	**18.12**	**14.62**

(1) Flowpaths hand-delineated. Source WC_longestflowpaths.shp

(2) n-Value was based on the land use

(3) Land use was estimated from aerial imagery and parcel data

(4)Overland flow was considered to occur at short distances with a maximum of 100 feet

(5) 2-YR 24-HR Rainfall - Based on Austin Drainage Criteria Manual Table = 4.06 inches

(6) Overland flow slope = (US elevation - DS elevation) / overland flow length

(7) Overland Flow Time of Concentration (hr) = (0.007*(nL)^0.8)/((P2)^0.5*s^0.4)

(8) Length of Shallow Concentrated Flow

(9) Ground Slope over Shallow Concentrated Flow Path

(10) From aerial imagery

(11) Channel Velocity: Paved Areas = 20.3282 * SQRT (Slope / 100) Unpaved Areas = 16.1345 * SQRT (S

(12) Channel Flow Tc (Shallow Concentrated) = L1 / V1

(13) Main channel length

(14) Average Bankfull Area

(15) Average Bankfull Wetted Perimeter

(16) Hydraulic Radius = Bankfull Area / Bankfull Wetted Perimeter

(17) Channel Slope

(18) Manning's n-Value for Channel

(19) Channel Velocity (Manning's Equation)

(20) Channel Time of Concentration (Channel Length/Channel Velocity)

(21) Total Tc = Overland Flow+Shallow Concentrated Flow+Channel Flow+Pipe Flow

(22) Lag Time (Tlag) = 0.6 * Final Tc (Soil Conservation Service)

Wilbarger Creek Watershed, Time of Concentration													
Variable	Variable description	Unit	Subbasin WC_230	Subbasin WC_240	Subbasin WC_250	Subbasin WC_260	Subbasin WC_270	Subbasin WC_280	Subbasin WC_290	Subbasin WC_300	Subbasin WC_310	Subbasin WC_320	Subbasin WC_330
Sheet Flow [eq. 3-3]													
n	Manning's roughness coefficient (table 3-1)$_{2,3}$	n/a	0.15	0.24	0.24	0.4	0.24	0.15	0.4	0.15	0.06	0.4	0.15
L	flow length$_4$	ft	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
P_2	2-year, 24-hour rainfall$_5$	in	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
s	slope of hydraulic grade line (land slope)$_6$	ft/ft	0.039	0.011	0.008	0.031	0.005	0.016	0.040	0.025	0.013	0.010	0.005
V	velocity	ft/s	0.25	0.10	0.09	0.10	0.07	0.18	0.12	0.21	0.34	0.06	0.11
T_t	travel time$_7$	hr	0.11	0.27	0.30	0.27	0.38	0.16	0.24	0.13	0.08	0.43	0.25
Shallow Concentrated Flow [eq. 3-1]													
L	flow length$_8$	ft	1574.25	1157.52	4403.44	2637.15	3327.19	3600.32	761.50	1562.25	4201.63	2175.45	1765.01
s	slope of hydraulic grade line (watercourse slope)$_9$	ft/ft	0.007	0.021	0.007	0.005	0.032	0.007	0.056	0.020	0.008	0.006	0.020
n/a	surface (Unpaved, Paved)$_{10}$	n/a	paved	unpaved	paved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved
V	average velocity$_{11}$	ft/s	1.68	2.35	1.72	1.13	2.90	1.36	3.81	2.29	1.48	1.25	2.30
T_t	travel time$_{12}$	hr	0.26	0.14	0.71	0.65	0.32	0.74	0.06	0.19	0.79	0.48	0.21
Channel Flow [eq. 3-4 and eq. 3-1]													
L	flow length$_{13}$	ft	9529.92	4871.41	17223.80	11591.64	11680.12	9133.93	1804.65	10560.42	10612.36	9881.85	1763.34
a	cross sectional flow area$_{14}$	ft^2	14.12	158.25	61.03	29.36	288.32	44.50	118.25	62.21	382.46	33.81	44.36
p_w	wetted perimeter$_{15}$	ft	9.05	37.26	24.55	24.26	49.58	21.21	28.88	22.81	55.91	18.03	27.49
r	hydraulic radius = a/p_{w16}	ft	1.56	4.25	2.49	1.21	5.82	2.10	4.09	2.73	6.84	1.87	1.61
s	slope of hydraulic grade line$_{17}$	ft/ft	0.005	0.009	0.004	0.010	0.005	0.006	0.004	0.012	0.004	0.014	0.008
n	Manning's roughness coefficient for open channel flow$_{18}$	n/a	0.045	0.05	0.045	0.05	0.055	0.05	0.05	0.05	0.05	0.05	0.05
V	average velocity$_{19}$	ft/s	3.17	7.34	4.04	3.45	6.02	3.77	4.84	6.28	6.96	5.36	3.65
T_t	travel time$_{20}$	hr	0.84	0.18	1.18	0.93	0.54	0.67	0.10	0.47	0.42	0.51	0.13
Total Travel Time (Tt)$_{21}$		hr	1.21	0.59	2.20	1.85	1.23	1.56	0.40	0.79	1.29	1.42	0.59
Time of Concentration (TOC_min)		min	**72.46**	**35.32**	**131.86**	**110.88**	**74.00**	**93.85**	**24.03**	**47.36**	**77.63**	**85.43**	**35.61**
Lag Time$_{22}$		min	**43.47**	**21.19**	**79.12**	**66.53**	**44.40**	**56.31**	**14.42**	**28.42**	**46.58**	**51.26**	**21.37**

(1) Flowpaths hand-delineated. Source WC_longestflowpaths.shp

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(5) 2-YR 24-HR Rainfall - Based on Austin Drainage Criteria Manual Table = 4.06 inches

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(7) Overland Flow Time of Concentration (hr) = (0.007*(nL)^0.8)/((P2)^0.5*s^0.4)

(8) Length of Shallow Concentrated Flow

(9) Ground Slope over Shallow Concentrated Flow Path

(10) From aerial imagery

(11) Channel Velocity: Paved Areas = 20.3282 * SQRT (Slope / 100) Unpaved Areas = 16.1345 * SQRT (S

(12) Channel Flow Tc (Shallow Concentrated) = L1 / V1

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(14) Average Bankfull Area

(15) Average Bankfull Wetted Perimeter

(16) Hydraulic Radius = Bankfull Area / Bankfull Wetted Perimeter

(17) Channel Slope

(18) Manning's n-Value for Channel

(19) Channel Velocity (Manning's Equation)

(20) Channel Time of Concentration (Channel Length/Channel Velocity)

(21) Total Tc = Overland Flow+Shallow Concentrated Flow+Channel Flow+Pipe Flow

(22) Lag Time (Tlag) = 0.6 * Final Tc (Soil Conservation Service)

Wilbarger Creek Watershed, Time of Concentration													
Variable	Variable description	Unit	Subbasin WC_340	Subbasin WC_350	Subbasin WC_360	Subbasin WC_370	Subbasin WC_380	Subbasin EC_10	Subbasin EC_20	Subbasin EC_30	Subbasin EC_40	Subbasin EC_50	Subbasin EC_60
Sheet Flow [eq. 3-3]													
n	Manning's roughness coefficient (table 3-1)[2,3]	n/a	0.24	0.15	0.15	0.15	0.13	0.13	0.15	0.06	0.15	0.011	0.17
L	flow length[4]	ft	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	50.00	100.00
P_2	2-year, 24-hour rainfall[5]	in	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
s	slope of hydraulic grade line (land slope)[6]	ft/ft	0.012	0.009	0.005	0.026	0.029	0.002	0.023	0.006	0.004	0.016	0.028
V	velocity	ft/s	0.11	0.14	0.11	0.21	0.25	0.09	0.20	0.24	0.09	1.23	0.20
T_t	travel time[7]	hr	0.26	0.20	0.26	0.13	0.11	0.32	0.14	0.11	0.16	0.01	0.14
Shallow Concentrated Flow [eq. 3-1]													
L	flow length[8]	ft	366.39	1094.76	933.94	1236.62	2450.25	2053.39	1463.86	1167.76	473.30	882.34	564.67
s	slope of hydraulic grade line (watercourse slope)[9]	ft/ft	0.039	0.012	0.007	0.019	0.024	0.010	0.011	0.016	0.011	0.035	0.016
n/a	surface (Unpaved, Paved)[10]	n/a	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	paved	unpaved
V	average velocity[11]	ft/s	3.20	1.77	1.36	2.21	2.52	1.64	1.71	2.07	1.67	3.82	2.05
T_t	travel time[12]	hr	0.03	0.17	0.19	0.16	0.27	0.35	0.24	0.16	0.08	0.06	0.08
Channel Flow [eq. 3-4 and eq. 3-1]													
L	flow length[13]	ft	1493.66	2975.37	19976.94	4733.15	12156.96	3317.54	10086.43	11636.32	6625.35	9397.13	5719.99
a	cross sectional flow area[14]	ft^2	655.96	6.79	78.04	64.26	1009.04	7.14	44.68	49.17	8.79	75.83	235.39
p_w	wetted perimeter[15]	ft	73.05	8.75	24.76	25.63	96.65	26.14	27.36	26.61	11.90	19.88	42.67
r	hydraulic radius = a/p_w[16]	ft	8.98	0.78	3.15	2.51	10.44	0.27	1.63	1.85	0.74	3.81	5.52
s	slope of hydraulic grade line[17]	ft/ft	0.000	0.005	0.006	0.029	0.009	0.006	0.007	0.006	0.010	0.008	0.012
n	Manning's roughness coefficient for open channel flow[18]	n/a	0.05	0.04	0.05	0.05	0.05	0.04	0.05	0.05	0.05	0.05	0.05
V	average velocity[19]	ft/s	0.36	2.29	4.78	9.31	13.52	1.21	3.45	3.77	2.41	7.18	10.32
T_t	travel time[20]	hr	1.14	0.36	1.16	0.14	0.25	0.76	0.81	0.86	0.76	0.36	0.15
Total Travel Time (Tt)[21]		hr	1.43	0.73	1.61	0.43	0.63	1.43	1.19	1.13	1.00	0.44	0.37
Time of Concentration (TOC_min)		min	**85.82**	**43.71**	**96.82**	**25.62**	**37.95**	**85.81**	**71.30**	**67.61**	**60.29**	**26.35**	**22.24**
Lag Time[22]		min	**51.49**	**26.23**	**58.09**	**15.37**	**22.77**	**51.49**	**42.78**	**40.56**	**36.17**	**15.81**	**13.35**

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(8) Length of Shallow Concentrated Flow

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(20) Channel Time of Concentration (Channel Length/Channel Velocity)

(21) Total Tc = Overland Flow+Shallow Concentrated Flow+Channel Flow+Pipe Flow

(22) Lag Time (Tlag) = 0.6 * Final Tc (Soil Conservation Service)

Wilbarger Creek Watershed, Time of Concentration													
Variable	Variable description	Unit	Subbasin EC_70	Subbasin EC_80	Subbasin ECT001_10	Subbasin ECT001_20	Subbasin WCT165_10	Subbasin WCT167_10	Subbasin WCT167_20	Subbasin WCT167_30	Subbasin WCT167_40	Subbasin WCT178_10	Subbasin WCT178_20
Sheet Flow [eq. 3-3]													
n	Manning's roughness coefficient (table 3-1)$_{2,3}$	n/a	0.17	0.15	0.011	0.011	0.17	0.15	0.15	0.17	0.17	0.011	0.06
L	flow length$_4$	ft	100.00	100.00	50.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00
P_2	2-year, 24-hour rainfall$_5$	in	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
s	slope of hydraulic grade line (land slope)$_6$	ft/ft	0.006	0.026	0.062	0.014	0.009	0.010	0.024	0.010	0.024	0.044	0.013
V	velocity	ft/s	0.10	0.21	2.12	1.34	0.12	0.14	0.21	0.13	0.19	1.84	0.33
T_t	travel time$_7$	hr	0.26	0.13	0.01	0.02	0.22	0.19	0.14	0.21	0.15	0.01	0.08
Shallow Concentrated Flow [eq. 3-1]													
L	flow length$_8$	ft	1304.78	1837.77	605.55	219.61	1346.43	3115.76	3278.76	2003.96	1203.94	2171.17	743.82
s	slope of hydraulic grade line (watercourse slope)$_9$	ft/ft	0.012	0.043	0.010	0.016	0.011	0.010	0.010	0.004	0.007	0.020	0.015
n/a	surface (Unpaved, Paved)$_{10}$	n/a	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved
V	average velocity$_{11}$	ft/s	1.79	3.33	1.60	2.01	1.66	1.61	1.60	1.04	1.34	2.31	1.98
T_t	travel time$_{12}$	hr	0.20	0.15	0.10	0.03	0.22	0.54	0.57	0.53	0.25	0.26	0.10
Channel Flow [eq. 3-4 and eq. 3-1]													
L	flow length$_{13}$	ft	10292.40	7492.78	5140.89	5991.44	3317.74	3205.32	9097.02	1408.89	1871.37	2007.57	2178.14
a	cross sectional flow area$_{14}$	ft^2	39.42	280.97	18.24	53.66	87.46	14.77	108.58	118.63	30.55	31.31	448.78
p_w	wetted perimeter$_{15}$	ft	18.69	40.55	15.00	18.98	30.62	46.91	42.89	37.36	21.04	18.76	99.91
r	hydraulic radius = a/p_{w16}	ft	2.11	6.93	1.22	2.83	2.86	0.31	2.53	3.18	1.45	1.67	4.49
s	slope of hydraulic grade line$_{17}$	ft/ft	0.008	0.003	0.012	0.015	0.005	0.006	0.005	0.009	0.009	0.018	0.006
n	Manning's roughness coefficient for open channel flow$_{18}$	n/a	0.05	0.05	0.045	0.05	0.04	0.045	0.04	0.040	0.05	0.045	0.045
V	average velocity$_{19}$	ft/s	4.46	5.84	4.10	7.19	5.20	1.20	5.78	7.83	3.63	6.29	6.97
T_t	travel time$_{20}$	hr	0.64	0.36	0.35	0.23	0.18	0.74	0.44	0.05	0.14	0.09	0.09
Total Travel Time (Tt)$_{21}$		hr	1.11	0.64	0.46	0.28	0.63	1.48	1.14	0.79	0.54	0.36	0.27
Time of Concentration (TOC_min)		min	**66.52**	**38.39**	**27.59**	**16.95**	**37.57**	**88.62**	**68.42**	**47.60**	**32.57**	**21.45**	**16.49**
Lag Time$_{22}$		min	**39.91**	**23.03**	**16.55**	**10.17**	**22.54**	**53.17**	**41.05**	**28.56**	**19.54**	**12.87**	**9.89**

(1) Flowpaths hand-delineated. Source WC_longestflowpaths.shp

(2) n-Value was based on the land use

(3) Land use was estimated from aerial imagery and parcel data

(4)Overland flow was considered to occur at short distances with a maximum of 100 feet

(5) 2-YR 24-HR Rainfall - Based on Austin Drainage Criteria Manual Table = 4.06 inches

(6) Overland flow slope = (US elevation - DS elevation) / overland flow length

(7) Overland Flow Time of Concentration (hr) = (0.007*(nL)^0.8)/((P2)^0.5*s^0.4)

(8) Length of Shallow Concentrated Flow

(9) Ground Slope over Shallow Concentrated Flow Path

(10) From aerial imagery

(11) Channel Velocity: Paved Areas = 20.3282 * SQRT (Slope / 100) Unpaved Areas = 16.1345 * SQRT (S

(12) Channel Flow Tc (Shallow Concentrated) = L1 / V1

(13) Main channel length

(14) Average Bankfull Area

(15) Average Bankfull Wetted Perimeter

(16) Hydraulic Radius = Bankfull Area / Bankfull Wetted Perimeter

(17) Channel Slope

(18) Manning's n-Value for Channel

(19) Channel Velocity (Manning's Equation)

(20) Channel Time of Concentration (Channel Length/Channel Velocity)

(21) Total Tc = Overland Flow+Shallow Concentrated Flow+Channel Flow+Pipe Flow

(22) Lag Time (Tlag) = 0.6 * Final Tc (Soil Conservation Service)

Wilbarger Creek Watershed, Time of Concentration													
Variable	Variable description	Unit	Subbasin WCT185_10	Subbasin WCT185_20	Subbasin WCT186_10	Subbasin WCT186_20	Subbasin WCT187_10	Subbasin WCT187_20	Subbasin WCT196_10	Subbasin WCT196_15	Subbasin WCT196_20	Subbasin WCT196_30	Subbasin WCT206_10
Sheet Flow [eq. 3-3]													
n	Manning's roughness coefficient (table 3-1)[2,3]	n/a	0.24	0.011	0.15	0.15	0.011	0.011	0.011	0.15	0.011	0.011	0.011
L	flow length[4]	ft	100.00	50.00	100.00	50.00	100.00	50.00	50.00	100.00	50.00	50.00	50.00
P_2	2-year, 24-hour rainfall[5]	in	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
s	slope of hydraulic grade line (land slope)[6]	ft/ft	0.006	0.014	0.012	0.018	0.031	0.025	0.011	0.021	0.007	0.020	0.000
V	velocity	ft/s	0.08	1.18	0.16	0.16	1.84	1.47	1.06	0.19	0.90	1.34	0.29
T_t	travel time[7]	hr	0.34	0.01	0.18	0.09	0.02	0.01	0.01	0.14	0.02	0.01	0.05
Shallow Concentrated Flow [eq. 3-1]													
L	flow length[8]	ft	3435.34	1233.34	2634.01	2328.20	737.42	899.50	2776.86	2113.44	3984.59	2414.44	2865.26
s	slope of hydraulic grade line (watercourse slope)[9]	ft/ft	0.015	0.013	0.017	0.012	0.021	0.032	0.011	0.018	0.015	0.018	0.020
n/a	surface (Unpaved, Paved)[10]	n/a	paved	paved	unpaved	paved	unpaved	paved	paved	unpaved	paved	unpaved	paved
V	average velocity[11]	ft/s	2.46	2.29	2.09	2.24	2.35	3.62	2.09	2.13	2.45	2.14	2.88
T_t	travel time[12]	hr	0.39	0.15	0.35	0.29	0.09	0.07	0.37	0.28	0.45	0.31	0.28
Channel Flow [eq. 3-4 and eq. 3-1]													
L	flow length[13]	ft	5112.64	2343.06	4365.24	5339.58	4450.95	2571.63	2558.05	5006.92	4894.27	8788.25	2947.33
a	cross sectional flow area[14]	ft^2	171.96	19.62	175.38	50.38	267.15	3.67	6.90	31.86	POND	56.03	81.43
p_w	wetted perimeter[15]	ft	36.95	20.63	46.41	41.48	66.42	5.81	8.83	35.87	POND	30.41	35.78
r	hydraulic radius = a/p_w[16]	ft	4.65	0.95	3.78	1.21	4.02	0.63	0.78	0.89	POND	1.84	2.28
s	slope of hydraulic grade line[17]	ft/ft	0.009	0.009	0.007	0.007	0.010	0.009	0.010	0.007	0.002	0.003	0.010
n	Manning's roughness coefficient for open channel flow[18]	n/a	0.035	0.04	0.045	0.04	0.04	0.04	0.045	0.045	POND	0.045	0.04
V	average velocity[19]	ft/s	11.00	3.44	6.90	3.61	9.24	2.54	2.79	2.61	POND	2.93	6.51
T_t	travel time[20]	hr	0.13	0.19	0.18	0.41	0.13	0.28	0.25	0.53	0.00	0.83	0.13
Total Travel Time (Tt)[21]		hr	0.86	0.35	0.70	0.79	0.24	0.36	0.64	0.95	0.47	1.16	0.45
Time of Concentration (TOC_min)		min	**51.69**	**21.05**	**42.23**	**47.26**	**14.16**	**21.57**	**38.23**	**57.09**	**27.98**	**69.37**	**27.00**
Lag Time[22]		min	**31.02**	**12.63**	**25.34**	**28.36**	**8.50**	**12.94**	**22.94**	**34.25**	**16.79**	**41.62**	**16.20**

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(6) Overland flow slope = (US elevation - DS elevation) / overland flow length

(7) Overland Flow Time of Concentration (hr) = (0.007*(nL)^0.8)/((P2)^0.5*s^0.4)

(8) Length of Shallow Concentrated Flow

(9) Ground Slope over Shallow Concentrated Flow Path

(10) From aerial imagery

(11) Channel Velocity: Paved Areas = 20.3282 * SQRT (Slope / 100) Unpaved Areas = 16.1345 * SQRT (S

(12) Channel Flow Tc (Shallow Concentrated) = L1 / V1

(13) Main channel length

(14) Average Bankfull Area

(15) Average Bankfull Wetted Perimeter

(16) Hydraulic Radius = Bankfull Area / Bankfull Wetted Perimeter

(17) Channel Slope

(18) Manning's n-Value for Channel

(19) Channel Velocity (Manning's Equation)

(20) Channel Time of Concentration (Channel Length/Channel Velocity)

(21) Total Tc = Overland Flow+Shallow Concentrated Flow+Channel Flow+Pipe Flow

(22) Lag Time (Tlag) = 0.6 * Final Tc (Soil Conservation Service)

Wilbarger Creek Watershed, Time of Concentration													
Variable	Variable description	Unit	Subbasin WCT206_20	Subbasin WCT209_10	Subbasin WCT209_20	Subbasin WCT210_10	Subbasin WCT210_20	Subbasin WCT210_25	Subbasin WCT210_30	Subbasin WCT210_40	Subbasin WCT210_50	Subbasin WCT210_60	Subbasin WCT210_70
Sheet Flow [eq. 3-3]													
n	Manning's roughness coefficient (table 3-1)$_{2,3}$	n/a	0.011	0.011	0.15	0.011	0.011	0.011	0.011	0.011	0.15	0.24	0.15
L	flow length$_4$	ft	50.00	50.00	100.00	50.00	50.00	50.00	50.00	50.00	100.00	100.00	100.00
P_2	2-year, 24-hour rainfall$_5$	in	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
s	slope of hydraulic grade line (land slope)$_6$	ft/ft	0.003	0.017	0.017	0.042	0.018	0.013	0.019	0.027	0.004	0.023	0.027
V	velocity	ft/s	0.59	1.27	0.18	1.81	1.30	1.15	1.31	1.51	0.10	0.14	0.22
T_t	travel time$_7$	hr	0.02	0.01	0.15	0.01	0.01	0.01	0.01	0.01	0.28	0.20	0.13
Shallow Concentrated Flow [eq. 3-1]													
L	flow length$_8$	ft	2261.49	2883.01	1744.80	3098.08	2554.15	3328.97	4584.28	3792.26	1559.61	951.47	2872.34
s	slope of hydraulic grade line (watercourse slope)$_9$	ft/ft	0.025	0.012	0.018	0.015	0.018	0.017	0.016	0.009	0.009	0.020	0.006
n/a	surface (Unpaved, Paved)$_{10}$	n/a	paved	paved	paved	paved	paved	paved	paved	paved	unpaved	unpaved	unpaved
V	average velocity$_{11}$	ft/s	3.19	2.27	2.75	2.48	2.73	2.69	2.59	1.94	1.52	2.27	1.20
T_t	travel time$_{12}$	hr	0.20	0.35	0.18	0.35	0.26	0.34	0.49	0.54	0.28	0.12	0.66
Channel Flow [eq. 3-4 and eq. 3-1]													
L	flow length$_{13}$	ft	2031.62	294.14	588.14	3179.36	2602.89	8351.33	3666.30	1899.81	12294.53	8793.15	8430.84
a	cross sectional flow area$_{14}$	ft^2	21.14	22.06	16.77	14.88	59.96	POND	58.72	23.08	78.49	21.02	79.91
p_w	wetted perimeter$_{15}$	ft	17.93	18.17	20.21	26.74	30.18	POND	24.28	15.55	39.46	36.14	25.49
r	hydraulic radius = a/p_{w16}	ft	1.18	1.21	0.83	0.56	1.99	POND	2.42	1.48	1.99	0.58	3.14
s	slope of hydraulic grade line$_{17}$	ft/ft	0.009	0.008	0.020	0.007	0.009	0.004	0.003	0.005	0.003	0.005	0.002
n	Manning's roughness coefficient for open channel flow$_{18}$	n/a	0.045	0.04	0.04	0.04	0.04	POND	0.05	0.05	0.04	0.045	0.05
V	average velocity$_{19}$	ft/s	3.45	3.81	4.67	2.17	5.70	POND	3.09	2.61	3.38	1.63	3.17
T_t	travel time$_{20}$	hr	0.16	0.02	0.03	0.41	0.13	0.00	0.33	0.20	1.01	1.50	0.74
Total Travel Time (Tt)$_{21}$		hr	0.38	0.39	0.37	0.76	0.40	0.36	0.83	0.75	1.57	1.81	1.53
Time of Concentration (TOC_min)		min	**23.03**	**23.12**	**21.95**	**45.69**	**23.87**	**21.36**	**49.89**	**45.28**	**94.47**	**108.72**	**91.77**
Lag Time$_{22}$		min	**13.82**	**13.87**	**13.17**	**27.42**	**14.32**	**12.82**	**29.93**	**27.17**	**56.68**	**65.23**	**55.06**

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(10) From aerial imagery

(11) Channel Velocity: Paved Areas = 20.3282 * SQRT (Slope / 100) Unpaved Areas = 16.1345 * SQRT (S

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(20) Channel Time of Concentration (Channel Length/Channel Velocity)

(21) Total Tc = Overland Flow+Shallow Concentrated Flow+Channel Flow+Pipe Flow

(22) Lag Time (Tlag) = 0.6 * Final Tc (Soil Conservation Service)

Wilbarger Creek Watershed, Time of Concentration													
Variable	Variable description	Unit	Subbasin WCT216_10	Subbasin WCT216_20	Subbasin WCT216_30	Subbasin WCT207_10	Subbasin WCT207_20	Subbasin WCT200_05	Subbasin WCT200_10	Subbasin WCT200_20	Subbasin WCT200_30	Subbasin WCT200_40	Subbasin WCT200_45
Sheet Flow [eq. 3-3]													
n	Manning's roughness coefficient (table 3-1)[2,3]	n/a	0.011	0.011	0.011	0.011	0.011	0.24	0.17	0.011	0.011	0.011	0.011
L	flow length[4]	ft	50.01	50.00	50.00	50.00	50.00	50.00	100.00	50.00	100.00	50.00	50.00
P_2	2-year, 24-hour rainfall[5]	in	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
s	slope of hydraulic grade line (land slope)[6]	ft/ft	0.021	0.046	0.007	0.010	0.012	0.011	0.016	0.017	0.015	0.038	0.028
V	velocity	ft/s	1.38	1.88	0.91	1.02	1.12	0.09	0.16	1.26	1.37	1.74	1.55
T_t	travel time[7]	hr	0.01	0.01	0.02	0.01	0.01	0.16	0.17	0.01	0.02	0.01	0.01
Shallow Concentrated Flow [eq. 3-1]													
L	flow length[8]	ft	1607.73	5256.17	971.69	2555.64	1510.28	3619.29	2893.48	4666.88	1680.30	1186.90	1789.95
s	slope of hydraulic grade line (watercourse slope)[9]	ft/ft	0.010	0.013	0.021	0.006	0.019	0.019	0.022	0.020	0.015	0.010	0.007
n/a	surface (Unpaved, Paved)[10]	n/a	unpaved	paved	paved	paved	paved	paved	unpaved	unpaved	paved	paved	unpaved
V	average velocity[11]	ft/s	1.64	2.29	2.97	1.58	2.77	2.82	2.39	2.30	2.45	2.06	1.40
T_t	travel time[12]	hr	0.27	0.64	0.09	0.45	0.15	0.36	0.34	0.56	0.19	0.16	0.36
Channel Flow [eq. 3-4 and eq. 3-1]													
L	flow length[13]	ft	5893.61	1479.27	4242.66	661.87	842.18	6761.91	5525.39	5134.35	7473.02	5504.92	1373.07
a	cross sectional flow area[14]	ft^2	12.14	POND	32.79	POND	41.40	45.72	65.31	33.16	59.53	35.69	54.34
p_w	wetted perimeter[15]	ft	26.45	POND	41.85	POND	33.11	29.35	24.28	15.32	30.36	24.29	30.62
r	hydraulic radius = a/p_w[16]	ft	0.46	POND	0.78	POND	1.25	1.56	2.69	2.16	1.96	1.47	1.77
s	slope of hydraulic grade line[17]	ft/ft	0.010	0.003	0.006	0.003	0.012	0.006	0.007	0.004	0.006	0.005	0.002
n	Manning's roughness coefficient for open channel flow[18]	n/a	0.04	POND	0.05	POND	0.04	0.04	0.04	0.05	0.05	0.05	0.04
V	average velocity[19]	ft/s	2.27	POND	2.17	POND	4.69	3.97	5.91	3.10	3.67	3.02	2.20
T_t	travel time[20]	hr	0.72	0.00	0.54	0.00	0.05	0.47	0.26	0.46	0.57	0.51	0.17
Total Travel Time (Tt)[21]		hr	1.00	0.64	0.65	0.46	0.21	0.99	0.77	1.03	0.78	0.67	0.54
Time of Concentration (TOC_min)		min	**60.29**	**38.62**	**38.90**	**27.78**	**12.81**	**59.15**	**46.23**	**62.04**	**46.56**	**40.48**	**32.31**
Lag Time[22]		min	**36.18**	**23.17**	**23.34**	**16.67**	**7.69**	**35.49**	**27.74**	**37.22**	**27.94**	**24.29**	**19.38**

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(19) Channel Velocity (Manning's Equation)

(20) Channel Time of Concentration (Channel Length/Channel Velocity)

(21) Total Tc = Overland Flow+Shallow Concentrated Flow+Channel Flow+Pipe Flow

(22) Lag Time (Tlag) = 0.6 * Final Tc (Soil Conservation Service)

Wilbarger Creek Watershed, Time of Concentration													
Variable	Variable description	Unit	Subbasin WCT200_50	Subbasin WCT183_10	Subbasin WCT183_20	Subbasin CC_10	Subbasin CC_20	Subbasin CC_30	Subbasin CC_40	Subbasin CC_50	Subbasin CC_60	Subbasin CC_70	Subbasin CC_80
Sheet Flow [eq. 3-3]													
n	Manning's roughness coefficient (table 3-1)$_{2,3}$	n/a	0.011	0.011	0.4	0.15	0.15	0.15	0.17	0.15	0.15	0.06	0.15
L	flow length$_4$	ft	50.00	50.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
P_2	2-year, 24-hour rainfall$_5$	in	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
s	slope of hydraulic grade line (land slope)$_6$	ft/ft	0.024	0.026	0.009	0.009	0.024	0.004	0.004	0.008	0.033	0.004	0.023
V	velocity	ft/s	1.46	1.50	0.06	0.14	0.21	0.10	0.09	0.13	0.24	0.20	0.20
T_t	travel time$_7$	hr	0.01	0.01	0.43	0.20	0.13	0.29	0.31	0.21	0.12	0.14	0.14
Shallow Concentrated Flow [eq. 3-1]													
L	flow length$_8$	ft	2466.60	2186.20	1168.71	1452.26	2040.18	2853.51	2207.67	1651.44	2951.92	3791.72	6090.91
s	slope of hydraulic grade line (watercourse slope)$_9$	ft/ft	0.018	0.015	0.006	0.013	0.018	0.012	0.012	0.016	0.020	0.007	0.008
n/a	surface (Unpaved, Paved)$_{10}$	n/a	paved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved
V	average velocity$_{11}$	ft/s	2.73	1.96	1.22	1.82	2.18	1.80	1.75	2.07	2.26	1.33	1.48
T_t	travel time$_{12}$	hr	0.25	0.31	0.27	0.22	0.26	0.44	0.35	0.22	0.36	0.79	1.14
Channel Flow [eq. 3-4 and eq. 3-1]													
L	flow length$_{13}$	ft	4666.49	3218.81	1138.29	15116.72	3220.70	16829.47	16826.41	16509.31	6083.21	8748.92	10446.49
a	cross sectional flow area$_{14}$	ft^2	83.95	24.65	9.87	52.03	12.93	78.13	208.66	184.90	254.15	297.89	261.50
p_w	wetted perimeter$_{15}$	ft	28.37	21.05	11.79	28.94	10.22	29.05	60.03	50.44	61.77	51.04	52.44
r	hydraulic radius = a/p_{w16}	ft	2.96	1.17	0.84	1.80	1.27	2.69	3.48	3.67	4.11	5.84	4.99
s	slope of hydraulic grade line$_{17}$	ft/ft	0.002	0.007	0.004	0.004	0.001	0.004	0.004	0.004	0.001	0.004	0.001
n	Manning's roughness coefficient for open channel flow$_{18}$	n/a	0.04	0.05	0.045	0.04	0.04	0.04	0.045	0.05	0.045	0.045	0.04
V	average velocity$_{19}$	ft/s	3.81	2.74	1.80	3.64	1.60	4.38	4.66	4.23	2.50	7.13	2.67
T_t	travel time$_{20}$	hr	0.34	0.33	0.18	1.15	0.56	1.07	1.00	1.08	0.68	0.34	1.09
Total Travel Time (Tt)$_{21}$		hr	0.60	0.65	0.87	1.57	0.95	1.80	1.66	1.52	1.16	1.27	2.37
Time of Concentration (TOC_min)		min	**36.01**	**38.71**	**52.42**	**94.27**	**57.19**	**108.03**	**99.56**	**90.94**	**69.43**	**76.39**	**142.05**
Lag Time$_{22}$		min	**21.61**	**23.23**	**31.45**	**56.56**	**34.31**	**64.82**	**59.73**	**54.56**	**41.66**	**45.83**	**85.23**

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(7) Overland Flow Time of Concentration (hr) = (0.007*(nL)^0.8)/((P2)^0.5*s^0.4)

(8) Length of Shallow Concentrated Flow

(9) Ground Slope over Shallow Concentrated Flow Path

(10) From aerial imagery

(11) Channel Velocity: Paved Areas = 20.3282 * SQRT (Slope / 100) Unpaved Areas = 16.1345 * SQRT (S

(12) Channel Flow Tc (Shallow Concentrated) = L1 / V1

(13) Main channel length

(14) Average Bankfull Area

(15) Average Bankfull Wetted Perimeter

(16) Hydraulic Radius = Bankfull Area / Bankfull Wetted Perimeter

(17) Channel Slope

(18) Manning's n-Value for Channel

(19) Channel Velocity (Manning's Equation)

(20) Channel Time of Concentration (Channel Length/Channel Velocity)

(21) Total Tc = Overland Flow+Shallow Concentrated Flow+Channel Flow+Pipe Flow

(22) Lag Time (Tlag) = 0.6 * Final Tc (Soil Conservation Service)

Wilbarger Creek Watershed, Time of Concentration													
Variable	Variable description	Unit	Subbasin CC_90	Subbasin DCW_10	Subbasin DCW_20	Subbasin DCW_30	Subbasin DCW_40	Subbasin DCW_50	Subbasin DCW_60	Subbasin DCW_70	Subbasin DCW_80	Subbasin DCW_90	Subbasin HBS_10
Sheet Flow [eq. 3-3]													
n	Manning's roughness coefficient (table 3-1)$_{2,3}$	n/a	0.15	0.06	0.15	0.15	0.06	0.17	0.15	0.15	0.15	0.15	0.15
L	flow length$_4$	ft	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
P_2	2-year, 24-hour rainfall$_5$	in	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
s	slope of hydraulic grade line (land slope)$_6$	ft/ft	0.008	0.034	0.007	0.006	0.016	0.020	0.020	0.028	0.008	0.004	0.019
V	velocity	ft/s	0.13	0.50	0.13	0.12	0.37	0.17	0.19	0.22	0.13	0.10	0.19
T_t	travel time$_7$	hr	0.21	0.06	0.22	0.23	0.08	0.16	0.14	0.13	0.21	0.28	0.15
Shallow Concentrated Flow [eq. 3-1]													
L	flow length$_8$	ft	2772.18	1534.24	4721.85	3389.07	4634.79	3730.06	2468.00	3931.28	4061.70	1236.40	3786.99
s	slope of hydraulic grade line (watercourse slope)$_9$	ft/ft	0.006	0.010	0.010	0.008	0.010	0.016	0.018	0.010	0.020	0.022	0.007
n/a	surface (Unpaved, Paved)$_{10}$	n/a	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved
V	average velocity$_{11}$	ft/s	1.21	1.57	1.59	1.45	1.61	2.03	2.18	1.59	2.30	2.40	1.33
T_t	travel time$_{12}$	hr	0.64	0.27	0.83	0.65	0.80	0.51	0.31	0.69	0.49	0.14	0.79
Channel Flow [eq. 3-4 and eq. 3-1]													
L	flow length$_{13}$	ft	9342.37	13055.31	12754.32	3313.44	3788.40	9830.31	12498.37	8702.81	4030.95	16318.69	7638.35
a	cross sectional flow area$_{14}$	ft^2	314.59	204.79	76.06	81.49	54.95	73.04	76.86	236.89	198.79	165.08	22.70
p_w	wetted perimeter$_{15}$	ft	45.07	196.14	52.05	28.59	39.50	43.14	37.59	43.13	46.83	37.70	23.98
r	hydraulic radius = a/p_{w16}	ft	6.98	1.04	1.46	2.85	1.39	1.69	2.04	5.49	4.24	4.38	0.95
s	slope of hydraulic grade line$_{17}$	ft/ft	0.005	0.003	0.003	0.002	0.005	0.003	0.002	0.002	0.002	0.004	0.006
n	Manning's roughness coefficient for open channel flow$_{18}$	n/a	0.05	0.045	0.045	0.045	0.05	0.05	0.04	0.045	0.05	0.05	0.045
V	average velocity$_{19}$	ft/s	7.76	1.96	2.39	2.99	2.63	2.16	2.68	4.99	3.55	4.77	2.43
T_t	travel time$_{20}$	hr	0.33	1.85	1.48	0.31	0.40	1.27	1.30	0.48	0.32	0.95	0.87
Total Travel Time (Tt)$_{21}$		hr	1.18	2.18	2.53	1.19	1.27	1.94	1.76	1.30	1.02	1.37	1.82
Time of Concentration (TOC_min)		min	**71.00**	**130.60**	**152.03**	**71.14**	**76.38**	**116.18**	**105.34**	**77.93**	**61.17**	**82.21**	**108.91**
Lag Time$_{22}$		min	**42.60**	**78.36**	**91.22**	**42.68**	**45.83**	**69.71**	**63.21**	**46.76**	**36.70**	**49.33**	**65.34**

(1) Flowpaths hand-delineated. Source WC_longestflowpaths.shp

(2) n-Value was based on the land use

(3) Land use was estimated from aerial imagery and parcel data

(4)Overland flow was considered to occur at short distances with a maximum of 100 feet

(5) 2-YR 24-HR Rainfall - Based on Austin Drainage Criteria Manual Table = 4.06 inches

(6) Overland flow slope = (US elevation - DS elevation) / overland flow length

(7) Overland Flow Time of Concentration (hr) = (0.007*(nL)^0.8)/((P2)^0.5*s^0.4)

(8) Length of Shallow Concentrated Flow

(9) Ground Slope over Shallow Concentrated Flow Path

(10) From aerial imagery

(11) Channel Velocity: Paved Areas = 20.3282 * SQRT (Slope / 100) Unpaved Areas = 16.1345 * SQRT (S

(12) Channel Flow Tc (Shallow Concentrated) = L1 / V1

(13) Main channel length

(14) Average Bankfull Area

(15) Average Bankfull Wetted Perimeter

(16) Hydraulic Radius = Bankfull Area / Bankfull Wetted Perimeter

(17) Channel Slope

(18) Manning's n-Value for Channel

(19) Channel Velocity (Manning's Equation)

(20) Channel Time of Concentration (Channel Length/Channel Velocity)

(21) Total Tc = Overland Flow+Shallow Concentrated Flow+Channel Flow+Pipe Flow

(22) Lag Time (Tlag) = 0.6 * Final Tc (Soil Conservation Service)

Wilbarger Creek Watershed, Time of Concentration													
Variable	Variable description	Unit	Subbasin HBS_20	Subbasin HBS_30	Subbasin LWC_10	Subbasin LWC_20	Subbasin LWC_30	Subbasin LWC_40	Subbasin LWC_50	Subbasin LC_10	Subbasin LC_20	Subbasin LC_30	Subbasin LC_40
Sheet Flow [eq. 3-3]													
n	Manning's roughness coefficient (table 3-1)$_{2,3}$	n/a	0.15	0.15	0.15	0.15	0.15	0.06	0.15	0.15	0.15	0.15	0.4
L	flow length$_4$	ft	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
P_2	2-year, 24-hour rainfall$_5$	in	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
s	slope of hydraulic grade line (land slope)$_6$	ft/ft	0.002	0.036	0.005	0.025	0.006	0.006	0.000	0.002	0.011	0.028	0.019
V	velocity	ft/s	0.07	0.24	0.11	0.21	0.12	0.25	0.04	0.07	0.15	0.22	0.08
T_t	travel time$_7$	hr	0.41	0.11	0.25	0.13	0.24	0.11	0.67	0.37	0.19	0.13	0.33
Shallow Concentrated Flow [eq. 3-1]													
L	flow length$_8$	ft	4483.76	1775.83	542.99	2764.80	4324.77	3931.14	4189.42	5826.48	4865.24	2560.33	3070.77
s	slope of hydraulic grade line (watercourse slope)$_9$	ft/ft	0.007	0.030	0.006	0.007	0.010	0.014	0.016	0.005	0.015	0.031	0.023
n/a	surface (Unpaved, Paved)$_{10}$	n/a	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved
V	average velocity$_{11}$	ft/s	1.39	2.80	1.21	1.35	1.65	1.88	2.07	1.18	1.97	2.84	2.46
T_t	travel time$_{12}$	hr	0.90	0.18	0.12	0.57	0.73	0.58	0.56	1.37	0.68	0.25	0.35
Channel Flow [eq. 3-4 and eq. 3-1]													
L	flow length$_{13}$	ft	7431.20	9512.33	12435.30	9029.73	8673.36	12961.07	11313.18	16532.84	19176.14	14045.63	11202.90
a	cross sectional flow area$_{14}$	ft^2	129.26	60.13	18.74	34.07	144.14	76.28	66.83	132.67	114.48	93.13	286.33
p_w	wetted perimeter$_{15}$	ft	93.51	27.58	19.38	29.16	68.95	30.89	29.27	69.05	54.21	31.17	58.54
r	hydraulic radius = a/p_{w16}	ft	1.38	2.18	0.97	1.17	2.09	2.47	2.28	1.92	2.11	2.99	4.89
s	slope of hydraulic grade line$_{17}$	ft/ft	0.009	0.004	0.004	0.005	0.003	0.002	0.002	0.005	0.004	0.003	0.002
n	Manning's roughness coefficient for open channel flow$_{18}$	n/a	0.045	0.05	0.04	0.045	0.04	0.045	0.05	0.045	0.05	0.05	0.05
V	average velocity$_{19}$	ft/s	3.99	3.35	2.36	2.48	3.40	2.98	2.43	3.70	2.91	3.19	4.27
T_t	travel time$_{20}$	hr	0.52	0.79	1.46	1.01	0.71	1.21	1.29	1.24	1.83	1.22	0.73
Total Travel Time (Tt)$_{21}$		hr	1.82	1.08	1.84	1.71	1.67	1.90	2.52	2.99	2.70	1.60	1.40
Time of Concentration (TOC_min)		min	**109.29**	**64.73**	**110.44**	**102.87**	**100.29**	**113.95**	**151.46**	**179.33**	**162.27**	**96.08**	**84.15**
Lag Time$_{22}$		min	**65.57**	**38.84**	**66.26**	**61.72**	**60.18**	**68.37**	**90.88**	**107.60**	**97.36**	**57.65**	**50.49**

(1) Flowpaths hand-delineated. Source WC_longestflowpaths.shp

(2) n-Value was based on the land use

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(8) Length of Shallow Concentrated Flow

(9) Ground Slope over Shallow Concentrated Flow Path

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(11) Channel Velocity: Paved Areas = 20.3282 * SQRT (Slope / 100) Unpaved Areas = 16.1345 * SQRT (S

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(17) Channel Slope

(18) Manning's n-Value for Channel

(19) Channel Velocity (Manning's Equation)

(20) Channel Time of Concentration (Channel Length/Channel Velocity)

(21) Total Tc = Overland Flow+Shallow Concentrated Flow+Channel Flow+Pipe Flow

(22) Lag Time (Tlag) = 0.6 * Final Tc (Soil Conservation Service)

Wilbarger Creek Watershed, Time of Concentration											
Variable	Variable description	Unit	Subbasin WCT018_10	Subbasin WCT018_20	Subbasin WCT019_10	Subbasin WCT020_10	Subbasin WCT021_10	Subbasin WCT024_10	Subbasin WCT024_20	Subbasin WCT024_30	Subbasin WCT024_40
Sheet Flow [eq. 3-3]											
n	Manning's roughness coefficient (table 3-1)[2,3]	n/a	0.4	0.15	0.4	0.4	0.4	0.4	0.4	0.4	0.4
L	flow length[4]	ft	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
P_2	2-year, 24-hour rainfall[5]	in	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
s	slope of hydraulic grade line (land slope)[6]	ft/ft	0.026	0.018	0.020	0.014	0.023	0.011	0.011	0.024	0.035
V	velocity	ft/s	0.10	0.18	0.09	0.08	0.09	0.07	0.07	0.09	0.11
T_t	travel time[7]	hr	0.29	0.15	0.32	0.37	0.30	0.40	0.41	0.29	0.25
Shallow Concentrated Flow [eq. 3-1]											
L	flow length[8]	ft	1718.95	2156.19	2035.81	1440.25	1923.19	2795.18	3838.03	1290.25	1532.28
s	slope of hydraulic grade line (watercourse slope)[9]	ft/ft	0.024	0.031	0.022	0.017	0.018	0.009	0.025	0.042	0.035
n/a	surface (Unpaved, Paved)[10]	n/a	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved
V	average velocity[11]	ft/s	2.51	2.86	2.38	2.11	2.19	1.53	2.57	3.33	3.02
T_t	travel time[12]	hr	0.19	0.21	0.24	0.19	0.24	0.51	0.41	0.11	0.14
Channel Flow [eq. 3-4 and eq. 3-1]											
L	flow length[13]	ft	9031.02	4477.92	2646.04	3979.60	3240.60	4672.90	2894.73	1017.59	7326.41
a	cross sectional flow area[14]	ft^2	71.05	55.32	333.23	16.44	96.42	11.00	30.51	104.77	133.70
p_w	wetted perimeter[15]	ft	21.52	24.94	68.60	27.10	25.97	23.79	24.38	51.29	38.40
r	hydraulic radius = a/p_w[16]	ft	3.30	2.22	4.86	0.61	3.71	0.46	1.25	2.04	3.48
s	slope of hydraulic grade line[17]	ft/ft	0.012	0.007	0.017	0.020	0.016	0.013	0.009	0.008	0.006
n	Manning's roughness coefficient for open channel flow[18]	n/a	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
V	average velocity[19]	ft/s	7.32	4.73	11.01	2.98	9.14	2.25	3.27	4.40	5.38
T_t	travel time[20]	hr	0.34	0.26	0.07	0.37	0.10	0.58	0.25	0.06	0.38
Total Travel Time (Tt)[21]		hr	0.82	0.62	0.62	0.93	0.64	1.48	1.07	0.47	0.77
Time of Concentration (TOC_min)		min	**49.22**	**37.38**	**37.40**	**55.64**	**38.60**	**89.04**	**64.11**	**27.91**	**46.38**
Lag Time[22]		min	**29.53**	**22.43**	**22.44**	**33.39**	**23.16**	**53.42**	**38.47**	**16.75**	**27.83**

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(5) 2-YR 24-HR Rainfall - Based on Austin Drainage Criteria Manual Table = 4.06 inches

(6) Overland flow slope = (US elevation - DS elevation) / overland flow length

(7) Overland Flow Time of Concentration (hr) = (0.007*(nL)^0.8)/((P2)^0.5*s^0.4)

(8) Length of Shallow Concentrated Flow

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(10) From aerial imagery

(11) Channel Velocity: Paved Areas = 20.3282 * SQRT (Slope / 100) Unpaved Areas = 16.1345 * SQRT (S

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(18) Manning's n-Value for Channel

(19) Channel Velocity (Manning's Equation)

(20) Channel Time of Concentration (Channel Length/Channel Velocity)

(21) Total Tc = Overland Flow+Shallow Concentrated Flow+Channel Flow+Pipe Flow

(22) Lag Time (Tlag) = 0.6 * Final Tc (Soil Conservation Service)

Wilbarger Creek Watershed, Time of Concentration													
Variable	Variable description	Unit	Subbasin WCT025_10	Subbasin WCT026_10	Subbasin WCT027_10	Subbasin WCT030_10	Subbasin WCT030_20	Subbasin WCT047_10	Subbasin WCT047_20	Subbasin WCT047_30	Subbasin WCT047_40	Subbasin WCT049_10	Subbasin WCT056_10
Sheet Flow [eq. 3-3]													
n	Manning's roughness coefficient (table 3-1)[2,3]	n/a	0.4	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.24
L	flow length[4]	ft	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
P_2	2-year, 24-hour rainfall[5]	in	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
s	slope of hydraulic grade line (land slope)[6]	ft/ft	0.010	0.011	0.004	0.023	0.021	0.014	0.038	0.012	0.008	0.015	0.004
V	velocity	ft/s	0.07	0.15	0.10	0.20	0.20	0.17	0.25	0.16	0.13	0.17	0.07
T_t	travel time[7]	hr	0.41	0.18	0.29	0.14	0.14	0.17	0.11	0.18	0.21	0.16	0.39
Shallow Concentrated Flow [eq. 3-1]													
L	flow length[8]	ft	1816.71	1435.26	1874.45	3831.33	836.36	3090.14	3373.61	2844.24	2895.65	3333.89	1503.16
s	slope of hydraulic grade line (watercourse slope)[9]	ft/ft	0.033	0.044	0.005	0.009	0.021	0.011	0.008	0.010	0.016	0.014	0.011
n/a	surface (Unpaved, Paved)[10]	n/a	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved
V	average velocity[11]	ft/s	2.93	3.39	1.18	1.53	2.34	1.65	1.47	1.62	2.05	1.94	1.73
T_t	travel time[12]	hr	0.17	0.12	0.44	0.69	0.10	0.52	0.64	0.49	0.39	0.48	0.24
Channel Flow [eq. 3-4 and eq. 3-1]													
L	flow length[13]	ft	5132.42	3407.56	6788.81	6326.93	10375.30	3424.03	4842.51	11099.92	10005.97	2657.86	6284.92
a	cross sectional flow area[14]	ft^2	62.88	28.21	133.53	156.67	96.82	94.42	49.04	96.38	221.79	24.17	31.63
p_w	wetted perimeter[15]	ft	26.12	15.97	31.04	35.82	29.99	50.19	38.78	39.97	78.45	18.14	36.04
r	hydraulic radius = a/p_w[16]	ft	2.41	1.77	4.30	4.37	3.23	1.88	1.26	2.41	2.83	1.33	0.88
s	slope of hydraulic grade line[17]	ft/ft	0.014	0.020	0.014	0.007	0.007	0.007	0.007	0.006	0.003	0.014	0.005
n	Manning's roughness coefficient for open channel flow[18]	n/a	0.05	0.05	0.05	0.050	0.050	0.045	0.04	0.04	0.04	0.04	0.04
V	average velocity[19]	ft/s	6.35	6.08	9.31	6.71	5.50	4.18	3.56	5.19	4.30	5.33	2.45
T_t	travel time[20]	hr	0.22	0.16	0.20	0.26	0.52	0.23	0.38	0.59	0.65	0.14	0.71
Total Travel Time (Tt)[21]		hr	0.81	0.45	0.93	1.09	0.76	0.91	1.13	1.26	1.25	0.78	1.35
Time of Concentration (TOC_min)		min	**48.48**	**27.28**	**56.00**	**65.49**	**45.84**	**54.85**	**67.64**	**75.62**	**75.00**	**46.71**	**80.75**
Lag Time[22]		min	**29.09**	**16.37**	**33.60**	**39.29**	**27.50**	**32.91**	**40.59**	**45.37**	**45.00**	**28.02**	**48.45**

(1) Flowpaths hand-delineated. Source WC_longestflowpaths.shp

(2) n-Value was based on the land use

(3) Land use was estimated from aerial imagery and parcel data

(4)Overland flow was considered to occur at short distances with a maximum of 100 feet

(5) 2-YR 24-HR Rainfall - Based on Austin Drainage Criteria Manual Table = 4.06 inches

(6) Overland flow slope = (US elevation - DS elevation) / overland flow length

(7) Overland Flow Time of Concentration (hr) = (0.007*(nL)^0.8)/((P2)^0.5*s^0.4)

(8) Length of Shallow Concentrated Flow

(9) Ground Slope over Shallow Concentrated Flow Path

(10) From aerial imagery

(11) Channel Velocity: Paved Areas = 20.3282 * SQRT (Slope / 100) Unpaved Areas = 16.1345 * SQRT (S

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(18) Manning's n-Value for Channel

(19) Channel Velocity (Manning's Equation)

(20) Channel Time of Concentration (Channel Length/Channel Velocity)

(21) Total Tc = Overland Flow+Shallow Concentrated Flow+Channel Flow+Pipe Flow

(22) Lag Time (Tlag) = 0.6 * Final Tc (Soil Conservation Service)

Wilbarger Creek Watershed, Time of Concentration													
Variable	Variable description	Unit	Subbasin WCT056_20	Subbasin WCT056_30	Subbasin WCT056_40	Subbasin WCT056_50	Subbasin WCT056_60	Subbasin WCT056_70	Subbasin WCT056_80	Subbasin WCT056_90	Subbasin WCT062_05	Subbasin WCT062_10	Subbasin WCT062_20
Sheet Flow [eq. 3-3]													
n	Manning's roughness coefficient (table 3-1)[2,3]	n/a	0.15	0.06	0.06	0.17	0.15	0.24	0.15	0.15	0.15	0.15	0.15
L	flow length[4]	ft	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
P_2	2-year, 24-hour rainfall[5]	in	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
s	slope of hydraulic grade line (land slope)[6]	ft/ft	0.010	0.011	0.014	0.003	0.044	0.003	0.014	0.006	0.031	0.006	0.043
V	velocity	ft/s	0.15	0.32	0.35	0.08	0.26	0.06	0.17	0.12	0.23	0.12	0.26
T_t	travel time[7]	hr	0.19	0.09	0.08	0.33	0.11	0.46	0.16	0.23	0.12	0.23	0.11
Shallow Concentrated Flow [eq. 3-1]													
L	flow length[8]	ft	5047.99	1760.19	1892.65	4222.38	1522.33	3192.73	4325.95	3936.19	3932.48	1640.29	2619.25
s	slope of hydraulic grade line (watercourse slope)[9]	ft/ft	0.014	0.012	0.007	0.017	0.039	0.012	0.012	0.020	0.009	0.009	0.013
n/a	surface (Unpaved, Paved)[10]	n/a	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved
V	average velocity[11]	ft/s	1.91	1.75	1.34	2.11	3.19	1.78	1.75	2.27	1.53	1.53	1.86
T_t	travel time[12]	hr	0.73	0.28	0.39	0.56	0.13	0.50	0.69	0.48	0.72	0.30	0.39
Channel Flow [eq. 3-4 and eq. 3-1]													
L	flow length[13]	ft	9452.93	4024.59	6989.45	7489.16	20134.60	6456.12	21399.24	4652.62	3818.06	5680.17	5861.18
a	cross sectional flow area[14]	ft^2	193.98	188.94	63.35	112.28	138.89	137.65	53.24	230.05	39.31	36.30	41.03
p_w	wetted perimeter[15]	ft	52.04	64.31	23.20	49.52	41.24	40.40	22.16	64.52	32.79	24.27	33.35
r	hydraulic radius = a/p_w[16]	ft	3.73	2.94	2.73	2.27	3.37	3.41	2.40	3.57	1.20	1.50	1.23
s	slope of hydraulic grade line[17]	ft/ft	0.005	0.014	0.011	0.003	0.002	0.002	0.004	0.003	0.006	0.009	0.004
n	Manning's roughness coefficient for open channel flow[18]	n/a	0.05	0.05	0.05	0.04	0.05	0.05	0.05	0.05	0.04	0.045	0.04
V	average velocity[19]	ft/s	5.45	8.12	6.06	3.40	3.29	2.80	3.72	3.76	3.29	4.03	2.66
T_t	travel time[20]	hr	0.48	0.14	0.32	0.61	1.70	0.64	1.60	0.34	0.32	0.39	0.61
Total Travel Time (Tt)[21]		hr	1.40	0.50	0.79	1.50	1.94	1.60	2.45	1.05	1.16	0.92	1.11
Time of Concentration (TOC_min)		min	**84.12**	**30.25**	**47.61**	**90.09**	**116.23**	**96.02**	**146.83**	**63.17**	**69.57**	**55.16**	**66.59**
Lag Time[22]		min	**50.47**	**18.15**	**28.57**	**54.06**	**69.74**	**57.61**	**88.10**	**37.90**	**41.74**	**33.09**	**39.96**

(1) Flowpaths hand-delineated. Source WC_longestflowpaths.shp

(2) n-Value was based on the land use

(3) Land use was estimated from aerial imagery and parcel data

(4)Overland flow was considered to occur at short distances with a maximum of 100 feet

(5) 2-YR 24-HR Rainfall - Based on Austin Drainage Criteria Manual Table = 4.06 inches

(6) Overland flow slope = (US elevation - DS elevation) / overland flow length

(7) Overland Flow Time of Concentration (hr) = (0.007*(nL)^0.8)/((P2)^0.5*s^0.4)

(8) Length of Shallow Concentrated Flow

(9) Ground Slope over Shallow Concentrated Flow Path

(10) From aerial imagery

(11) Channel Velocity: Paved Areas = 20.3282 * SQRT (Slope / 100) Unpaved Areas = 16.1345 * SQRT (S

(12) Channel Flow Tc (Shallow Concentrated) = L1 / V1

(13) Main channel length

(14) Average Bankfull Area

(15) Average Bankfull Wetted Perimeter

(16) Hydraulic Radius = Bankfull Area / Bankfull Wetted Perimeter

(17) Channel Slope

(18) Manning's n-Value for Channel

(19) Channel Velocity (Manning's Equation)

(20) Channel Time of Concentration (Channel Length/Channel Velocity)

(21) Total Tc = Overland Flow+Shallow Concentrated Flow+Channel Flow+Pipe Flow

(22) Lag Time (Tlag) = 0.6 * Final Tc (Soil Conservation Service)

Wilbarger Creek Watershed, Time of Concentration													
Variable	Variable description	Unit	Subbasin WCT070_10	Subbasin WCT080_05	Subbasin WCT080_10	Subbasin WCT080_20	Subbasin WCT080_30	Subbasin WCT080_40	Subbasin WCT080_50	Subbasin WCT080_60	Subbasin WCT082_10	Subbasin WCT082_15	Subbasin WCT082_20
Sheet Flow [eq. 3-3]													
n	Manning's roughness coefficient (table 3-1)[2,3]	n/a	0.15	0.15	0.06	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
L	flow length[4]	ft	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
P_2	2-year, 24-hour rainfall[5]	in	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
s	slope of hydraulic grade line (land slope)[6]	ft/ft	0.012	0.025	0.010	0.007	0.011	0.003	0.006	0.025	0.017	0.011	0.012
V	velocity	ft/s	0.15	0.21	0.30	0.12	0.15	0.08	0.12	0.21	0.18	0.15	0.15
T_t	travel time[7]	hr	0.18	0.13	0.09	0.22	0.19	0.33	0.23	0.13	0.16	0.18	0.18
Shallow Concentrated Flow [eq. 3-1]													
L	flow length[8]	ft	2932.40	2220.71	1982.11	3201.19	2771.22	3567.03	3319.78	5306.58	823.66	2689.26	4197.09
s	slope of hydraulic grade line (watercourse slope)[9]	ft/ft	0.013	0.012	0.020	0.003	0.025	0.004	0.011	0.013	0.025	0.016	0.015
n/a	surface (Unpaved, Paved)[10]	n/a	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved
V	average velocity[11]	ft/s	1.86	1.80	2.28	0.94	2.53	1.02	1.71	1.81	2.53	2.06	1.95
T_t	travel time[12]	hr	0.44	0.34	0.24	0.95	0.30	0.97	0.54	0.81	0.09	0.36	0.60
Channel Flow [eq. 3-4 and eq. 3-1]													
L	flow length[13]	ft	4304.08	1651.23	4279.32	3542.71	4936.22	9658.42	9836.53	13053.92	4103.88	3122.93	6465.42
a	cross sectional flow area[14]	ft^2	42.17	9.31	10.33	16.49	51.19	44.63	94.81	473.36	39.14	38.97	52.62
p_w	wetted perimeter[15]	ft	24.38	38.24	20.71	15.10	30.53	39.09	33.97	97.71	22.03	53.72	20.15
r	hydraulic radius = a/p_w[16]	ft	1.73	0.24	0.50	1.09	1.68	1.14	2.79	4.84	1.78	0.73	2.61
s	slope of hydraulic grade line[17]	ft/ft	0.011	0.009	0.006	0.013	0.004	0.006	0.004	0.003	0.009	0.008	0.005
n	Manning's roughness coefficient for open channel flow[18]	n/a	0.04	0.04	0.04	0.04	0.045	0.04	0.045	0.04	0.045	0.04	0.05
V	average velocity[19]	ft/s	5.73	1.37	1.79	4.43	2.94	3.12	3.96	5.99	4.64	2.75	3.95
T_t	travel time[20]	hr	0.21	0.33	0.66	0.22	0.47	0.86	0.69	0.61	0.25	0.32	0.45
Total Travel Time (Tt)[21]		hr	0.83	0.81	1.00	1.40	0.96	2.16	1.46	1.55	0.49	0.86	1.23
Time of Concentration (TOC_min)		min	**49.53**	**48.50**	**59.93**	**83.78**	**57.34**	**129.44**	**87.31**	**93.06**	**29.52**	**51.59**	**73.96**
Lag Time[22]		min	**29.72**	**29.10**	**35.96**	**50.27**	**34.41**	**77.67**	**52.39**	**55.83**	**17.71**	**30.96**	**44.37**

(1) Flowpaths hand-delineated. Source WC_longestflowpaths.shp

(2) n-Value was based on the land use

(3) Land use was estimated from aerial imagery and parcel data

(4)Overland flow was considered to occur at short distances with a maximum of 100 feet

(5) 2-YR 24-HR Rainfall - Based on Austin Drainage Criteria Manual Table = 4.06 inches

(6) Overland flow slope = (US elevation - DS elevation) / overland flow length

(7) Overland Flow Time of Concentration (hr) = (0.007*(nL)^0.8)/((P2)^0.5*s^0.4)

(8) Length of Shallow Concentrated Flow

(9) Ground Slope over Shallow Concentrated Flow Path

(10) From aerial imagery

(11) Channel Velocity: Paved Areas = 20.3282 * SQRT (Slope / 100) Unpaved Areas = 16.1345 * SQRT (S

(12) Channel Flow Tc (Shallow Concentrated) = L1 / V1

(13) Main channel length

(14) Average Bankfull Area

(15) Average Bankfull Wetted Perimeter

(16) Hydraulic Radius = Bankfull Area / Bankfull Wetted Perimeter

(17) Channel Slope

(18) Manning's n-Value for Channel

(19) Channel Velocity (Manning's Equation)

(20) Channel Time of Concentration (Channel Length/Channel Velocity)

(21) Total Tc = Overland Flow+Shallow Concentrated Flow+Channel Flow+Pipe Flow

(22) Lag Time (Tlag) = 0.6 * Final Tc (Soil Conservation Service)

Wilbarger Creek Watershed, Time of Concentration													
Variable	Variable description	Unit	Subbasin WCT085_10	Subbasin WCT086_10	Subbasin WCT086_20	Subbasin WCT113_10	Subbasin WCT113_20	Subbasin WCT113_30	Subbasin WCT113_40	Subbasin WCT113_50	Subbasin WCT138_10	Subbasin WCT138_20	Subbasin WCT138_30
Sheet Flow [eq. 3-3]													
n	Manning's roughness coefficient (table 3-1)$_{2,3}$	n/a	0.15	0.15	0.06	0.15	0.15	0.15	0.15	0.011	0.06	0.06	0.011
L	flow length$_4$	ft	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
P_2	2-year, 24-hour rainfall$_5$	in	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
s	slope of hydraulic grade line (land slope)$_6$	ft/ft	0.008	0.015	0.025	0.012	0.072	0.029	0.020	0.019	0.001	0.003	0.002
V	velocity	ft/s	0.13	0.17	0.43	0.16	0.32	0.22	0.19	1.33	0.13	0.19	0.56
T_t	travel time$_7$	hr	0.21	0.16	0.06	0.18	0.09	0.13	0.14	0.01	0.21	0.15	0.05
Shallow Concentrated Flow [eq. 3-1]													
L	flow length$_8$	ft	3064.55	2179.16	2787.12	2597.11	4815.46	5198.16	1870.92	3796.48	5885.01	3594.32	2800.65
s	slope of hydraulic grade line (watercourse slope)$_9$	ft/ft	0.010	0.013	0.016	0.009	0.011	0.012	0.027	0.022	0.008	0.008	0.008
n/a	surface (Unpaved, Paved)$_{10}$	n/a	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved
V	average velocity$_{11}$	ft/s	1.63	1.82	2.03	1.51	1.71	1.74	2.65	2.39	1.40	1.46	1.49
T_t	travel time$_{12}$	hr	0.52	0.33	0.38	0.48	0.78	0.83	0.20	0.44	1.17	0.68	0.52
Channel Flow [eq. 3-4 and eq. 3-1]													
L	flow length$_{13}$	ft	4320.65	2268.46	2944.62	2744.73	6801.97	5765.72	12043.86	15410.74	18123.22	12764.04	6875.09
a	cross sectional flow area$_{14}$	ft^2	25.95	51.01	17.56	19.39	55.24	50.77	142.28	200.34	38.06	24.12	35.77
p_w	wetted perimeter$_{15}$	ft	27.25	39.06	32.78	33.00	33.08	35.87	52.10	60.83	45.38	30.03	30.13
r	hydraulic radius = a/p_{w16}	ft	0.95	1.31	0.54	0.59	1.67	1.42	2.73	3.29	0.84	0.80	1.19
s	slope of hydraulic grade line$_{17}$	ft/ft	0.009	0.009	0.010	0.005	0.004	0.005	0.001	0.002	0.003	0.005	0.006
n	Manning's roughness coefficient for open channel flow$_{18}$	n/a	0.045	0.045	0.04	0.04	0.04	0.05	0.045	0.05	0.04	0.04	0.04
V	average velocity$_{19}$	ft/s	3.06	3.74	2.40	1.84	3.15	3.01	2.24	2.90	1.93	2.23	3.22
T_t	travel time$_{20}$	hr	0.39	0.17	0.34	0.41	0.60	0.53	1.50	1.48	2.61	1.59	0.59
Total Travel Time (Tt)$_{21}$		hr	1.13	0.66	0.79	1.07	1.47	1.49	1.84	1.93	3.99	2.42	1.17
Time of Concentration (TOC_min)		min	**67.79**	**39.80**	**47.19**	**64.02**	**88.05**	**89.17**	**110.18**	**115.63**	**239.14**	**145.16**	**69.96**
Lag Time$_{22}$		min	**40.67**	**23.88**	**28.31**	**38.41**	**52.83**	**53.50**	**66.11**	**69.38**	**143.48**	**87.09**	**41.98**

(1) Flowpaths hand-delineated. Source WC_longestflowpaths.shp

(2) n-Value was based on the land use

(3) Land use was estimated from aerial imagery and parcel data

(4)Overland flow was considered to occur at short distances with a maximum of 100 feet

(5) 2-YR 24-HR Rainfall - Based on Austin Drainage Criteria Manual Table = 4.06 inches

(6) Overland flow slope = (US elevation - DS elevation) / overland flow length

(7) Overland Flow Time of Concentration (hr) = (0.007*(nL)^0.8)/((P2)^0.5*s^0.4)

(8) Length of Shallow Concentrated Flow

(9) Ground Slope over Shallow Concentrated Flow Path

(10) From aerial imagery

(11) Channel Velocity: Paved Areas = 20.3282 * SQRT (Slope / 100) Unpaved Areas = 16.1345 * SQRT (S

(12) Channel Flow Tc (Shallow Concentrated) = L1 / V1

(13) Main channel length

(14) Average Bankfull Area

(15) Average Bankfull Wetted Perimeter

(16) Hydraulic Radius = Bankfull Area / Bankfull Wetted Perimeter

(17) Channel Slope

(18) Manning's n-Value for Channel

(19) Channel Velocity (Manning's Equation)

(20) Channel Time of Concentration (Channel Length/Channel Velocity)

(21) Total Tc = Overland Flow+Shallow Concentrated Flow+Channel Flow+Pipe Flow

(22) Lag Time (Tlag) = 0.6 * Final Tc (Soil Conservation Service)

Wilbarger Creek Watershed, Time of Concentration													
Variable	Variable description	Unit	Subbasin WCT169_10	Subbasin WCT171_10	Subbasin WCT171_20	Subbasin WCT171_30	Subbasin WCT208_10	Subbasin WCT208_20	Subbasin WCT208_30	Subbasin WCT220_10	Subbasin WCT220_20	Subbasin WCT220_30	Subbasin WCT220_40
Sheet Flow [eq. 3-3]													
n	Manning's roughness coefficient (table 3-1)$_{2,3}$	n/a	0.15	0.011	0.15	0.06	0.011	0.15	0.15	0.15	0.15	0.15	0.15
L	flow length$_4$	ft	100.00	100.00	100.00	100.00	50.00	50.00	100.00	100.00	100.00	100.00	100.00
P_2	2-year, 24-hour rainfall$_5$	in	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
s	slope of hydraulic grade line (land slope)$_6$	ft/ft	0.006	0.015	0.013	0.015	0.030	0.003	0.010	0.006	0.021	0.009	0.036
V	velocity	ft/s	0.12	1.39	0.16	0.35	1.58	0.08	0.14	0.11	0.19	0.14	0.24
T_t	travel time$_7$	hr	0.24	0.02	0.17	0.08	0.01	0.18	0.19	0.24	0.14	0.20	0.11
Shallow Concentrated Flow [eq. 3-1]													
L	flow length$_8$	ft	4916.41	2062.93	1847.36	3086.17	1662.10	1839.37	2461.10	2152.45	3386.18	2340.52	2087.29
s	slope of hydraulic grade line (watercourse slope)$_9$	ft/ft	0.012	0.017	0.017	0.015	0.012	0.011	0.012	0.012	0.013	0.010	0.011
n/a	surface (Unpaved, Paved)$_{10}$	n/a	unpaved	unpaved	unpaved	unpaved	paved	paved	unpaved	unpaved	unpaved	unpaved	unpaved
V	average velocity$_{11}$	ft/s	1.73	2.10	2.12	1.96	2.21	2.17	1.79	1.74	1.84	1.58	1.72
T_t	travel time$_{12}$	hr	0.79	0.27	0.24	0.44	0.21	0.24	0.38	0.34	0.51	0.41	0.34
Channel Flow [eq. 3-4 and eq. 3-1]													
L	flow length$_{13}$	ft	4209.86	8228.05	3635.93	3961.18	844.12	1540.74	1887.93	6319.24	8711.63	10975.18	8137.57
a	cross sectional flow area$_{14}$	ft^2	3.48	182.26	14.14	62.98	POND	242.04	3.79	64.61	17.62	192.24	87.02
p_w	wetted perimeter$_{15}$	ft	6.01	60.68	12.46	22.17	POND	311.93	17.95	36.78	15.44	62.03	36.80
r	hydraulic radius = a/p_{w16}	ft	0.58	3.00	1.13	2.84	POND	0.78	0.21	1.76	1.14	3.10	2.36
s	slope of hydraulic grade line$_{17}$	ft/ft	0.008	0.007	0.005	0.002	0.003	0.004	0.004	0.008	0.005	0.005	0.004
n	Manning's roughness coefficient for open channel flow$_{18}$	n/a	0.05	0.05	0.045	0.045	POND	0.040	0.045	0.04	0.04	0.045	0.05
V	average velocity$_{19}$	ft/s	1.91	5.34	2.62	3.06	POND	1.89	0.74	4.79	2.95	4.80	3.55
T_t	travel time$_{20}$	hr	0.61	0.43	0.39	0.36	0.00	0.23	0.71	0.37	0.82	0.64	0.64
Total Travel Time (Tt)$_{21}$		hr	1.64	0.72	0.80	0.88	0.22	0.64	1.28	0.95	1.47	1.25	1.09
Time of Concentration (TOC_min)		min	**98.37**	**43.29**	**48.11**	**52.60**	**13.05**	**38.32**	**77.08**	**57.15**	**88.45**	**74.76**	**65.34**
Lag Time$_{22}$		min	**59.02**	**25.97**	**28.86**	**31.56**	**7.83**	**22.99**	**46.25**	**34.29**	**53.07**	**44.86**	**39.20**

(1) Flowpaths hand-delineated. Source WC_longestflowpaths.shp

(2) n-Value was based on the land use

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(5) 2-YR 24-HR Rainfall - Based on Austin Drainage Criteria Manual Table = 4.06 inches

(6) Overland flow slope = (US elevation - DS elevation) / overland flow length

(7) Overland Flow Time of Concentration (hr) = (0.007*(nL)^0.8)/((P2)^0.5*s^0.4)

(8) Length of Shallow Concentrated Flow

(9) Ground Slope over Shallow Concentrated Flow Path

(10) From aerial imagery

(11) Channel Velocity: Paved Areas = 20.3282 * SQRT (Slope / 100) Unpaved Areas = 16.1345 * SQRT (S

(12) Channel Flow Tc (Shallow Concentrated) = L1 / V1

(13) Main channel length

(14) Average Bankfull Area

(15) Average Bankfull Wetted Perimeter

(16) Hydraulic Radius = Bankfull Area / Bankfull Wetted Perimeter

(17) Channel Slope

(18) Manning's n-Value for Channel

(19) Channel Velocity (Manning's Equation)

(20) Channel Time of Concentration (Channel Length/Channel Velocity)

(21) Total Tc = Overland Flow+Shallow Concentrated Flow+Channel Flow+Pipe Flow

(22) Lag Time (Tlag) = 0.6 * Final Tc (Soil Conservation Service)

Wilbarger Creek Watershed, Time of Concentration													
Variable	Variable description	Unit	Subbasin WCT227_10	Subbasin WCT227_20	Subbasin WCT227_30	Subbasin WCT229_10	Subbasin WCT260_10	Subbasin WCT260_20	Subbasin WCT286_10	Subbasin WCT286_20	Subbasin WCT298_10	Subbasin WCT298_20	Subbasin WCT304_10
Sheet Flow [eq. 3-3]													
n	Manning's roughness coefficient (table 3-1)$_{2,3}$	n/a	0.15	0.15	0.06	0.4	0.15	0.06	0.15	0.15	0.15	0.13	0.15
L	flow length$_4$	ft	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
P_2	2-year, 24-hour rainfall$_5$	in	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
s	slope of hydraulic grade line (land slope)$_6$	ft/ft	0.092	0.009	0.027	0.009	0.007	0.012	0.004	0.023	0.015	0.021	0.022
V	velocity	ft/s	0.35	0.14	0.45	0.06	0.13	0.33	0.10	0.20	0.17	0.22	0.20
T_t	travel time$_7$	hr	0.08	0.20	0.06	0.43	0.22	0.09	0.26	0.14	0.16	0.13	0.14
Shallow Concentrated Flow [eq. 3-1]													
L	flow length$_8$	ft	1734.95	2521.26	1494.11	871.55	387.55	3226.07	2372.97	2638.33	2203.76	637.24	948.75
s	slope of hydraulic grade line (watercourse slope)$_9$	ft/ft	0.009	0.016	0.014	0.014	0.015	0.011	0.017	0.010	0.007	0.024	0.020
n/a	surface (Unpaved, Paved)$_{10}$	n/a	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved
V	average velocity$_{11}$	ft/s	1.57	2.01	1.89	1.92	1.98	1.73	2.10	1.61	1.36	2.49	2.28
T_t	travel time$_{12}$	hr	0.31	0.35	0.22	0.13	0.05	0.52	0.31	0.45	0.45	0.07	0.12
Channel Flow [eq. 3-4 and eq. 3-1]													
L	flow length$_{13}$	ft	3544.64	6189.79	6688.41	6266.47	10782.65	5223.47	3282.11	6668.80	6771.61	6305.22	6583.11
a	cross sectional flow area$_{14}$	ft^2	25.95	128.49	35.93	34.31	132.79	51.89	45.32	81.62	36.49	64.55	525.60
p_w	wetted perimeter$_{15}$	ft	27.00	41.37	24.10	26.97	46.58	22.80	62.99	53.49	24.52	53.91	79.75
r	hydraulic radius = a/p_{w16}	ft	0.96	3.11	1.49	1.27	2.85	2.28	0.72	1.53	1.49	1.20	6.59
s	slope of hydraulic grade line$_{17}$	ft/ft	0.011	0.005	0.004	0.014	0.007	0.008	0.007	0.007	0.010	0.013	0.013
n	Manning's roughness coefficient for open channel flow$_{18}$	n/a	0.04	0.05	0.045	0.045	0.045	0.05	0.04	0.04	0.045	0.04	0.05
V	average velocity$_{19}$	ft/s	3.77	5.16	2.85	4.59	5.50	4.58	2.46	4.13	4.30	4.84	12.13
T_t	travel time$_{20}$	hr	0.26	0.33	0.65	0.38	0.54	0.32	0.37	0.45	0.44	0.36	0.15
Total Travel Time (Tt)$_{21}$		hr	0.65	0.88	0.93	0.94	0.82	0.92	0.95	1.04	1.05	0.56	0.41
Time of Concentration (TOC_min)		min	**38.80**	**52.67**	**56.01**	**56.35**	**49.12**	**55.25**	**56.96**	**62.33**	**62.89**	**33.59**	**24.35**
Lag Time$_{22}$		min	**23.28**	**31.60**	**33.61**	**33.81**	**29.47**	**33.15**	**34.17**	**37.40**	**37.74**	**20.15**	**14.61**

(1) Flowpaths hand-delineated. Source WC_longestflowpaths.shp

(2) n-Value was based on the land use

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(4)Overland flow was considered to occur at short distances with a maximum of 100 feet

(5) 2-YR 24-HR Rainfall - Based on Austin Drainage Criteria Manual Table = 4.06 inches

(6) Overland flow slope = (US elevation - DS elevation) / overland flow length

(7) Overland Flow Time of Concentration (hr) = (0.007*(nL)^0.8)/((P2)^0.5*s^0.4)

(8) Length of Shallow Concentrated Flow

(9) Ground Slope over Shallow Concentrated Flow Path

(10) From aerial imagery

(11) Channel Velocity: Paved Areas = 20.3282 * SQRT (Slope / 100) Unpaved Areas = 16.1345 * SQRT (S

(12) Channel Flow Tc (Shallow Concentrated) = L1 / V1

(13) Main channel length

(14) Average Bankfull Area

(15) Average Bankfull Wetted Perimeter

(16) Hydraulic Radius = Bankfull Area / Bankfull Wetted Perimeter

(17) Channel Slope

(18) Manning's n-Value for Channel

(19) Channel Velocity (Manning's Equation)

(20) Channel Time of Concentration (Channel Length/Channel Velocity)

(21) Total Tc = Overland Flow+Shallow Concentrated Flow+Channel Flow+Pipe Flow

(22) Lag Time (Tlag) = 0.6 * Final Tc (Soil Conservation Service)

Wilbarger Creek Watershed, Time of Concentration													
Variable	Variable description	Unit	Subbasin WCT304_20	Subbasin WCT305_10	Subbasin WCT305_20	Subbasin WCT307_10	Subbasin WCT307_20	Subbasin WCT326_10	Subbasin WCT326_20	Subbasin WCT328_10	Subbasin WCT346_10	Subbasin WCT346_20	Subbasin WCT001_10
Sheet Flow [eq. 3-3]													
n	Manning's roughness coefficient (table 3-1)$_{2,3}$	n/a	0.4	0.15	0.4	0.4	0.4	0.15	0.4	0.4	0.15	0.15	0.15
L	flow length$_4$	ft	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
P_2	2-year, 24-hour rainfall$_5$	in	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
s	slope of hydraulic grade line (land slope)$_6$	ft/ft	0.025	0.012	0.019	0.016	0.015	0.009	0.008	0.117	0.017	0.011	0.024
V	velocity	ft/s	0.10	0.16	0.09	0.08	0.08	0.14	0.06	0.18	0.18	0.15	0.21
T_t	travel time$_7$	hr	0.29	0.18	0.32	0.35	0.36	0.20	0.47	0.16	0.15	0.18	0.13
Shallow Concentrated Flow [eq. 3-1]													
L	flow length$_8$	ft	777.03	3580.50	1214.51	2354.28	2110.18	1146.01	356.65	956.32	2561.01	1608.13	2411.23
s	slope of hydraulic grade line (watercourse slope)$_9$	ft/ft	0.069	0.007	0.017	0.014	0.020	0.057	0.050	0.066	0.025	0.010	0.026
n/a	surface (Unpaved, Paved)$_{10}$	n/a	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved
V	average velocity$_{11}$	ft/s	4.23	1.36	2.12	1.88	2.27	3.84	3.61	4.13	2.54	1.64	2.62
T_t	travel time$_{12}$	hr	0.05	0.73	0.16	0.35	0.26	0.08	0.03	0.06	0.28	0.27	0.26
Channel Flow [eq. 3-4 and eq. 3-1]													
L	flow length$_{13}$	ft	3419.18	6893.64	10330.08	7312.70	7270.18	1787.12	10217.66	7418.74	6651.55	8484.82	5355.86
a	cross sectional flow area$_{14}$	ft^2	57.51	542.25	275.72	46.46	83.96	140.25	82.46	17.92	16.95	205.61	6.79
p_w	wetted perimeter$_{15}$	ft	20.96	84.52	67.81	27.34	37.16	52.18	43.04	15.22	33.01	56.42	12.07
r	hydraulic radius = a/p_{w16}	ft	2.74	6.42	4.07	1.70	2.26	2.69	1.92	1.18	0.51	3.64	0.56
s	slope of hydraulic grade line$_{17}$	ft/ft	0.017	0.011	0.012	0.008	0.011	0.029	0.016	0.014	0.011	0.013	0.015
n	Manning's roughness coefficient for open channel flow$_{18}$	n/a	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.045	0.05
V	average velocity$_{19}$	ft/s	7.69	10.98	8.38	3.84	5.44	9.88	5.88	3.99	2.01	8.90	2.51
T_t	travel time$_{20}$	hr	0.12	0.17	0.34	0.53	0.37	0.05	0.48	0.52	0.92	0.26	0.59
Total Travel Time (Tt)$_{21}$		hr	0.47	1.08	0.83	1.22	0.99	0.33	0.98	0.74	1.35	0.72	0.98
Time of Concentration (TOC_min)		min	**27.97**	**64.98**	**49.50**	**73.33**	**59.35**	**19.92**	**58.52**	**44.27**	**81.30**	**43.17**	**59.02**
Lag Time$_{22}$		min	**16.78**	**38.99**	**29.70**	**44.00**	**35.61**	**11.95**	**35.11**	**26.56**	**48.78**	**25.90**	**35.41**

(1) Flowpaths hand-delineated. Source WC_longestflowpaths.shp

(2) n-Value was based on the land use

(3) Land use was estimated from aerial imagery and parcel data

(4)Overland flow was considered to occur at short distances with a maximum of 100 feet

(5) 2-YR 24-HR Rainfall - Based on Austin Drainage Criteria Manual Table = 4.06 inches

(6) Overland flow slope = (US elevation - DS elevation) / overland flow length

(7) Overland Flow Time of Concentration (hr) = (0.007*(nL)^0.8)/((P2)^0.5*s^0.4)

(8) Length of Shallow Concentrated Flow

(9) Ground Slope over Shallow Concentrated Flow Path

(10) From aerial imagery

(11) Channel Velocity: Paved Areas = 20.3282 * SQRT (Slope / 100) Unpaved Areas = 16.1345 * SQRT (S

(12) Channel Flow Tc (Shallow Concentrated) = L1 / V1

(13) Main channel length

(14) Average Bankfull Area

(15) Average Bankfull Wetted Perimeter

(16) Hydraulic Radius = Bankfull Area / Bankfull Wetted Perimeter

(17) Channel Slope

(18) Manning's n-Value for Channel

(19) Channel Velocity (Manning's Equation)

(20) Channel Time of Concentration (Channel Length/Channel Velocity)

(21) Total Tc = Overland Flow+Shallow Concentrated Flow+Channel Flow+Pipe Flow

(22) Lag Time (Tlag) = 0.6 * Final Tc (Soil Conservation Service)

Wilbarger Creek Watershed, Time of Concentration													
Variable	Variable description	Unit	Subbasin WCT001_20	Subbasin WCT003_10	Subbasin WCT003_20	Subbasin WCT004_10	Subbasin WCT004_20	Subbasin WCT004_30	Subbasin WCT004_40	Subbasin WCT004_50	Subbasin WCT004_60	Subbasin WCT004_70	Subbasin WCT006_10
Sheet Flow [eq. 3-3]													
n	Manning's roughness coefficient (table 3-1)$_{2,3}$	n/a	0.15	0.4	0.15	0.15	0.4	0.15	0.15	0.15	0.4	0.24	0.15
L	flow length$_4$	ft	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
P_2	2-year, 24-hour rainfall$_5$	in	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
s	slope of hydraulic grade line (land slope)$_6$	ft/ft	0.013	0.014	0.010	0.031	0.019	0.012	0.022	0.020	0.012	0.029	0.036
V	velocity	ft/s	0.16	0.08	0.15	0.23	0.09	0.16	0.20	0.19	0.07	0.15	0.24
T_t	travel time$_7$	hr	0.17	0.37	0.19	0.12	0.32	0.18	0.14	0.14	0.39	0.18	0.12
Shallow Concentrated Flow [eq. 3-1]													
L	flow length$_8$	ft	2011.79	4055.24	3081.65	5537.77	4266.44	3255.45	974.75	720.82	1201.76	2283.76	2893.79
s	slope of hydraulic grade line (watercourse slope)$_9$	ft/ft	0.014	0.019	0.016	0.010	0.020	0.014	0.052	0.010	0.038	0.023	0.011
n/a	surface (Unpaved, Paved)$_{10}$	n/a	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved
V	average velocity$_{11}$	ft/s	1.93	2.23	2.01	1.57	2.30	1.90	3.68	1.61	3.16	2.44	1.68
T_t	travel time$_{12}$	hr	0.29	0.51	0.43	0.98	0.52	0.48	0.07	0.12	0.11	0.26	0.48
Channel Flow [eq. 3-4 and eq. 3-1]													
L	flow length$_{13}$	ft	13932.74	7133.21	8420.00	12138.29	8551.92	4515.13	1321.52	2285.75	821.06	4491.82	6442.10
a	cross sectional flow area$_{14}$	ft^2	122.44	138.83	30.88	26.71	96.88	494.52	210.93	76.82	396.14	484.02	39.16
p_w	wetted perimeter$_{15}$	ft	40.60	38.46	33.20	18.38	23.67	65.80	45.31	20.56	67.89	72.78	45.59
r	hydraulic radius = a/p_{w16}	ft	3.02	3.61	0.93	1.45	4.09	7.52	4.66	3.74	5.84	6.65	0.86
s	slope of hydraulic grade line$_{17}$	ft/ft	0.010	0.013	0.012	0.005	0.006	0.010	0.002	0.022	0.002	0.005	0.007
n	Manning's roughness coefficient for open channel flow$_{18}$	n/a	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.055	0.05
V	average velocity$_{19}$	ft/s	6.11	8.13	3.06	2.62	6.09	11.17	3.30	10.76	4.50	6.93	2.29
T_t	travel time$_{20}$	hr	0.63	0.24	0.76	1.29	0.39	0.11	0.11	0.06	0.05	0.18	0.78
Total Travel Time (Tt)$_{21}$		hr	1.09	1.11	1.38	2.38	1.23	0.76	0.33	0.33	0.55	0.62	1.38
Time of Concentration (TOC_min)		min	**65.63**	**66.86**	**82.83**	**143.02**	**73.67**	**45.87**	**19.50**	**19.65**	**32.75**	**37.35**	**82.57**
Lag Time$_{22}$		min	**39.38**	**40.12**	**49.70**	**85.81**	**44.20**	**27.52**	**11.70**	**11.79**	**19.65**	**22.41**	**49.54**

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(7) Overland Flow Time of Concentration (hr) = (0.007*(nL)^0.8)/((P2)^0.5*s^0.4)

(8) Length of Shallow Concentrated Flow

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(10) From aerial imagery

(11) Channel Velocity: Paved Areas = 20.3282 * SQRT (Slope / 100) Unpaved Areas = 16.1345 * SQRT (S

(12) Channel Flow Tc (Shallow Concentrated) = L1 / V1

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(19) Channel Velocity (Manning's Equation)

(20) Channel Time of Concentration (Channel Length/Channel Velocity)

(21) Total Tc = Overland Flow+Shallow Concentrated Flow+Channel Flow+Pipe Flow

(22) Lag Time (Tlag) = 0.6 * Final Tc (Soil Conservation Service)

Wilbarger Creek Watershed, Time of Concentration													
Variable	Variable description	Unit	Subbasin WCT006_20	Subbasin WCT006_30	Subbasin WCT009_10	Subbasin WCT009_20	Subbasin WCT009_30	Subbasin WCT009_40	Subbasin WCT009_50	Subbasin WCT009_60	Subbasin WCT009_70	Subbasin WCT009_80	Subbasin WLC_10
Sheet Flow [eq. 3-3]													
n	Manning's roughness coefficient (table 3-1)[2,3]	n/a	0.15	0.15	0.011	0.011	0.15	0.15	0.17	0.15	0.13	0.13	0.06
L	flow length[4]	ft	100.00	100.00	50.00	50.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
P_2	2-year, 24-hour rainfall[5]	in	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
s	slope of hydraulic grade line (land slope)[6]	ft/ft	0.008	0.033	0.038	0.061	0.008	0.012	0.005	0.027	0.014	0.038	0.021
V	velocity	ft/s	0.13	0.24	1.75	2.11	0.13	0.16	0.10	0.22	0.18	0.28	0.40
T_t	travel time[7]	hr	0.21	0.12	0.01	0.01	0.21	0.18	0.27	0.13	0.15	0.10	0.07
Shallow Concentrated Flow [eq. 3-1]													
L	flow length[8]	ft	2656.69	1169.83	1859.85	1435.69	3925.13	3968.18	2472.24	3727.89	3538.97	3131.54	1064.59
s	slope of hydraulic grade line (watercourse slope)[9]	ft/ft	0.018	0.019	0.007	0.008	0.014	0.011	0.005	0.013	0.007	0.011	0.011
n/a	surface (Unpaved, Paved)[10]	n/a	unpaved	unpaved	unpaved	paved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved
V	average velocity[11]	ft/s	2.18	2.23	1.39	1.78	1.90	1.72	1.17	1.85	1.38	1.66	1.68
T_t	travel time[12]	hr	0.34	0.15	0.37	0.22	0.58	0.64	0.59	0.56	0.71	0.52	0.18
Channel Flow [eq. 3-4 and eq. 3-1]													
L	flow length[13]	ft	9344.61	2451.54	2370.14	12263.12	5451.97	4908.08	10543.40	2444.87	13107.17	4717.47	14506.93
a	cross sectional flow area[14]	ft^2	68.57	156.19	5.09	94.27	78.81	74.04	61.34	54.09	88.87	561.64	23.68
p_w	wetted perimeter[15]	ft	34.22	37.01	29.71	42.95	29.35	22.40	25.14	22.70	60.18	121.71	24.23
r	hydraulic radius = a/p_w[16]	ft	2.00	4.22	0.17	2.19	2.69	3.31	2.44	2.38	1.48	4.61	0.98
s	slope of hydraulic grade line[17]	ft/ft	0.004	0.006	0.008	0.007	0.005	0.003	0.008	0.002	0.004	0.004	0.006
n	Manning's roughness coefficient for open channel flow[18]	n/a	0.045	0.055	0.04	0.05	0.05	0.05	0.045	0.04	0.045	0.05	0.045
V	average velocity[19]	ft/s	3.12	5.45	1.05	4.27	3.95	3.76	5.44	2.70	2.59	5.23	2.57
T_t	travel time[20]	hr	0.83	0.12	0.63	0.80	0.38	0.36	0.54	0.25	1.41	0.25	1.57
Total Travel Time (Tt)[21]		hr	1.38	0.39	1.01	1.03	1.17	1.18	1.40	0.94	2.27	0.87	1.81
Time of Concentration (TOC_min)		min	**82.79**	**23.33**	**60.41**	**61.73**	**69.96**	**70.86**	**83.98**	**56.47**	**136.08**	**52.49**	**108.78**
Lag Time[22]		min	**49.67**	**14.00**	**36.25**	**37.04**	**41.98**	**42.52**	**50.39**	**33.88**	**81.65**	**31.49**	**65.27**

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(6) Overland flow slope = (US elevation - DS elevation) / overland flow length

(7) Overland Flow Time of Concentration (hr) = (0.007*(nL)^0.8)/((P2)^0.5*s^0.4)

(8) Length of Shallow Concentrated Flow

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(10) From aerial imagery

(11) Channel Velocity: Paved Areas = 20.3282 * SQRT (Slope / 100) Unpaved Areas = 16.1345 * SQRT (S

(12) Channel Flow Tc (Shallow Concentrated) = L1 / V1

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(19) Channel Velocity (Manning's Equation)

(20) Channel Time of Concentration (Channel Length/Channel Velocity)

(21) Total Tc = Overland Flow+Shallow Concentrated Flow+Channel Flow+Pipe Flow

(22) Lag Time (Tlag) = 0.6 * Final Tc (Soil Conservation Service)

Wilbarger Creek Watershed, Time of Concentration													
Variable	Variable description	Unit	Subbasin WLC_20	Subbasin WLC_30	Subbasin WLC_40	Subbasin WLC_50	Subbasin WLC_60	Subbasin WLC_70	Subbasin WLC_80	Subbasin WLC_90	Subbasin WLC_100	Subbasin WC_390	Subbasin WC_400
Sheet Flow [eq. 3-3]													
n	Manning's roughness coefficient (table 3-1)[2,3]	n/a	0.17	0.13	0.15	0.15	0.06	0.17	0.15	0.06	0.011	0.15	0.4
L	flow length[4]	ft	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00
P_2	2-year, 24-hour rainfall[5]	in	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
s	slope of hydraulic grade line (land slope)[6]	ft/ft	0.016	0.009	0.024	0.008	0.002	0.003	0.007	0.006	0.028	0.013	0.051
V	velocity	ft/s	0.16	0.16	0.21	0.13	0.16	0.08	0.13	0.25	1.54	0.16	0.13
T_t	travel time[7]	hr	0.18	0.18	0.13	0.21	0.18	0.33	0.22	0.11	0.01	0.17	0.22
Shallow Concentrated Flow [eq. 3-1]													
L	flow length[8]	ft	1347.33	1182.78	3608.02	2243.61	1424.51	2730.43	616.67	5618.84	3039.32	3177.02	2203.42
s	slope of hydraulic grade line (watercourse slope)[9]	ft/ft	0.018	0.016	0.007	0.008	0.014	0.013	0.016	0.008	0.020	0.010	0.016
n/a	surface (Unpaved, Paved)[10]	n/a	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved
V	average velocity[11]	ft/s	2.17	2.03	1.37	1.46	1.90	1.81	2.05	1.41	2.29	1.58	2.01
T_t	travel time[12]	hr	0.17	0.16	0.73	0.43	0.21	0.42	0.08	1.10	0.37	0.56	0.30
Channel Flow [eq. 3-4 and eq. 3-1]													
L	flow length[13]	ft	10196.19	11915.06	6884.33	4440.15	8669.69	6334.82	9055.86	13755.32	14522.99	14094.45	4678.66
a	cross sectional flow area[14]	ft^2	54.25	46.34	55.09	150.49	76.33	18.58	223.92	199.70	92.83	1181.67	634.50
p_w	wetted perimeter[15]	ft	28.32	24.96	21.30	43.96	22.72	15.59	37.90	44.27	33.53	201.92	88.72
r	hydraulic radius = a/p_w[16]	ft	1.92	1.86	2.59	3.42	3.36	1.19	5.91	4.51	2.77	5.85	7.15
s	slope of hydraulic grade line[17]	ft/ft	0.007	0.005	0.005	0.002	0.006	0.007	0.007	0.001	0.002	0.008	0.006
n	Manning's roughness coefficient for open channel flow[18]	n/a	0.04	0.04	0.045	0.045	0.04	0.04	0.05	0.04	0.045	0.05	0.05
V	average velocity[19]	ft/s	4.82	3.88	4.49	3.05	6.70	3.52	8.07	3.68	2.65	8.57	8.40
T_t	travel time[20]	hr	0.59	0.85	0.43	0.40	0.36	0.50	0.31	1.04	1.52	0.46	0.15
Total Travel Time (Tt)[21]		hr	0.94	1.19	1.29	1.04	0.74	1.25	0.61	2.25	1.90	1.19	0.68
Time of Concentration (TOC_min)		min	**56.24**	**71.47**	**77.37**	**62.41**	**44.60**	**74.89**	**36.72**	**135.18**	**114.19**	**71.10**	**40.72**
Lag Time[22]		min	**33.74**	**42.88**	**46.42**	**37.45**	**26.76**	**44.93**	**22.03**	**81.11**	**68.52**	**42.66**	**24.43**

(1) Flowpaths hand-delineated. Source WC_longestflowpaths.shp

(2) n-Value was based on the land use

(3) Land use was estimated from aerial imagery and parcel data

(4)Overland flow was considered to occur at short distances with a maximum of 100 feet

(5) 2-YR 24-HR Rainfall - Based on Austin Drainage Criteria Manual Table = 4.06 inches

(6) Overland flow slope = (US elevation - DS elevation) / overland flow length

(7) Overland Flow Time of Concentration (hr) = (0.007*(nL)^0.8)/((P2)^0.5*s^0.4)

(8) Length of Shallow Concentrated Flow

(9) Ground Slope over Shallow Concentrated Flow Path

(10) From aerial imagery

(11) Channel Velocity: Paved Areas = 20.3282 * SQRT (Slope / 100) Unpaved Areas = 16.1345 * SQRT (S

(12) Channel Flow Tc (Shallow Concentrated) = L1 / V1

(13) Main channel length

(14) Average Bankfull Area

(15) Average Bankfull Wetted Perimeter

(16) Hydraulic Radius = Bankfull Area / Bankfull Wetted Perimeter

(17) Channel Slope

(18) Manning's n-Value for Channel

(19) Channel Velocity (Manning's Equation)

(20) Channel Time of Concentration (Channel Length/Channel Velocity)

(21) Total Tc = Overland Flow+Shallow Concentrated Flow+Channel Flow+Pipe Flow

(22) Lag Time (Tlag) = 0.6 * Final Tc (Soil Conservation Service)

Wilbarger Creek Watershed, Time of Concentration												
Variable	Variable description	Unit	Subbasin WC_410	Subbasin WC_420	Subbasin WC_430	Subbasin WC_440	Subbasin WC_450	Subbasin WC_460	Subbasin WC_470	Subbasin WC_480	Subbasin WC_490	Subbasin WC_500	Subbasin WC_510
Sheet Flow [eq. 3-3]													
n	Manning's roughness coefficient (table 3-1)[2,3]	n/a	0.24	0.15	0.24	0.4	0.4	0.4	0.4	0.4	0.4	0.17	0.06
L	flow length[4]	ft	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
P_2	2-year, 24-hour rainfall[5]	in	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06	4.06
s	slope of hydraulic grade line (land slope)[6]	ft/ft	0.022	0.013	0.034	0.010	0.078	0.013	0.005	0.053	0.033	0.004	0.007
V	velocity	ft/s	0.14	0.16	0.16	0.07	0.15	0.07	0.05	0.13	0.11	0.09	0.26
T_t	travel time[7]	hr	0.20	0.17	0.17	0.41	0.18	0.38	0.57	0.22	0.26	0.32	0.11
Shallow Concentrated Flow [eq. 3-1]													
L	flow length[8]	ft	1039.44	1250.34	1386.32	1786.29	1225.41	3464.25	3777.64	2835.62	646.42	5519.15	3937.11
s	slope of hydraulic grade line (watercourse slope)[9]	ft/ft	0.027	0.019	0.029	0.022	0.034	0.012	0.006	0.019	0.035	0.002	0.012
n/a	surface (Unpaved, Paved)[10]	n/a	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved	unpaved
V	average velocity[11]	ft/s	2.64	2.20	2.76	2.38	2.99	1.75	1.25	2.23	3.03	0.70	1.75
T_t	travel time[12]	hr	0.11	0.16	0.14	0.21	0.11	0.55	0.84	0.35	0.06	2.18	0.62
Channel Flow [eq. 3-4 and eq. 3-1]													
L	flow length[13]	ft	4245.05	5795.53	5027.77	13011.31	3652.03	12432.55	2973.16	9833.59	14747.98	6522.16	1233.01
a	cross sectional flow area[14]	ft^2	1633.40	1006.25	981.36	1717.89	1702.47	2199.66	1309.57	154.45	430.53	2922.44	2575.44
p_w	wetted perimeter[15]	ft	150.00	125.78	96.62	121.10	119.98	155.54	184.28	57.67	83.24	199.84	180.63
r	hydraulic radius = a/p_w[16]	ft	10.89	8.00	10.16	14.19	14.19	14.14	7.11	2.68	5.17	14.62	14.26
s	slope of hydraulic grade line[17]	ft/ft	0.021	0.016	0.004	0.010	0.010	0.007	0.007	0.009	0.009	0.006	0.002
n	Manning's roughness coefficient for open channel flow[18]	n/a	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
V	average velocity[19]	ft/s	21.16	15.16	9.18	17.05	17.22	14.10	9.46	5.39	8.41	13.79	7.60
T_t	travel time[20]	hr	0.06	0.11	0.15	0.21	0.06	0.24	0.09	0.51	0.49	0.13	0.05
Total Travel Time (Tt)[21]		hr	0.37	0.44	0.46	0.83	0.36	1.17	1.49	1.08	0.81	2.63	0.78
Time of Concentration (TOC_min)		min	**22.10**	**26.20**	**27.73**	**50.03**	**21.45**	**70.43**	**89.69**	**64.56**	**48.44**	**157.85**	**46.61**
Lag Time[22]		min	**13.26**	**15.72**	**16.64**	**30.02**	**12.87**	**42.26**	**53.81**	**38.74**	**29.06**	**94.71**	**27.97**

(1) Flowpaths hand-delineated. Source WC_longestflowpaths.shp

(2) n-Value was based on the land use

(3) Land use was estimated from aerial imagery and parcel data

(4)Overland flow was considered to occur at short distances with a maximum of 100 feet

(5) 2-YR 24-HR Rainfall - Based on Austin Drainage Criteria Manual Table = 4.06 inches

(6) Overland flow slope = (US elevation - DS elevation) / overland flow length

(7) Overland Flow Time of Concentration (hr) = (0.007*(nL)^0.8)/((P2)^0.5*s^0.4)

(8) Length of Shallow Concentrated Flow

(9) Ground Slope over Shallow Concentrated Flow Path

(10) From aerial imagery

(11) Channel Velocity: Paved Areas = 20.3282 * SQRT (Slope / 100) Unpaved Areas = 16.1345 * SQRT (S

(12) Channel Flow Tc (Shallow Concentrated) = L1 / V1

(13) Main channel length

(14) Average Bankfull Area

(15) Average Bankfull Wetted Perimeter

(16) Hydraulic Radius = Bankfull Area / Bankfull Wetted Perimeter

(17) Channel Slope

(18) Manning's n-Value for Channel

(19) Channel Velocity (Manning's Equation)

(20) Channel Time of Concentration (Channel Length/Channel Velocity)

(21) Total Tc = Overland Flow+Shallow Concentrated Flow+Channel Flow+Pipe Flow

(22) Lag Time (Tlag) = 0.6 * Final Tc (Soil Conservation Service)

Wilbarger Creek Watershed, Time of Concentration				
Variable	Variable description	Unit	Subbasin WC_520	Subbasin WC_530
Sheet Flow [eq. 3-3]				
n	Manning's roughness coefficient (table 3-1)[2,3]	n/a	0.24	0.06
L	flow length[4]	ft	100.00	100.00
P_2	2-year, 24-hour rainfall[5]	in	4.06	4.06
s	slope of hydraulic grade line (land slope)[6]	ft/ft	0.005	0.010
V	velocity	ft/s	0.07	0.31
T_t	travel time[7]	hr	0.37	0.09
Shallow Concentrated Flow [eq. 3-1]				
L	flow length[8]	ft	2820.34	3568.22
s	slope of hydraulic grade line (watercourse slope)[9]	ft/ft	0.009	0.004
n/a	surface (Unpaved, Paved)[10]	n/a	unpaved	unpaved
V	average velocity[11]	ft/s	1.57	1.00
T_t	travel time[12]	hr	0.50	0.99
Channel Flow [eq. 3-4 and eq. 3-1]				
L	flow length[13]	ft	1466.51	10064.31
a	cross sectional flow area[14]	ft^2	3087.15	2460.62
p_w	wetted perimeter[15]	ft	245.31	186.30
r	hydraulic radius = a/p_w[16]	ft	12.58	13.21
s	slope of hydraulic grade line[17]	ft/ft	0.003	0.004
n	Manning's roughness coefficient for open channel flow[18]	n/a	0.05	0.05
V	average velocity[19]	ft/s	8.92	10.25
T_t	travel time[20]	hr	0.05	0.27
Total Travel Time (Tt)[21]		hr	0.92	1.35
Time of Concentration (TOC_min)		min	**55.12**	**81.27**
Lag Time[22]		min	**33.07**	**48.76**

(1) Flowpaths hand-delineated. Source WC_longestflowpaths.shp

(2) n-Value was based on the land use

(3) Land use was estimated from aerial imagery and parcel data

(4)Overland flow was considered to occur at short distances with a maximum of 100 feet

(5) 2-YR 24-HR Rainfall - Based on Austin Drainage Criteria Manual Table = 4.06 inches

(6) Overland flow slope = (US elevation - DS elevation) / overland flow length

(7) Overland Flow Time of Concentration (hr) = (0.007*(nL)^0.8)/((P2)^0.5*s^0.4)

(8) Length of Shallow Concentrated Flow

(9) Ground Slope over Shallow Concentrated Flow Path

(10) From aerial imagery

(11) Channel Velocity: Paved Areas = 20.3282 * SQRT (Slope / 100) Unpaved Areas = 16.1345 * SQRT (S

(12) Channel Flow Tc (Shallow Concentrated) = L1 / V1

(13) Main channel length

(14) Average Bankfull Area

(15) Average Bankfull Wetted Perimeter

(16) Hydraulic Radius = Bankfull Area / Bankfull Wetted Perimeter

(17) Channel Slope

(18) Manning's n-Value for Channel

(19) Channel Velocity (Manning's Equation)

(20) Channel Time of Concentration (Channel Length/Channel Velocity)

(21) Total Tc = Overland Flow+Shallow Concentrated Flow+Channel Flow+Pipe Flow

(22) Lag Time (Tlag) = 0.6 * Final Tc (Soil Conservation Service)

Appendix E: Hydrologic Model Analysis

E-4 Routing – Modified Puls

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek

R_WC_20	
From_RS	to_RS
242551	237765
Volume (acre-ft)	Q Total (cfs)
0	0
28.69	660
51.8	1320
72.44	1900
88.46	2550
112.93	3400
142.07	4500
153.44	5000
192.53	7280
201.97	7900
213.5	8700
224.82	9540
246.48	11250
268.07	12960
279.12	14000
306.35	16500
331.35	18850
366.9	22000

R_WC_30	
From_RS	to_RS
237765	236150
Volume (acre-ft)	Q Total (cfs)
0	0
11.11	660
19.94	1320
26.96	1900
33.19	2550
41.19	3400
50.5	4500
54.42	5000
70.83	7280
74.98	7900
80.42	8700
85.58	9540
95.72	11250
104.79	12960
110.01	14000
122.13	16500
133.04	18850
146.69	22000

R_WC_40	
From_RS	to_RS
236150	232336
Volume (acre-ft)	Q Total (cfs)
0	0
18.01	660
34.02	1320
47.64	1900
62.48	2550
80.52	3400
102.19	4500
111.55	5000
151.91	7280
162.92	7900
177.78	8700
193.1	9540
225.38	11250
253.6	12960
270.23	14000
308.28	16500
342.03	18850
382.89	22000

R_WC_50	
From_RS	to_RS
232336	228794
Volume (acre-ft)	Q Total (cfs)
0	0
18.02	660
29.37	1320
38.07	1900
49.16	2550
63.61	3400
79.29	4500
86.58	5000
120.93	7280
130.29	7900
142.49	8700
154.87	9540
182.99	11250
207.91	12960
221.6	14000
252.23	16500
278.32	18850
310.66	22000

R_WC_60	
From_RS	to_RS
228794	213621
Volume (acre-ft)	Q Total (cfs)
0	0
88.25	660
144.64	1320
188.89	1900
239.73	2550
310.57	3400
398.68	4500
434.89	5000
585.52	7280
621.99	7900
665.89	8700
712.76	9540
800.88	11250
885.04	12960
933.31	14000
1046.17	16500
1147.64	18850
1270.56	22000

R_WC_70	
From_RS	to_RS
213621	208890
Volume (acre-ft)	Q Total (cfs)
0	0
32.87	660
58.16	1320
76.62	1900
94.37	2550
122.63	3400
160.56	4500
178.24	5000
224.4	7280
243.77	7900
269.89	8700
296.21	9540
349.16	11250
383.02	12960
409.85	14000
457.52	16500
511.32	18850
597.56	22000

R_WC_80	
From_RS	to_RS
208890	201252
Volume (acre-ft)	Q Total (cfs)
0	0
42.14	660
72.98	1320
94.27	1900
118.55	2550
151.38	3400
192.19	4500
210.22	5000
282.88	7280
301.22	7900
324.18	8700
356.27	9540
399.88	11250
448.38	12960
474.08	14000
537.21	16500
600.48	18850
678.8	22000

R_WC_90	
From_RS	to_RS
201252	191643
Volume (acre-ft)	Q Total (cfs)
0	0
65.77	660
103.12	1320
132.33	1900
161.96	2550
197.66	3400
239.94	4500
258.23	5000
338.67	7280
359.69	7900
386.21	8700
413.09	9540
465.11	11250
516.69	12960
546.96	14000
615.48	16500
679.52	18850
763.21	22000

R_WC_110	
From_RS	to_RS
191643	181779
Volume (acre-ft)	Q Total (cfs)
0	0
55.79	660
100.52	1320
131.85	1900
164.59	2550
203.5	3400
248.48	4500
269.74	5000
341.61	7280
362.25	7900
388.2	8700
414.17	9540
466.79	11250
515.01	12960
542.83	14000
608.51	16500
667.18	18850
742.82	22000

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek (Continued)

R_WC_120	
From_RS	to_RS
181779	169317
Volume (acre-ft)	Q Total (cfs)
0	0
292.6	3200
502.75	6400
686.85	9600
808.9	12000
1016.75	16500
1317.3	23680
1598.72	30940
1817.64	37000
1973.83	41500
2159.59	47000
2296.32	51100
2575.12	60000
2897.06	71240
3165.53	81300
3419.4	91370
3744.14	105070
4097.33	121000

R_WC_130	
From_RS	to_RS
169317	155254
Volume (acre-ft)	Q Total (cfs)
0	0
361.38	3200
568.43	6400
748.43	9600
871.29	12000
1081.5	16500
1371.9	23680
1640.89	30940
1853.23	37000
2004.86	41500
2184.19	47000
2313.62	51100
2590.66	60000
2929.69	71240
3207.9	81300
3468.53	91370
3802.03	105070
4164.2	121000

R_WC_140	
From_RS	to_RS
155254	153406
Volume (acre-ft)	Q Total (cfs)
0	0
62.98	3200
94.08	6400
127.75	9600
151.44	12000
193.52	16500
256.82	23680
315.53	30940
361.46	37000
393.53	41500
431.36	47000
458.52	51100
514.68	60000
581.9	71240
638.25	81300
690.74	91370
756.02	105070
825.2	121000

R_WC_150	
From_RS	to_RS
153406	148743
Volume (acre-ft)	Q Total (cfs)
0	0
173.83	3200
275.14	6400
367.7	9600
429.26	12000
533.38	16500
677.99	23680
809.64	30940
912.12	37000
982.41	41500
1067.2	47000
1128.91	51100
1254.69	60000
1406.69	71240
1533.75	81300
1652.91	91370
1803.67	105070
1964.22	121000

R_WC_160	
From_RS	to_RS
148743	142037
Volume (acre-ft)	Q Total (cfs)
0	0
237.49	3200
397	6400
529.08	9600
617.88	12000
769.51	16500
989.08	23680
1191.21	30940
1349.53	37000
1448.68	41500
1571.1	47000
1662.6	51100
1829.01	60000
2037.05	71240
2210.56	81300
2368.08	91370
2572.17	105070
2793.93	121000

R_WC_170	
From_RS	to_RS
142037	134553
Volume (acre-ft)	Q Total (cfs)
0	0
271	3200
427.22	6400
572.13	9600
672.47	12000
849.73	16500
1142.37	23680
1412.8	30940
1714.91	37000
1842.82	41500
1981.05	47000
2124.42	51100
2359.61	60000
2616.09	71240
2822.01	81300
2998.19	91370
3235.2	105070
3493.21	121000

R_WC_180	
From_RS	to_RS
134553	129612
Volume (acre-ft)	Q Total (cfs)
0	0
197.67	3200
337.15	6400
463.79	9600
551.86	12000
707.59	16500
969.84	23680
1051.39	30940
1285.81	37000
1417.32	41500
1536.76	47000
1610.59	51100
1750.28	60000
1900.98	71240
2022.14	81300
2134.95	91370
2283.1	105070
2443.46	121000

R_WC_190	
From_RS	to_RS
129612	127456
Volume (acre-ft)	Q Total (cfs)
0	0
92.47	3200
154.27	6400
207.46	9600
244.24	12000
308.97	16500
402.97	23680
489.34	30940
562.55	37000
613.76	41500
673.94	47000
718.45	51100
808.12	60000
916.11	71240
1003.05	81300
1083.96	91370
1186.23	105070
1298.6	121000

R_WC_200	
From_RS	to_RS
127456	123752
Volume (acre-ft)	Q Total (cfs)
0	0
157.39	3200
266.19	6400
357.76	9600
424.2	12000
533.72	16500
685.41	23680
821.58	30940
927.13	37000
1003.12	41500
1091.59	47000
1158.83	51100
1296.79	60000
1472.16	71240
1620.84	81300
1757.36	91370
1931.73	105070
2123.27	121000

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek (Continued)

R_WC_210	
From_RS	to_RS
123752	119250
Volume (acre-ft)	Q Total (cfs)
0	0
139.73	3200
234.02	6400
322.58	9600
383.45	12000
489.52	16500
639.76	23680
777.58	30940
886.02	37000
962.4	41500
1052.46	47000
1117.42	51100
1253.38	60000
1416.48	71240
1553.9	81300
1685.84	91370
1854.25	105070
2038.21	121000

R_WC_220	
From_RS	to_RS
119250	117124
Volume (acre-ft)	Q Total (cfs)
0	0
63.82	3200
107.58	6400
143.58	9600
168.06	12000
211.37	16500
275.45	23680
335.91	30940
384.6	37000
419.01	41500
459.4	47000
489.72	51100
553.26	60000
630.28	71240
695.98	81300
759.58	91370
841.38	105070
930.42	121000

R_WC_240	
From_RS	to_RS
117124	113417
Volume (acre-ft)	Q Total (cfs)
0	0
197.8	3200
331.13	6400
439.56	9600
513.21	12000
637.33	16500
810.24	23680
994.53	30940
1144.42	37000
1249.55	41500
1373.23	47000
1460.82	51100
1633.53	60000
1828.45	71240
1989.86	81300
2141.25	91370
2334.27	105070
2545.43	121000

R_WC_260	
From_RS	to_RS
113417	111879
Volume (acre-ft)	Q Total (cfs)
0	0
59.55	3200
115.03	6400
163.38	9600
196.24	12000
247.09	16500
314.62	23680
406.76	30940
477.55	37000
524.8	41500
578	47000
613.73	51100
678.86	60000
746.22	71240
799.6	81300
848.61	91370
909.94	105070
977.69	121000

R_WC_270	
From_RS	to_RS
111879	102284
Volume (acre-ft)	Q Total (cfs)
0	0
317.22	3200
514.32	6400
673.79	9600
779.93	12000
960.35	16500
1215.07	23680
1448.41	30940
1631.13	37000
1759.97	41500
1911.13	47000
2020.21	51100
2248.86	60000
2522.46	71240
2754.56	81300
2975.31	91370
3259.46	105070
3569.01	121000

R_WC_290	
From_RS	to_RS
102284	100579
Volume (acre-ft)	Q Total (cfs)
0	0
52.85	3200
87.91	6400
115.84	9600
134.42	12000
165.73	16500
209.24	23680
248.18	30940
277.65	37000
298.17	41500
322.11	47000
339.27	51100
374.62	60000
416.72	71240
452.52	81300
486.61	91370
530.22	105070
578.52	121000

R_WC_310	
From_RS	to_RS
100579	90543
Volume (acre-ft)	Q Total (cfs)
0	0
303.7	3200
556.16	6400
753.54	9600
884.64	12000
1102.78	16500
1404.1	23680
1673.26	30940
1880.92	37000
2025.04	41500
2193.52	47000
2314.58	51100
2564.29	60000
2860.24	71240
3116.99	81300
3352.16	91370
3654.49	105070
3983.91	121000

R_WC_330	
From_RS	to_RS
90543	87254
Volume (acre-ft)	Q Total (cfs)
0	0
71.58	3200
150.15	6400
222.19	9600
271.8	12000
348.5	16500
444.48	23680
528.8	30940
593.56	37000
637.65	41500
689.17	47000
726.13	51100
803	60000
892.46	71240
968.62	81300
1040.78	91370
1135.3	105070
1240.22	121000

R_WC_340	
From_RS	to_RS
87254	85846
Volume (acre-ft)	Q Total (cfs)
0	0
32.06	3200
82.79	6400
138.33	9600
184.89	12000
263.67	16500
336.33	23680
416.11	30940
477.41	37000
515.83	41500
565.53	47000
601.32	51100
676.75	60000
766.99	71240
844.17	81300
919.02	91370
1018.37	105070
1129.98	121000
1882.47	245200

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek (Continued)

R_WC_350	
From_RS	to_RS
85846	83470
Volume (acre-ft)	Q Total (cfs)
0	0
76.82	4000
178.88	7600
305.02	12000
424.25	16500
513.73	23400
648.67	30740
781.06	39000
912.96	48500
1006.73	54800
1086.18	60260
1227.6	70000
1344.48	78370
1514.29	91010
1679.81	103660
1793.63	112500
2088.63	136500
2274.58	152000
5157	474000

R_WC_360	
From_RS	to_RS
83470	78537
Volume (acre-ft)	Q Total (cfs)
0	0
181.22	4000
404.5	7600
607.93	12000
788.17	16500
1013.52	23400
1236.59	30740
1459.85	39000
1696.95	48500
1847.11	54800
1972.42	60260
2189.81	70000
2369.49	78370
2626.54	91010
2872.68	103660
3041.41	112500
3477.71	136500
3751.28	152000
7932.3	474000

R_WC_370	
From_RS	to_RS
78537	74152
Volume (acre-ft)	Q Total (cfs)
0	0
123.04	4000
321.99	7600
516.02	12000
704.31	16500
970.89	23400
1217.34	30740
1461.39	39000
1715.2	48500
1873.02	54800
2002.62	60260
2222.23	70000
2402.28	78370
2658.52	91010
2901.6	103660
3061.93	112500
3472.89	136500
3722.69	152000
7603.9	474000

R_WC_380	
From_RS	to_RS
74152	65291
Volume (acre-ft)	Q Total (cfs)
0	0
234.36	4000
543.72	7600
852.88	12000
1065.12	16500
1361.27	23400
1629.35	30740
1908.19	39000
2199.02	48500
2381.63	54800
2531.47	60260
2787.31	70000
2999.55	78370
3305	91010
3595.26	103660
3793.78	112500
4307.61	136500
4624.16	152000
9917.12	474000

R_WC_390	
From_RS	to_RS
65291	54540
Volume (acre-ft)	Q Total (cfs)
0	0
293.23	4000
701.35	7600
1057.03	12000
1333.88	16500
1750.64	23400
2131.84	30740
2510.78	39000
2922.2	48500
3178.03	54800
3390.92	60260
3756.37	70000
4055.84	78370
4489.1	91010
4857.28	103660
5131.44	112500
5827.88	136500
6269.77	152000
13736.59	474000

R_WC_400	
From_RS	to_RS
54540	49978
Volume (acre-ft)	Q Total (cfs)
0	0
110.04	4000
241.96	7600
435.1	12000
633.7	16500
892.35	23400
1101.88	30740
1246.81	39000
1477.54	48500
1620.61	54800
1740.02	60260
1946.53	70000
2118.72	78370
2368.28	91010
2587.45	103660
2752.95	112500
3152.1	136500
3422.18	152000
7789.37	474000

R_WC_410	
From_RS	to_RS
49978	46966
Volume (acre-ft)	Q Total (cfs)
0	0
74.2	4000
144.62	7600
241.56	12000
344.34	16500
492.39	23400
623.36	30740
797.42	39000
1008.94	48500
1137.24	54800
1243.48	60260
1424.57	70000
1573.74	78370
1784.8	91010
1990.14	103660
2131.93	112500
2445.25	136500
2667.22	152000
6004.39	474000

R_WC_420	
From_RS	to_RS
46966	43530
Volume (acre-ft)	Q Total (cfs)
0	0
80.24	4000
180.49	7600
302.3	12000
442.67	16500
635.18	23400
820.77	30740
1016.77	39000
1246.64	48500
1386.42	54800
1500.47	60260
1695.18	70000
1857.64	78370
2084.18	91010
2308.86	103660
2467.9	112500
2887.21	136500
3158.08	152000
7295.58	474000

R_WC_430	
From_RS	to_RS
43530	37425
Volume (acre-ft)	Q Total (cfs)
0	0
124.82	4000
260.43	7600
420.53	12000
583.16	16500
823.86	23400
1086.6	30740
1428.3	39000
1847.39	48500
2085.39	54800
2264.93	60260
2559.27	70000
2796.27	78370
3109.11	91010
3418.09	103660
3634.29	112500
4202.99	136500
4545.99	152000
9747.3	474000

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek (Continued)

R_WC_440	
From_RS	to_RS
37425	27323
Volume (acre-ft)	Q Total (cfs)
0	0
234.64	4000
386.68	7600
594.79	12000
853.71	16500
1231.11	23400
1604.78	30740
1993.24	39000
2415.49	48500
2683.71	54800
2905.3	60260
3285.16	70000
3607.75	78370
4086.93	91010
4561.43	103660
4887.56	112500
5752.78	136500
6285.93	152000
13972.35	474000

R_WC_450	
From_RS	to_RS
27323	24211
Volume (acre-ft)	Q Total (cfs)
0	0
71.1	4000
112.77	7600
158.93	12000
251.27	16500
379.64	23400
505.99	30740
609.01	39000
701.19	48500
772.47	54800
831.8	60260
925.1	70000
1007.53	78370
1119.97	91010
1225.84	103660
1295.35	112500
1473.26	136500
1579.87	152000
3137.32	474000

R_WC_460	
From_RS	to_RS
24211	17203
Volume (acre-ft)	Q Total (cfs)
0	0
170.94	4000
277.28	7600
407.75	12000
742.15	16500
1144.1	23400
1593.58	30740
2093.99	39000
2442.68	48500
2767.43	54800
3038.6	60260
3426.11	70000
3823.64	78370
4361.15	91010
4906.51	103660
5233.51	112500
6092.01	136500
6586.91	152000
12524.81	474000

R_WC_500	
From_RS	to_RS
17203	10725
Volume (acre-ft)	Q Total (cfs)
0	0
155.7	4000
249.81	7600
350.14	12000
505.98	16500
837.77	23400
1037.98	30740
1235.2	39000
1435.61	48500
1562.6	54800
1666.92	60260
1841.28	70000
1985.07	78370
2183.86	91010
2398	103660
2552.97	112500
3006.19	136500
3311.61	152000
10095.87	474000

R_WC_510	
From_RS	to_RS
10725	7693
Volume (acre-ft)	Q Total (cfs)
0	0
79.62	4000
126.04	7600
176	12000
233.31	16500
420.93	23400
561.46	30740
685.78	39000
795.18	48500
869.37	54800
914.94	60260
991.35	70000
1066.62	78370
1170.43	91010
1268.1	103660
1332.74	112500
1476.75	136500
1571.18	152000
3502.95	474000

R_WC_520	
From_RS	to_RS
7693	4513
Volume (acre-ft)	Q Total (cfs)
0	0
81.06	4000
123.66	7600
166.04	12000
203.22	16500
367.87	23400
576.49	30740
785.42	39000
956.02	48500
1078.85	54800
1113.77	60260
1170.15	70000
1266.9	78370
1394.82	91010
1517.6	103660
1598.75	112500
1733.05	136500
1843.14	152000
3251.32	474000

R_WC_530	
From_RS	to_RS
4513	2477
Volume (acre-ft)	Q Total (cfs)
0	0
37.2	4000
55.22	7600
74.65	12000
92.4	16500
128.41	23400
220.34	30740
370.7	39000
559.68	48500
739.28	54800
899.78	60260
1003.78	70000
1129.37	78370
1301.98	91010
1468.71	103660
1578.9	112500
1722.12	136500
1868.03	152000
3554.13	474000

Modified Puls Routing Reaches
Storage Outflow Tables - Elm Creek

R_EC_20	
From_RS	to_RS
40560	29340
Volume (acre-ft)	Q Total (cfs)
0	0
90.68	600
185.54	1300
249.86	2000
291.62	2560
333.13	3170
412.42	4420
485.11	5680
552.21	6930
587.64	7640
623.46	8360
658.21	9070
732.94	10680
803.2	12290
872.21	13890
938.31	15500
1025.42	17830
1107.31	20150

R_EC_30	
From_RS	to_RS
29340	21542
Volume (acre-ft)	Q Total (cfs)
0	0
41.61	600
90.72	1300
132.71	2000
167.79	2560
202.8	3170
268.6	4420
328.32	5680
383.5	6930
413.38	7640
442.9	8360
471.47	9070
532.19	10680
590.33	12290
646.94	13890
701.78	15500
779.12	17830
852.25	20150

R_EC_40	
From_RS	to_RS
21542	18244
Volume (acre-ft)	Q Total (cfs)
0	0
15.95	600
51.89	1300
74.76	2000
98.79	2560
125.22	3170
182.48	4420
268.21	5680
322.42	6930
352.64	7640
420.68	8360
433.44	9070
463.66	10680
495.12	12290
529.12	13890
555.85	15500
594.82	17830
628.3	20150

R_EC_50	
From_RS	to_RS
18244	11504
Volume (acre-ft)	Q Total (cfs)
0	0
35.39	600
100.22	1300
150.46	2000
185.26	2560
220.25	3170
279.8	4420
329.84	5680
378.41	6930
403.98	7640
430.59	8360
454.14	9070
505.24	10680
554.04	12290
598.81	13890
646.62	15500
709.55	17830
768.96	20150

R_EC_60	
From_RS	to_RS
11504	8251
Volume (acre-ft)	Q Total (cfs)
0	0
15.2	600
46.97	1300
68.96	2000
84.9	2560
99.89	3170
126.4	4420
149.68	5680
171.3	6930
182.99	7640
194.64	8360
205.83	9070
229.89	10680
252.51	12290
274.41	13890
295.57	15500
325.34	17830
354.51	20150

R_EC_80	
From_RS	to_RS
8251	963
Volume (acre-ft)	Q Total (cfs)
0	0
55.2	600
117.54	1300
162.69	2000
195.19	2560
228.54	3170
288.13	4420
343.83	5680
395.8	6930
425.69	7640
452.48	8360
478.03	9070
533.88	10680
586.88	12290
639.27	13890
688.61	15500
757.64	17830
823.35	20150

Modified Puls Routing Reaches
Storage Outflow Tables - Elm Creek Tributary 1

R_ECT001_20	
From_RS	to_RS
5825	562
Volume (acre-ft)	Q Total (cfs)
0	0
5.31	150
9.44	300
15.22	450
20.65	600
30.15	880
45.39	1330
59.26	1775
66.28	2020
72.85	2260
90.59	2970
106.69	3680
118.67	4230

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 165

R_WCT165_10	
From_RS	to_RS
3501	274
Volume (acre-ft)	Q Total (cfs)
0	0
0.73	20
1.3	45
1.61	60
2.02	80
2.18	90
2.53	110
2.95	135
3.11	145
3.34	160
3.93	200
5.36	300
11.09	650
17.11	1000

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 167

R_WCT167_20	
From_RS	to_RS
12293	3150
Volume (acre-ft)	Q Total (cfs)
0	0
25.71	240
38.91	410
58.42	730
73.26	960
86.25	1170
112.25	1580
135.94	1980
167.43	2390
189.21	2610
209	2840
222.99	3060
253.3	3550
282.49	4040
309.5	4530
335.91	5020
375.18	5770
424.09	6530

R_WCT167_30	
From_RS	to_RS
3150	1981
Volume (acre-ft)	Q Total (cfs)
0	0
7.53	240
13.42	410
28.05	730
35.99	960
40.49	1170
47.64	1580
52.44	1980
56.79	2390
58.79	2610
60.87	2840
62.76	3060
66.74	3550
70.45	4040
74.18	4530
78.18	5020
86.49	5770
96.32	6530

R_WCT167_40	
From_RS	to_RS
1981	973
Volume (acre-ft)	Q Total (cfs)
0	0
3.55	240
5.12	410
7.8	730
9.33	960
10.58	1170
12.69	1580
14.59	1980
16.32	2390
17.22	2610
18.15	2840
19	3060
20.87	3550
22.66	4040
24.37	4530
26.01	5020
28.42	5770
30.8	6530

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 178

R_WCT178_20	
From_RS	to_RS
2598	269
Volume (acre-ft)	Q Total (cfs)
0	0
3.06	80
5.06	160
6.76	240
8.31	320
10.41	440
13.62	640
16.94	840
18.55	945
20.08	1050
24.09	1340
28.05	1630
31.61	1875

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 183

R_WCT183_20	
From_RS	to_RS
1849	1188
Volume (acre-ft)	Q Total (cfs)
0	0
2.18	150
4.21	300
5.65	450
6.9	600
7.6	690
10.01	1025
12.08	1360
13.15	1540
14.16	1720
16.86	2225
19.39	2730
21.28	3140

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 185

R_WCT185_20	
From_RS	to_RS
2352	769
Volume (acre-ft)	Q Total (cfs)
0	0
2.64	100
5.05	240
6.37	360
8.57	480
11.75	700
14.88	930
19.09	1230
21.26	1390
23.48	1550
28.97	2000
33.62	2460
37.16	2830

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 186

R_WCT186_20	
From_RS	to_RS
6185	535
Volume (acre-ft)	Q Total (cfs)
0	0
6.81	120
12.09	240
18.04	360
23.27	480
28.49	600
40.51	900
53.38	1200
59.88	1365
65.95	1520
82.83	1960
99.31	2400
111.11	2760

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 187

R_WCT187_20	
From_RS	to_RS
2496	496
Volume (acre-ft)	Q Total (cfs)
0	0
1.57	100
2.89	200
4.51	300
5.8	400
6.3	470
8.57	685
10.83	900
11.92	1010
13	1120
16.1	1435
19.08	1750
25.75	2500

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 196

R_WCT196_15	
From_RS	to_RS
17601	14160
Volume (acre-ft)	Q Total (cfs)
0	0
63.48	260
86.08	600
100.33	900
108.09	1200
114.38	1510
128.41	2360
140.26	3200
146.64	3650
152.16	4050
171.49	5500
188.56	6900
201.94	8000

R_WCT196_20	
From_RS	to_RS
14160	9997
Volume (acre-ft)	Q Total (cfs)
0	0
532.11	260
582.9	600
621.05	900
654.61	1200
686.72	1510
769.74	2360
852.96	3200
898.14	3650
936.62	4050
1045.38	5500
1139.46	6900
1216.45	8000

R_WCT196_30	
From_RS	to_RS
9997	498
Volume (acre-ft)	Q Total (cfs)
0	0
362.66	260
407.66	600
440.79	900
471.82	1200
501.41	1510
572.49	2360
634.59	3200
668.28	3650
697.03	4050
794.71	5500
881.03	6900
947.19	8000

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 200

R_WCT200_10	
From_RS	to_RS
28565	27305
Volume (acre-ft)	Q Total (cfs)
0	0
0.98	100
2.34	300
4.03	500
13.03	1550
21.78	2500
42	3700
91.1	4600
112.43	5250
127.12	5950
142.32	6800
161.85	8200
171.36	9000
181.45	9900
191.58	10900
200.63	11800
213.48	13216
221.29	14000

R_WCT200_20	
From_RS	to_RS
27305	21000
Volume (acre-ft)	Q Total (cfs)
0	0
11.6	100
23.6	300
31.52	500
62.16	1550
86.76	2500
124.56	3700
147.25	4600
166.78	5250
186.49	5950
210.16	6800
245.5	8200
266.97	9000
288.75	9900
312.16	10900
332.63	11800
363.63	13216
380.94	14000

R_WCT200_30	
From_RS	to_RS
21000	14098
Volume (acre-ft)	Q Total (cfs)
0	0
8.64	100
29.46	300
46.89	500
109.39	1550
151.81	2500
198.21	3700
233.5	4600
260.46	5250
289.37	5950
325.19	6800
382.5	8200
411.16	9000
444.69	9900
478.42	10900
507.34	11800
554.88	13216
581.13	14000

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 200 (Continued)

R_WCT200_40	
From_RS	to_RS
14098	8556
Volume (acre-ft)	Q Total (cfs)
0	0
5.88	100
18.69	300
27.67	500
69.78	1550
100.52	2500
135.8	3700
160.34	4600
178.43	5250
232.68	5950
255.85	6800
289.81	8200
308.88	9000
329.15	9900
350.34	10900
369.17	11800
397.46	13216
412.7	14000

R_WCT200_45	
From_RS	to_RS
8556	6582
Volume (acre-ft)	Q Total (cfs)
0	0
2.69	100
6.4	300
9.76	500
24.36	1550
34.5	2500
45.66	3700
53.26	4600
58.42	5250
64.44	5950
71	6800
81.62	8200
88.09	9000
94.23	9900
101.15	10900
107.16	11800
116.4	13216
124.85	14000
143.82	17000

R_WCT200_50	
From_RS	to_RS
6582	868
Volume (acre-ft)	Q Total (cfs)
0	0
6.58	100
18.41	300
27.64	500
66.15	1550
97.72	2500
132.8	3700
154.96	4600
170.25	5250
186.32	5950
205.19	6800
236.35	8200
253.31	9000
271.84	9900
292.31	10900
310.64	11800
338.81	13216
358.47	14000
418.93	17000

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 206

R_WCT206_20	
From_RS	to_RS
4085	128
Volume (acre-ft)	Q Total (cfs)
0	0
8.34	100
14.72	300
19.65	500
27	1000
32.48	1100
39.28	1200
44.84	1400
49.06	1600
56.06	2000
61.15	2300
67.73	2700
80.27	3500

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 207

R_WCT207_20	
From_RS	to_RS
1902	121
Volume (acre-ft)	Q Total (cfs)
0	0
1.97	60
3.52	120
4.72	180
5.97	240
7.17	300
9.69	420
11.79	535
12.93	600
14.32	650
16.93	810
18.82	970
20.37	1120

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 209

R_WCT209_20	
From_RS	to_RS
1374	96
Volume (acre-ft)	Q Total (cfs)
0	0
0.99	60
1.6	120
2.39	180
3.01	240
3.35	280
4.25	390
5.35	505
6.01	560
6.79	620
7.96	700
9.72	920
10.6	1060

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 210

R_WCT210_20	
From_RS	to_RS
46694	42748
Volume (acre-ft)	Q Total (cfs)
0	0
16.78	440
27.65	880
51.52	2000
85.08	3600
114.17	5200
142.28	6770
174.54	8790
204.99	10800
221.33	11970
237.61	13130
253.49	14300
287.56	17050
321.68	19800
354.73	22550
385.71	25300
428.38	29100
469.24	32890

R_WCT210_25	
From_RS	to_RS
42748	39891
Volume (acre-ft)	Q Total (cfs)
0	0
10.9	440
20.1	880
44.47	2000
81.09	3600
112.89	5200
131.36	6770
152.79	8790
172.3	10800
182.72	11970
193.92	13130
201.23	14300
225.55	17050
248.12	19800
269.92	22550
290.35	25300
315.43	29100
340.17	32890

R_WCT210_30	
From_RS	to_RS
39891	34662
Volume (acre-ft)	Q Total (cfs)
0	0
25.35	440
51.43	880
97.46	2000
156.25	3600
210.6	5200
263.4	6770
314.62	8790
358.14	10800
382.38	11970
400.94	13130
422.96	14300
475.25	17050
520.29	19800
561.8	22550
601.13	25300
652.81	29100
701.05	32890

R_WCT210_40	
From_RS	to_RS
34662	29984
Volume (acre-ft)	Q Total (cfs)
0	0
23.32	440
39.97	880
68.65	2000
114.44	3600
149.2	5200
180.26	6770
218.05	8790
252.86	10800
271.8	11970
290.07	13130
307.05	14300
345.47	17050
380.82	19800
413.43	22550
445.32	25300
488.23	29100
528.18	32890

R_WCT210_50	
From_RS	to_RS
29984	17916
Volume (acre-ft)	Q Total (cfs)
0	0
69.77	440
118.14	880
220.46	2000
333.57	3600
434.24	5200
520.34	6770
619.97	8790
711.58	10800
762.71	11970
811.59	13130
859.43	14300
967.26	17050
1069.23	19800
1164.46	22550
1255.33	25300
1376.11	29100
1489.8	32890

R_WCT210_60	
From_RS	to_RS
17916	9522
Volume (acre-ft)	Q Total (cfs)
0	0
49.23	440
81.15	880
140.33	2000
211.82	3600
281.84	5200
343.77	6770
414.42	8790
479.09	10800
516.21	11970
552.43	13130
589.57	14300
671.67	17050
751.15	19800
830.47	22550
907.28	25300
1023.63	29100
1143.86	32890

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 210 (Continued)

R_WCT210_70	
From_RS	to_RS
9522	912
Volume (acre-ft)	Q Total (cfs)
0	0
36.24	440
64.7	880
126.97	2000
204.12	3600
269.63	5200
326.58	6770
392.4	8790
452.38	10800
485.67	11970
519.36	13130
551.04	14300
625.14	17050
694.71	19800
760.79	22550
827.65	25300
918.58	29100
1015.42	32890

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 216

R_WCT216_20	
From_RS	to_RS
7004	4036
Volume (acre-ft)	Q Total (cfs)
0	0
20.02	180
23.21	360
27.44	540
31.66	720
35.51	880
50.99	1320
72.49	1760
79.54	2000
91.97	2240
114.3	2920
130.34	3600
140.36	4140

R_WCT216_30	
From_RS	to_RS
4036	528
Volume (acre-ft)	Q Total (cfs)
0	0
9.2	180
14.79	360
20.06	540
24.93	720
29.16	880
40.02	1320
51.17	1760
57.15	2000
63.01	2240
78.3	2920
92.91	3600
103.6	4140

Modified Puls Routing Reaches
Storage Outflow Tables - Cottonmouth Creek

R_CC_20	
From_RS	to_RS
63420	60164
Volume (acre-ft)	Q Total (cfs)
0	0
117.25	2500
165.9	4500
211.04	6750
260.99	9000
306.04	11250
394.96	16130
476.01	21020
552.34	25900
595.1	28770
636.39	31630
676.75	34500
768.18	41180
854.82	47850
938.19	54530
1018.79	61200
1126.13	70380
1230.04	79560

R_CC_40	
From_RS	to_RS
60164	45262
Volume (acre-ft)	Q Total (cfs)
0	0
313.86	2500
520.06	4500
703.63	6750
880.49	9000
1062.93	11250
1387.16	16130
1697.22	21020
1975.95	25900
2127.03	28770
2273.56	31630
2410.64	34500
2708.79	41180
2983.55	47850
3242.01	54530
3484.35	61200
3800.85	70380
4096.94	79560

R_CC_50	
From_RS	to_RS
45262	30640
Volume (acre-ft)	Q Total (cfs)
0	0
316.23	2500
547.38	4500
769.49	6750
958.13	9000
1139.82	11250
1479.39	16130
1779.4	21020
2054.23	25900
2203.26	28770
2348.52	31630
2489.1	34500
2800.84	41180
3094.06	47850
3377.55	54530
3650.43	61200
4005.47	70380
4338.08	79560

R_CC_60	
From_RS	to_RS
30640	24783
Volume (acre-ft)	Q Total (cfs)
0	0
147.86	2500
255.81	4500
363.01	6750
463.69	9000
557.03	11250
779.67	16130
988.1	21020
1157.3	25900
1248.21	28770
1334.02	31630
1416.82	34500
1599.65	41180
1772.23	47850
1938.46	54530
2087.55	61200
2279.43	70380
2460.13	79560

R_CC_70	
From_RS	to_RS
24783	19263
Volume (acre-ft)	Q Total (cfs)
0	0
216.26	2500
356.23	4500
506.3	6750
697.39	9000
847.22	11250
1402.01	16130
1793.39	21020
2032.59	25900
2152.12	28770
2259.51	31630
2360.47	34500
2575.47	41180
2770.72	47850
2955.24	54530
3127.19	61200
3351.21	70380
3564.8	79560
4173.67	108800

R_CC_80	
From_RS	to_RS
19263	9969
Volume (acre-ft)	Q Total (cfs)
0	0
314.66	2500
482.05	4500
643.67	6750
785.99	9000
915.41	11250
1171.2	16130
1400.45	21020
1609.58	25900
1726.27	28770
1839.57	31630
1947.87	34500
2191.47	41180
2417.72	47850
2633.89	54530
2844.26	61200
3121.9	70380
3386.33	79560
4095.8	108800

R_CC_90	
From_RS	to_RS
9969	1470
Volume (acre-ft)	Q Total (cfs)
0	0
271.02	2500
503.09	4500
708	6750
930.45	9000
1076.41	11250
1423.92	16130
1696.3	21020
1933.45	25900
2065.84	28770
2234.32	31630
2339.67	34500
2591.06	41180
2841.23	47850
3079.28	54530
3370.03	61200
3684.46	70380
3977.01	79560
4704.27	108800

Modified Puls Routing Reaches
Storage Outflow Tables - Dry Creek West

R_DCW_20	
From_RS	to_RS
62105	53607
Volume (acre-ft)	Q Total (cfs)
0	0
84.73	900
156.1	1800
216.19	2700
268.85	3600
324.15	4600
463.7	7350
591.15	10100
657.9	11650
735.17	13500
835.57	16000
949.93	19000
1060.53	22000
1415.05	32000

R_DCW_30	
From_RS	to_RS
53607	49144
Volume (acre-ft)	Q Total (cfs)
0	0
52.25	900
102.66	1800
145.03	2700
177.59	3600
211.17	4600
292.29	7350
364.58	10100
404.36	11650
448.66	13500
504.94	16000
572.34	19000
637.28	22000
838.58	32000

R_DCW_50	
From_RS	to_RS
49144	39555
Volume (acre-ft)	Q Total (cfs)
0	0
118.84	900
207.48	1800
295.44	2700
363.97	3600
431.51	4600
590.07	7350
722.75	10100
790.87	11650
867.92	13500
966.89	16000
1080.47	19000
1187.45	22000
1516.13	32000

R_DCW_60	
From_RS	to_RS
39555	27388
Volume (acre-ft)	Q Total (cfs)
0	0
121.96	900
213.9	1800
300.13	2700
391.85	3600
521.43	4600
745.77	7350
935.81	10100
1030.21	11650
1137.79	13500
1279.1	16000
1436.89	19000
1590.48	22000
2065.38	32000

R_DCW_70	
From_RS	to_RS
27388	20395
Volume (acre-ft)	Q Total (cfs)
0	0
72.57	900
120.94	1800
163.62	2700
201.69	3600
239.8	4600
331.77	7350
413.44	10100
457.65	11650
508.07	13500
576.13	16000
653.63	19000
729.71	22000
976.33	32000

R_DCW_80	
From_RS	to_RS
20395	14008
Volume (acre-ft)	Q Total (cfs)
0	0
70.9	900
130.69	1800
188.09	2700
236.09	3600
283.23	4600
392.01	7350
488.03	10100
538.11	11650
596.83	13500
673.1	16000
757.56	19000
841.35	22000
1105.08	32000

R_DCW_90	
From_RS	to_RS
14008	4267
Volume (acre-ft)	Q Total (cfs)
0	0
145.76	900
257.99	1800
350.13	2700
426.07	3600
506.28	4600
699.7	7350
872.7	10100
955.6	11650
1053.05	13500
1186.38	16000
1348.58	19000
1511.06	22000
2016.71	32000

Modified Puls Routing Reaches
Storage Outflow Tables - Harris Branch South

R_HBS_20	
From_RS	to_RS
17418	9124
Volume (acre-ft)	Q Total (cfs)
0	0
23.99	300
40.44	600
53.45	900
64.54	1200
73.11	1440
99.85	2220
125.96	3000
140.45	3420
155.23	3840
199.63	5100
239.21	6350
268.04	7300

R_HBS_30	
From_RS	to_RS
9124	125
Volume (acre-ft)	Q Total (cfs)
0	0
30.89	300
51.96	600
68.44	900
83.51	1200
94.71	1440
128.66	2220
159.56	3000
174.79	3420
189.73	3840
232.18	5100
272.18	6350
300.74	7300

Modified Puls Routing Reaches
Storage Outflow Tables - Little Willow Creek

R_LWC_20	
From_RS	to_RS
40517	31946
Volume (acre-ft)	Q Total (cfs)
0	0
50.73	400
89.8	800
126.37	1200
160.21	1600
195.67	2050
245.68	2800
295.49	3550
341.37	4300
366.5	4710
389.63	5120
412.56	5530
462.74	6440
510.57	7340
558.02	8250
602.35	9150
667.8	10520
730.22	11900

R_LWC_30	
From_RS	to_RS
31946	23301
Volume (acre-ft)	Q Total (cfs)
0	0
26.79	400
48.31	800
74.59	1200
104.1	1600
132.68	2050
171.57	2800
210.69	3550
247.44	4300
266.53	4710
284.99	5120
303.3	5530
342.47	6440
379.63	7340
416.17	8250
451.78	9150
503.77	10520
554.69	11900

R_LWC_40	
From_RS	to_RS
23301	11129
Volume (acre-ft)	Q Total (cfs)
0	0
52.1	400
94.12	800
135.32	1200
182.65	1600
255.61	2050
371.99	2800
451.81	3550
515.74	4300
547.26	4710
575.87	5120
604.18	5530
661.53	6440
716.13	7340
762.13	8250
814.76	9150
895.23	10520
969.43	11900

R_LWC_50	
From_RS	to_RS
11129	1238
Volume (acre-ft)	Q Total (cfs)
0	0
37.67	400
69.44	800
96.48	1200
123.78	1600
154.77	2050
202.51	2800
245.88	3550
287.74	4300
309.5	4710
331.27	5120
352.3	5530
394.15	6440
435.1	7340
474.97	8250
512.64	9150
567.39	10520
620.39	11900

Modified Puls Routing Reaches
Storage Outflow Tables - Lockwood Creek

R_LC_20	
From_RS	to_RS
41106	24204
Volume (acre-ft)	Q Total (cfs)
0	0
118.47	800
215.14	1600
294.86	2400
379.24	3300
438.42	3960
636.88	6370
826.19	8780
933.61	10200
1029.91	11500
1135.39	13000
1296.75	15500
1547.73	19500

R_LC_30	
From_RS	to_RS
24204	10432
Volume (acre-ft)	Q Total (cfs)
0	0
92.39	800
173.46	1600
246.48	2400
324	3300
374.95	3960
544.86	6370
697.77	8780
781.41	10200
854.23	11500
936.75	13000
1066.3	15500
1257.84	19500
1710.7	30100

R_LC_40	
From_RS	to_RS
10432	6409
Volume (acre-ft)	Q Total (cfs)
0	0
27.43	800
61.4	1600
85.54	2400
106.12	3300
118.78	3960
169.54	6370
215.7	8780
238.5	10200
258.58	11500
281.02	13000
316.14	15500
366.57	19500
481.43	30100

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 1

R_WC001_10	
From_RS	to_RS
15589	10488
Volume (acre-ft)	Q Total (cfs)
0	0
15.86	300
22.59	600
28.35	900
33.48	1200
43.03	1800
51.97	2400
64.68	3300
71.86	3810
79.2	4310
101.41	5820
124.25	7330
141.24	8430

R_WC001_20	
From_RS	to_RS
10488	160
Volume (acre-ft)	Q Total (cfs)
0	0
33.98	300
52.7	600
68.82	900
84.36	1200
113.15	1800
137.94	2400
171.21	3300
189.27	3810
206.3	4310
256.75	5820
306.79	7330
346.22	8430

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 3

R_WC003_20	
From_RS	to_RS
5811	1914
Volume (acre-ft)	Q Total (cfs)
0	0
13.93	300
22.3	600
30.37	900
44.69	1200
52.36	1480
65.18	2340
75.32	3190
80.76	3690
85.69	4180
100.64	5670
113.86	7150
123.21	8230

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 4

R_WCT004_30	
From_RS	to_RS
16327	9992
Volume (acre-ft)	Q Total (cfs)
0	0
44.15	500
68.78	1000
86.29	1500
99.93	2000
110.31	2440
140.71	3880
168.8	5310
183.49	6130
197.63	6950
239.49	9420
280.34	11900
311.41	13700

R_WCT004_40	
From_RS	to_RS
9992	8654
Volume (acre-ft)	Q Total (cfs)
0	0
4.48	500
7.39	1000
10.23	1500
12.94	2000
15.44	2440
24.77	3880
31.63	5310
36.03	6130
40.33	6950
52.57	9420
64.09	11900
72.2	13700

R_WCT004_50	
From_RS	to_RS
8654	6879
Volume (acre-ft)	Q Total (cfs)
0	0
5.45	500
9.02	1000
12.12	1500
15.53	2000
18.61	2440
32.02	3880
41.76	5310
47.67	6130
53.07	6950
68.08	9420
81.56	11900
90.63	13700

R_WCT004_60	
From_RS	to_RS
6879	5429
Volume (acre-ft)	Q Total (cfs)
0	0
6.69	500
9.28	1000
11.38	1500
13.34	2000
15.54	2440
28.02	3880
41.61	5310
48.69	6130
55.28	6950
71.38	9420
86.69	11900
96.76	13700

R_WCT004_70	
From_RS	to_RS
5429	2299
Volume (acre-ft)	Q Total (cfs)
0	0
10.24	500
16.33	1000
22.33	1500
29.27	2000
36.28	2440
53.52	3880
74.45	5310
85.45	6130
95.23	6950
118.03	9420
139.05	11900
153.89	13700

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 6

R_WCT006_20	
From_RS	to_RS
16679	3503
Volume (acre-ft)	Q Total (cfs)
0	0
39.31	250
64.21	500
84.84	750
105.66	1000
127.21	1240
186.1	1910
229.73	2580
250.25	2940
270.8	3310
326.61	4390
377.43	5470
425.31	6560

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 9

R_WCT009_20	
From_RS	to_RS
41574	30427
Volume (acre-ft)	Q Total (cfs)
0	0
56.45	500
86.97	1000
113.08	1500
136.77	2000
157.28	2460
214.88	3880
266.52	5290
294.21	6080
321.28	6880
399	9260
471.13	11600
525.01	13400

R_WCT009_30	
From_RS	to_RS
30427	25687
Volume (acre-ft)	Q Total (cfs)
0	0
28.93	500
52.92	1000
73.59	1500
90.98	2000
105.56	2460
144.11	3880
177.11	5290
194.32	6080
211.13	6880
258.95	9260
302.48	11600
334.72	13400

R_WCT009_40	
From_RS	to_RS
25687	19566
Volume (acre-ft)	Q Total (cfs)
0	0
40.53	500
67.51	1000
90.26	1500
110.56	2000
127.47	2460
173.97	3880
214.14	5290
234.94	6080
254.96	6880
310.77	9260
360.66	11600
397.64	13400

R_WCT009_60	
From_RS	to_RS
19566	15547
Volume (acre-ft)	Q Total (cfs)
0	0
26.04	500
43.54	1000
57.92	1500
71.35	2000
82.48	2460
114.16	3880
141.66	5290
155.8	6080
169.69	6880
207.7	9260
242.16	11600
267.12	13400
315.67	17100

R_WCT009_70	
From_RS	to_RS
15547	4985
Volume (acre-ft)	Q Total (cfs)
0	0
69.31	500
127.18	1000
162.62	1500
197.26	2000
228	2460
308.03	3880
378.71	5290
416.44	6080
452.55	6880
550.75	9260
638.32	11600
700.51	13400
819.81	17100

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 018

R_WCT018_20	
From_RS	to_RS
4866	400
Volume (acre-ft)	Q Total (cfs)
0	0
13.95	160
19.59	320
25.05	480
29.69	640
34.1	810
43.84	1230
52.4	1650
56.38	1880
60.05	2100
71.27	2770
81.74	3440
88.93	3960

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 019

R_WCT019_10	
From_RS	to_RS
1624	498
Volume (acre-ft)	Q Total (cfs)
0	0
1.06	30
1.66	60
1.9	90
2.08	120
2.27	150
2.53	205
2.77	260
2.88	285
2.98	310
3.24	370
3.46	430
3.71	495

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 020

R_WCT020_10	
From_RS	to_RS
2260	418
Volume (acre-ft)	Q Total (cfs)
0	0
0.87	40
1.54	80
1.97	120
2.34	160
2.78	210
3.44	290
4.03	370
4.29	410
4.57	450
5.13	555
5.75	660
6.3	760

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 021

R_WCT021_10	
From_RS	to_RS
1325	537
Volume (acre-ft)	Q Total (cfs)
0	0
0.45	50
0.62	100
0.79	150
0.94	200
1.02	230
1.26	320
1.47	410
1.58	455
1.67	500
1.92	615
2.2	730
2.51	840

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 024

R_WCT024_20	
From_RS	to_RS
13888	9293
Volume (acre-ft)	Q Total (cfs)
0	0
10.85	250
18.96	500
25.78	750
32.16	1000
37.99	1240
53.49	1920
66.74	2600
73.8	2980
80.54	3360
99.31	4490
116.45	5610
128.56	6450

R_WCT024_30	
From_RS	to_RS
9293	8008
Volume (acre-ft)	Q Total (cfs)
0	0
4.01	250
6.48	500
8.13	750
9.79	1000
11.2	1240
14.5	1920
18.16	2600
19.96	2980
21.66	3360
26.35	4490
30.37	5610
33.25	6450

R_WCT024_40	
From_RS	to_RS
8008	2145
Volume (acre-ft)	Q Total (cfs)
0	0
11.13	250
20.33	500
28.61	750
37.76	1000
46.38	1240
69.4	1920
88.18	2600
98.32	2980
107.68	3360
133.89	4490
157.43	5610
173.72	6450

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 025

R_ACT025_10	
From_RS	to_RS
2939	168
Volume (acre-ft)	Q Total (cfs)
0	0
1.72	100
3.27	200
4.74	300
6.11	400
7.53	500
11.09	740
14.19	980
15.74	1110
17.18	1240
21.15	1605
25.28	1970
28.26	2270

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 026

R_ACT026_10	
From_RS	to_RS
2807	665
Volume (acre-ft)	Q Total (cfs)
0	0
0.71	40
1.22	80
1.72	120
2.18	160
2.52	190
3.2	255
3.83	320
4.1	350
4.38	380
5.17	470
5.83	550
6.47	630

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 027

R_WCT027_10	
From_RS	to_RS
3466	915
Volume (acre-ft)	Q Total (cfs)
0	0
1.44	90
2.51	180
3.39	270
4.19	360
5	460
6.7	670
8.34	880
9.16	990
9.95	1100
12.12	1410
14.22	1720
15.95	1980

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 030

R_WCT030_20	
From_RS	to_RS
9161	2199
Volume (acre-ft)	Q Total (cfs)
0	0
10.98	200
24.75	400
33.07	600
41.27	800
48.65	990
63.27	1500
77.09	2010
84.13	2290
90.68	2570
108.65	3380
125.15	4190
136.94	4820

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 047

R_WCT047_20	
From_RS	to_RS
30126	21040
Volume (acre-ft)	Q Total (cfs)
0	0
23.58	340
40.88	680
58.28	1020
73.63	1360
88.36	1710
111.05	2340
132.04	2970
152.08	3600
163.18	3950
173.72	4290
184.41	4640
207.08	5420
228.67	6190
249.62	6970
270.76	7740
300.44	8900
328.36	10060

R_WCT047_30	
From_RS	to_RS
21040	11179
Volume (acre-ft)	Q Total (cfs)
0	0
27.37	340
47.95	680
65.51	1020
82.43	1360
98.94	1710
127.43	2340
154.31	2970
183.64	3600
202.91	3950
220.13	4290
233.29	4640
262.52	5420
288.18	6190
313.62	6970
337.01	7740
370.56	8900
402.89	10060

R_WCT047_40	
From_RS	to_RS
11179	2491
Volume (acre-ft)	Q Total (cfs)
0	0
33.41	340
60.03	680
80.52	1020
100.36	1360
118.81	1710
149.77	2340
185.73	2970
225.26	3600
249.17	3950
269.24	4290
284.67	4640
316.29	5420
344.59	6190
372.81	6970
399.37	7740
437.38	8900
473.98	10060

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 049

R_WCT049_10	
From_RS	to_RS
1538	257
Volume (acre-ft)	Q Total (cfs)
0	0
7.51	100
9.23	200
10.63	300
11.7	400
12.72	510
14.72	755
16.32	1000
17.13	1130
17.96	1260
19.93	1625
21.8	1990
23.28	2290

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 056

R_WCT056_20	
From_RS	to_RS
58299	46172
Volume (acre-ft)	Q Total (cfs)
0	0
83.14	900
140.37	1800
191.41	2700
236.82	3600
274.67	4380
393.93	7020
503.29	9650
562.38	11160
706.67	15000
882.04	20000
1045.81	25000
1141.06	28000

R_WCT056_30	
From_RS	to_RS
46172	44137
Volume (acre-ft)	Q Total (cfs)
0	0
11.52	900
20.87	1800
32.72	2700
43.53	3600
51.93	4380
77.41	7020
100.58	9650
113.39	11160
147.02	15000
186.72	20000
225.83	25000
247.23	28000

R_WCT056_50	
From_RS	to_RS
44137	36156
Volume (acre-ft)	Q Total (cfs)
0	0
59.19	900
116.55	1800
168.06	2700
213.79	3600
250.07	4380
359.61	7020
457.67	9650
509.58	11160
633.38	15000
780.7	20000
919.9	25000
999.28	28000

R_WCT056_60	
From_RS	to_RS
36156	15330
Volume (acre-ft)	Q Total (cfs)
0	0
163.26	900
322.61	1800
452.58	2700
576.3	3600
671.54	4380
951.81	7020
1198.7	9650
1329.99	11160
1636.63	15000
1995.68	20000
2324.71	25000
2513.65	28000

R_WCT056_70	
From_RS	to_RS
15330	7313
Volume (acre-ft)	Q Total (cfs)
0	0
56.7	900
105.15	1800
159.14	2700
219.56	3600
258.16	4380
375.32	7020
468.27	9650
514.27	11160
623.92	15000
753.99	20000
875.49	25000
945.42	28000
1522	57200

R_WCT056_90	
From_RS	to_RS
7313	2661
Volume (acre-ft)	Q Total (cfs)
0	0
49.3	900
106.05	1800
155.04	2700
199.24	3600
234.91	4380
343.46	7020
441.06	9650
493.82	11160
625.78	15000
781.47	20000
923.02	25000
1004.45	28000
1649.03	57200

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 062

R_WCT062_05	
From_RS	to_RS
13635	10504
Volume (acre-ft)	Q Total (cfs)
0	0
4	100
6.63	200
13.18	500
22.25	1000
30.28	1500
40.89	2250
44.22	2500
51.16	3000
57.62	3500
63.97	4000
69.87	4500
81.3	5500

R_WCT062_10	
From_RS	to_RS
10504	6722
Volume (acre-ft)	Q Total (cfs)
0	0
4.58	100
8.06	200
16.94	500
31.43	1000
42.38	1500
57.19	2250
62.06	2500
71.17	3000
79.7	3500
88.29	4000
96.17	4500
111.92	5500

R_WCT062_20	
From_RS	to_RS
6722	278
Volume (acre-ft)	Q Total (cfs)
0	0
8.08	100
14.38	200
29.41	500
50.39	1000
66.73	1500
89.59	2250
96.78	2500
110.69	3000
124.12	3500
136.44	4000
148.66	4500
171.75	5500

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 070

R_WCT070_10	
From_RS	to_RS
3049	408
Volume (acre-ft)	Q Total (cfs)
0	0
1.58	90
2.71	180
3.84	270
4.83	360
6.3	490
10.08	720
13.01	940
14.54	1060
16.14	1180
20.16	1510
23.91	1840
27.78	2210
34.89	2900

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 080

R_WCT080_10	
From_RS	to_RS
40440	35041
Volume (acre-ft)	Q Total (cfs)
0	0
25.7	500
40.55	1000
53.24	1500
65.25	2000
82.49	2760
105.28	3840
126.92	4910
146.67	5980
157.52	6590
167.85	7190
177.61	7800
199.41	9160
219.25	10530
238.4	11900
257.11	13260
282.49	15250
306.47	17240

R_WCT080_20	
From_RS	to_RS
35041	31899
Volume (acre-ft)	Q Total (cfs)
0	0
14.79	500
28.61	1000
37.6	1500
47.57	2000
60.01	2760
75.99	3840
92.14	4910
107.75	5980
116.11	6590
124.57	7190
133.15	7800
151.24	9160
167.66	10530
183.91	11900
199.51	13260
220.74	15250
239.96	17240

R_WCT080_30	
From_RS	to_RS
31899	25864
Volume (acre-ft)	Q Total (cfs)
0	0
27.3	500
46.35	1000
63.42	1500
79.33	2000
101.79	2760
133.67	3840
163.95	4910
192.45	5980
207.41	6590
221.99	7190
237.31	7800
269.95	9160
302.16	10530
331.36	11900
359.18	13260
397.78	15250
435.76	17240

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 080 (Continued)

R_WCT080_50	
From_RS	to_RS
25864	15092
Volume (acre-ft)	Q Total (cfs)
0	0
47.36	500
79.14	1000
112.67	1500
146.72	2000
193.93	2760
261.38	3840
324.08	4910
384.31	5980
415.65	6590
445.96	7190
476.67	7800
541.5	9160
605.83	10530
665.34	11900
721.47	13260
801.24	15250
876.99	17240

R_WCT080_60	
From_RS	to_RS
15092	628
Volume (acre-ft)	Q Total (cfs)
0	0
65.02	500
113.17	1000
158.36	1500
206.01	2000
278.45	2760
390.25	3840
484.48	4910
577.8	5980
627.41	6590
673.04	7190
721.17	7800
825.03	9160
923.49	10530
1017.26	11900
1106.7	13260
1233.73	15250
1355.72	17240

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 082

R_WCT082_10	
From_RS	to_RS
10608	8347
Volume (acre-ft)	Q Total (cfs)
0	0
5.08	200
8.44	400
11.73	600
14.5	800
17.5	1040
23.79	1590
29.55	2130
32.78	2430
35.64	2730
43.75	3590
51.2	4460
55.83	5040

R_WCT082_20	
From_RS	to_RS
8347	539
Volume (acre-ft)	Q Total (cfs)
0	0
11.97	200
21.76	400
30.47	600
39.66	800
50.85	1040
76.4	1590
107	2130
123.63	2430
134.01	2730
162.03	3590
194.6	4460
213.94	5040

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 085

R_WCT085_10	
From_RS	to_RS
2099	638
Volume (acre-ft)	Q Total (cfs)
0	0
2.1	80
3.22	160
4.27	240
4.97	320
5.49	380
6.8	540
8.12	700
8.81	790
9.47	870
11.15	1100
12.6	1300
14.77	1600

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 086

R_WCT086_20	
From_RS	to_RS
3415	218
Volume (acre-ft)	Q Total (cfs)
0	0
4.03	120
7.14	240
9.53	360
11.55	480
12.98	570
16.71	840
20.01	1100
21.76	1250
23.23	1390
27.43	1790
31.5	2190
35.61	2630

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 113

R_WCT113_20	
From_RS	to_RS
43691	33615
Volume (acre-ft)	Q Total (cfs)
0	0
53.89	400
81.4	750
126.81	1200
166.55	1600
198.77	2000
249.57	2730
293.78	3460
334.57	4190
355.87	4590
376.3	4990
398.13	5390
441.63	6280
483.35	7170
523.82	8060
562.54	8950
619.6	10290
671.92	11630

R_WCT113_30	
From_RS	to_RS
33615	28463
Volume (acre-ft)	Q Total (cfs)
0	0
19.76	400
32.55	750
46.93	1200
60.03	1600
73.6	2000
106.51	2730
125.45	3460
144.14	4190
154.17	4590
163.96	4990
173.6	5390
193.41	6280
214.42	7170
234.86	8060
254.24	8950
282.54	10290
309.36	11630

R_WCT113_40	
From_RS	to_RS
28463	15906
Volume (acre-ft)	Q Total (cfs)
0	0
50.85	400
86.98	750
129.52	1200
167.73	1600
215.76	2000
279.39	2730
338.53	3460
397.82	4190
430.57	4590
462.83	4990
495.19	5390
577.59	6280
628.04	7170
673.92	8060
717.05	8950
777.9	10290
838.95	11630

R_WCT113_50	
From_RS	to_RS
15906	487
Volume (acre-ft)	Q Total (cfs)
0	0
72.9	400
137.75	750
197.48	1200
245.51	1600
291.34	2000
369.88	2730
440.02	3460
504.28	4190
537.94	4590
570.12	4990
601.77	5390
668.7	6280
732.41	7170
793.92	8060
852.56	8950
937.02	10290
1017.48	11630

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 138

R_WCT138_30	
From_RS	to_RS
5130	1651
Volume (acre-ft)	Q Total (cfs)
0	0
17.09	360
32.28	720
45.46	1080
55.55	1440
66.67	1830
93.98	2840
118.98	3850
132.08	4410
145.07	4970
181.63	6620
217.3	8270
255.41	9920

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 169

R_WCT169_10	
From_RS	to_RS
1352	149
Volume (acre-ft)	Q Total (cfs)
0	0
1.95	150
5.46	300
6.86	450
7.97	600
9.1	760
11.48	1140
13.1	1520
14.02	1730
15.02	1940
18.37	2540
22.24	3140
25.65	3770

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 171

R_WCT171_20	
From_RS	to_RS
8977	4789
Volume (acre-ft)	Q Total (cfs)
0	0
7.33	250
12.57	500
17.88	750
23.45	1000
33.68	1310
52.45	2010
65.78	2700
72.81	3100
79.05	3480
96.14	4610
112.64	5740
122.73	6490
138.69	7630

R_WCT171_30	
From_RS	to_RS
4789	351
Volume (acre-ft)	Q Total (cfs)
0	0
14.85	250
25.72	500
35.32	750
44.54	1000
55.07	1310
76.71	2010
95.17	2700
105.1	3100
114.12	3480
139.35	4610
162.72	5740
177.56	6490
199.56	7630

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 208

R_WCT208_30	
From_RS	to_RS
2504	525
Volume (acre-ft)	Q Total (cfs)
0	0
2.6	90
4.27	180
5.64	270
7.15	360
8.03	400
11.46	570
13.8	730
15.12	820
16.36	900
19.88	1130
22.96	1355
26.7	1630
34.89	2240

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 220

R_WCT220_20	
From_RS	to_RS
27472	17214
Volume (acre-ft)	Q Total (cfs)
0	0
34.33	360
60.56	720
85.24	1080
109.22	1440
135.04	1800
201.98	2800
254.34	3800
281.03	4350
307.77	4910
380.86	6550
448.58	8200
490.35	9260

R_WCT220_30	
From_RS	to_RS
17214	8441
Volume (acre-ft)	Q Total (cfs)
0	0
26.32	360
47.84	720
68.78	1080
88.52	1440
108.44	1800
162.72	2800
219.43	3800
246.32	4350
272.99	4910
334.37	6550
395.23	8200
432.15	9260

R_WCT220_40	
From_RS	to_RS
8441	1652
Volume (acre-ft)	Q Total (cfs)
0	0
17.54	360
34.17	720
52.26	1080
68.91	1440
84.16	1800
122.04	2800
156.95	3800
175.37	4350
192.71	4910
238.74	6550
282.01	8200
307.95	9260
440.62	15100

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 227

R_WCT227_20	
From_RS	to_RS
14357	7142
Volume (acre-ft)	Q Total (cfs)
0	0
10.87	180
18.23	360
25.11	540
31.82	720
37.57	875
54.57	1310
73.2	1750
83.84	1980
98.55	2210
128.56	2880
151.51	3560
167.87	4020
207.57	5340

R_WCT227_30	
From_RS	to_RS
7142	2471
Volume (acre-ft)	Q Total (cfs)
0	0
11.54	180
17.13	360
23.12	540
28.2	720
32.37	875
44.07	1310
53.79	1750
58.45	1980
63.2	2210
75.95	2880
88.54	3560
96.66	4020
118.61	5340

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 229

R_WCT229_10	
From_RS	to_RS
1501	208
Volume (acre-ft)	Q Total (cfs)
0	0
1.7	100
2.91	200
4.01	300
4.98	400
6.04	520
7.86	750
9.59	990
10.49	1120
11.38	1250
13.68	1610
15.74	1970
17.81	2360

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 260

R_WCT260_20	
From_RS	to_RS
2966	165
Volume (acre-ft)	Q Total (cfs)
0	0
1.97	90
3.33	180
5.64	270
8.95	360
22.71	760
38.93	1130
60.06	1510
71.45	1710
81.51	1910
94.03	2480
104.01	3050
113.46	3660

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 286

R_WCT286_20	
From_RS	to_RS
8129	671
Volume (acre-ft)	Q Total (cfs)
0	0
34.33	90
43.31	180
50.61	270
57.36	360
65.68	480
78.06	690
88.7	900
93.86	1010
98.83	1120
111.9	1430
123.57	1730
136.16	2080

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 298

R_WCT298_20	
From_RS	to_RS
4733	697
Volume (acre-ft)	Q Total (cfs)
0	0
5.7	90
9.57	180
12.9	270
16.32	360
30.08	810
41.86	1220
52.08	1620
57.28	1840
62.21	2060
75.59	2690
88.15	3320
100.5	3990

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 304

R_WCT304_10	
From_RS	to_RS
7819	3007
Volume (acre-ft)	Q Total (cfs)
0	0
5.72	100
9.26	200
12.18	300
14.76	400
18.12	550
23.6	820
27.89	1080
30.01	1220
32.03	1360
37.47	1750
42.79	2150
52.46	3000

R_WCT304_20	
From_RS	to_RS
3007	1439
Volume (acre-ft)	Q Total (cfs)
0	0
1.02	100
1.78	200
2.54	300
3.73	400
5.48	550
8.18	820
10.6	1080
11.83	1220
12.99	1360
15.99	1750
18.85	2150
24.26	3000

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 305

R_WCT305_10	
From_RS	to_RS
10222	5427
Volume (acre-ft)	Q Total (cfs)
0	0
5.51	180
9.12	360
12.28	540
15.15	720
17.81	900
24.86	1400
31.37	1900
33.86	2100
37.55	2400
47.18	3200
55.44	3900
62.69	4500

R_WCT305_20	
From_RS	to_RS
5427	3469
Volume (acre-ft)	Q Total (cfs)
0	0
2.55	180
4.18	360
5.48	540
6.63	720
7.68	900
10.47	1400
12.93	1900
13.83	2100
15.06	2400
18.1	3200
20.7	3900
22.95	4500

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 307

R_WCT307_20	
From_RS	to_RS
6020	812
Volume (acre-ft)	Q Total (cfs)
0	0
12.72	240
22.44	480
32.29	720
42.77	960
53.71	1210
80.62	1870
106.83	2530
119.42	2890
130.62	3260
159.33	4340
184.53	5420
202.13	6240

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 326

R_WCT326_20	
From_RS	to_RS
6997	3082
Volume (acre-ft)	Q Total (cfs)
0	0
4.35	120
7.86	240
10.69	360
13.48	480
17.57	650
24.84	980
32.6	1310
37.37	1490
42.16	1670
56.33	2190
65.51	2710
74.79	3250

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 328

R_WCT328_10	
From_RS	to_RS
6139	4026
Volume (acre-ft)	Q Total (cfs)
0	0
2.14	90
3.29	180
4.41	270
5.72	360
7.79	530
10.53	790
12.73	1040
14	1180
15.17	1320
18.44	1720
21.71	2120
24.88	2540

Modified Puls Routing Reaches
Storage Outflow Tables - Wilbarger Creek Tributary 346

R_WCT346_20	
From_RS	to_RS
8063	180
Volume (acre-ft)	Q Total (cfs)
0	0
38.62	160
48.76	320
56.99	480
64.34	640
71.59	820
85.79	1240
98.38	1660
104.72	1890
110.52	2110
126.28	2770
141.67	3430
154.01	3940

Modified Puls Routing Reaches
Storage Outflow Tables - Willow Creek

R_WLC_40	
From_RS	to_RS
56393	48928
Volume (acre-ft)	Q Total (cfs)
0	0
65.43	1000
117.88	2000
184.75	3000
249.95	4000
325.48	5330
441.3	7490
540.64	9640
630.35	11790
680.8	13020
728.91	14250
776.08	15480
878.94	18270
969.25	21070
1150.08	27000
1262.79	31000
1396.37	36000
1473.09	39000

R_WLC_50	
From_RS	to_RS
48928	44187
Volume (acre-ft)	Q Total (cfs)
0	0
95.65	1000
154.05	2000
200.09	3000
251.03	4000
315.57	5330
404.26	7490
491.27	9640
570.44	11790
613.85	13020
655.93	14250
696.42	15480
790.2	18270
877.1	21070
1046.33	27000
1153.28	31000
1280.36	36000
1352.92	39000

R_WLC_60	
From_RS	to_RS
44187	38406
Volume (acre-ft)	Q Total (cfs)
0	0
52.06	1000
106.35	2000
155.11	3000
199.1	4000
252.27	5330
331.6	7490
404.95	9640
473.36	11790
510.55	13020
547.59	14250
583.78	15480
662.52	18270
736.76	21070
886.33	27000
981.26	31000
1097.56	36000
1163.72	39000

R_WLC_80	
From_RS	to_RS
38406	31507
Volume (acre-ft)	Q Total (cfs)
0	0
51.91	1000
120.66	2000
187.88	3000
247.66	4000
326.77	5330
447.16	7490
543.74	9640
652.59	11790
698.85	13020
745.65	14250
792.18	15480
897.84	18270
1004.48	21070
1222.03	27000
1355.49	31000
1515.39	36000
1609.23	39000

R_WLC_90	
From_RS	to_RS
31507	15244
Volume (acre-ft)	Q Total (cfs)
0	0
139.52	1000
290.2	2000
435.98	3000
602.04	4000
763.14	5330
1029.77	7490
1259.51	9640
1477.68	11790
1600.8	13020
1787.45	14250
1893.87	15480
2133.26	18270
2496.15	21070
2956.29	27000
3233.02	31000
3648.6	36000
3921.64	39000

R_WLC_100	
From_RS	to_RS
15244	1733
Volume (acre-ft)	Q Total (cfs)
0	0
195.07	1000
334.5	2000
498.26	3000
687.73	4000
937.19	5330
1291.66	7490
1608.94	9640
1914.87	11790
2083.57	13020
2251.31	14250
2417.35	15480
2801.82	18270
3155.42	21070
3866.17	27000
4220.5	31000
4667.74	36000
4982.21	39000
6018.75	52500

Wilbarger Creek Modified Puls Routing Step Calculations								
							Time Step (min) =	2
Creek/River	HEC-HMS Reach Name	Upstream	Downstream	Length	Channel Velocity[1]	Floodwave Velocity[2]	# Subreaches for Mod Puls[3]	# Subreaches for Mod Puls[4]
WILBARGER CREEK	R_WC_20	242551	237765	4786	3.8	5.7	7.1	8
	R_WC_30	237765	236150	1615	2.7	4.1	3.3	4
	R_WC_40	236150	232336	3814	4.0	6.0	5.3	6
	R_WC_50	232336	228794	3542	3.6	5.5	5.4	6
	R_WC_60	228794	213621	15173	3.2	4.8	26.1	27
	R_WC_70	213621	208890	4731	2.6	3.9	10.2	11
	R_WC_80	208890	201252	7638	3.3	4.9	13.0	13
	R_WC_90	201252	191643	9609	3.2	4.7	16.9	17
	R_WC_110	191643	181779	9864	3.1	4.7	17.6	18
	R_WC_120	181779	169317	12462	4.1	6.1	17.0	18
	R_WC_130	169317	155254	14063	3.9	5.8	20.0	21
	R_WC_140	155254	153406	1848	3.4	5.1	3.0	4
	R_WC_150	153406	148743	4663	3.1	4.6	8.4	9
	R_WC_160	148743	142037	6706	2.9	4.4	12.7	13
	R_WC_170	142037	134553	7484	2.8	4.2	14.8	15
	R_WC_180	134553	129612	4941	3.1	4.6	9.0	9
	R_WC_190	129612	127456	2156	3.6	5.4	3.3	4
	R_WC_200	127456	123752	3704	3.5	5.3	5.9	6
	R_WC_210	123752	119250	4502	3.8	5.8	6.5	7
	R_WC_220	119250	117124	2126	3.7	5.6	3.2	4
	R_WC_240	117124	113417	3707	3.2	4.7	6.5	7
	R_WC_260	113417	111879	1538	3.8	5.7	2.3	3
	R_WC_270	111879	102284	9595	3.7	5.6	14.3	15
	R_WC_290	102284	100579	1705	4.1	6.1	2.3	3
	R_WC_310	100579	90543	10036	3.9	5.9	14.3	15
	R_WC_330	90543	87254	3289	4.3	6.4	4.3	5
	R_WC_340	87254	85846	1408	4.6	6.9	1.7	2
	R_WC_350	85846	83470	2376	4.5	6.8	2.9	3
	R_WC_360	83470	78537	4933	3.4	5.1	8.0	8
	R_WC_370	78537	74152	4385	3.9	5.9	6.2	7
	R_WC_380	74152	65291	8861	4.0	6.1	12.2	13
	R_WC_390	65291	54540	10751	3.8	5.7	15.6	16
	R_WC_400	54540	49978	4562	4.0	6.0	6.3	7
	R_WC_410	49978	46966	3012	4.8	7.2	3.5	4
	R_WC_420	46966	43530	3436	4.5	6.7	4.3	5
	R_WC_430	43530	37425	6105	4.9	7.3	6.9	7
	R_WC_440	37425	27323	10102	5.2	7.8	10.8	11
	R_WC_450	27323	24211	3112	5.4	8.2	3.2	4
	R_WC_460	24211	17203	7008	5.6	8.4	6.9	7
	R_WC_500	17203	10725	6478	5.6	8.5	6.4	7
	R_WC_510	10725	7693	3032	4.6	6.8	3.7	4
	R_WC_520	7693	4513	3180	5.1	7.6	3.5	4
	R_WC_530	4513	2477	2036	9.9	14.8	1.1	2
ELM CREEK	R_EC_20	40560	29340	11220	3.1	4.7	19.8	20
	R_EC_30	29340	21497	7843	3.6	5.4	12.0	12
	R_EC_40	21497	18244	3253	3.7	5.6	4.9	5
	R_EC_50	18244	11504	6740	4.1	6.2	9.1	10
	R_EC_60	11504	8251	3253	4.1	6.2	4.4	5
	R_EC_80	8251	963	7288	3.5	5.3	11.5	12

Wilbarger Creek Modified Puls Routing Step Calculations								
							Time Step (min) =	2
Creek/River	HEC-HMS Reach Name	Upstream	Downstream	Length	Channel Velocity[1]	Floodwave Velocity[2]	# Subreaches for Mod Puls[3]	# Subreaches for Mod Puls[4]
ELM CREEK TRIBUTARY 1	R_ECT001_20	5825	562	5263	5.5	8.2	5.3	6
WILBARGER CREEK TRIBUTARY 165	R_WCT165_10	3501	274	3227	2.8	4.2	5.9	6
WILBARGER CREEK TRIBUTARY 167	R_WCT167_20	12293	3150	9143	3.3	4.9	15.6	16
	R_WCT167_30	3150	1981	1169	2.1	3.1	3.1	4
	R_WCT167_40	1981	973	1008	4.3	6.4	1.3	2
WILBARGER CREEK TRIBUTARY 178	R_WCT178_20	2598	269	2329	5.2	7.9	2.5	3
WILBARGER CREEK TRIBUTARY 183	R_WCT183_20	1849	1188	661	2.8	4.3	1.3	2
WILBARGER CREEK TRIBUTARY 185	R_WCT185_20	2352	769	1583	3.9	5.8	2.3	3
WILBARGER CREEK TRIBUTARY 186	R_WCT186_20	6185	535	5650	3.9	5.8	8.1	9
WILBARGER CREEK TRIBUTARY 187	R_WCT187_20	2496	496	2000	4.4	6.6	2.5	3
WILBARGER CREEK TRIBUTARY 196	R_WCT196_15	17601	14160	3441	2.6	3.9	7.4	8
	R_WCT196_20	14160	9997	4163	2.3	3.4	10.2	11
	R_WCT196_30	9997	498	9499	3.4	5.2	15.3	16
WILBARGER CREEK TRIBUTARY 200	R_WCT200_10	28565	27305	1260	4.7	7.1	1.5	2
	R_WCT200_20	27305	21000	6305	3.7	5.6	9.4	10
	R_WCT200_30	21000	14098	6902	3.4	5.0	11.4	12
	R_WCT200_40	14098	8556	5542	4.0	6.0	7.7	8
	R_WCT200_45	8556	6582	1974	5.0	7.4	2.2	3
	R_WCT200_50	6582	868	5714	3.3	5.0	9.5	10
WILBARGER CREEK TRIBUTARY 206	R_WCT206_20	4085	128	3957	3.2	4.8	6.9	7
WILBARGER CREEK TRIBUTARY 207	R_WCT207_20	1902	121	1781	2.9	4.3	3.4	4
WILBARGER CREEK TRIBUTARY 209	R_WCT209_20	1374	96	1278	2.8	4.1	2.6	3
WILBARGER CREEK TRIBUTARY 210	R_WCT210_20	46694	42748	3946	3.7	5.5	6.0	6
	R_WCT210_25	42748	39891	2857	3.5	5.2	4.6	5
	R_WCT210_30	39891	34662	5229	3.7	5.5	7.9	8
	R_WCT210_40	34662	29984	4678	3.7	5.5	7.1	8
	R_WCT210_50	29984	17916	12068	2.8	4.1	24.3	25
	R_WCT210_60	17916	9522	8394	2.4	3.7	19.1	20
	R_WCT210_70	9522	912	8610	3.1	4.7	15.3	16
WILBARGER CREEK TRIBUTARY 216	R_WCT216_20	7004	4036	2968	2.7	4.1	6.0	7
	R_WCT216_30	4036	528	3508	2.2	3.3	8.8	9
COTTONMOUTH CREEK	R_CC_20	63420	60164	3256	4.5	6.8	4.0	4
	R_CC_40	60164	45262	14902	4.0	6.0	20.8	21
	R_CC_50	45262	30640	14622	3.5	5.2	23.5	24
	R_CC_60	30640	24783	5857	3.6	5.3	9.2	10
	R_CC_70	24783	19263	5520	3.1	4.6	10.0	10
	R_CC_80	19263	9969	9294	3.6	5.4	14.5	15
	R_CC_90	9969	1470	8499	3.6	5.4	13.2	14

Wilbarger Creek Modified Puls Routing Step Calculations								
							Time Step (min) =	2
Creek/River	HEC-HMS Reach Name	Upstream	Downstream	Length	Channel Velocity[1]	Floodwave Velocity[2]	# Subreaches for Mod Puls[3]	# Subreaches for Mod Puls[4]
DRY CREEK WEST	R_DCW_20	62105	53607	8498	3.3	4.9	14.5	15
	R_DCW_30	53607	49144	4463	2.9	4.4	8.5	9
	R_DCW_50	49144	39555	9589	3.4	5.1	15.7	16
	R_DCW_60	39555	27388	12167	4.1	6.1	16.5	17
	R_DCW_70	27388	20395	6993	3.9	5.8	10.0	10
	R_DCW_80	20395	14008	6387	3.4	5.1	10.4	11
	R_DCW_90	14008	4267	9741	2.9	4.4	18.6	19
HARRIS BRANCH SOUTH	R_HBS_20	17418	9124	8294	3.3	4.9	14.2	15
	R_HBS_30	9124	125	8999	2.9	4.3	17.3	18
LITTLE WILLOW CREEK	R_LWC_20	40517	31946	8571	2.9	4.3	16.5	17
	R_LWC_30	31946	23301	8645	3.4	5.1	14.0	15
	R_LWC_40	23301	11129	12172	2.9	4.3	23.7	24
	R_LWC_50	11129	1238	9891	3.2	4.8	17.2	18
LOCKWOOD CREEK	R_LC_20	41106	24204	16902	3.6	5.4	26.2	27
	R_LC_30	24204	10432	13772	3.6	5.3	21.5	22
	R_LC_40	10432	6409	4023	2.9	4.4	7.7	8
WILBARGER CREEK TRIBUTARY 1	R_WCT001_10	15589	10488	5101	7.0	10.5	4.0	5
	R_WCT001_20	10488	160	10328	4.8	7.2	12.0	12
WILBARGER CREEK TRIBUTARY 3	R_WCT003_20	5811	1914	3897	4.6	6.8	4.7	5
WILBARGER CREEK TRIBUTARY 4	R_WCT004_30	16327	9992	6335	4.7	7.0	7.5	8
	R_WCT004_40	9992	8654	1338	4.9	7.4	1.5	2
	R_WCT004_50	8654	6879	1775	5.5	8.2	1.8	2
	R_WCT004_60	6879	5429	1450	5.3	7.9	1.5	2
	R_WCT004_70	5429	2299	3130	5.5	8.3	3.2	4
WILBARGER CREEK TRIBUTARY 6	R_WCT006_20	16679	3503	13176	3.6	5.4	20.2	21
WILBARGER CREEK TRIBUTARY 9	R_WCT009_20	41574	30427	11147	2.8	4.3	21.8	22
	R_WCT009_30	30427	25687	4740	3.0	4.6	8.7	9
	R_WCT009_40	25687	19566	6121	3.3	5.0	10.2	11
	R_WCT009_60	19566	15547	4019	2.8	4.2	7.9	8
	R_WCT009_70	15547	4985	10562	2.8	4.2	21.0	22
WILBARGER CREEK TRIBUTARY 018	R_WCT018_20	4866	400	4466	3.4	5.2	7.2	8
WILBARGER CREEK TRIBUTARY 019	R_WCT019_10	1624	498	1126	2.6	3.9	2.4	3
WILBARGER CREEK TRIBUTARY 020	R_WCT020_10	2260	418	1842	4.2	6.3	2.4	3
WILBARGER CREEK TRIBUTARY 021	R_WCT021_10	1325	537	788	6.1	9.1	0.7	1
WILBARGER CREEK TRIBUTARY 024	R_WCT024_20	13888	9293	4595	3.9	5.9	6.5	7
	R_WCT024_30	9293	8008	1285	3.1	4.6	2.3	3
	R_WCT024_40	8008	2145	5863	3.9	5.9	8.3	9

Wilbarger Creek Modified Puls Routing Step Calculations								
							Time Step (min) =	2
Creek/River	HEC-HMS Reach Name	Upstream	Downstream	Length	Channel Velocity[1]	Floodwave Velocity[2]	# Subreaches for Mod Puls[3]	# Subreaches for Mod Puls[4]
WILBARGER CREEK TRIBUTARY 025	R_WCT025_10	2939	168	2771	5.0	7.5	3.1	4
WILBARGER CREEK TRIBUTARY 026	R_WCT026_10	2807	665	2142	3.6	5.4	3.3	4
WILBARGER CREEK TRIBUTARY 027	R_WCT027_10	3466	915	2551	5.4	8.1	2.6	3
WILBARGER CREEK TRIBUTARY 030	R_WCT030_20	9161	2199	6962	3.2	4.8	12.0	13
WILBARGER CREEK TRIBUTARY 047	R_WCT047_20	30126	21040	9086	4.3	6.4	11.8	12
	R_WCT047_30	21040	11179	9861	3.9	5.9	14.0	15
	R_WCT047_40	11179	2491	8688	3.4	5.0	14.4	15
WILBARGER CREEK TRIBUTARY 049	R_WCT049_10	1538	257	1281	4.1	6.2	1.7	2
WILBARGER CREEK TRIBUTARY 056	R_WCT056_20	58299	46172	12127	4.3	6.5	15.5	16
	R_WCT056_30	46172	44137	2035	4.3	6.4	2.6	3
	R_WCT056_50	44137	36156	7981	3.5	5.2	12.7	13
	R_WCT056_60	36156	15330	20826	3.5	5.2	33.4	34
	R_WCT056_70	15330	7313	8017	3.4	5.2	12.9	13
	R_WCT056_90	7313	2661	4652	3.0	4.5	8.6	9
WILBARGER CREEK TRIBUTARY 062	R_WCT062_05	13635	10504	3131	2.5	3.8	6.9	7
	R_WCT062_10	10504	6722	3782	2.8	4.2	7.5	8
	R_WCT062_20	6722	278	6444	3.1	4.6	11.7	12
WILBARGER CREEK TRIBUTARY 070	R_WCT070_10	3049	408	2641	6.0	9.0	2.4	3
WILBARGER CREEK TRIBUTARY 080	R_WCT080_10	40440	35041	5399	3.7	5.5	8.2	9
	R_WCT080_20	35041	31899	3142	4.0	6.0	4.4	5
	R_WCT080_30	31899	25864	6035	3.5	5.3	9.5	10
	R_WCT080_50	25864	15092	10772	3.8	5.7	15.8	16
	R_WCT080_60	15092	628	14464	3.9	5.9	20.4	21
WILBARGER CREEK TRIBUTARY 082	R_WCT082_10	10608	8347	2261	3.7	5.6	3.4	4
	R_WCT082_20	8347	539	7808	3.8	5.7	11.4	12
WILBARGER CREEK TRIBUTARY 085	R_WCT085_10	2099	638	1461	2.5	3.8	3.2	4
WILBARGER CREEK TRIBUTARY 086	R_WCT086_20	3415	218	3197	4.1	6.2	4.3	5
WILBARGER CREEK TRIBUTARY 113	R_WCT113_20	43691	33615	10076	3.0	4.6	18.4	19
	R_WCT113_30	33615	28463	5152	3.2	4.8	9.0	10
	R_WCT113_40	28463	15906	12557	2.9	4.4	23.8	24
	R_WCT113_50	15906	487	15419	3.0	4.4	28.9	29
WILBARGER CREEK TRIBUTARY 138	R_WCT138_30	5130	1651	3479	2.8	4.3	6.8	7
WILBARGER CREEK TRIBUTARY 169	R_WCT169_10	1352	149	1203	5.7	8.5	1.2	2
WILBARGER CREEK TRIBUTARY 171	R_WCT171_20	8977	4789	4188	5.4	8.0	4.3	5
	R_WCT171_30	4789	351	4438	3.6	5.4	6.9	7
WILBARGER CREEK TRIBUTARY 208	R_WCT208_30	2504	525	1979	2.5	3.8	4.4	5

Wilbarger Creek Modified Puls Routing Step Calculations								
							Time Step (min) =	2
Creek/River	HEC-HMS Reach Name	Upstream	Downstream	Length	Channel Velocity[1]	Floodwave Velocity[2]	# Subreaches for Mod Puls[3]	# Subreaches for Mod Puls[4]
WILBARGER CREEK TRIBUTARY 220	R_WCT220_20	27472	17214	10258	4.0	6.0	14.3	15
	R_WCT220_30	17214	8441	8773	3.6	5.4	13.5	14
	R_WCT220_40	8441	1652	6789	4.3	6.5	8.8	9
WILBARGER CREEK TRIBUTARY 227	R_WCT227_20	14357	7142	7215	3.7	5.5	10.9	11
	R_WCT227_30	7142	2471	4671	3.5	5.3	7.4	8
WILBARGER CREEK TRIBUTARY 229	R_WCT229_10	1501	208	1293	3.4	5.0	2.1	3
WILBARGER CREEK TRIBUTARY 260	R_WCT260_20	2966	165	2801	4.2	6.3	3.7	4
WILBARGER CREEK TRIBUTARY 286	R_WCT286_20	8129	671	7458	2.8	4.2	14.8	15
WILBARGER CREEK TRIBUTARY 298	R_WCT298_20	4733	697	4036	2.7	4.1	8.3	9
WILBARGER CREEK TRIBUTARY 304	R_WCT304_10	7819	3007	4812	6.4	9.6	4.2	5
	R_WCT304_20	3007	1439	1568	4.9	7.3	1.8	2
WILBARGER CREEK TRIBUTARY 305	R_WCT305_10	10222	5427	4795	6.0	9.0	4.4	5
	R_WCT305_20	5427	3469	1958	6.9	10.4	1.6	2
WILBARGER CREEK TRIBUTARY 307	R_WCT307_20	6020	812	5208	3.3	4.9	8.8	9
WILBARGER CREEK TRIBUTARY 326	R_WCT326_20	6997	3082	3915	5.1	7.7	4.3	5
WILBARGER CREEK TRIBUTARY 328	R_WCT328_10	6139	4026	2113	4.2	6.2	2.8	3
WILBARGER CREEK TRIBUTARY 346	R_WCT346_20	8063	180	7883	5.1	7.7	8.6	9
WILLOW CREEK	R_WLC_40	56393	48928	7465	3.3	4.9	12.6	13
	R_WLC_50	48928	44187	4741	2.9	4.3	9.1	10
	R_WLC_60	44187	38406	5781	3.0	4.4	10.8	11
	R_WLC_80	38406	31507	6899	3.6	5.4	10.6	11
	R_WLC_90	31507	15244	16263	3.5	5.2	26.1	27
	R_WLC_100	15244	1733	13511	3.5	5.2	21.6	22

Notes:

[1] Average channel velocity calculated in RAS Routing Model (V2)

[2] Flood Wave Velocity = 1.5 * average channel velocity

[3] Number of Routing Steps = (River Length / Flood Wave Velocity) * (1 / 60 min/s) / Time Step, where Flood Wave Velocity = 1.5 * average channel velocity

[4] Rounded Steps = the number of routing steps rounded up

Appendix E: Hydrologic Model Analysis

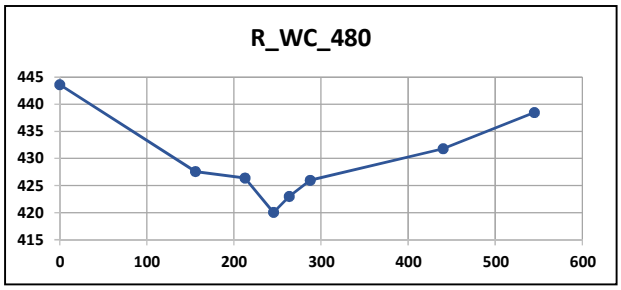
E-5 Routing – Muskingum Cunge

Muskingum-Cunge Routing Reaches							
Reach	Length (FT)	Slope (FT/FT)	Channel Manning's n	Shape	LOB Manning's n	ROB Manning's n	Cross Section Table
R_WC_480	12769	0.0114	0.05	Eight Point	0.1	0.1	R_WC_480
R_WC_490	15494	0.0103	0.05	Eight Point	0.1	0.08	R_WC_490
R_WCT006_30	3721	0.0114	0.05	Eight Point	0.08	0.1	R_WCT006_30
R_WCT009_80	7949	0.0071	0.05	Eight Point	0.1	0.1	R_WCT009_80
R_WCT208_20	3430	0.0084	0.04	Eight Point	0.06	0.06	R_WCT208_20

Reach	R_WC_480	
Point	Station	Elevation
1	0.00	443.62
2	155.66	427.59
3	212.54	426.42
4	245.47	420.05
5	263.43	423.00
6	287.38	425.98
7	440.05	431.80
8	544.82	438.48

Manning's n		
LOB	Chnl	ROB
0.1	0.05	0.1

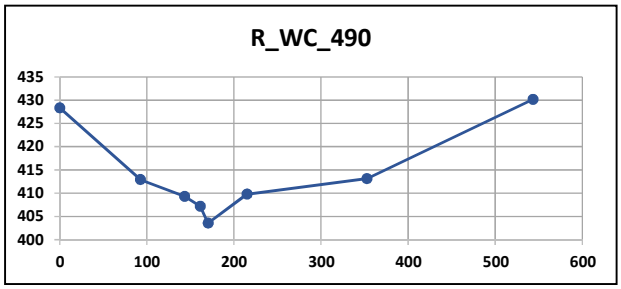
Dimensions		
Segment	Width (ft)	Depth (ft)
XS	544.8	18.4
Channel	74.8	6.4



Reach	R_WC_490	
Point	Station	Elevation
1	0.00	428.32
2	92.61	412.93
3	143.39	409.27
4	161.31	407.16
5	170.27	403.55
6	215.08	409.81
7	352.50	413.12
8	543.25	430.16

Manning's n		
LOB	Chnl	ROB
0.1	0.05	0.08

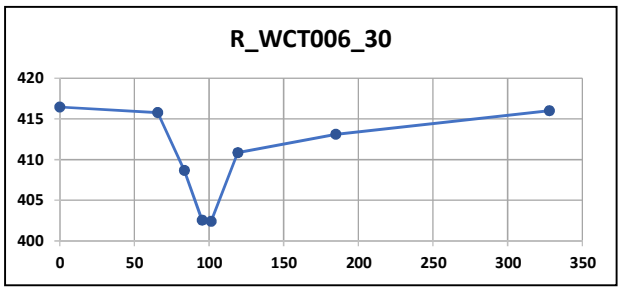
Dimensions		
Segment	Width (ft)	Depth (ft)
XS	543.2	26.6
Channel	77.7	5.7



Reach	R_WCT006_30	
Point	Station	Elevation
1	0.00	416.46
2	65.57	415.76
3	83.45	408.67
4	95.37	402.54
5	101.33	402.41
6	119.21	410.85
7	184.78	413.11
8	327.83	416.01

Manning's n		
LOB	Chnl	ROB
0.08	0.05	0.1

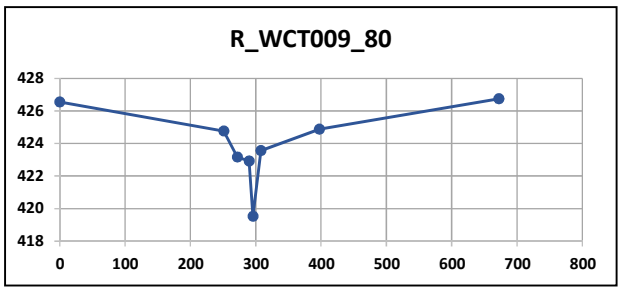
Dimensions		
Segment	Width (ft)	Depth (ft)
XS	327.8	13.6
Channel	35.8	8.4



Reach	R_WCT009_80	
Point	Station	Elevation
1	0.00	426.55
2	250.97	424.77
3	271.89	423.17
4	289.81	422.93
5	295.79	419.53
6	307.74	423.56
7	397.37	424.89
8	672.24	426.75

Manning's n		
LOB	Chnl	ROB
0.1	0.05	0.1

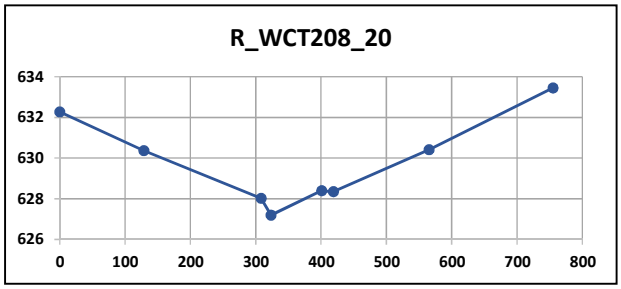
Dimensions		
Segment	Width (ft)	Depth (ft)
XS	672.2	7.2
Channel	35.9	4.0



Reach	R_WCT208_20	
Point	Station	Elevation
1	0.00	632.27
2	128.72	630.37
3	308.32	628.01
4	323.29	627.19
5	401.12	628.39
6	419.08	628.35
7	565.32	630.41
8	755.04	633.44

Manning's n		
LOB	Chnl	ROB
0.06	0.04	0.06

Dimensions		
Segment	Width (ft)	Depth (ft)
XS	755.0	6.3
Channel	110.8	1.2



Appendix E: Hydrologic Model Analysis

E-6 Hydrology Results – Computed Peak Discharge Existing

Wilbarger Creek Watershed			Existing Flows (cfs)						
Stream Name	Hydrologic Element	DA (Sq. Miles)	50% ACE	20% ACE	10% ACE	4% ACE	2% ACE	1% ACE	0.2% ACE
			City of Pflugerville Atlas 14 Rainfall						
Wilbarger Creek	J_WC_10	0.56	710	920	1,100	1,400	1,600	1,900	2,800
	J_WC_20	0.98	640	860	1,000	1,300	1,500	1,800	2,400
	J_WC_20_WCT183_20	1.49	3,600	5,000	6,400	9,000	10,800	13,300	20,900
	J_WC_30	1.62	850	1,100	1,400	1,700	2,000	2,300	3,600
	J_WC_30_WCT185_20	2.34	1,500	2,000	2,400	3,100	3,600	4,200	5,800
	J_WC_40	2.75	1,600	2,100	2,600	3,300	3,900	4,500	6,200
	J_WC_50	3.14	2,000	2,700	3,400	4,300	5,100	5,900	8,600
	J_WC_50_WCT186_20	3.74	2,100	2,800	3,500	4,600	5,400	6,400	9,200
	J_WC_50_WCT186_20_WCT187_20	4.15	2,200	3,000	3,800	4,900	5,900	6,900	10,000
	J_WC_60	5.24	2,300	3,300	4,200	5,500	6,700	8,200	12,100
	J_WC_60_WCT178_20	5.59	2,600	3,700	4,600	6,000	7,200	8,800	13,000
	J_WC_70	5.96	3,200	4,300	5,500	7,400	8,900	10,700	15,800
	J_WC_80	7.49	3,300	4,400	5,600	7,600	9,200	11,100	16,200
	J_WC_90	7.97	3,300	4,400	5,700	7,700	9,300	11,200	16,600
	J_WC_90_WC_100	8.53	3,500	4,800	6,200	8,600	10,200	12,700	19,400
	J_WC_100	0.56	3,500	4,800	6,200	8,700	10,300	12,800	19,800
	J_WC_110	9.19	3,600	4,900	6,400	8,800	10,600	13,100	20,400
Wilbarger Creek Tributary 178	J_WCT178_10	0.26	480	640	780	990	1,100	1,300	1,800
	J_WCT178_20	0.35	490	670	820	1,000	1,200	1,400	1,900
Wilbarger Creek Tributary 183	J_WCT183_10	0.47	680	890	1,100	1,400	1,600	1,800	2,400
	J_WCT183_20	0.51	700	930	1,100	1,400	1,700	1,900	2,600
Wilbarger Creek Tributary 185	J_WCT185_10	0.58	570	790	980	1,300	1,500	1,700	2,600
	J_WCT185_20	0.72	590	830	1,000	1,300	1,600	1,800	2,800
Wilbarger Creek Tributary 186	J_WCT186_10	0.37	140	250	360	530	860	1,200	1,800
	J_WCT186_20	0.6	320	420	520	680	990	1,300	2,100
Wilbarger Creek Tributary 187	J_WCT187_10	0.33	420	610	790	1,100	1,300	1,500	2,100
	J_WCT187_20	0.41	460	700	910	1,200	1,500	1,700	2,400
Wilbarger Creek Tributary 196	J_WCT196_10	0.32	380	500	610	770	900	1,000	1,400
	J_WCT196_15	0.82	550	750	930	1,200	1,400	1,600	3,000
	J_WCT196_20	2.03	480	640	780	980	1,200	1,400	2,300
	J_WCT196_30	2.67	600	810	1,000	1,300	1,500	1,800	2,500
Wilbarger Creek Tributary 200	J_WCT200_05	0.77	860	1,100	1,400	1,700	2,000	2,400	3,200
	J_WCT200_10	1.65	1,800	2,500	3,000	3,800	4,400	5,100	6,700
	J_WCT200_20	2.45	2,600	3,400	4,100	5,100	6,100	7,000	9,400
	J_WCT200_20_WCT206_20	3.18	3,300	4,300	5,200	6,600	7,800	9,000	11,900
	J_WCT200_30	3.85	3,400	4,500	5,500	6,800	8,100	9,500	13,100
	J_WCT200_40	4.17	3,300	4,500	5,400	6,600	8,100	9,600	13,400
	J_WCT200_45	4.24	3,300	4,500	5,400	6,600	8,100	9,600	13,400
	J_WCT200_45_WCT207_20	4.46	3,300	4,600	5,500	6,700	8,300	9,800	13,800
	J_WCT200_50	4.74	3,300	4,500	5,500	6,700	8,300	9,900	13,900
Wilbarger Creek Tributary 206	J_WCT206_10	0.55	690	820	1,300	1,800	2,200	2,500	3,400
	J_WCT206_20	0.73	800	980	1,200	1,500	2,000	2,600	3,800
Wilbarger Creek Tributary 207	J_WCT207_10	0.13	90	130	180	260	330	410	610
	J_WCT207_20	0.22	250	320	390	490	560	640	910
Wilbarger Creek Tributary 208	J_WCT208_10	0.16	220	300	370	480	570	660	900
	J_WCT208_20	0.3	370	510	640	830	980	1,100	1,600
	J_WCT208_30	0.51	550	740	920	1,200	1,400	1,600	2,200
Wilbarger Creek Tributary 209	J_WCT209_10	0.09	170	220	270	340	390	450	590
	J_WCT209_20	0.18	310	400	490	630	740	840	1,100
Wilbarger Creek Tributary 210	J_WCT210_10	0.73	990	1,300	1,600	1,900	2,300	2,600	3,500
	J_WCT210_20	1.07	1,100	1,500	1,800	2,300	2,600	3,000	4,100
	J_WCT210_20_WCT209_20	1.25	1,200	1,700	2,100	2,600	3,000	3,600	4,800
	J_WCT210_25	1.6	1,500	1,900	2,400	3,200	3,700	4,400	6,100
	J_WCT210_30	2.29	1,800	2,400	3,100	4,000	4,700	5,600	7,800
	J_WCT210_40	2.55	1,800	2,500	3,200	4,200	5,000	5,900	8,300
	J_WCT210_40_WCT208_30	4.29	3,100	4,300	5,400	7,000	8,300	9,700	13,500
	J_WCT210_40_WCT216_30	3.78	2,700	3,700	4,700	6,100	7,200	8,400	11,700
	J_WCT210_50	5.07	3,300	4,600	5,900	7,700	9,300	11,000	15,600
	J_WCT210_50_200_50	9.81	6,400	9,100	11,200	13,500	16,700	20,000	28,700
	J_WCT210_60	10.47	6,500	9,200	11,600	14,100	17,200	20,700	29,900
	J_WCT210_60_WCT196_30	13.14	6,600	9,400	11,800	14,400	17,500	21,200	30,800
	J_WCT210_70	13.61	6,500	9,400	11,900	14,600	17,700	21,500	31,300
Wilbarger Creek Tributary 216	J_WCT216_10	0.56	620	820	1,000	1,300	1,500	1,700	2,300
	J_WCT216_20	0.94	860	1,200	1,400	1,800	2,000	2,300	3,000
	J_WCT216_30	1.23	920	1,300	1,700	2,200	2,500	2,900	3,900

Wilbarger Creek Watershed			Existing Flows (cfs)						
Stream Name	Hydrologic Element	DA (Sq. Miles)	50% ACE	20% ACE	10% ACE	4% ACE	2% ACE	1% ACE	0.2% ACE
			City of Austin Atlas 14 Rainfall						
Cottonmouth Creek	J_CC_10	2.31	1,900	2,600	3,200	4,000	4,800	5,600	7,800
	J_CC_20	2.54	1,800	2,400	3,200	4,100	5,000	5,900	8,200
	J_CC_20_CC_30	4.84	3,400	4,600	6,000	7,700	9,400	11,100	15,400
	J_CC_30	2.3	1,700	2,300	2,900	3,600	4,400	5,200	7,200
	J_CC_40	6.43	3,500	4,800	6,500	8,500	10,500	12,500	18,300
	J_CC_40_WCT080_60	13.73	6,500	9,300	12,300	16,200	20,500	24,800	37,100
	J_CC_50	15.21	6,500	9,300	12,300	16,400	20,900	25,500	38,700
	J_CC_60	15.59	6,400	9,300	12,100	16,200	20,700	25,400	38,700
	J_CC_60_WCT056_90	31.04	11,300	16,600	22,000	29,400	38,400	47,700	73,600
	J_CC_70	32.47	11,300	16,000	21,700	29,500	38,700	48,000	74,500
	J_CC_80	34.1	11,200	16,000	21,500	29,700	39,100	48,700	76,100
	J_CC_80_WCT113_50	39.34	12,100	17,000	23,600	32,800	43,600	54,500	85,800
	J_CC_90	40.17	11,900	16,900	23,300	32,500	43,400	54,300	86,000
	J_CC_90_WLC_100	62.87	18,400	26,400	36,000	48,100	62,000	78,000	124,500
Dry Creek West	J_DCW_10	1.66	970	1,400	1,700	2,200	2,700	3,200	4,700
	J_DCW_20	3.72	1,800	2,600	3,400	4,400	5,500	6,700	9,700
	J_DCW_30	4.21	1,800	2,700	3,500	4,600	5,800	7,000	10,300
	J_DCW_30_DCW_40	4.76	1,900	2,800	3,700	4,800	6,100	7,400	11,100
	J_DCW_40	0.55	460	650	810	1,000	1,300	1,500	2,100
	J_DCW_50	5.91	1,900	2,900	3,900	5,300	6,800	8,300	12,800
	J_DCW_60	7.37	2,000	2,900	3,900	5,400	7,100	8,800	14,000
	J_DCW_70	8.16	2,000	2,900	3,900	5,400	7,200	9,000	14,500
	J_DCW_70_EC_80	16.82	4,000	6,000	8,100	10,800	14,400	17,900	29,600
	J_DCW_80	17.62	4,000	6,100	8,200	11,000	14,600	18,100	30,100
	J_DCW_90	18.55	4,000	6,100	8,300	11,200	14,900	18,300	30,500
Elm Creek Tributary 1	J_ECT001_10	0.46	620	880	1,100	1,400	1,700	2,000	2,800
	J_ECT001_20	0.99	920	1,400	1,800	2,300	2,800	3,300	4,800
Elm Creek	J_EC_10	0.42	300	430	550	700	860	1,000	1,500
	J_EC_20	2.28	1,500	2,100	2,700	3,500	4,400	5,200	7,300
	J_EC_30	3.89	1,900	2,900	3,700	4,900	6,300	7,700	11,500
	J_EC_30_ECT001_20	4.88	2,400	3,400	4,400	5,800	7,300	9,000	13,600
	J_EC_40	5.33	2,400	3,500	4,600	5,800	7,700	8,900	14,600
	J_EC_50	6.05	2,400	3,600	4,700	5,900	7,900	9,200	15,400
	J_EC_50_WCT260_20	7.02	2,600	4,000	5,200	6,700	8,900	10,600	17,800
	J_EC_60	7.3	2,600	4,000	5,200	6,800	9,000	10,700	18,100
	J_EC_60_EC_70	7.91	2,700	4,100	5,500	7,300	9,500	11,400	19,400
	J_EC_70	0.61	550	770	970	1,200	1,500	1,800	2,400
	J_EC_80	8.66	2,700	4,200	5,600	7,400	9,700	11,700	20,100
Harris Branch South	J_HBS_10	1.11	640	940	1,200	1,600	2,000	2,300	3,400
	J_HBS_20	2.15	1,200	1,700	2,300	3,000	3,700	4,400	6,300
	J_HBS_30	2.57	1,200	1,800	2,400	3,200	4,000	4,800	7,000
Lockwood Creek	J_LC_10	3.89	1,600	2,300	3,000	4,000	5,000	6,000	8,900
	J_LC_20	5.66	1,900	2,900	3,900	5,100	6,600	8,000	12,000
	J_LC_20_WCT307_20_HBS_30	9.83	2,900	4,500	6,200	8,400	10,900	13,400	20,300
	J_LC_30	11.17	3,000	4,700	6,400	8,800	11,500	14,300	22,000
	J_LC_40	11.96	3,000	4,700	6,500	9,000	11,900	14,800	22,900
Little Willow Creek	J_LWC_10	0.84	620	840	1,000	1,300	1,600	1,900	2,600
	J_LWC_20	2.08	1,000	1,400	1,800	2,300	2,900	3,500	5,400
	J_LWC_30	3.23	1,600	2,100	2,600	3,500	4,400	5,300	7,900
	J_LWC_40	4.74	1,800	2,300	2,900	4,000	5,500	6,900	11,000
	J_LWC_50	5.73	2,000	2,600	3,300	4,400	6,000	7,800	12,800
Wilbarger Creek Tributary 1	J_WCT001_10	0.58	340	540	740	1,000	1,300	1,600	2,300
	J_WCT001_10_WCT001_20	0.58	280	510	710	970	1,300	1,500	2,200
	J_WCT001_20	1.88	800	1,300	1,700	2,300	2,900	3,500	5,700
Wilbarger Creek Tributary 3	J_WCT003_10	1.02	250	500	760	1,100	1,600	2,000	3,200
	J_WCT003_20	1.56	490	920	1,300	1,800	2,500	3,200	5,100
Wilbarger Creek Tributary 4	J_WCT004_10	1.88	930	1,400	1,800	2,300	2,800	3,400	4,900
	J_WCT004_10_WCT004_20	3.18	1,400	2,100	2,800	3,700	4,700	5,700	8,500
	J_WCT004_20	1.3	640	1,000	1,400	1,900	2,500	3,000	4,500
	J_WCT004_30	3.56	1,400	2,200	3,000	4,000	5,100	6,200	9,200
	J_WCT004_30_WCT018_20	4.38	1,700	2,700	3,800	5,000	6,400	7,800	11,700
	J_WCT004_40	4.44	1,700	2,800	3,800	5,100	6,500	7,900	11,800
	J_WCT004_40_WCT019_10	4.52	1,700	2,800	3,800	5,100	6,600	8,000	12,000
	J_WCT004_50	4.6	1,700	2,800	3,800	5,200	6,600	8,100	12,100
	J_WCT004_50_WCT020_10	4.72	1,800	2,900	3,900	5,300	6,800	8,300	12,500
	J_WCT004_60	4.79	1,800	2,900	3,900	5,300	6,900	8,400	12,700
	J_WCT004_60_WCT021_10	4.94	1,800	2,900	4,000	5,400	7,000	8,600	13,000
	J_WCT004_70	5.1	1,800	2,900	4,000	5,500	7,100	8,700	13,300
	J_WCT006_10	0.86	620	900	1,100	1,500	1,800	2,100	3,000

Wilbarger Creek Watershed			Existing Flows (cfs)						
Stream Name	Hydrologic Element	DA (Sq. Miles)	50% ACE	20% ACE	10% ACE	4% ACE	2% ACE	1% ACE	0.2% ACE
			City of Austin Atlas 14 Rainfall						
Wilbarger Creek Tributary 6	J_WCT006_20	1.86	790	1,200	1,600	2,100	2,600	3,300	5,300
	J_WCT006_20_WCT030_20	3.21	1,500	2,300	3,100	4,100	5,300	6,400	9,400
	J_WCT006_30	3.3	1,500	2,300	3,100	4,100	5,300	6,500	9,500
Wilbarger Creek Tributary 9	J_WCT009_10	0.23	220	310	390	490	590	700	970
	J_WCT009_20	1.5	1,000	1,500	2,000	2,600	3,200	3,800	5,400
	J_WCT009_30	2.86	1,700	2,600	3,500	4,600	5,900	7,000	10,200
	J_WCT009_40	3.28	1,700	2,700	3,700	5,000	6,400	7,700	11,400
	J_WCT009_40_WCT009_50	3.95	2,100	3,200	4,400	5,900	7,700	9,300	13,600
	J_WCT009_50	0.67	530	740	940	1,200	1,400	1,700	2,400
	J_WCT009_60	4.13	2,000	3,200	4,400	6,000	7,800	9,400	14,000
	J_WCT009_60_WCT298_20	5.07	2,300	3,700	5,200	7,000	9,200	11,100	16,600
Wilbarger Creek Tributary 9	J_WCT009_70	6.13	2,600	4,200	5,800	8,000	10,500	12,800	19,200
	J_WCT009_70_WCT286_20	6.63	2,600	4,300	6,000	8,300	11,100	13,600	20,400
	J_WCT009_80	6.94	2,600	4,300	6,000	8,400	11,200	13,800	20,900
Wilbarger Creek Tributary 018	J_WCT018_10	0.64	460	720	960	1,300	1,600	2,000	2,800
	J_WCT018_20	0.82	480	800	1,100	1,500	1,900	2,300	3,400
Wilbarger Creek Tributary 019	J_WCT019_10	0.08	90	130	170	220	260	310	430
Wilbarger Creek Tributary 020	J_WCT020_10	0.12	110	160	200	260	320	370	520
Wilbarger Creek Tributary 021	J_WCT021_10	0.15	160	230	300	380	470	560	780
Wilbarger Creek Tributary 024	J_WCT024_10	0.51	330	480	620	810	1,000	1,200	1,700
	J_WCT024_20	0.76	420	620	830	1,100	1,400	1,600	2,400
	J_WCT024_20_WCT025_10	1.12	640	970	1,300	1,700	2,200	2,600	3,800
	J_WCT024_30	1.17	650	990	1,300	1,800	2,200	2,700	3,900
	J_WCT024_30_WCT026_10	1.27	720	1,100	1,400	1,900	2,400	2,900	4,200
	J_WCT024_40	1.62	820	1,200	1,600	2,200	2,800	3,400	5,000
Wilbarger Creek Tributary 025	J_WCT025_10	0.36	350	500	640	830	1,000	1,200	1,700
Wilbarger Creek Tributary 026	J_WCT026_10	0.1	150	210	260	320	390	460	630
Wilbarger Creek Tributary 027	J_WCT027_10	0.39	380	540	680	860	1,000	1,200	1,700
Wilbarger Creek Tributary 030	J_WCT030_10	0.9	750	1,100	1,400	1,800	2,200	2,600	3,600
	J_WCT030_20	1.35	880	1,300	1,800	2,300	2,900	3,400	4,900
Wilbarger Creek Tributary 047	J_WCT047_10	0.42	490	660	810	1,000	1,200	1,400	1,900
	J_WCT047_20	0.97	780	1,100	1,400	1,800	2,200	2,600	3,700
	J_WCT047_30	1.95	1,200	1,700	2,200	2,800	3,600	4,300	6,100
	J_WCT047_30_WCT049_10	2.34	1,400	2,000	2,600	3,400	4,200	5,000	7,200
	J_WCT047_40	3.59	2,000	2,900	3,700	4,600	5,600	7,100	10,900
Wilbarger Creek Tributary 049	J_WCT049_10	0.39	490	660	810	1,000	1,200	1,400	1,900
Wilbarger Creek Tributary 056	J_WCT056_10	0.72	650	880	1,100	1,400	1,600	1,900	2,600
	J_WCT056_20	2.17	1,400	1,900	2,400	3,000	3,700	4,600	6,700
	J_WCT056_20_WCT062_20	3.82	2,500	3,600	4,500	5,700	7,000	8,300	12,300
	J_WCT056_30	4.02	2,500	3,600	4,600	5,800	7,200	8,500	12,600
	J_WCT056_30_WCT056_40	4.68	2,900	4,100	5,200	6,700	8,200	9,700	14,300
	J_WCT056_40	0.66	840	1,100	1,400	1,700	2,000	2,400	3,200
	J_WCT056_50	5.98	3,400	4,900	6,400	8,300	10,300	12,300	18,000
	J_WCT056_50_WCT070_10	6.52	3,600	5,200	6,800	8,800	11,100	13,200	19,300
	J_WCT056_60	8.4	3,800	5,600	7,400	9,900	12,600	15,300	22,900
	J_WCT056_60_WCT047_40	11.99	4,700	7,200	9,600	13,300	17,200	20,800	31,400
	J_WCT056_70	12.82	4,700	7,200	9,700	13,500	17,600	21,400	32,800
	J_WCT056_70_WCT056_80	14.93	5,100	7,900	10,800	15,200	19,900	24,500	37,800
	J_WCT056_80	2.11	1,300	1,800	2,200	2,800	3,400	4,000	5,600
	J_WCT056_90	15.45	5,100	7,800	10,700	15,000	19,800	24,400	38,100
Wilbarger Creek Tributary 062	J_WCT062_05	0.56	560	760	930	1,200	1,400	1,600	2,200
	J_WCT062_05_WCT062_10	0.56	550	750	920	1,100	1,400	1,600	2,200
	J_WCT062_10	1.33	960	1,400	1,700	2,200	2,700	3,200	4,700
	J_WCT062_20	1.65	1,200	1,700	2,200	2,700	3,300	3,900	5,700
Wilbarger Creek Tributary 070	J_WCT070_10	0.54	660	900	1,100	1,400	1,600	1,900	2,600
Wilbarger Creek Tributary 080	J_WCT080_05	0.25	280	390	480	610	740	860	1,200
	J_WCT080_10	0.51	400	560	710	940	1,300	1,500	2,200
	J_WCT080_10_WCT086_20	1.1	1,000	1,400	1,800	2,300	2,800	3,300	4,800
	J_WCT080_20	1.44	1,300	1,800	2,200	2,800	3,500	4,100	5,900
	J_WCT080_20_WCT085_10	1.82	1,600	2,300	2,900	3,600	4,400	5,200	7,400
	J_WCT080_30	2.42	1,800	2,600	3,300	4,200	5,200	6,200	8,900
	J_WCT080_30_WCT080_40	3.17	2,300	3,300	4,100	5,200	6,400	7,600	11,000
	J_WCT080_40	0.75	480	660	820	1,000	1,300	1,500	2,100
	J_WCT080_50	4.15	2,400	3,500	4,500	5,800	7,300	8,800	12,900
	J_WCT080_50_WCT082_20	5.59	2,900	4,200	5,400	7,100	9,000	11,100	16,700
	J_WCT080_60	7.3	3,100	4,500	5,900	7,800	10,000	12,500	19,100
Wilbarger Creek Tributary 082	J_WCT082_10	0.33	550	730	890	1,100	1,300	1,500	2,000
	J_WCT082_10_WCT082_15	0.62	850	1,100	1,400	1,700	2,100	2,400	3,300
	J_WCT082_15	0.29	350	470	580	710	860	990	1,400

Wilbarger Creek Watershed			Existing Flows (cfs)						
Stream Name	Hydrologic Element	DA (Sq. Miles)	50% ACE	20% ACE	10% ACE	4% ACE	2% ACE	1% ACE	0.2% ACE
			City of Austin Atlas 14 Rainfall						
	J_WCT082_20	1.44	1,500	2,000	2,400	3,000	3,500	4,000	5,900
Wilbarger Creek Tributary 085	J_WCT085_10	0.38	370	510	630	780	950	1,100	1,500
Wilbarger Creek Tributary 086	J_WCT086_10	0.26	340	470	580	720	870	1,000	1,400
	J_WCT086_20	0.59	700	970	1,200	1,500	1,800	2,100	2,900
Wilbarger Creek Tributary 113	J_WCT113_10	0.31	330	440	540	670	810	940	1,300
	J_WCT113_20	1.52	1,000	1,400	1,700	2,200	2,700	3,200	4,700
	J_WCT113_30	2.69	1,800	2,500	3,100	3,900	4,600	5,800	8,300
	J_WCT113_40	3.83	1,900	2,800	3,600	4,700	5,700	6,800	10,900
	J_WCT113_50	5.24	2,000	2,800	3,800	5,100	6,400	7,800	12,600
Wilbarger Creek Tributary 138	J_WCT138_10	2.69	1,100	1,600	2,000	2,500	3,100	3,700	5,400
	J_WCT138_20	1.21	730	1,000	1,300	1,600	1,900	2,300	3,200
	J_WCT138_30	4.75	1,700	2,400	3,100	4,000	5,000	6,000	8,900
Wilbarger Creek Tributary 165	J_WCT165_10	0.13	170	240	300	370	440	520	700
Wilbarger Creek Tributary 167	J_WCT167_10	0.44	360	490	610	770	940	1,100	1,500
	J_WCT167_20	1.6	1,200	1,600	2,000	2,500	3,000	3,600	5,200
	J_WCT167_20_WCT165_10	1.73	1,300	1,800	2,200	2,800	3,400	4,100	5,800
	J_WCT167_30	1.88	1,300	1,900	2,400	3,100	3,800	4,400	6,300
	J_WCT167_40	1.99	1,300	2,000	2,500	3,200	3,900	4,600	6,600
Wilbarger Creek Tributary 169	J_WCT169_10	0.74	530	740	930	1,200	1,500	1,700	2,400
Wilbarger Creek Tributary 171	J_WCT171_10	0.77	880	1,200	1,600	2,000	2,400	2,800	3,900
	J_WCT171_20	0.99	1,000	1,400	1,700	2,200	2,800	3,300	4,700
	J_WCT171_20_WCT169_10	1.73	1,400	2,000	2,500	3,200	4,000	4,700	6,600
	J_WCT171_30	2.1	1,500	2,200	2,800	3,500	4,400	5,300	7,600
Wilbarger Creek Tributary 220	J_WCT220_10	1.02	1,300	1,700	2,000	2,400	2,900	3,300	4,500
	J_WCT220_20	2.22	1,900	2,500	3,100	3,900	4,700	5,600	8,100
	J_WCT220_30	3.29	2,100	2,900	3,500	4,400	5,600	6,800	10,200
	J_WCT220_40	3.67	2,100	2,900	3,600	4,500	5,700	7,000	10,700
Wilbarger Creek Tributary 227	J_WCT227_10	0.55	750	1,000	1,300	1,600	1,900	2,200	2,900
	J_WCT227_20	1.17	1,200	1,700	2,100	2,500	3,000	3,500	4,500
	J_WCT227_30	1.45	1,300	1,900	2,400	2,900	3,500	4,100	5,500
Wilbarger Creek Tributary 229	J_WCT229_10	0.44	430	600	760	960	1,200	1,400	1,900
Wilbarger Creek Tributary 260	J_WCT260_10	0.68	780	1,100	1,300	1,700	2,000	2,300	3,200
	J_WCT260_20	0.97	920	1,200	1,500	1,700	2,100	2,400	4,100
Wilbarger Creek Tributary 286	J_WCT286_10	0.17	160	230	290	360	450	530	730
	J_WCT286_20	0.5	310	430	550	690	850	1,000	1,500
Wilbarger Creek Tributary 298	J_WCT298_10	0.62	540	770	980	1,200	1,500	1,800	2,500
	J_WCT298_20	0.94	620	900	1,200	1,500	1,900	2,300	3,300
Wilbarger Creek Tributary 304	J_WCT304_10	0.42	590	840	1,100	1,400	1,700	2,000	2,700
	J_WCT304_10_WCT304_20	0.42	480	730	960	1,300	1,600	1,800	2,600
	J_WCT304_20	0.5	490	750	990	1,300	1,700	2,000	2,900
Wilbarger Creek Tributary 305	J_WCT305_10	0.58	490	700	900	1,100	1,400	1,700	2,300
	J_WCT305_10_WCT305_20	0.58	480	690	880	1,100	1,400	1,600	2,300
	J_WCT305_20	1.09	780	1,200	1,500	2,000	2,500	2,900	4,200
Wilbarger Creek Tributary 307	J_WCT307_10	1.17	720	1,100	1,500	1,900	2,400	2,900	4,200
	J_WCT307_20	1.6	860	1,300	1,700	2,300	2,900	3,500	5,400
Wilbarger Creek Tributary 326	J_WCT326_10	0.12	180	260	330	430	520	610	840
	J_WCT326_20	0.49	460	670	860	1,100	1,400	1,600	2,200
	J_WCT326_20_WCT328_10	0.83	800	1,200	1,500	1,900	2,400	2,800	3,900
Wilbarger Creek Tributary 328	J_WCT328_10	0.34	360	520	660	840	1,000	1,200	1,700
Wilbarger Creek Tributary 346	J_WCT346_10	0.36	130	230	330	460	610	750	1,100
	J_WCT346_20	0.93	150	320	510	780	1,100	1,400	2,300
	J_WC_110_WCT210_70	22.8	9,800	13,600	17,800	22,900	29,000	35,200	55,000
	J_WC_120	24.09	9,700	13,700	17,900	23,000	29,200	35,700	56,000
	J_WC_130	25.76	9,700	13,900	18,300	23,600	30,100	36,900	58,100
	J_WC_130_WCT220_40	29.43	10,100	14,800	19,700	25,300	32,600	40,300	63,700
	J_WC_140	29.45	10,100	14,800	19,600	25,300	32,600	40,300	63,600
	J_WC_140_WCT227_30	30.9	10,200	15,000	19,900	25,600	33,100	40,900	64,700
	J_WC_150	31.42	10,200	15,000	19,900	25,800	33,300	41,300	65,300
	J_WC_150_WCT171_30	33.52	10,300	15,200	20,300	26,300	34,100	42,300	67,000
	J_WC_160	33.83	10,200	15,100	20,200	26,300	34,100	42,300	67,000
	J_WC_160_WCT229_10	34.27	10,300	15,200	20,300	26,400	34,200	42,400	67,300
	J_WC_170	35.49	10,200	15,100	20,200	26,500	34,200	42,700	67,600
	J_WC_180	35.91	10,100	15,000	20,000	26,500	34,100	42,700	67,700
	J_WC_190	36.12	10,000	14,900	20,000	26,500	34,100	42,700	67,600
	J_WC_190_WCT167_40	38.11	10,100	15,100	20,200	26,900	34,600	43,400	68,800
	J_WC_200	39.31	10,100	15,000	20,200	27,000	34,700	43,500	69,200
	J_WC_210	40.19	10,000	15,000	20,200	27,000	34,700	43,600	69,300
	J_WC_220	40.43	10,000	15,000	20,200	27,000	34,700	43,600	69,300
	J_WC_220_WC_230	41.1	10,000	15,000	20,200	27,100	34,800	43,700	69,500

Wilbarger Creek Watershed			Existing Flows (cfs)						
Stream Name	Hydrologic Element	DA (Sq. Miles)	50% ACE	20% ACE	10% ACE	4% ACE	2% ACE	1% ACE	0.2% ACE
			City of Austin Atlas 14 Rainfall						
Wilbarger Creek	J_WC_230	0.67	600	830	1,000	1,300	1,600	1,800	2,600
	J_WC_240	41.25	10,000	14,900	20,100	27,000	34,800	43,600	69,400
	J_WC_240_WC_250	43	10,000	15,000	20,300	27,200	35,000	44,000	70,400
	J_WC_250	1.75	1,000	1,400	1,800	2,300	2,900	3,400	4,900
	J_WC_260	44.27	10,000	15,000	20,300	27,300	35,200	44,200	70,900
	J_WC_270	45.39	10,000	15,000	20,300	27,300	35,200	44,200	71,100
	J_WC_270_WC_280	46.06	10,000	15,000	20,300	27,400	35,300	44,400	71,300
	J_WC_280	0.67	520	720	900	1,100	1,400	1,600	2,300
	J_WC_290	46.11	10,000	15,000	20,300	27,400	35,300	44,300	71,300
	J_WC_290_WC_300	47.05	10,000	15,000	20,400	27,400	35,400	44,500	71,500
	J_WC_300	0.94	920	1,300	1,700	2,200	2,700	3,200	4,400
	J_WC_310	47.94	9,900	14,900	20,300	27,400	35,400	44,500	71,600
	J_WC_310_WC_320	48.67	9,900	15,000	20,300	27,400	35,400	44,600	71,800
	J_WC_320	0.73	490	720	930	1,200	1,500	1,800	2,500
	J_WC_330	48.78	9,800	14,900	20,300	27,400	35,400	44,500	71,800
	J_WC_330_CC_90_WLC_100	111.65	21,700	33,700	45,200	62,500	82,200	101,900	173,500
	J_WC_340	111.67	21,700	33,600	45,100	62,400	82,100	101,900	173,300
	J_WC_340_DCW_90	130.22	25,100	38,200	51,300	71,400	93,300	118,300	197,700
	J_WC_350	130.63	25,000	38,000	51,200	71,200	93,200	118,200	197,500
	J_WC_360	132.6	25,000	38,000	51,200	71,200	93,300	118,500	197,900
	J_WC_370	133.03	24,900	37,900	51,100	71,100	93,200	118,500	197,800
	J_WC_370_WCT009_80	139.97	25,300	38,400	52,000	72,300	95,000	121,000	201,900
	J_WC_380	141.13	25,200	38,300	51,900	72,300	95,000	121,100	202,000
	J_WC_380_WCT006_30	144.43	25,300	38,500	52,200	72,600	95,500	121,800	203,100
	J_WC_390	145.94	25,300	38,400	52,100	72,500	95,600	121,900	203,300
	J_WC_390_WCT304_20	146.44	25,300	38,400	52,200	72,600	95,600	122,000	203,400
	J_WC_400	146.62	25,200	38,400	52,100	72,500	95,500	121,900	203,300
	J_WC_400_WCT305_20	147.71	25,200	38,400	52,100	72,500	95,600	122,100	203,600
	J_WC_410	147.91	25,200	38,300	52,100	72,400	95,500	122,000	203,500
	J_WC_410_WCT027_10	148.3	25,200	38,300	52,100	72,400	95,500	122,100	203,600
	J_WC_410_WCT027_10_LC_40	160.26	25,800	39,200	53,500	74,600	99,000	126,800	213,500
	J_WC_420	160.52	25,700	39,100	53,400	74,500	98,900	126,700	213,500
	J_WC_420_WCT024_40	162.14	25,700	39,100	53,500	74,600	99,000	127,000	214,000
	J_WC_430	162.43	25,600	39,000	53,300	74,500	98,900	126,800	213,900
	J_WC_430_WCT326_20_WCT328_10	163.26	25,600	39,000	53,300	74,500	99,000	126,900	214,100
	J_WC_440	164.86	25,500	38,900	53,300	74,400	98,800	126,800	214,300
	J_WC_440_WCT004_70	169.96	25,700	39,100	53,500	74,800	99,400	127,600	216,000
	J_WC_450	170.21	25,600	39,000	53,500	74,800	99,400	127,600	216,100
	J_WC_450_WCT003_20	171.77	25,600	39,100	53,600	74,900	99,500	127,700	216,400
	J_WC_460	172.55	25,400	38,800	53,300	74,500	99,100	127,400	216,500
	J_WC_460_WC_490	175.55	25,500	38,900	53,400	74,600	99,300	127,700	217,200
	J_WC_470	0.58	230	380	530	740	960	1,200	1,800
	J_WC_480	1.83	990	1,500	1,900	2,600	3,200	3,900	5,800
	J_WC_490	3	1,400	2,200	2,800	3,600	4,500	5,400	8,200
	J_WC_500	176.81	25,400	38,900	53,400	74,700	99,300	127,700	217,400
Wilbarger Creek	J_WC_500_WCT346_20	177.74	25,400	38,900	53,500	74,700	99,400	127,800	217,700
	J_WC_510	177.94	25,400	38,900	53,400	74,700	99,400	127,800	217,700
	J_WC_510_WCT001_20	179.82	25,400	38,900	53,500	74,800	99,500	128,000	218,200
	J_WC_520	179.96	25,400	38,900	53,500	74,800	99,500	128,000	218,200
	J_WC_530	180.61	25,300	38,800	53,300	74,700	99,400	128,000	218,300
	J_WLC_10	1.93	1,400	1,900	2,400	3,000	3,600	4,300	6,000
	J_WLC_10_WLC_20_WLC_30	3.96	3,200	4,400	5,400	6,800	8,200	9,600	13,400
	J_WLC_100	22.7	6,500	9,800	12,800	16,900	21,400	26,400	42,700
	J_WLC_20	0.98	1,100	1,500	1,900	2,300	2,800	3,200	4,400
	J_WLC_30	1.05	1,000	1,400	1,700	2,100	2,600	3,000	4,100
	J_WLC_40	5.58	3,700	5,100	6,600	8,400	10,400	12,400	17,900
	J_WLC_50	6.01	3,700	5,100	6,500	8,400	10,500	12,600	18,400
	J_WLC_50_WCT138_30	10.76	5,400	7,500	9,700	12,400	15,500	18,500	27,100
	J_WLC_60	11.52	5,400	7,600	9,700	12,500	15,600	18,800	27,800
	J_WLC_60_WLC_70	12.4	5,500	7,800	10,000	13,000	16,300	19,700	29,300
	J_WLC_70	0.88	820	1,100	1,400	1,700	2,100	2,400	3,400
	J_WLC_80	13.58	5,500	7,800	10,000	13,100	16,400	19,900	29,800
	J_WLC_90	15.23	5,400	7,700	10,100	13,200	16,800	19,900	31,400
	J_WLC_90_LWC_50	20.96	6,900	10,100	13,200	17,400	22,300	26,600	42,700

Appendix E: Hydrologic Model Analysis

E-7 Hydrology Results – Computed Subbasin Discharge Existing

Wilbarger Creek Watershed			Existing Flows (cfs)						
Stream Name	Hydrologic Element	DA (Sq. Miles)	50% ACE	20% ACE	10% ACE	4% ACE	2% ACE	1% ACE	0.2% ACE
			City of Pflugerville Atlas 14 Rainfall						
Wilbarger Creek	WC_10	0.56	890	1,200	1,400	1,800	2,000	2,300	3,100
	WC_20	0.42	700	900	1,100	1,400	1,600	1,800	2,400
	WC_30	0.13	230	310	370	470	540	630	830
	WC_40	0.41	910	1,200	1,400	1,800	2,000	2,300	3,000
	WC_50	0.39	600	780	940	1,200	1,400	1,600	2,100
	WC_60	1.09	880	1,200	1,400	1,800	2,100	2,400	3,300
	WC_70	0.37	610	800	960	1,200	1,400	1,600	2,100
	WC_80	1.53	1,500	1,900	2,400	3,000	3,500	4,000	5,500
	WC_90	0.48	530	710	870	1,100	1,300	1,500	2,000
	WC_100	0.56	640	860	1,000	1,300	1,500	1,800	2,400
	WC_110	0.66	650	870	1,100	1,400	1,600	1,800	2,500
Wilbarger Creek Tributary 178	WCT178_10	0.26	480	640	780	990	1,100	1,300	1,800
	WCT178_20	0.09	190	250	300	380	440	510	680
Wilbarger Creek Tributary 183	WCT183_10	0.47	680	890	1,100	1,400	1,600	1,800	2,400
	WCT183_20	0.04	50	60	80	100	110	130	180
Wilbarger Creek Tributary 185	WCT185_10	0.58	750	970	1,200	1,500	1,700	1,900	2,600
	WCT185_20	0.14	280	370	440	550	630	730	960
Wilbarger Creek Tributary 186	WCT186_10	0.37	530	690	830	1,000	1,200	1,400	1,800
	WCT186_20	0.23	290	390	470	590	690	800	1,100
Wilbarger Creek Tributary 187	WCT187_10	0.33	820	1,100	1,300	1,600	1,800	2,000	2,700
	WCT187_20	0.08	150	200	240	310	360	410	540
Wilbarger Creek Tributary 196	WCT196_10	0.32	510	650	770	960	1,100	1,300	1,700
	WCT196_15	0.5	540	730	890	1,100	1,300	1,500	2,100
	WCT196_20	1.21	2,200	2,900	3,400	4,200	4,900	5,600	7,300
	WCT196_30	0.64	590	810	1,000	1,300	1,500	1,800	2,400
Wilbarger Creek Tributary 200	WCT200_05	0.77	860	1,100	1,400	1,700	2,000	2,400	3,200
	WCT200_10	0.88	1,100	1,500	1,800	2,300	2,600	3,100	4,100
	WCT200_20	0.8	920	1,200	1,400	1,800	2,100	2,400	3,200
	WCT200_30	0.67	880	1,200	1,400	1,800	2,000	2,300	3,100
	WCT200_40	0.32	460	600	730	910	1,100	1,200	1,600
	WCT200_45	0.07	110	140	170	220	250	290	390
	WCT200_50	0.28	380	520	640	810	950	1,100	1,500
Wilbarger Creek Tributary 206	WCT206_10	0.55	1,100	1,400	1,600	2,000	2,300	2,600	3,400
	WCT206_20	0.18	360	460	550	690	790	900	1,200
Wilbarger Creek Tributary 207	WCT207_10	0.13	230	300	360	450	520	600	790
	WCT207_20	0.09	210	280	340	420	490	560	740
Wilbarger Creek Tributary 208	WCT208_10	0.16	390	510	610	760	880	1,000	1,300
	WCT208_20	0.14	180	250	300	390	460	530	710
	WCT208_30	0.21	200	270	330	410	480	560	760
Wilbarger Creek Tributary 209	WCT209_10	0.09	170	220	270	340	390	450	590
	WCT209_20	0.09	180	230	280	350	400	460	600
Wilbarger Creek Tributary 210	WCT210_10	0.73	990	1,300	1,600	1,900	2,300	2,600	3,500
	WCT210_20	0.34	630	820	1,000	1,200	1,400	1,700	2,200
	WCT210_25	0.35	700	910	1,100	1,400	1,600	1,800	2,400
	WCT210_30	0.69	870	1,100	1,400	1,700	2,000	2,300	3,100
	WCT210_40	0.26	350	460	560	700	810	930	1,200
	WCT210_50	0.78	630	850	1,000	1,300	1,600	1,800	2,500
	WCT210_60	0.66	470	650	800	1,000	1,200	1,400	2,000
	WCT210_70	0.47	370	500	630	800	950	1,100	1,500
Wilbarger Creek Tributary 216	WCT216_10	0.56	620	820	1,000	1,300	1,500	1,700	2,300
	WCT216_20	0.38	560	740	890	1,100	1,300	1,500	2,000
	WCT216_30	0.29	420	550	670	830	970	1,100	1,500

Wilbarger Creek Watershed			Existing Flows (cfs)						
Stream Name	Hydrologic Element	DA (Sq. Miles)	50% ACE	20% ACE	10% ACE	4% ACE	2% ACE	1% ACE	0.2% ACE
			City of Austin Atlas 14 Rainfall						
Cottonmouth Creek	CC_10	2.31	1,900	2,600	3,200	4,000	4,800	5,600	7,800
	CC_20	0.23	240	330	410	520	630	730	1,000
	CC_30	2.3	1,700	2,300	2,900	3,600	4,400	5,200	7,200
	CC_40	1.59	1,300	1,700	2,100	2,600	3,200	3,700	5,200
	CC_50	1.48	1,200	1,600	2,000	2,500	3,100	3,600	5,100
	CC_60	0.38	340	480	600	750	920	1,100	1,500
	CC_70	1.43	1,200	1,700	2,100	2,700	3,300	3,800	5,300
	CC_80	1.63	900	1,300	1,600	2,100	2,600	3,000	4,400
	CC_90	0.83	690	980	1,200	1,600	1,900	2,300	3,200
Dry Creek West	DCW_10	1.66	970	1,400	1,700	2,200	2,700	3,200	4,700
	DCW_20	2.06	1,100	1,600	2,000	2,600	3,200	3,700	5,400
	DCW_30	0.49	460	630	790	980	1,200	1,400	1,900
	DCW_40	0.55	460	650	810	1,000	1,300	1,500	2,100
	DCW_50	1.15	770	1,100	1,300	1,700	2,100	2,400	3,500
	DCW_60	1.46	980	1,400	1,800	2,200	2,700	3,200	4,600
	DCW_70	0.79	700	970	1,200	1,500	1,800	2,100	2,900
	DCW_80	0.8	730	1,000	1,300	1,700	2,000	2,400	3,300
	DCW_90	0.93	670	970	1,200	1,600	2,000	2,300	3,300
Elm Creek Tributary 1	ECT001_10	0.46	620	880	1,100	1,400	1,700	2,000	2,800
	ECT001_20	0.53	820	1,200	1,500	2,000	2,400	2,800	3,900
Elm Creek	EC_10	0.42	300	430	550	700	860	1,000	1,500
	EC_20	1.86	1,500	2,100	2,700	3,500	4,300	5,000	7,100
	EC_30	1.61	1,400	2,000	2,500	3,200	3,900	4,600	6,400
	EC_40	0.45	390	560	720	920	1,100	1,300	1,900
	EC_50	0.72	1,100	1,500	1,900	2,400	2,900	3,300	4,600
	EC_60	0.28	440	620	780	990	1,200	1,400	1,900
	EC_70	0.61	550	770	970	1,200	1,500	1,800	2,400
	EC_80	0.75	930	1,300	1,600	2,000	2,500	2,900	4,000
Harris Branch South	HBS_10	1.11	640	940	1,200	1,600	2,000	2,300	3,400
	HBS_20	1.04	660	940	1,200	1,500	1,900	2,200	3,200
	HBS_30	0.42	390	540	680	860	1,100	1,200	1,700
Lockwood Creek	LC_10	3.89	1,600	2,300	3,000	4,000	5,000	6,000	8,900
	LC_20	1.77	780	1,100	1,500	1,900	2,400	2,900	4,300
	LC_30	1.34	840	1,200	1,600	2,000	2,500	3,000	4,300
	LC_40	0.79	540	780	1,000	1,300	1,600	1,900	2,700
Little Willow Creek	LWC_10	0.84	620	840	1,000	1,300	1,600	1,900	2,600
	LWC_20	1.24	960	1,300	1,600	2,000	2,500	2,900	4,000
	LWC_30	1.15	850	1,200	1,500	1,900	2,300	2,700	3,700
	LWC_40	1.51	1,100	1,500	1,800	2,300	2,800	3,300	4,600
	LWC_50	0.99	530	750	950	1,200	1,500	1,800	2,600
Wilbarger Creek Tributary 1	WCT001_10	0.58	340	540	740	1,000	1,300	1,600	2,300
	WCT001_20	1.3	800	1,300	1,700	2,200	2,800	3,400	5,000
Wilbarger Creek Tributary 3	WCT003_10	1.02	250	500	760	1,100	1,600	2,000	3,200
	WCT003_20	0.54	330	490	650	850	1,100	1,300	1,900
Wilbarger Creek Tributary 4	WCT004_10	1.88	930	1,400	1,800	2,300	2,800	3,400	4,900
	WCT004_20	1.3	640	1,000	1,400	1,900	2,500	3,000	4,500
	WCT004_30	0.38	350	520	670	870	1,100	1,300	1,800
	WCT004_40	0.06	70	110	150	200	250	290	410
	WCT004_50	0.08	120	170	220	280	350	410	570
	WCT004_60	0.07	80	120	150	200	240	280	400
	WCT004_70	0.16	140	220	290	380	480	570	820

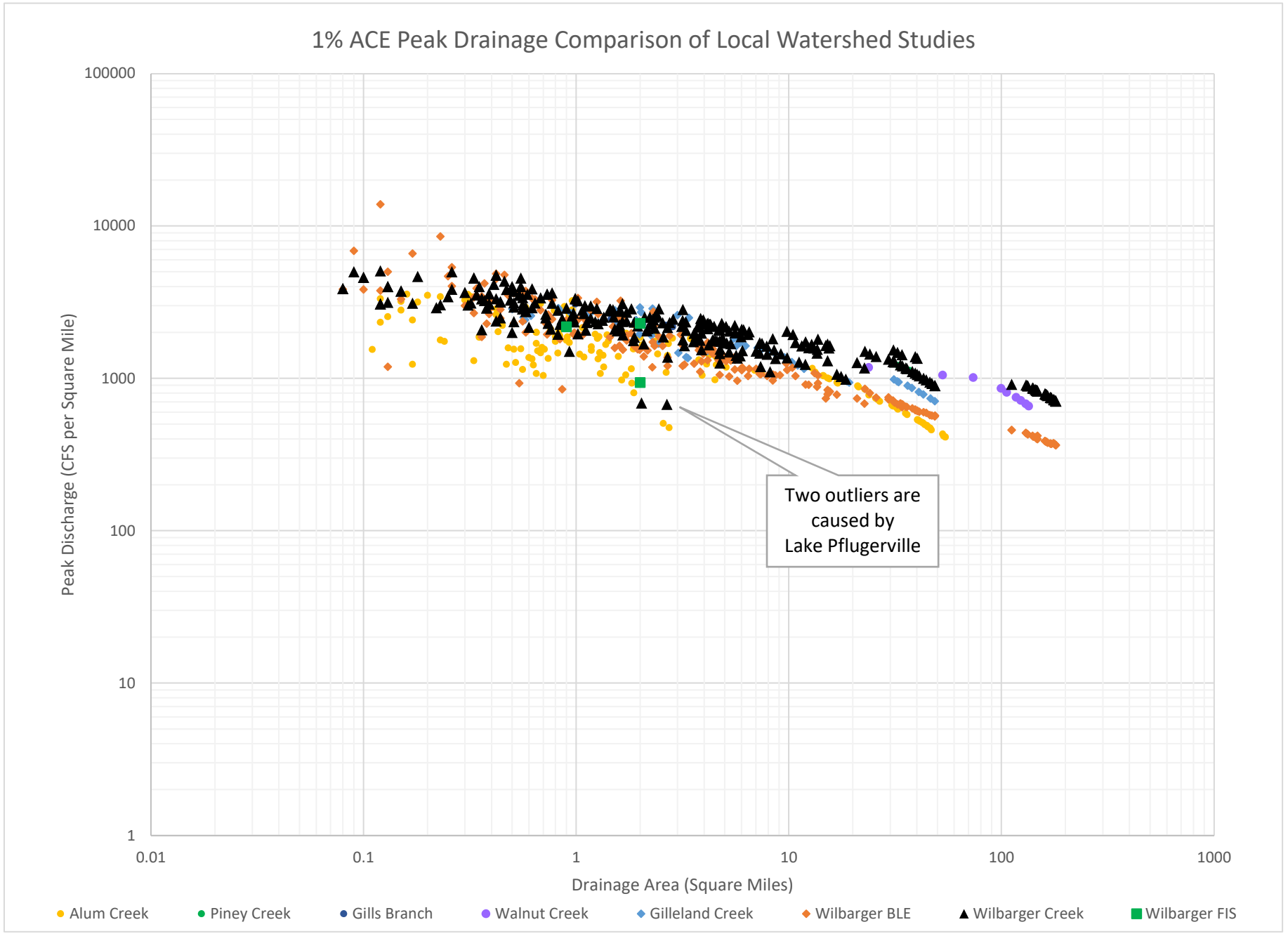
Wilbarger Creek Watershed			Existing Flows (cfs)						
Stream Name	Hydrologic Element	DA (Sq. Miles)	50% ACE	20% ACE	10% ACE	4% ACE	2% ACE	1% ACE	0.2% ACE
			City of Austin Atlas 14 Rainfall						
Wilbarger Creek Tributary 6	WCT006_10	0.86	620	900	1,100	1,500	1,800	2,100	3,000
	WCT006_20	1	650	960	1,200	1,600	2,000	2,400	3,500
	WCT006_30	0.09	140	200	250	310	380	440	600
Wilbarger Creek Tributary 9	WCT009_10	0.23	220	310	390	490	590	700	970
	WCT009_20	1.27	1,000	1,500	1,900	2,500	3,100	3,600	5,200
	WCT009_30	1.36	1,000	1,500	1,900	2,500	3,100	3,600	5,200
	WCT009_40	0.42	290	430	560	730	920	1,100	1,600
	WCT009_50	0.67	530	740	940	1,200	1,400	1,700	2,400
	WCT009_60	0.18	150	220	290	370	460	540	770
	WCT009_70	1.06	530	780	1,000	1,300	1,600	2,000	2,900
	WCT009_80	0.31	310	440	560	710	870	1,000	1,400
Wilbarger Creek Tributary 018	WCT018_10	0.64	460	720	960	1,300	1,600	2,000	2,800
	WCT018_20	0.18	200	290	370	480	590	690	960
Wilbarger Creek Tributary 019	WCT019_10	0.08	90	130	170	220	260	310	430
Wilbarger Creek Tributary 020	WCT020_10	0.12	110	160	200	260	320	370	520
Wilbarger Creek Tributary 021	WCT021_10	0.15	160	230	300	380	470	560	780
Wilbarger Creek Tributary 024	WCT024_10	0.51	330	480	620	810	1,000	1,200	1,700
	WCT024_20	0.25	190	280	370	470	590	700	990
	WCT024_30	0.05	70	90	120	150	190	220	300
	WCT024_40	0.35	350	500	650	830	1,000	1,200	1,700
Wilbarger Creek Tributary 025	WCT025_10	0.36	350	500	640	830	1,000	1,200	1,700
Wilbarger Creek Tributary 026	WCT026_10	0.1	150	210	260	320	390	460	630
Wilbarger Creek Tributary 027	WCT027_10	0.39	380	540	680	860	1,000	1,200	1,700
Wilbarger Creek Tributary 030	WCT030_10	0.9	750	1,100	1,400	1,800	2,200	2,600	3,600
	WCT030_20	0.45	460	660	840	1,100	1,300	1,500	2,200
Wilbarger Creek Tributary 047	WCT047_10	0.42	490	660	810	1,000	1,200	1,400	1,900
	WCT047_20	0.55	560	750	930	1,100	1,400	1,600	2,200
	WCT047_30	0.98	890	1,200	1,500	1,900	2,300	2,700	3,700
	WCT047_40	1.25	1,100	1,500	1,900	2,400	2,900	3,400	4,700
Wilbarger Creek Tributary 049	WCT049_10	0.39	490	660	810	1,000	1,200	1,400	1,900
Wilbarger Creek Tributary 056	WCT056_10	0.72	650	880	1,100	1,400	1,600	1,900	2,600
	WCT056_20	1.45	1,300	1,700	2,100	2,700	3,200	3,700	5,200
	WCT056_30	0.2	330	440	540	660	790	900	1,200
	WCT056_40	0.66	840	1,100	1,400	1,700	2,000	2,400	3,200
	WCT056_50	1.3	1,100	1,500	1,900	2,300	2,800	3,200	4,500
	WCT056_60	1.88	1,300	1,800	2,200	2,800	3,400	4,000	5,700
	WCT056_70	0.83	580	820	1,000	1,300	1,600	1,900	2,700
	WCT056_80	2.11	1,300	1,800	2,200	2,800	3,400	4,000	5,600
	WCT056_90	0.52	510	700	880	1,100	1,300	1,600	2,200
Wilbarger Creek Tributary 062	WCT062_05	0.56	560	760	930	1,200	1,400	1,600	2,200
	WCT062_10	0.77	890	1,200	1,500	1,800	2,200	2,500	3,500
	WCT062_20	0.32	330	440	550	680	820	950	1,300
Wilbarger Creek Tributary 070	WCT070_10	0.54	660	900	1,100	1,400	1,600	1,900	2,600
Wilbarger Creek Tributary 080	WCT080_05	0.25	280	390	480	610	740	860	1,200
	WCT080_10	0.26	250	350	440	550	680	790	1,100
	WCT080_20	0.34	290	400	500	620	750	880	1,200
	WCT080_30	0.6	640	870	1,100	1,400	1,600	1,900	2,600
	WCT080_40	0.75	480	660	820	1,000	1,300	1,500	2,100
	WCT080_50	0.98	850	1,100	1,400	1,800	2,100	2,500	3,500
	WCT080_60	1.71	1,400	1,900	2,400	2,900	3,600	4,200	5,800

Wilbarger Creek Watershed			Existing Flows (cfs)						
Stream Name	Hydrologic Element	DA (Sq. Miles)	50% ACE	20% ACE	10% ACE	4% ACE	2% ACE	1% ACE	0.2% ACE
			City of Austin Atlas 14 Rainfall						
Wilbarger Creek Tributary 082	WCT082_10	0.33	550	730	890	1,100	1,300	1,500	2,000
	WCT082_15	0.29	350	470	580	710	860	990	1,400
	WCT082_20	0.82	810	1,100	1,300	1,600	2,000	2,300	3,200
Wilbarger Creek Tributary 085	WCT085_10	0.38	370	510	630	780	950	1,100	1,500
Wilbarger Creek Tributary 086	WCT086_10	0.26	340	470	580	720	870	1,000	1,400
	WCT086_20	0.33	420	560	690	850	1,000	1,200	1,600
Wilbarger Creek Tributary 113	WCT113_10	0.31	330	440	540	670	810	940	1,300
	WCT113_20	1.21	970	1,300	1,700	2,100	2,600	3,000	4,200
	WCT113_30	1.17	900	1,300	1,600	2,000	2,400	2,900	4,000
	WCT113_40	1.14	710	1,000	1,300	1,700	2,100	2,400	3,500
	WCT113_50	1.41	830	1,200	1,500	2,000	2,500	2,900	4,200
Wilbarger Creek Tributary 138	WCT138_10	2.69	1,100	1,600	2,000	2,500	3,100	3,700	5,400
	WCT138_20	1.21	730	1,000	1,300	1,600	1,900	2,300	3,200
	WCT138_30	0.85	850	1,100	1,400	1,800	2,100	2,500	3,400
Wilbarger Creek Tributary 165	WCT165_10	0.13	170	240	300	370	440	520	700
Wilbarger Creek Tributary 167	WCT167_10	0.44	360	490	610	770	940	1,100	1,500
	WCT167_20	1.16	1,100	1,500	1,900	2,400	2,900	3,300	4,600
	WCT167_30	0.15	190	250	310	380	460	530	730
	WCT167_40	0.11	150	210	260	330	400	460	630
Wilbarger Creek Tributary 169	WCT169_10	0.74	530	740	930	1,200	1,500	1,700	2,400
Wilbarger Creek Tributary 171	WCT171_10	0.77	880	1,200	1,600	2,000	2,400	2,800	3,900
	WCT171_20	0.22	250	350	440	550	660	770	1,100
	WCT171_30	0.37	370	520	660	840	1,000	1,200	1,700
Wilbarger Creek Tributary 220	WCT220_10	1.02	1,300	1,700	2,000	2,400	2,900	3,300	4,500
	WCT220_20	1.2	990	1,400	1,700	2,100	2,600	3,000	4,200
	WCT220_30	1.07	970	1,300	1,700	2,100	2,500	2,900	4,100
	WCT220_40	0.38	380	520	640	800	970	1,100	1,600
Wilbarger Creek Tributary 227	WCT227_10	0.55	750	1,000	1,300	1,600	1,900	2,200	2,900
	WCT227_20	0.62	680	940	1,200	1,500	1,800	2,100	2,800
	WCT227_30	0.28	280	400	500	630	760	890	1,200
Wilbarger Creek Tributary 229	WCT229_10	0.44	430	600	760	960	1,200	1,400	1,900
Wilbarger Creek Tributary 260	WCT260_10	0.68	780	1,100	1,300	1,700	2,000	2,300	3,200
	WCT260_20	0.29	330	450	550	680	820	950	1,300
Wilbarger Creek Tributary 286	WCT286_10	0.17	160	230	290	360	450	530	730
	WCT286_20	0.33	310	430	540	690	840	980	1,400
Wilbarger Creek Tributary 298	WCT298_10	0.62	540	770	980	1,200	1,500	1,800	2,500
	WCT298_20	0.32	350	520	670	870	1,100	1,300	1,800
Wilbarger Creek Tributary 304	WCT304_10	0.42	590	840	1,100	1,400	1,700	2,000	2,700
	WCT304_20	0.08	100	150	190	240	300	350	490
Wilbarger Creek Tributary 305	WCT305_10	0.58	490	700	900	1,100	1,400	1,700	2,300
	WCT305_20	0.51	480	700	900	1,200	1,400	1,700	2,400
Wilbarger Creek Tributary 307	WCT307_10	1.17	720	1,100	1,500	1,900	2,400	2,900	4,200
	WCT307_20	0.43	360	530	680	870	1,100	1,300	1,800
Wilbarger Creek Tributary 326	WCT326_10	0.12	180	260	330	430	520	610	840
	WCT326_20	0.37	330	480	610	780	950	1,100	1,600
Wilbarger Creek Tributary 328	WCT328_10	0.34	360	520	660	840	1,000	1,200	1,700
Wilbarger Creek Tributary 346	WCT346_10	0.36	130	230	330	460	610	750	1,100
	WCT346_20	0.57	150	320	510	780	1,100	1,400	2,200

Wilbarger Creek Watershed			Existing Flows (cfs)						
Stream Name	Hydrologic Element	DA (Sq. Miles)	50% ACE	20% ACE	10% ACE	4% ACE	2% ACE	1% ACE	0.2% ACE
			City of Austin Atlas 14 Rainfall						
Wilbarger Creek	WC_120	1.29	1,100	1,600	1,900	2,400	2,900	3,300	4,600
	WC_130	1.67	930	1,300	1,600	2,100	2,600	3,000	4,400
	WC_140	0.02	10	20	30	40	40	50	80
	WC_150	0.52	260	370	470	600	740	880	1,300
	WC_160	0.31	260	370	460	580	710	830	1,200
	WC_170	1.22	1,300	1,700	2,100	2,700	3,200	3,800	5,200
	WC_180	0.42	570	770	950	1,200	1,400	1,700	2,300
	WC_190	0.21	270	370	460	570	690	810	1,100
	WC_200	1.2	800	1,200	1,500	1,900	2,400	2,800	4,000
	WC_210	0.88	1,200	1,600	2,100	2,600	3,200	3,800	5,200
	WC_220	0.24	330	470	600	770	950	1,100	1,500
	WC_230	0.67	600	830	1,000	1,300	1,600	1,800	2,600
	WC_240	0.15	160	230	300	390	490	580	810
	WC_250	1.75	1,000	1,400	1,800	2,300	2,900	3,400	4,900
	WC_260	1.27	710	1,000	1,400	1,800	2,200	2,600	3,800
	WC_270	1.12	900	1,300	1,600	2,100	2,500	3,000	4,200
	WC_280	0.67	520	720	900	1,100	1,400	1,600	2,300
	WC_290	0.05	80	110	140	170	210	240	330
	WC_300	0.94	920	1,300	1,700	2,200	2,700	3,200	4,400
	WC_310	0.89	740	1,000	1,300	1,600	2,000	2,400	3,300
	WC_320	0.73	490	720	930	1,200	1,500	1,800	2,500
	WC_330	0.11	150	210	260	320	390	450	610
	WC_340	0.02	20	20	30	30	40	50	70
	WC_350	0.41	450	640	810	1,000	1,300	1,500	2,000
	WC_360	1.97	1,400	1,900	2,500	3,100	3,900	4,600	6,500
	WC_370	0.43	630	890	1,100	1,400	1,700	2,000	2,700
	WC_380	1.16	1,400	2,000	2,500	3,200	3,900	4,500	6,200
	WC_390	1.51	1,200	1,800	2,300	2,900	3,500	4,100	5,800
	WC_400	0.18	200	280	360	460	570	660	920
	WC_410	0.2	280	410	520	670	830	970	1,300
	WC_420	0.26	390	550	690	860	1,000	1,200	1,700
	WC_430	0.29	420	590	740	930	1,100	1,300	1,800
	WC_440	1.6	1,600	2,300	2,900	3,700	4,500	5,300	7,400
	WC_450	0.25	380	540	690	880	1,100	1,300	1,700
	WC_460	0.78	310	540	760	1,100	1,400	1,700	2,700
	WC_470	0.58	230	380	530	740	960	1,200	1,800
	WC_480	1.25	980	1,400	1,900	2,400	3,000	3,500	5,000
	WC_490	1.17	1,200	1,700	2,200	2,700	3,400	3,900	5,500
	WC_500	1.26	460	710	960	1,300	1,700	2,000	3,000
	WC_510	0.2	170	250	330	440	550	650	930
	WC_520	0.14	140	200	250	310	380	450	620
	WC_530	0.65	400	600	790	1,000	1,300	1,600	2,300
Willow Creek	WLC_10	1.93	1,400	1,900	2,400	3,000	3,600	4,300	6,000
	WLC_20	0.98	1,100	1,500	1,900	2,300	2,800	3,200	4,400
	WLC_30	1.05	1,000	1,400	1,700	2,100	2,600	3,000	4,100
	WLC_40	1.62	1,500	2,000	2,500	3,100	3,800	4,400	6,100
	WLC_50	0.43	460	620	770	950	1,100	1,300	1,800
	WLC_60	0.76	1,000	1,300	1,600	2,000	2,400	2,800	3,800
	WLC_70	0.88	820	1,100	1,400	1,700	2,100	2,400	3,400
	WLC_80	1.18	1,700	2,300	2,800	3,500	4,200	4,800	6,500
	WLC_90	1.65	970	1,400	1,700	2,200	2,700	3,200	4,600
	WLC_100	1.74	1000	1500	1900	2500	3100	3600	5200

Appendix E: Hydrologic Model Analysis

E-8 Area Studies


1% ACE Peak Drainage Comparison of Local Watershed Studies
Peak Discharge (CFS per Square Mile)
100000
10000
1000
100
10
1
0.01
0.1
1
10
100
1000
Drainage Area (Square Miles)
Two outliers are caused by Lake Pflugerville
Alum Creek
Piney Creek
Gills Branch
Walnut Creek
Gilleland Creek
Wilbarger BLE
Wilbarger Creek
Wilbarger FIS

Appendix F: Hydraulic Model Analysis

F-1 HEC-RAS Flow Breaks

Wilbarger Creek Watershed			Existing Flows (cfs)						
Stream Name	Hydrologic Element	HEC-RAS Cross Section	50% ACE	20% ACE	10% ACE	4% ACE	2% ACE	1% ACE	0.2% ACE
Cottonmouth Creek	J_CC_10	63420	1,900	2,600	3,200	4,100	4,800	5,600	7,800
	J_CC_20_CC_30	60832	3,400	4,600	6,000	7,900	9,400	11,100	15,400
	J_CC_40	50968	3,500	4,800	6,500	8,700	10,500	12,500	18,300
	J_CC_40_WCT080_60	45028	6,500	9,300	12,300	16,800	20,500	24,800	37,100
	J_CC_50	35781	6,500	9,300	12,300	17,000	20,900	25,500	38,700
	J_CC_60	26161	6,500	9,300	12,300	17,000	20,900	25,500	38,700
	J_CC_60_WCT056_90	23889	11,300	16,600	22,000	30,600	38,400	47,700	73,600
	J_CC_70	21459	11,300	16,600	22,000	30,600	38,700	48,000	74,500
	J_CC_80	13357	11,300	16,600	22,000	30,800	39,100	48,700	76,100
	J_CC_80_WCT113_50	8616	12,100	17,000	23,600	34,200	43,600	54,500	85,800
	J_CC_90	3537	12,100	17,000	23,600	34,200	43,600	54,500	86,000
Dry Creek West	J_DCW_10	62105	970	1,400	1,700	2,300	2,700	3,200	4,700
	J_DCW_20	56347	1,800	2,600	3,400	4,600	5,500	6,700	9,700
	J_DCW_30	50716	1,800	2,700	3,500	4,700	5,800	7,000	10,300
	J_DCW_30_DCW_40	49436	1,900	2,800	3,700	5,000	6,100	7,400	11,100
	J_DCW_50	43396	1,900	2,900	3,900	5,500	6,800	8,300	12,800
	J_DCW_60	32630	2,000	2,900	3,900	5,600	7,100	8,800	14,000
	J_DCW_70	22401	2,000	2,900	3,900	5,700	7,200	9,000	14,500
	J_DCW_70_EC_80	18826	4,000	6,000	8,100	11,200	14,400	17,900	29,600
	J_DCW_80	15991	4,000	6,100	8,200	11,400	14,600	18,100	30,100
	J_DCW_90	7703	4,000	6,100	8,300	11,600	14,900	18,300	30,500
Elm Creek Tributary 1	J_ECT001_10	5825	620	880	1,100	1,500	1,700	2,000	2,800
	J_ECT001_20	1989	920	1,400	1,800	2,300	2,800	3,300	4,800
Elm Creek	J_EC_10	40560	300	360	550	720	860	1,000	1,500
	J_EC_20	32434	1,500	2,100	2,700	3,600	4,400	5,200	7,300
	J_EC_30	24345	1,900	2,900	3,700	5,100	6,300	7,700	11,500
	J_EC_30_ECT001_20	20771	2,400	3,400	4,400	6,000	7,300	9,000	13,600
	J_EC_40	18970	2,400	3,500	4,600	6,000	7,700	9,000	14,600
	J_EC_50	14026	2,400	3,600	4,700	6,200	7,900	9,200	15,400
	J_EC_50_WCT260_20	11017	2,600	4,000	5,200	6,900	8,900	10,600	17,800
	J_EC_60	9009	2,600	4,000	5,200	7,000	9,000	10,700	18,100
	J_EC_60_EC_70	7896	2,700	4,100	5,500	7,500	9,500	11,400	19,400
	J_EC_80	2770	2,700	4,200	5,600	7,600	9,700	11,700	20,100
Harris Branch South	J_HBS_10	17418	640	940	1,200	1,600	2,000	2,300	3,400
	J_HBS_20	11753	1,200	1,700	2,300	3,100	3,700	4,400	6,300
	J_HBS_30	3098	1,200	1,800	2,400	3,300	4,000	4,800	7,000
Lockwood Creek	J_LC_10	41106	1,600	2,300	3,000	4,100	5,000	6,000	8,900
	J_LC_20	30144	1,900	2,900	3,900	5,300	6,600	8,000	12,000
	J_LC_20_WCT307_20_HBS_30	23568	2,900	4,500	6,200	8,700	10,900	13,400	20,300
	J_LC_30	15960	3,000	4,700	6,400	9,100	11,500	14,300	22,000
	J_LC_40	7881	3,000	4,700	6,500	9,400	11,900	14,800	22,900
Little Willow Creek	J_LWC_10	40517	620	840	1,000	1,300	1,600	1,900	2,600
	J_LWC_20	34554	1,000	1,400	1,800	2,400	2,900	3,500	5,400
	J_LWC_30	26711	1,600	2,100	2,600	3,600	4,400	5,300	7,900
	J_LWC_40	15132	1,800	2,300	2,900	4,200	5,500	6,900	11,000
	J_LWC_50	3999	2,000	2,600	3,300	4,500	6,000	7,800	12,800
Wilbarger Creek Tributary 1	J_WCT001_10	15589	340	540	740	1,000	1,300	1,600	2,300
	J_WCT001_20	3926	800	1,300	1,700	2,400	2,900	3,500	5,700
Wilbarger Creek Tributary 3	J_WCT003_10	5811	250	500	760	1,200	1,600	2,000	3,200
	J_WCT003_20	2396	490	920	1,300	1,900	2,500	3,200	5,100
Wilbarger Creek Tributary 4	J_WCT004_10_WCT004_20	16327	1,400	2,100	2,800	3,800	4,700	5,700	8,500
	J_WCT004_30	12916	1,400	2,200	3,000	4,100	5,100	6,200	9,200
	J_WCT004_30_WCT018_20	9992	1,700	2,700	3,800	5,200	6,400	7,800	11,700
	J_WCT004_40	9170	1,700	2,800	3,800	5,200	6,500	7,900	11,800
	J_WCT004_40_WCT019_10	8654	1,700	2,800	3,800	5,300	6,600	8,000	12,000
	J_WCT004_50	7563	1,700	2,800	3,800	5,400	6,600	8,100	12,100
	J_WCT004_50_WCT020_10	6879	1,800	2,900	3,900	5,500	6,800	8,300	12,500
	J_WCT004_60	6006	1,800	2,900	3,900	5,500	6,900	8,400	12,700
	J_WCT004_60_WCT021_10	5429	1,800	2,900	4,000	5,700	7,000	8,600	13,000
	J_WCT004_70	3262	1,800	2,900	4,000	5,700	7,100	8,700	13,300
Wilbarger Creek Tributary 6	J_WCT006_10	16679	620	900	1,100	1,500	1,800	2,100	3,000
	J_WCT006_10	14918	620	900	1,100	1,500	1,800	2,100	3,000
	J_WCT006_20	8500	790	1,200	1,600	2,200	2,600	3,300	5,300
Wilbarger Creek Tributary 9	J_WCT009_10	41574	220	310	390	500	590	700	970
	J_WCT009_20	34884	1,000	1,500	2,000	2,600	3,200	3,800	5,400
	J_WCT009_30	27339	1,700	2,600	3,500	4,800	5,900	7,000	10,200
	J_WCT009_40	21688	1,700	2,700	3,700	5,200	6,400	7,700	11,400
	J_WCT009_40_WCT009_50	19566	2,100	3,200	4,400	6,200	7,700	9,300	13,600
	J_WCT009_60	16929	2,100	3,200	4,400	6,200	7,800	9,400	14,000

Wilbarger Creek Watershed			Existing Flows (cfs)						
Stream Name	Hydrologic Element	HEC-RAS Cross Section	50% ACE	20% ACE	10% ACE	4% ACE	2% ACE	1% ACE	0.2% ACE
	J_WCT009_60_WCT298_20	15547	2,300	3,700	5,200	7,300	9,200	11,100	16,600
	J_WCT009_70	9229	2,600	4,200	5,800	8,400	10,500	12,800	19,200
Wilbarger Creek Tributary 018	J_WCT018_10	4866	460	720	960	1,300	1,600	2,000	2,800
	J_WCT018_20	1845	480	800	1,100	1,500	1,900	2,300	3,400
Wilbarger Creek Tributary 019	J_WCT019_10	1624	90	130	170	220	260	310	430
	J_WCT019_10	633	90	130	170	220	260	310	430
Wilbarger Creek Tributary 020	J_WCT020_10	2260	110	160	200	270	320	370	520
	J_WCT020_10	1079	110	160	200	270	320	370	520
Wilbarger Creek Tributary 021	J_WCT021_10	1325	160	230	300	390	470	560	780
	J_WCT021_10	796	160	230	300	390	470	560	780
Wilbarger Creek Tributary 024	J_WCT024_10	13888	330	480	620	830	1,000	1,200	1,700
	J_WCT024_20	10923	420	620	830	1,100	1,400	1,600	2,400
	J_WCT024_20_WCT025_10	8662	640	970	1,300	1,800	2,200	2,600	3,800
	J_WCT024_30_WCT026_10	7456	720	1,100	1,400	2,000	2,400	2,900	4,200
	J_WCT024_40	3330	820	1,200	1,600	2,200	2,800	3,400	5,000
Wilbarger Creek Tributary 025	J_WCT025_10	2939	350	500	640	850	1,000	1,200	1,700
	J_WCT025_10	1026	350	500	640	850	1,000	1,200	1,700
Wilbarger Creek Tributary 026	J_WCT026_10	2807	150	210	260	330	390	460	630
	J_WCT026_10	1149	150	210	260	330	390	460	630
Wilbarger Creek Tributary 027	J_WCT027_10	3466	380	540	680	880	1,000	1,200	1,700
	J_WCT027_10	1726	380	540	680	880	1,000	1,200	1,700
Wilbarger Creek Tributary 030	J_WCT030_10	9161	750	1,100	1,400	1,800	2,200	2,600	3,600
	J_WCT030_20	5006	880	1,300	1,800	2,400	2,900	3,400	4,900
Wilbarger Creek Tributary 047	J_WCT047_10	30126	490	660	810	1,000	1,200	1,400	1,900
	J_WCT047_20	22787	780	1,100	1,400	1,800	2,200	2,600	3,700
	J_WCT047_30	13787	1,200	1,700	2,200	2,900	3,600	4,300	6,100
	J_WCT047_30_WCT049_10	10740	1,400	2,000	2,600	3,500	4,200	5,000	7,200
	J_WCT047_40	4089	2,000	2,900	3,700	4,700	5,600	7,100	10,900
Wilbarger Creek Tributary 049	J_WCT049_10	1538	490	660	810	1,000	1,200	1,400	1,900
	J_WCT049_10	518	490	660	810	1,000	1,200	1,400	1,900
Wilbarger Creek Tributary 056	J_WCT056_10	58299	650	880	1,100	1,400	1,600	1,900	2,600
	J_WCT056_20	49962	1,400	1,900	2,400	3,100	3,700	4,600	6,700
	J_WCT056_20_WCT062_20	45609	2,500	3,600	4,500	5,900	7,000	8,300	12,300
	J_WCT056_30_WCT056_40	44374	2,900	4,100	5,200	6,900	8,200	9,700	14,300
	J_WCT056_50	38587	3,400	4,900	6,400	8,500	10,300	12,300	18,000
	J_WCT056_50_WCT070_10	35708	3,600	5,200	6,800	9,100	11,100	13,200	19,300
	J_WCT056_60	24190	3,800	5,600	7,400	10,200	12,600	15,300	22,900
	J_WCT056_60_WCT047_40	14966	4,700	7,200	9,600	13,800	17,200	20,800	31,400
	J_WCT056_70	9442	4,700	7,200	9,700	14,000	17,600	21,400	32,800
	J_WCT056_70_WCT056_80	6450	5,100	7,900	10,800	15,800	19,900	24,500	37,800
	J_WCT056_90	3738	5,100	7,900	10,800	15,800	19,900	24,500	38,100
Wilbarger Creek Tributary 062	J_WCT062_05	13635	560	760	930	1,200	1,400	1,600	2,200
	J_WCT062_05_WCT062_10	11362	560	760	930	1,200	1,400	1,600	2,200
	J_WCT062_10	8009	960	1,400	1,700	2,300	2,700	3,200	4,700
	J_WCT062_20	2032	1,200	1,700	2,200	2,800	3,300	3,900	5,700
Wilbarger Creek Tributary 070	J_WCT070_10	3049	660	900	1,100	1,400	1,600	1,900	2,600
	J_WCT070_10	1032	660	900	1,100	1,400	1,600	1,900	2,600
Wilbarger Creek Tributary 080	J_WCT080_05	40440	280	390	480	620	740	860	1,200
	J_WCT080_10	36456	400	560	710	990	1,300	1,500	2,200
	J_WCT080_10_WCT086_20	34735	1,000	1,400	1,800	2,300	2,800	3,300	4,800
	J_WCT080_20	33072	1,300	1,800	2,200	2,900	3,500	4,100	5,900
	J_WCT080_20_WCT085_10	31899	1,600	2,300	2,900	3,700	4,400	5,200	7,400
	J_WCT080_30	28431	1,800	2,600	3,300	4,300	5,200	6,200	8,900
	J_WCT080_30_WCT080_40	25864	2,300	3,300	4,100	5,400	6,400	7,600	11,000
	J_WCT080_50	19053	2,400	3,500	4,500	6,000	7,300	8,800	12,900
	J_WCT080_50_WCT082_20	15092	2,900	4,200	5,400	7,300	9,000	11,100	16,700
	J_WCT080_60	5592	3,100	4,500	5,900	8,100	10,000	12,500	19,100
Wilbarger Creek Tributary 082	J_WCT082_10	10608	550	730	890	1,100	1,300	1,500	2,000
	J_WCT082_10_WCT082_15	8920	850	1,100	1,400	1,800	2,100	2,400	3,300
	J_WCT082_20	3075	1,500	2,000	2,400	3,100	3,500	4,000	5,900
Wilbarger Creek Tributary 085	J_WCT085_10	2099	370	510	630	800	950	1,100	1,500
	J_WCT085_10	638	370	510	630	800	950	1,100	1,500
Wilbarger Creek Tributary 086	J_WCT086_10	3415	340	470	580	740	870	1,000	1,400
	J_WCT086_20	1441	700	970	1,200	1,600	1,800	2,100	2,900
Wilbarger Creek Tributary 113	J_WCT113_10	43691	330	440	540	690	810	940	1,300
	J_WCT113_20	36603	1,000	1,400	1,700	2,300	2,700	3,200	4,700
	J_WCT113_30	29456	1,800	2,500	3,100	4,000	4,600	5,800	8,300
	J_WCT113_40	20567	1,900	2,800	3,600	4,800	5,700	6,800	10,900
	J_WCT113_50	6132	2,000	2,800	3,800	5,300	6,400	7,800	12,600

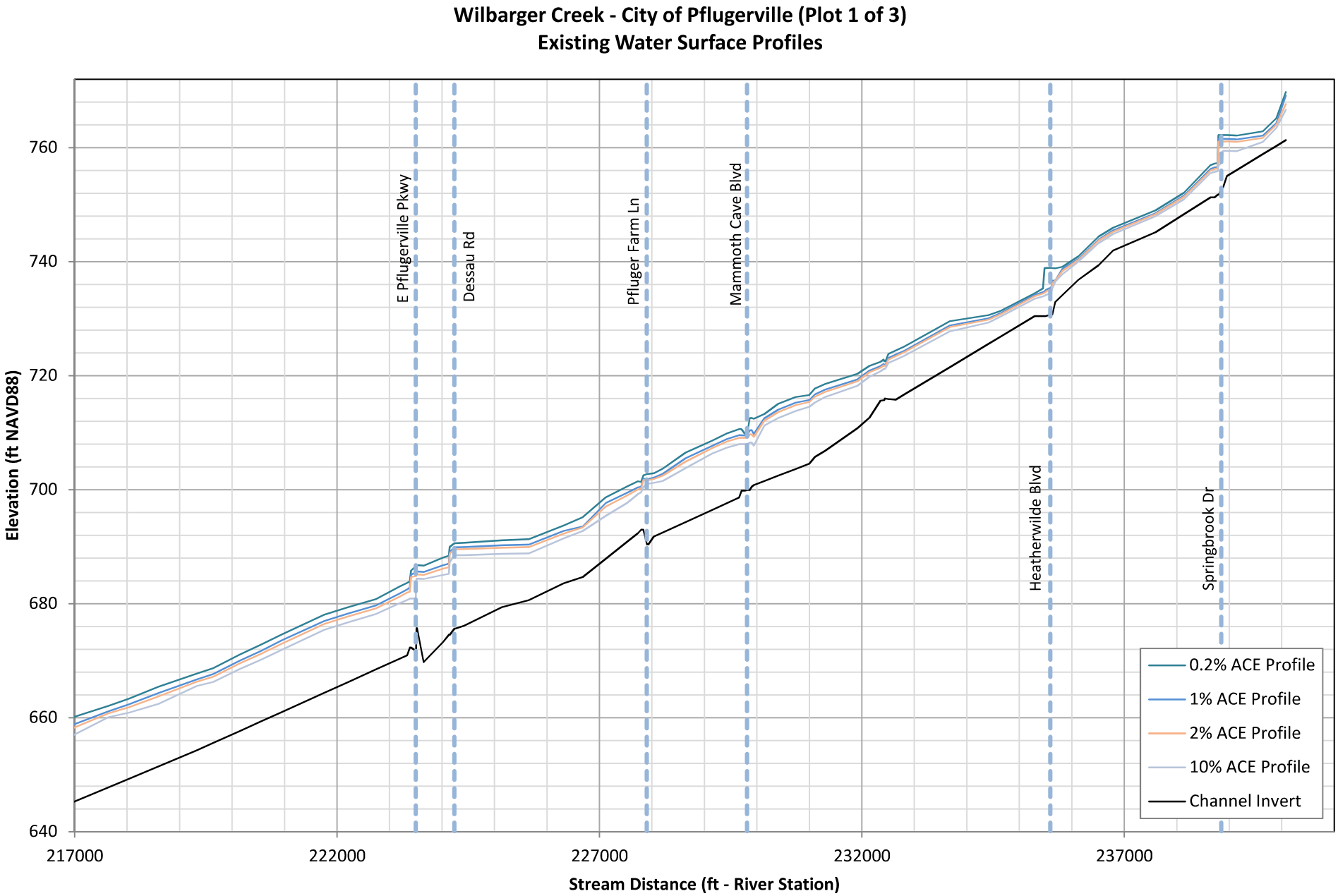
Wilbarger Creek Watershed			Existing Flows (cfs)						
Stream Name	Hydrologic Element	HEC-RAS Cross Section	50% ACE	20% ACE	10% ACE	4% ACE	2% ACE	1% ACE	0.2% ACE
Wilbarger Creek Tributary 138	J_WCT138_10	5130	1,100	1,600	2,000	2,600	3,100	3,700	5,400
	J_WCT138_30	2005	1,700	2,400	3,100	4,100	5,000	6,000	8,900
Wilbarger Creek Tributary 165	J_WCT165_10	3501	170	240	300	380	440	520	700
	J_WCT165_10	1000	170	240	300	380	440	520	700
Wilbarger Creek Tributary 167	J_WCT167_10	12293	360	490	610	790	940	1,100	1,500
	J_WCT167_20	5939	1,200	1,600	2,000	2,600	3,000	3,600	5,200
	J_WCT167_20_WCT165_10	3022	1,300	1,800	2,200	2,900	3,400	4,100	5,800
	J_WCT167_30	2207	1,300	1,900	2,400	3,200	3,800	4,400	6,300
	J_WCT167_40	1578	1,300	2,000	2,500	3,300	3,900	4,600	6,600
Wilbarger Creek Tributary 169	J_WCT169_10	1352	530	740	930	1,200	1,500	1,700	2,400
	J_WCT169_10	614	530	740	930	1,200	1,500	1,700	2,400
Wilbarger Creek Tributary 171	J_WCT171_10	8977	880	1,200	1,600	2,000	2,400	2,800	3,900
	J_WCT171_20	6182	1,000	1,400	1,700	2,300	2,800	3,300	4,700
	J_WCT171_20_WCT169_10	4467	1,400	2,000	2,500	3,300	4,000	4,700	6,600
	J_WCT171_30	1669	1,500	2,200	2,800	3,700	4,400	5,300	7,600
Wilbarger Creek Tributary 178	J_WCT178_10	2598	480	640	780	990	1,100	1,300	1,800
	J_WCT178_20	852	490	670	820	1,000	1,200	1,400	1,900
Wilbarger Creek Tributary 183	J_WCT183_10	1849	680	890	1,100	1,400	1,600	1,800	2,400
	J_WCT183_20	1188	700	930	1,100	1,400	1,700	1,900	2,600
Wilbarger Creek Tributary 185	J_WCT185_10	2352	570	790	980	1,300	1,500	1,700	2,600
	J_WCT185_20	1165	590	830	1,000	1,300	1,600	1,800	2,800
Wilbarger Creek Tributary 186	J_WCT186_10	6185	140	250	360	530	860	1,200	1,800
	J_WCT186_20	1906	320	420	520	680	990	1,300	2,100
Wilbarger Creek Tributary 187	J_WCT187_10	2496	420	610	790	1,100	1,300	1,500	2,100
	J_WCT187_20	1038	460	700	910	1,200	1,500	1,700	2,400
Wilbarger Creek Tributary 196	J_WCT196_10	17601	380	500	610	770	900	1,000	1,400
	J_WCT196_15	15626	550	750	930	1,200	1,400	1,600	3,000
	J_WCT196_20	10682	480	640	780	980	1,200	1,400	2,300
	J_WCT196_30	3471	600	810	1,000	1,300	1,500	1,800	2,500
Wilbarger Creek Tributary 200	J_WCT200_05	28565	860	1,100	1,400	1,700	2,040	2,400	3,200
	J_WCT200_10	27508	1,800	2,500	3,000	3,800	4,400	5,100	6,700
	J_WCT200_20	22645	2,600	3,400	4,100	5,100	6,100	7,000	9,400
	J_WCT200_20_WCT206_20	20874	3,300	4,300	5,200	6,600	7,800	9,000	11,900
	J_WCT200_30	15944	3,400	4,500	5,500	6,800	8,100	9,500	13,100
	J_WCT200_40	10654	3,400	4,500	5,500	6,800	8,100	9,600	13,400
	J_WCT200_45	7260	3,400	4,500	5,500	6,800	8,100	9,600	13,400
	J_WCT200_45_WCT207_20	5825	3,400	4,600	5,500	6,800	8,300	9,800	13,800
	J_WCT200_50	2464	3,400	4,600	5,500	6,800	8,300	9,900	13,900
Wilbarger Creek Tributary 206	J_WCT206_10	4085	690	820	1,300	1,800	2,200	2,500	3,400
	J_WCT206_20	948	800	980	1,300	1,800	2,200	2,600	3,800
Wilbarger Creek Tributary 207	J_WCT207_10	1902	90	130	180	260	330	410	610
	J_WCT207_20	591	250	320	390	490	560	640	910
Wilbarger Creek Tributary 208	J_WCT208_20	2504	370	510	640	830	980	1,100	1,600
	J_WCT208_30	1010	550	740	920	1,200	1,400	1,600	2,200
Wilbarger Creek Tributary 209	J_WCT209_10	1374	170	220	270	340	390	450	590
	J_WCT209_20	460	310	400	490	630	740	840	1,100
Wilbarger Creek Tributary 210	J_WCT210_10	46694	990	1,300	1,560	1,900	2,300	2,600	3,500
	J_WCT210_20	43761	1,100	1,500	1,800	2,300	2,600	3,000	4,100
	J_WCT210_20_WCT209_20	41828	1,200	1,700	2,100	2,600	3,000	3,600	4,800
	J_WCT210_25	40605	1,500	1,900	2,400	3,200	3,700	4,400	6,100
	J_WCT210_30	36460	1,800	2,400	3,100	4,000	4,700	5,600	7,800
	J_WCT210_40	31765	1,800	2,500	3,200	4,200	5,000	5,900	8,300
	J_WCT210_40_WCT208_30	29758	3,100	4,300	5,400	7,000	8,300	9,700	13,500
	J_WCT210_50	22307	3,300	4,600	5,900	7,700	9,300	11,000	15,600
	J_WCT210_50_200_50	17284	6,400	9,100	11,200	13,500	16,700	20,000	28,700
	J_WCT210_60	12626	6,400	9,100	11,500	14,000	16,900	20,300	29,500
	J_WCT210_60_WCT196_30	8954	6,500	9,300	11,700	14,400	17,200	20,800	30,400
	J_WCT210_70	3566	6,500	9,300	11,800	14,600	17,400	21,100	30,900
Wilbarger Creek Tributary 216	J_WCT216_10	7004	620	820	1,000	1,300	1,500	1,700	2,300
	J_WCT216_20	5151	860	1,200	1,400	1,800	2,000	2,300	3,000
	J_WCT216_30	1896	920	1,300	1,700	2,200	2,500	2,900	3,900
Wilbarger Creek Tributary 220	J_WCT220_10	27472	1,300	1,700	2,000	2,500	2,900	3,300	4,500
	J_WCT220_20	19762	1,900	2,500	3,100	4,000	4,700	5,600	8,100
	J_WCT220_30	10691	2,100	2,900	3,500	4,600	5,600	6,800	10,200
	J_WCT220_40	3783	2,100	2,900	3,600	4,700	5,700	7,000	10,700
Wilbarger Creek Tributary 227	J_WCT227_10	14357	750	1,000	1,300	1,600	1,900	2,200	2,900
	J_WCT227_20	9490	1,200	1,700	2,100	2,600	3,000	3,500	4,500
	J_WCT227_30	2940	1,300	1,900	2,400	3,000	3,500	4,100	5,500
Wilbarger Creek	J_WCT229_10	1501	430	600	760	990	1,200	1,400	1,900

Wilbarger Creek Watershed			Existing Flows (cfs)						
Stream Name	Hydrologic Element	HEC-RAS Cross Section	50% ACE	20% ACE	10% ACE	4% ACE	2% ACE	1% ACE	0.2% ACE
Tributary 229	J_WCT229_10	606	430	600	760	990	1,200	1,400	1,900
Wilbarger Creek Tributary 260	J_WCT260_10	2966	780	1,100	1,300	1,700	2,000	2,300	3,200
	J_WCT260_20	1649	920	1,200	1,500	1,800	2,100	2,400	4,100
Wilbarger Creek Tributary 286	J_WCT286_10	8129	160	230	290	380	450	530	730
	J_WCT286_20	3239	310	430	550	710	850	1,000	1,500
Wilbarger Creek Tributary 298	J_WCT298_10	4733	540	770	980	1,300	1,500	1,800	2,500
	J_WCT298_20	2281	620	900	1,200	1,500	1,900	2,300	3,300
Wilbarger Creek Tributary 304	J_WCT304_10	7819	590	840	1,100	1,400	1,700	2,000	2,700
	J_WCT304_10_WCT304_20	4611	590	840	1,100	1,400	1,700	2,000	2,700
	J_WCT304_20	1588	590	840	1,100	1,400	1,700	2,000	2,900
Wilbarger Creek Tributary 305	J_WCT305_10	10222	480	690	880	1,200	1,400	1,600	2,300
	J_WCT305_10_WCT305_20	7271	480	690	880	1,200	1,400	1,600	2,300
	J_WCT305_20	3944	780	1,200	1,500	2,100	2,500	2,900	4,200
Wilbarger Creek Tributary 307	J_WCT307_10	6020	720	1,100	1,500	2,000	2,400	2,900	4,200
	J_WCT307_20	2533	860	1,300	1,700	2,400	2,900	3,500	5,400
Wilbarger Creek Tributary 326	J_WCT326_10	6997	180	260	330	440	520	610	840
	J_WCT326_20	3556	460	670	860	1,100	1,400	1,600	2,200
Wilbarger Creek Tributary 328	J_WCT328_10	6139	360	520	660	860	1,000	1,200	1,700
	J_WCT328_10	4597	360	520	660	860	1,000	1,200	1,700
Wilbarger Creek Tributary 346	J_WCT346_10	8063	130	230	330	480	610	750	1,100
	J_WCT346_20	3039	150	320	510	820	1,100	1,400	2,300
Wilbarger Creek	J_WC_10	242551	710	920	1,100	1,400	1,600	1,900	2,800
	J_WC_20	238600	850	1,100	1,400	1,700	2,000	2,300	3,600
	J_WC_20_WCT183_20	237122	1,500	2,000	2,400	3,100	3,600	4,200	5,800
	J_WC_30	236150	1,600	2,100	2,600	3,300	3,900	4,500	6,200
	J_WC_30_WCT185_20	235286	2,000	2,700	3,400	4,300	5,100	5,900	8,600
	J_WC_40	233473	2,100	2,800	3,500	4,600	5,400	6,400	9,200
	J_WC_50	230001	2,200	3,000	3,800	4,900	5,900	6,900	10,000
	J_WC_50_WCT186_20	228124	2,300	3,300	4,200	5,500	6,700	8,200	12,100
	J_WC_50_WCT186_20_WCT187_20	226893	2,600	3,700	4,600	6,000	7,200	8,800	13,000
	J_WC_60	219313	3,200	4,300	5,500	7,400	8,900	10,700	15,800
	J_WC_60_WCT178_20	212999	3,300	4,400	5,600	7,600	9,200	11,100	16,200
	J_WC_70	209990	3,300	4,400	5,700	7,700	9,300	11,200	16,600
	J_WC_80	203727	3,500	4,800	6,200	8,600	10,200	12,700	19,400
	J_WC_90	194701	3,500	4,800	6,200	8,700	10,300	12,800	19,800
	J_WC_90_WC_100	191119	3,600	4,900	6,400	8,800	10,600	13,100	20,400
	J_WC_110	185570	3,600	5,000	6,400	9,000	10,800	13,300	20,900
	J_WC_110_WCT210_70	180881	9,500	13,300	17,300	23,000	28,200	34,300	53,800
	J_WC_120	172587	9,500	13,300	17,300	23,100	28,400	34,800	54,800
	J_WC_130	159797	9,500	13,600	17,700	23,700	29,300	35,900	56,900
	J_WC_130_WCT220_40	154353	9,900	14,500	19,000	25,500	31,800	39,300	62,400
	J_WC_140_WCT227_30	152744	9,900	14,600	19,200	25,800	32,200	39,800	63,300
	J_WC_150	150341	9,900	14,600	19,300	26,000	32,400	40,200	64,000
	J_WC_150_WCT171_30	146334	10,000	14,800	19,700	26,500	33,100	41,200	65,700
	J_WC_160_WCT229_10	140589	10,000	14,800	19,700	26,600	33,300	41,400	65,900
	J_WC_170	136622	10,000	14,800	19,700	26,700	33,400	41,600	66,300
	J_WC_180	130631	10,000	14,800	19,700	26,800	33,400	41,600	66,300
	J_WC_190_WCT167_40	126786	10,000	14,800	19,700	27,200	33,800	42,200	67,400
	J_WC_200	124606	10,000	14,800	19,700	27,300	33,900	42,500	67,800
	J_WC_210	121112	10,000	14,800	19,700	27,300	34,000	42,600	67,900
	J_WC_220_WC_230	117329	10,000	14,800	19,700	27,400	34,100	42,700	68,200
	J_WC_240_WC_250	114098	10,000	14,800	19,700	27,600	34,300	43,100	69,000
	J_WC_260	111995	10,000	14,800	19,800	27,700	34,400	43,300	69,500
	J_WC_270_WC_280	105651	10,000	14,800	19,800	27,800	34,600	43,500	69,900
	J_WC_290_WC_300	100579	10,000	14,800	19,900	27,900	34,700	43,600	70,200
	J_WC_310_WC_320	92639	10,000	14,800	19,900	27,900	34,800	43,700	70,500
	J_WC_330	88043	10,000	14,800	19,900	27,900	34,800	43,700	70,500
	J_WC_330_CC_90_WLC_100	86312	21,700	33,700	45,000	64,700	82,600	102,100	174,400
	J_WC_350	84082	25,000	38,000	51,200	73,700	93,200	118,300	198,500
	J_WC_360	79540	25,000	38,000	51,200	73,800	93,300	118,600	198,900
	J_WC_370	76043	25,000	38,000	51,200	73,800	93,300	118,600	198,900
	J_WC_370_WCT009_80	73452	25,300	38,400	52,000	74,900	95,000	121,100	202,800
	J_WC_380	68230	25,300	38,400	52,000	74,900	95,000	121,200	202,900
	J_WC_380_WCT006_30	64262	25,300	38,500	52,200	75,200	95,500	121,900	204,100
	J_WC_390	59251	25,300	38,500	52,200	75,200	95,600	122,000	204,200
	J_WC_390_WCT304_20	53573	25,300	38,500	52,200	75,200	95,600	122,100	204,300
	J_WC_400	51010	25,300	38,500	52,200	75,200	95,600	122,100	204,300
	J_WC_400_WCT305_20	49338	25,300	38,500	52,200	75,200	95,700	122,200	204,500
	J_WC_410	47362	25,300	38,500	52,200	75,200	95,700	122,200	204,500

Wilbarger Creek Watershed			Existing Flows (cfs)						
Stream Name	Hydrologic Element	HEC-RAS Cross Section	50% ACE	20% ACE	10% ACE	4% ACE	2% ACE	1% ACE	0.2% ACE
Wilbarger Creek	J_WC_410_WCT027_10_LC_40	45770	25,800	39,200	53,500	77,400	99,000	126,900	213,600
	J_WC_420	43999	25,800	39,200	53,500	77,400	99,000	126,900	213,600
	J_WC_420_WCT024_40	42294	25,800	39,200	53,500	77,400	99,100	127,000	214,000
	J_WC_430	38912	25,800	39,200	53,500	77,400	99,100	127,000	214,000
	J_WC_430_WCT326_20_WCT328_10	36389	25,800	39,200	53,500	77,400	99,100	127,000	214,200
	J_WC_440	30679	25,800	39,200	53,500	77,400	99,100	127,000	214,400
	J_WC_440_WCT004_70	26500	25,800	39,200	53,600	77,700	99,500	127,600	216,100
	J_WC_450	24740	25,800	39,200	53,600	77,700	99,500	127,600	216,200
	J_WC_450_WCT003_20	23688	25,800	39,200	53,600	77,700	99,600	127,800	216,500
	J_WC_460_WC_490	18642	25,800	39,200	53,600	77,700	99,600	127,800	217,300
	J_WC_500	11178	25,800	39,200	53,600	77,700	99,600	127,800	217,600
	J_WC_510_WCT001_20	8266	25,800	39,200	53,600	77,700	99,700	128,100	218,300
	J_WC_520	4513	25,800	39,200	53,600	77,700	99,700	128,100	218,300
	J_WC_530	2477	25,800	39,200	53,600	77,700	99,700	128,100	218,400
Willow Creek	J_WLC_10_WLC_20_WLC_30	56393	3,200	4,400	5,400	7,000	8,200	9,600	13,400
	J_WLC_40	51036	3,700	5,100	6,600	8,600	10,400	12,400	17,900
	J_WLC_50	46068	3,700	5,100	6,600	8,700	10,500	12,600	18,400
	J_WLC_50_WCT138_30	44187	5,400	7,500	9,700	12,800	15,500	18,500	27,100
	J_WLC_60	40581	5,400	7,600	9,700	12,900	15,600	18,800	27,800
	J_WLC_60_WLC_70	38406	5,500	7,800	10,000	13,400	16,300	19,700	29,300
	J_WLC_80	33755	5,500	7,800	10,000	13,500	16,400	19,900	29,800
	J_WLC_90	22155	5,500	7,800	10,100	13,500	16,800	19,900	31,400
	J_WLC_90_LWC_50	15116	6,900	10,100	13,200	17,900	22,300	26,600	42,700
	J_WLC_100	6105	6,900	10,100	13,200	17,900	22,300	26,600	42,700

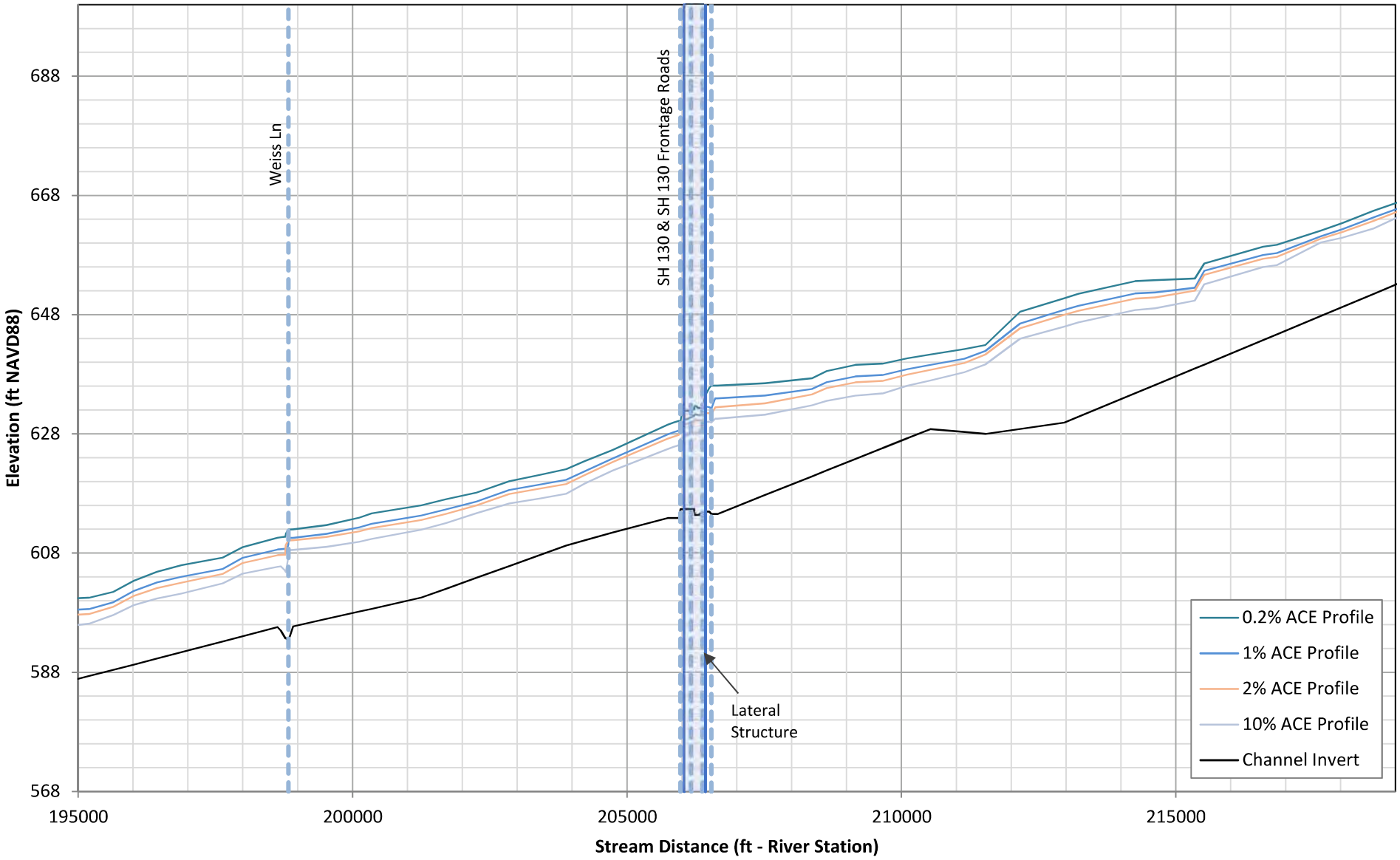
Appendix F: Hydraulic Model Analysis

F-2 Hydraulics Results – HEC-RAS Results

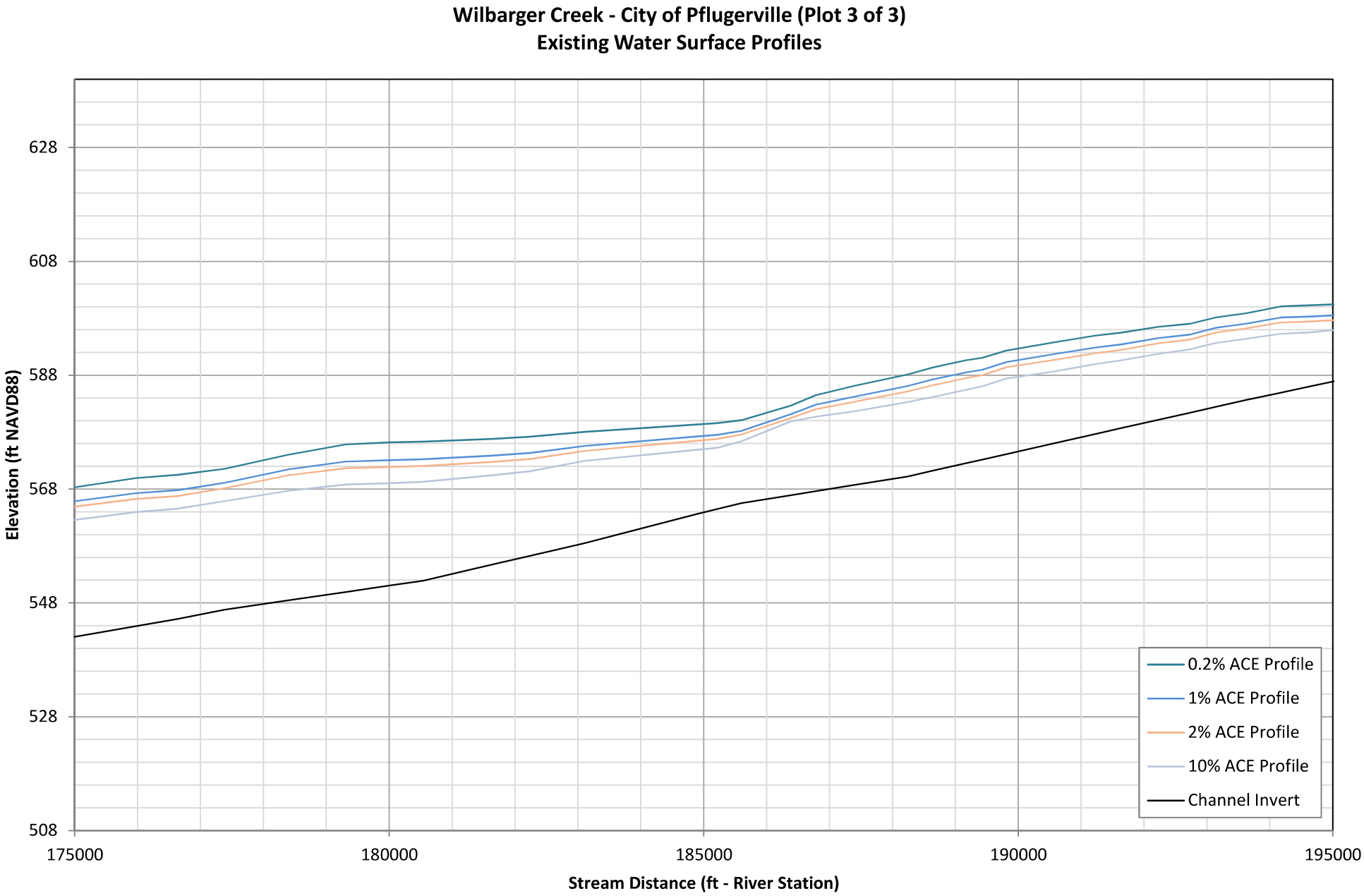


Pedestrian paths and golf cart paths are not shown in the plot

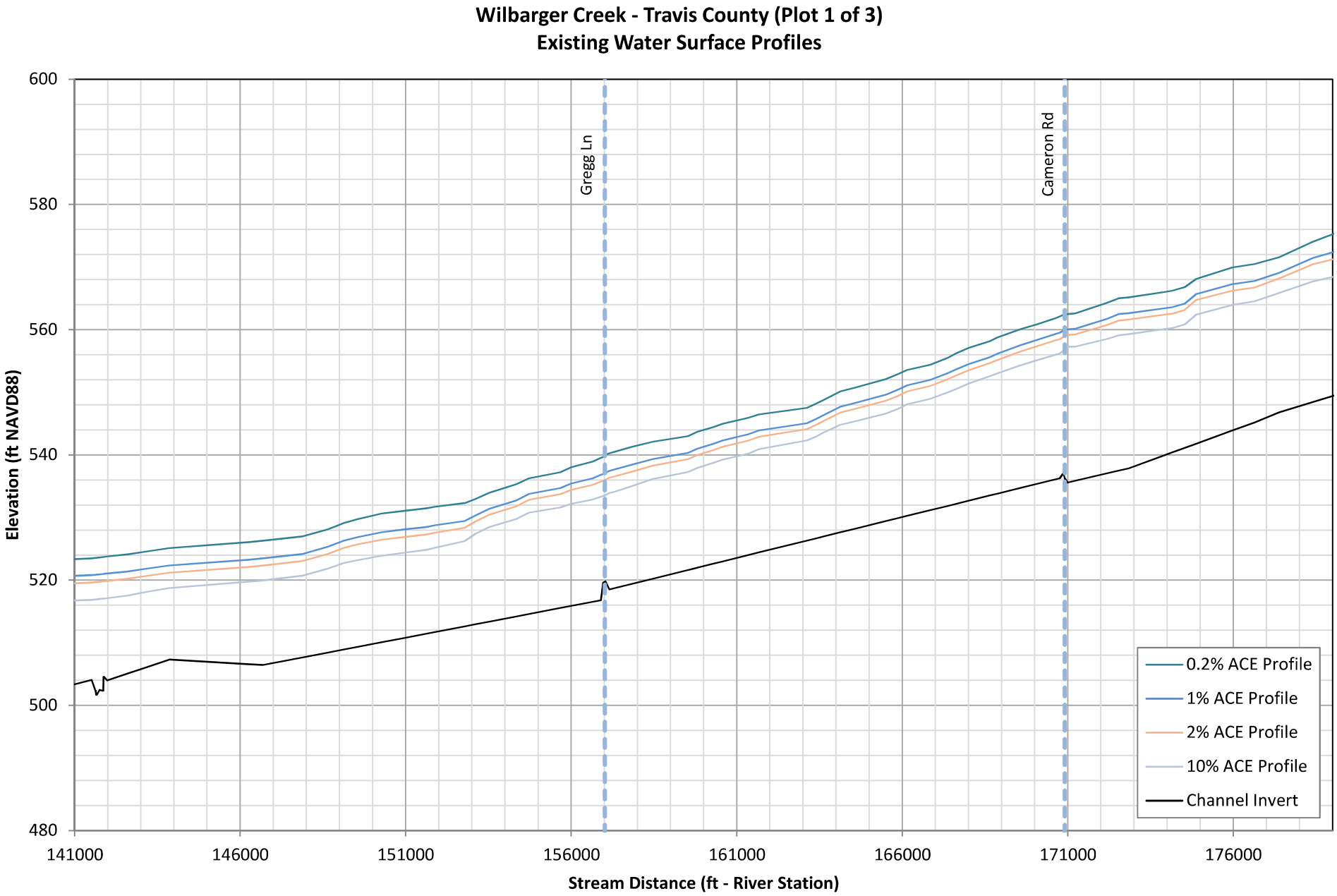
Wilbarger Creek - City of Pflugerville (Plot 2 of 3)
Existing Water Surface Profiles



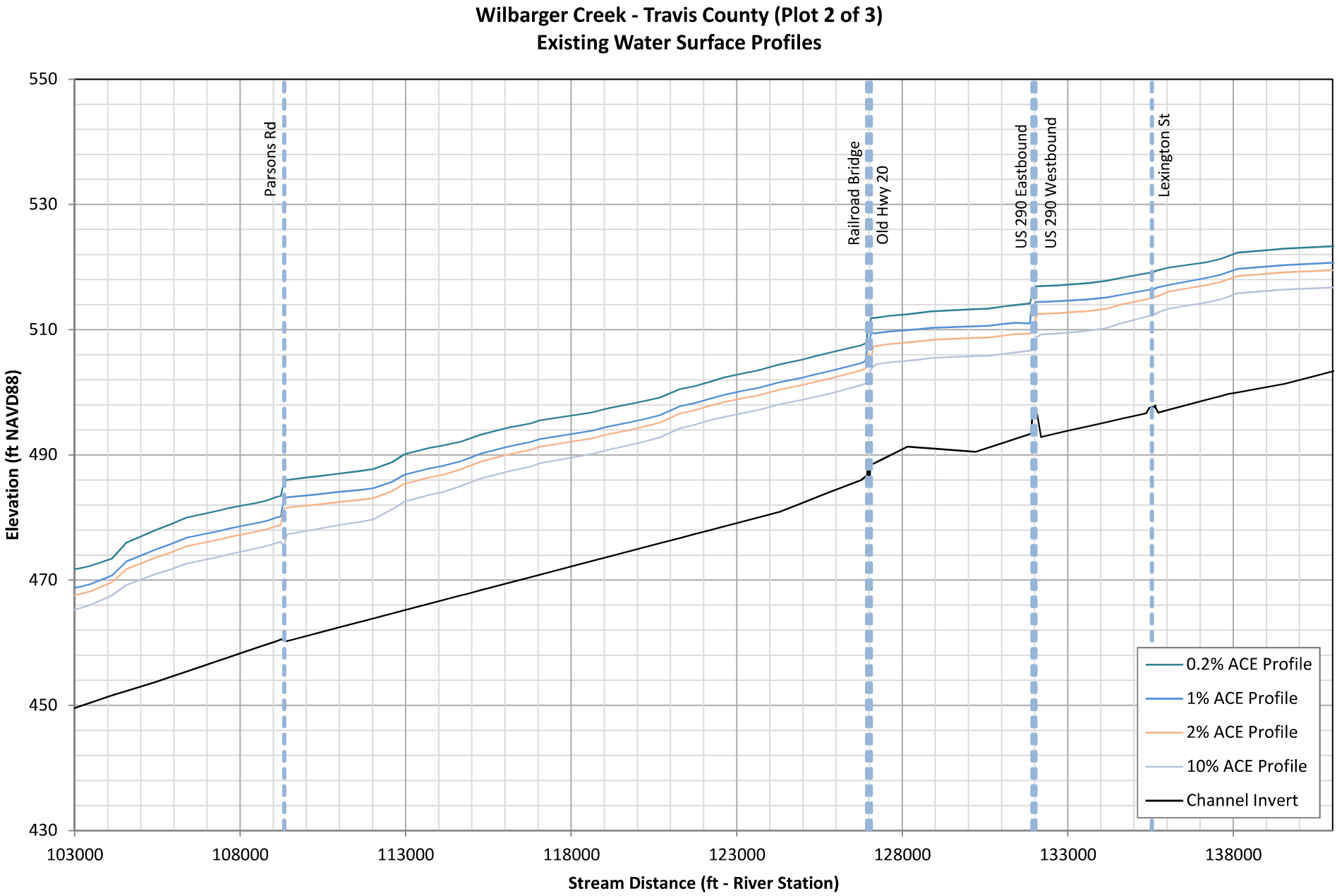
Pedestrian paths and golf cart paths are not shown in the plot



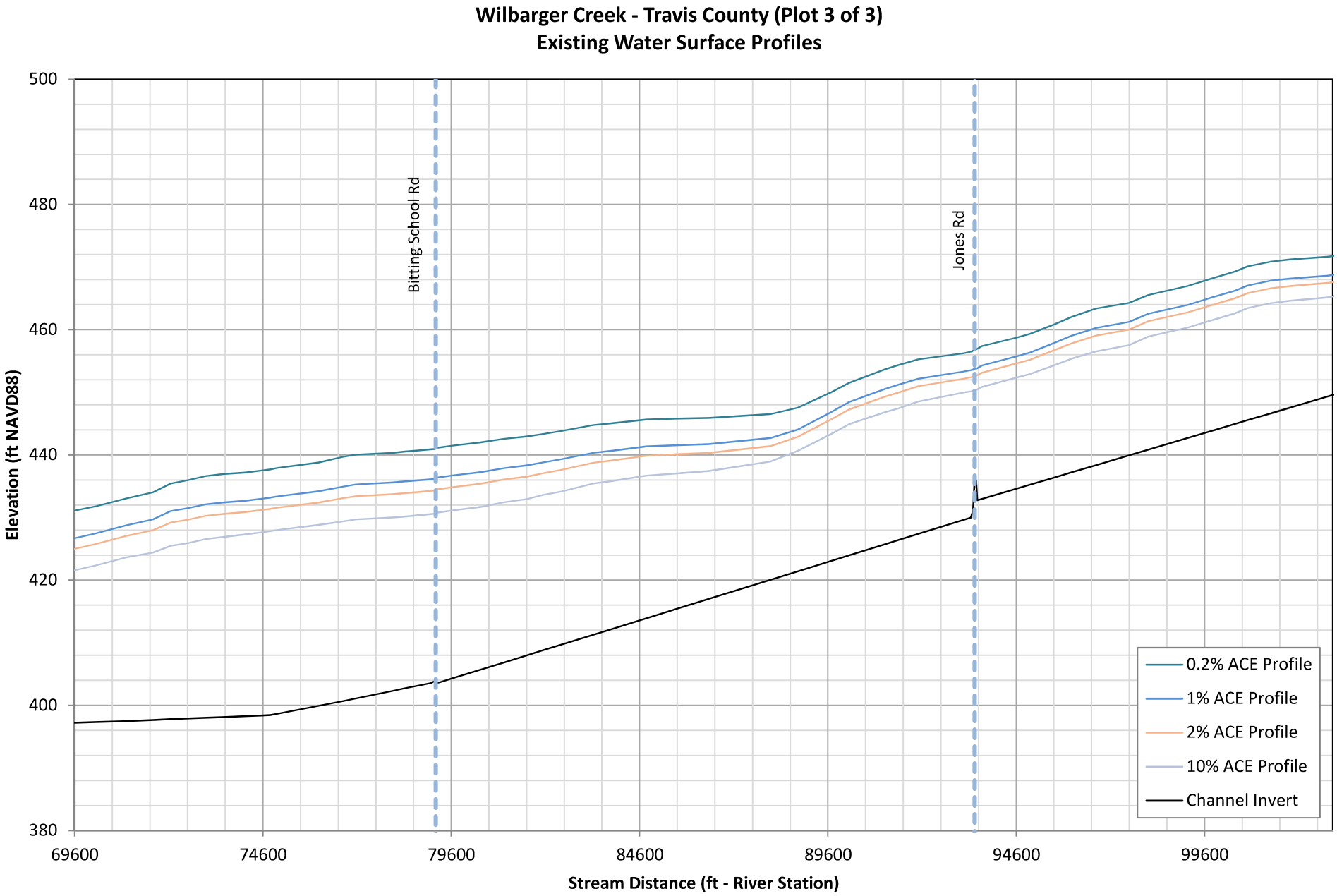
Pedestrian paths and golf cart paths are not shown in the plot



Pedestrian paths and golf cart paths are not shown in the plot

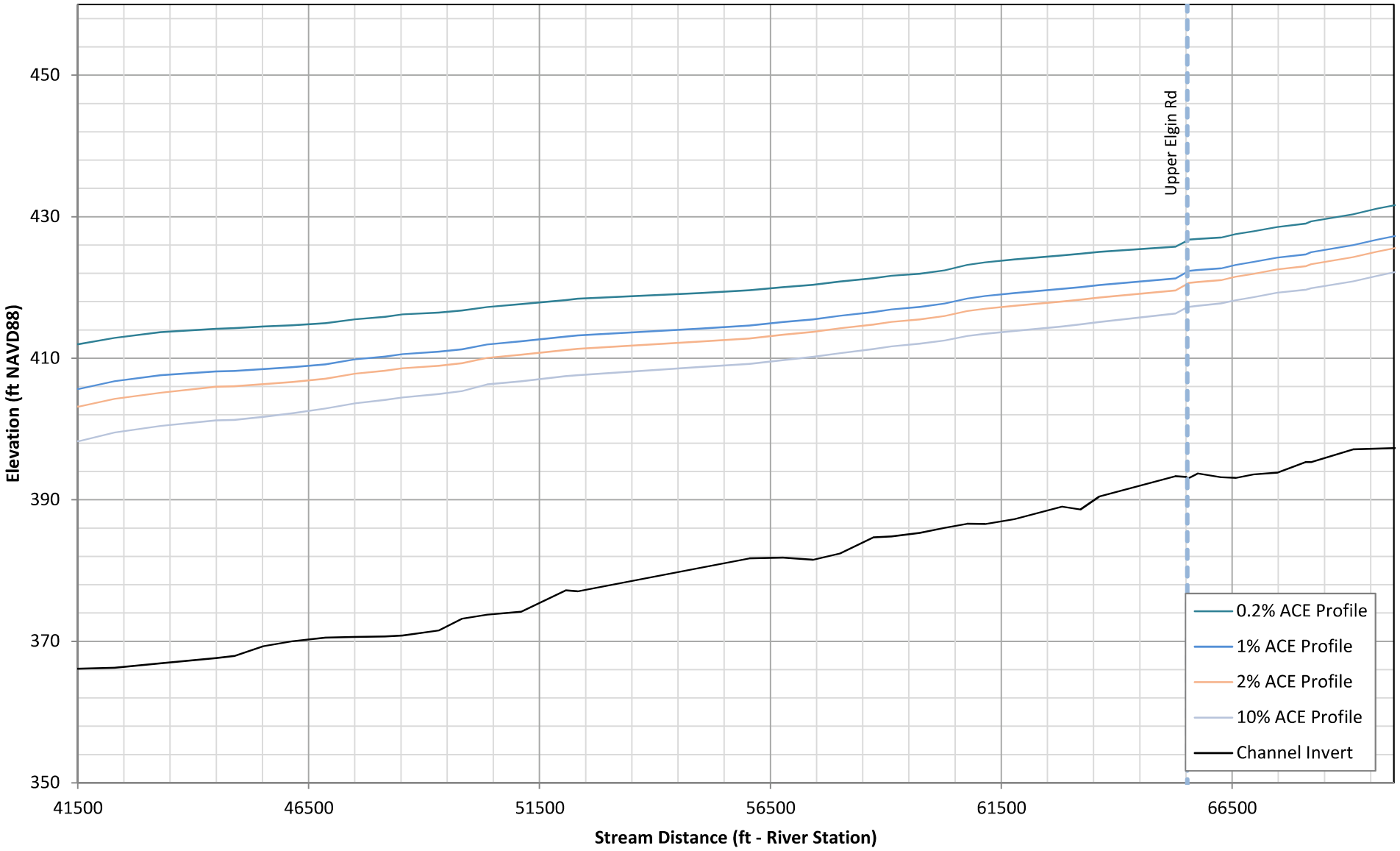


Pedestrian paths and golf cart paths are not shown in the plot



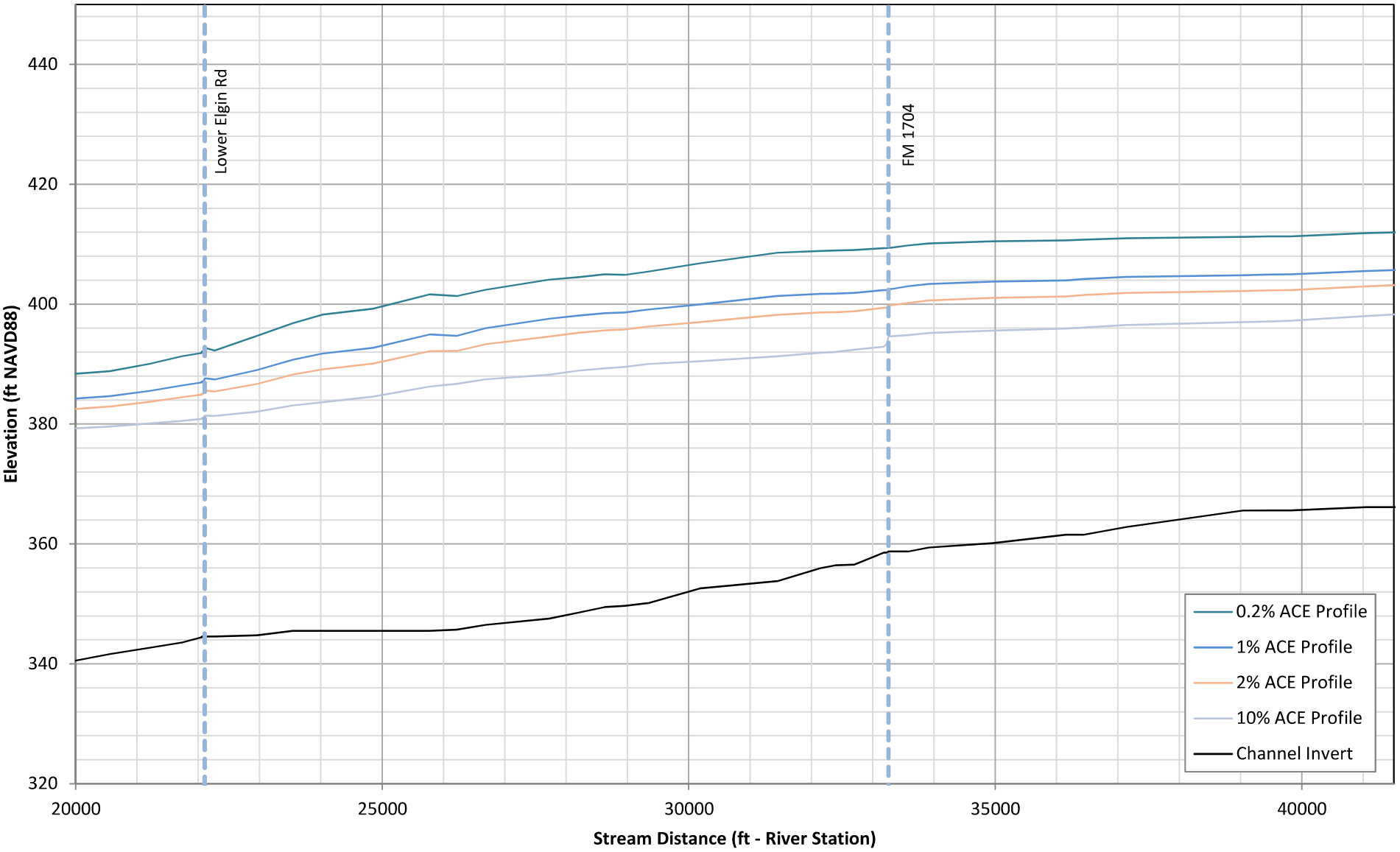
Pedestrian paths and golf cart paths are not shown in the plot

Wilbarger Creek - Bastrop County (Plot 1 of 3)
Existing Water Surface Profiles

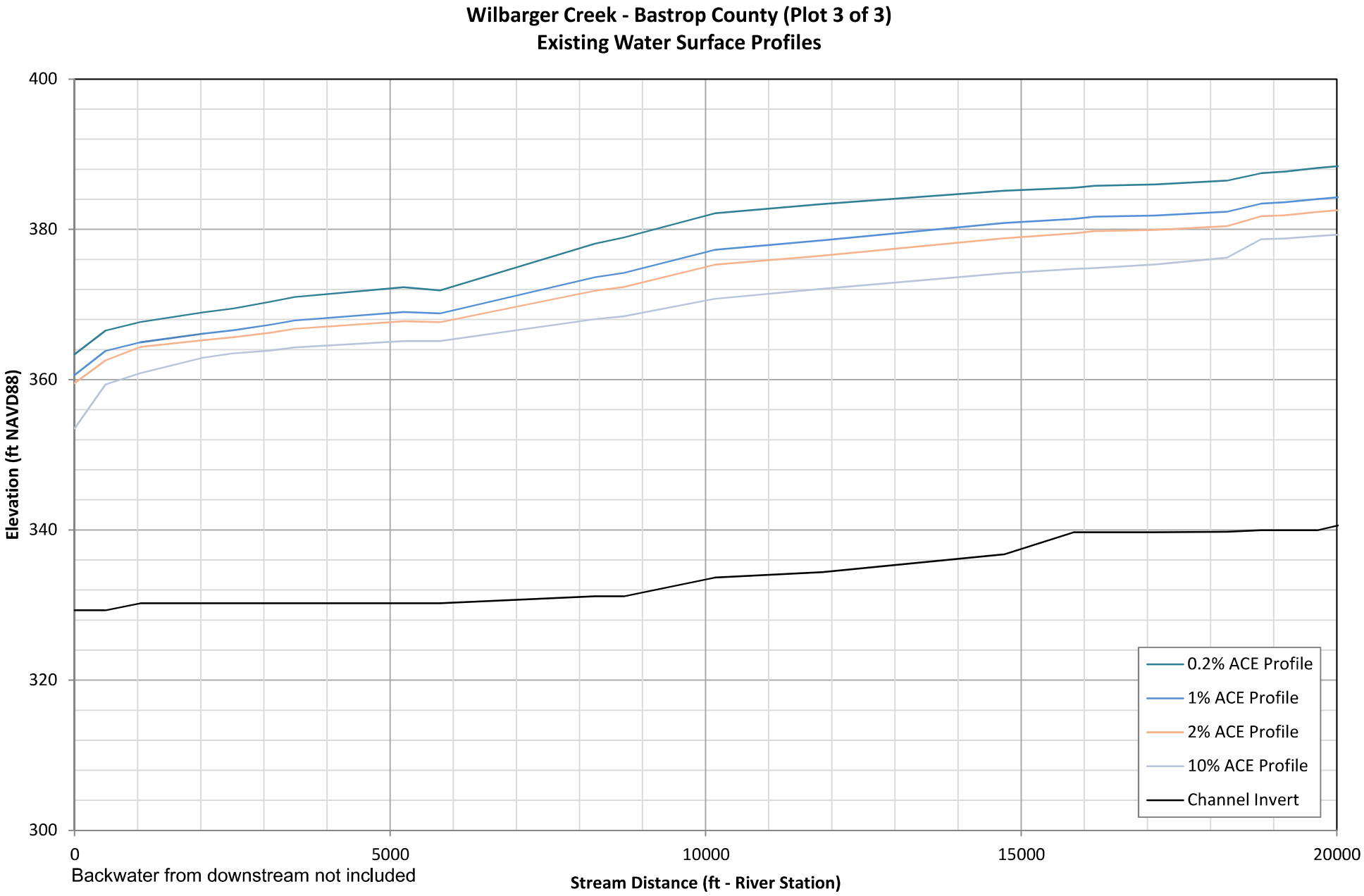


Pedestrian paths and golf cart paths are not shown in the plot

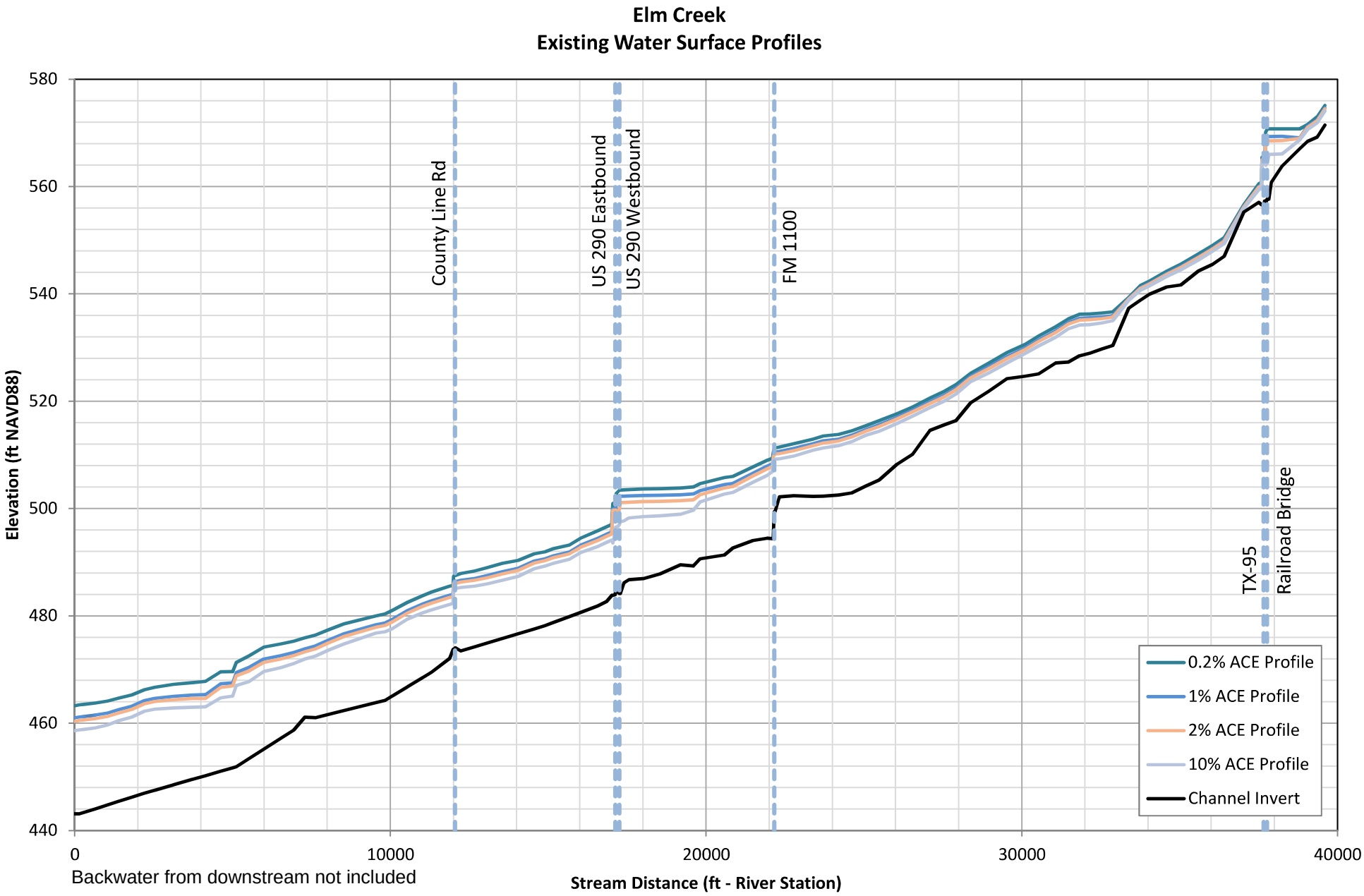
Wilbarger Creek - Bastrop County (Plot 2 of 3)
Existing Water Surface Profiles

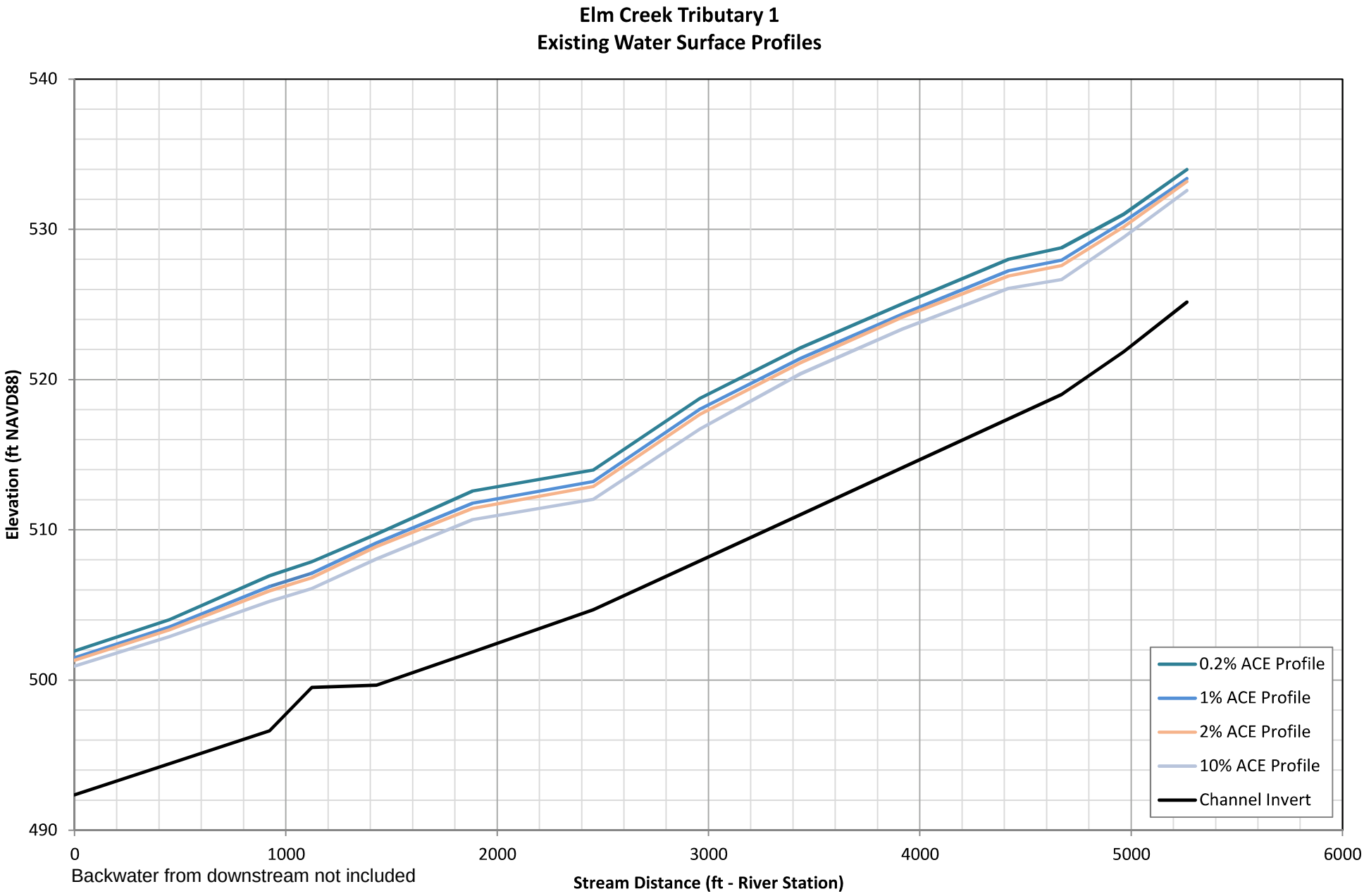


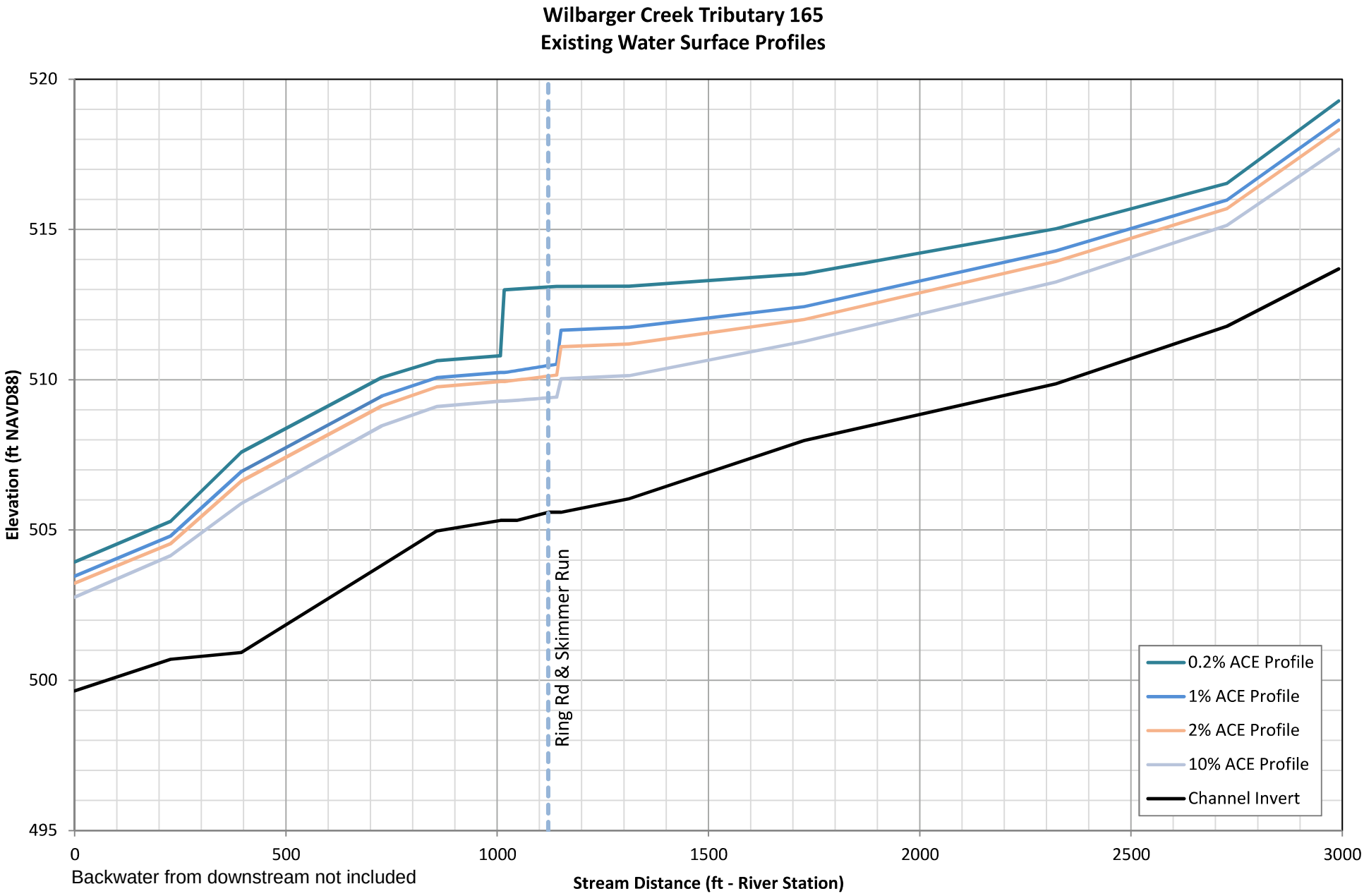
Pedestrian paths and golf cart paths are not shown in the plot

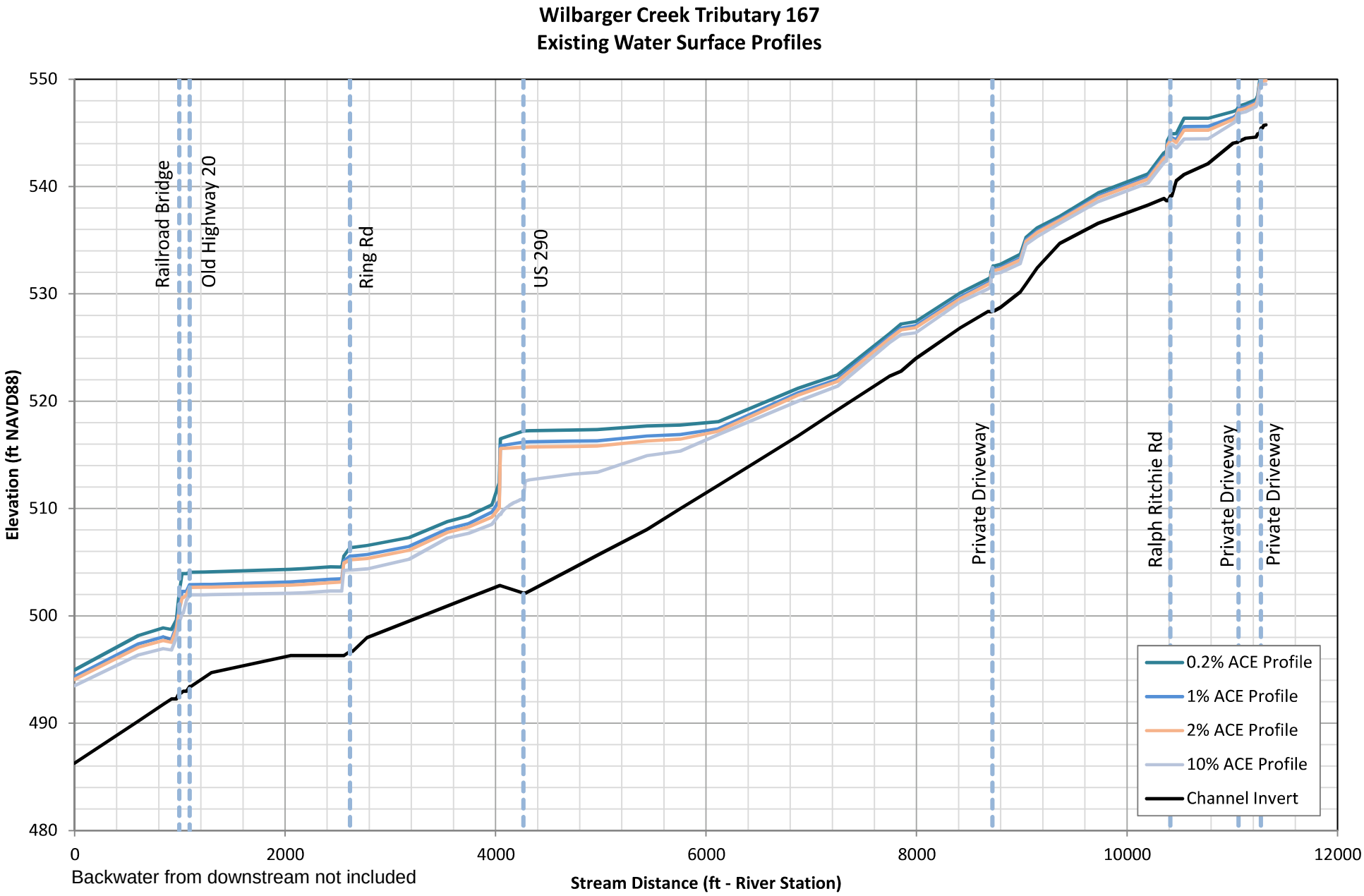


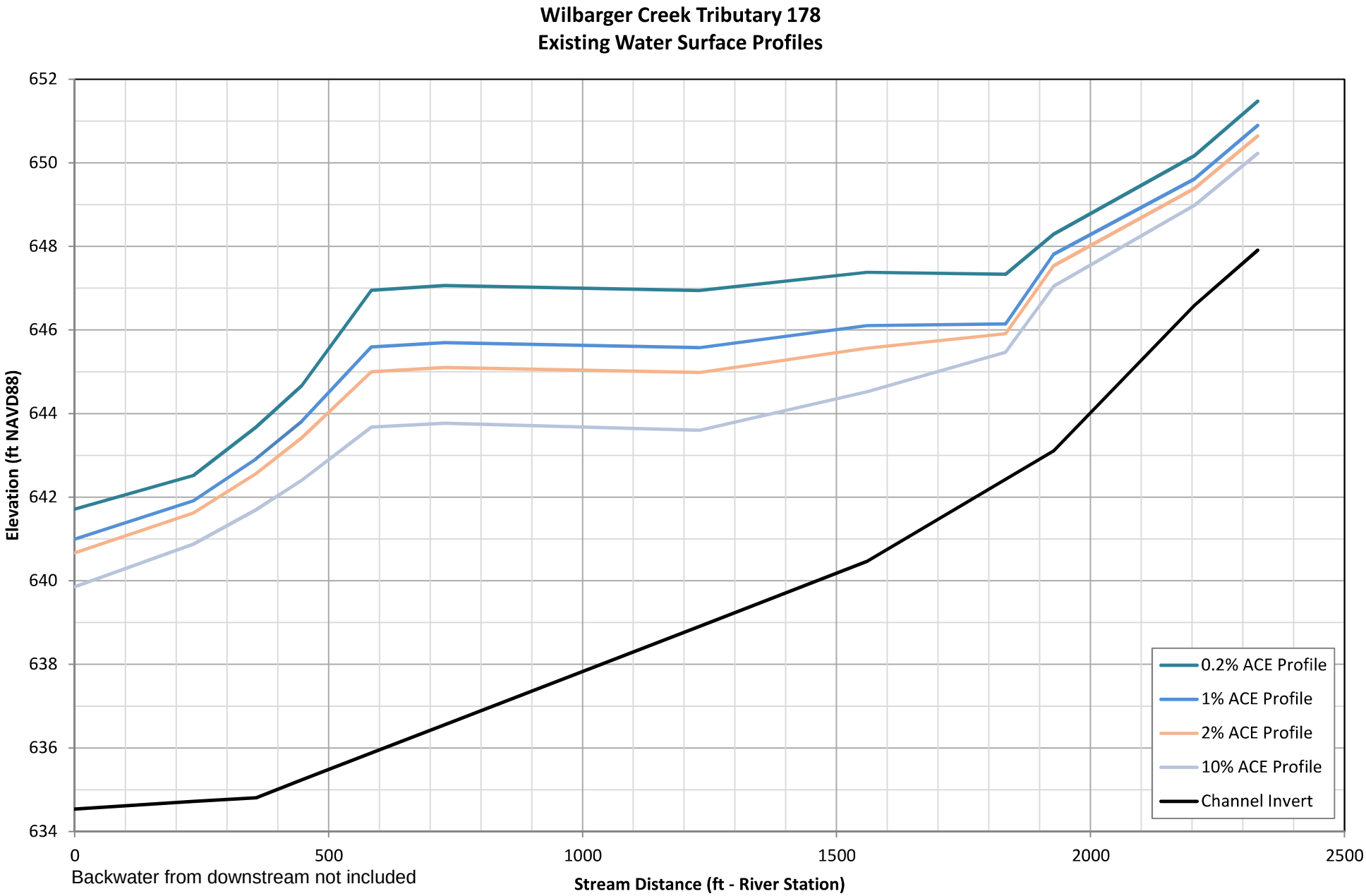
Pedestrian paths and golf cart paths are not shown in the plot

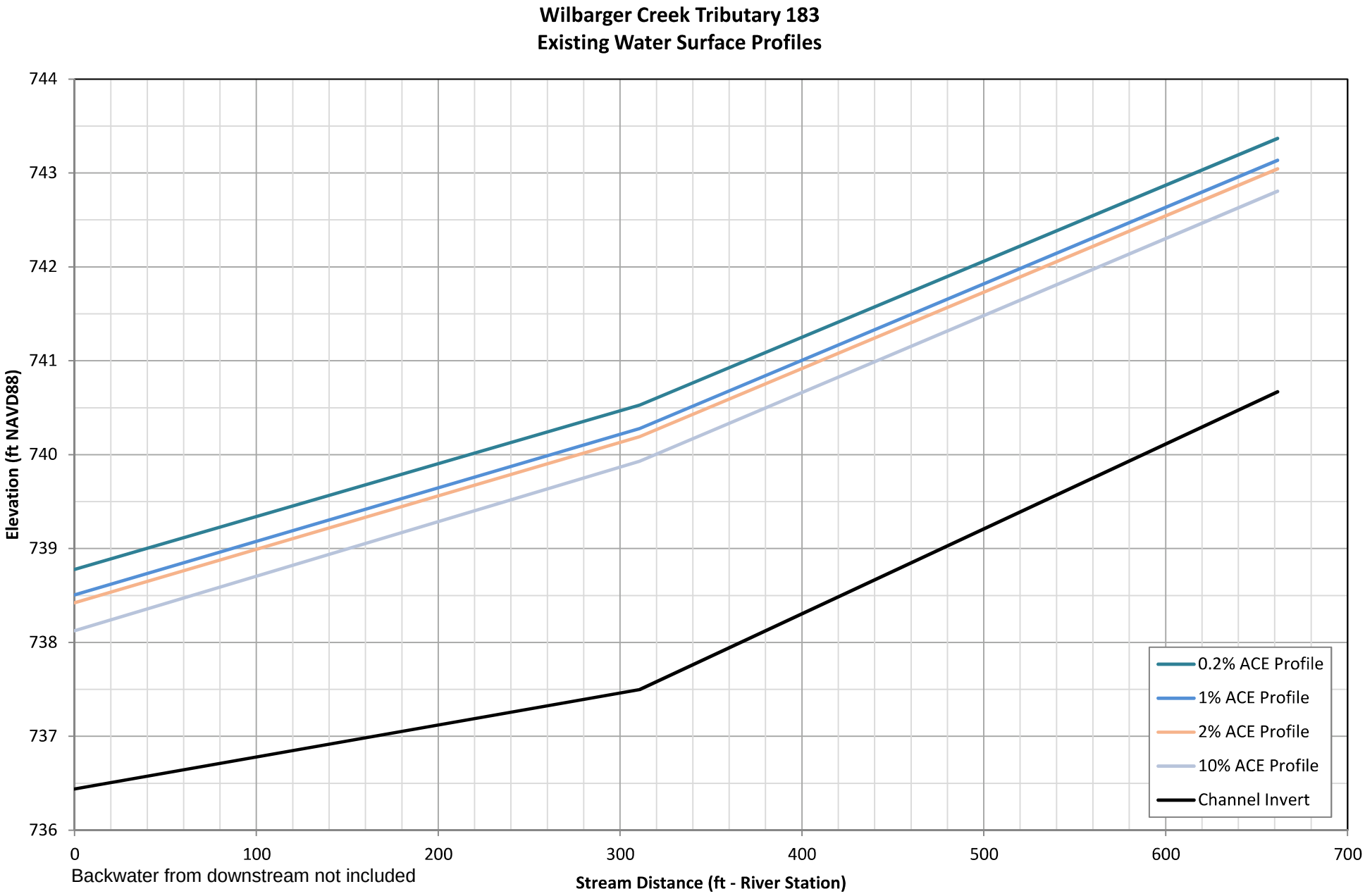

Elm Creek
Existing Water Surface Profiles
Elevation (ft NAVD88)
580
560
540
520
500
480
460
440
0
10000
20000
30000
40000
Stream Distance (ft - River Station)
Backwater from downstream not included
County Line Rd
US 290 Eastbound
US 290 Westbound
FM 1100
TX-95
Railroad Bridge
0.2% ACE Profile
1% ACE Profile
2% ACE Profile
10% ACE Profile
Channel Invert

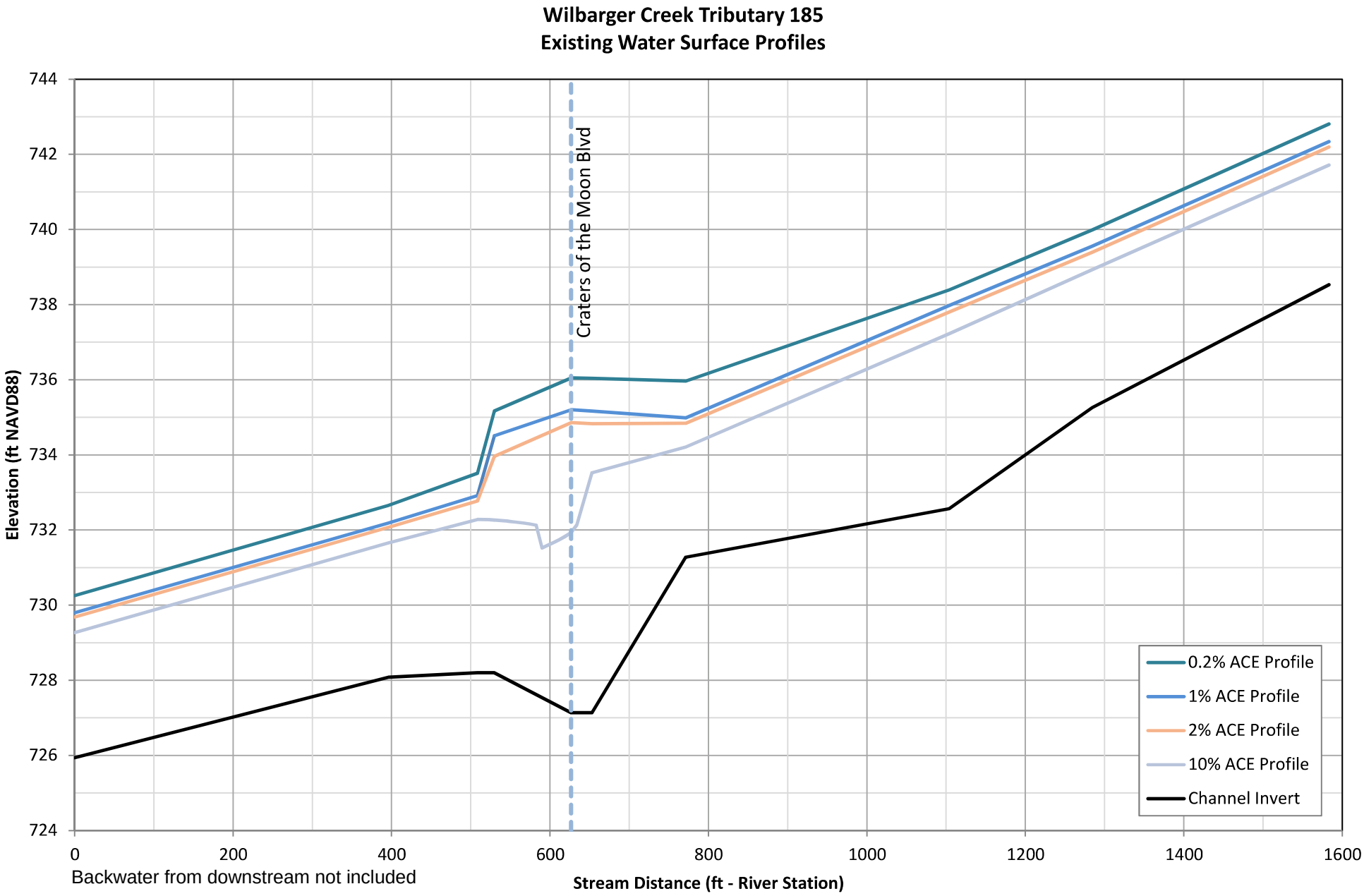

Elm Creek Tributary 1
Existing Water Surface Profiles
Elevation (ft NAVD88)
540
530
520
510
500
490
0
1000
2000
3000
4000
5000
6000
Stream Distance (ft - River Station)
Backwater from downstream not included
0.2% ACE Profile
1% ACE Profile
2% ACE Profile
10% ACE Profile
Channel Invert

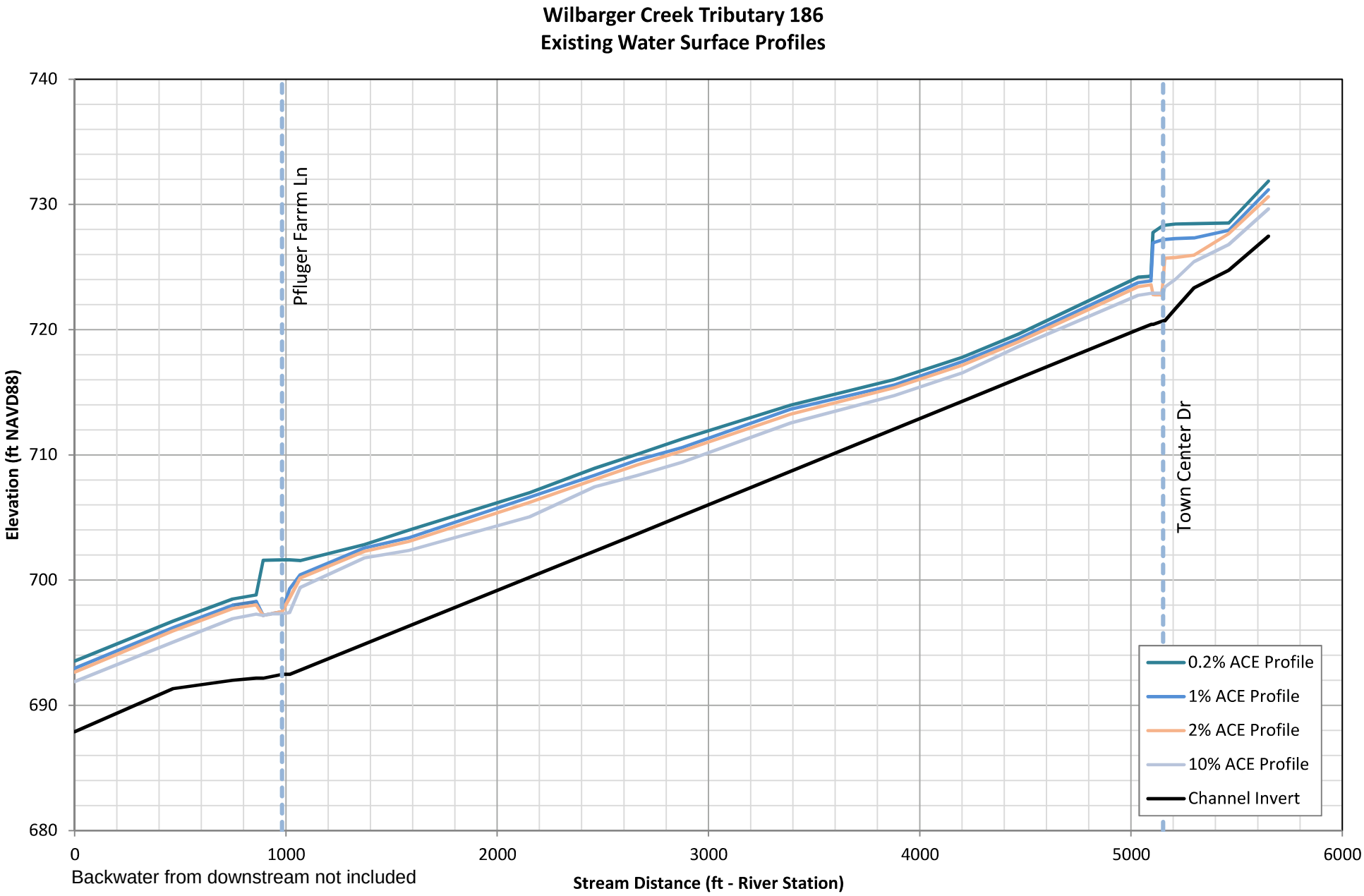

Wilbarger Creek Tributary 165
Existing Water Surface Profiles
Elevation (ft NAVD88)
520
515
510
505
500
495
0
500
1000
1500
2000
2500
3000
Stream Distance (ft - River Station)
Ring Rd & Skimmer Run
0.2% ACE Profile
1% ACE Profile
2% ACE Profile
10% ACE Profile
Channel Invert
Backwater from downstream not included

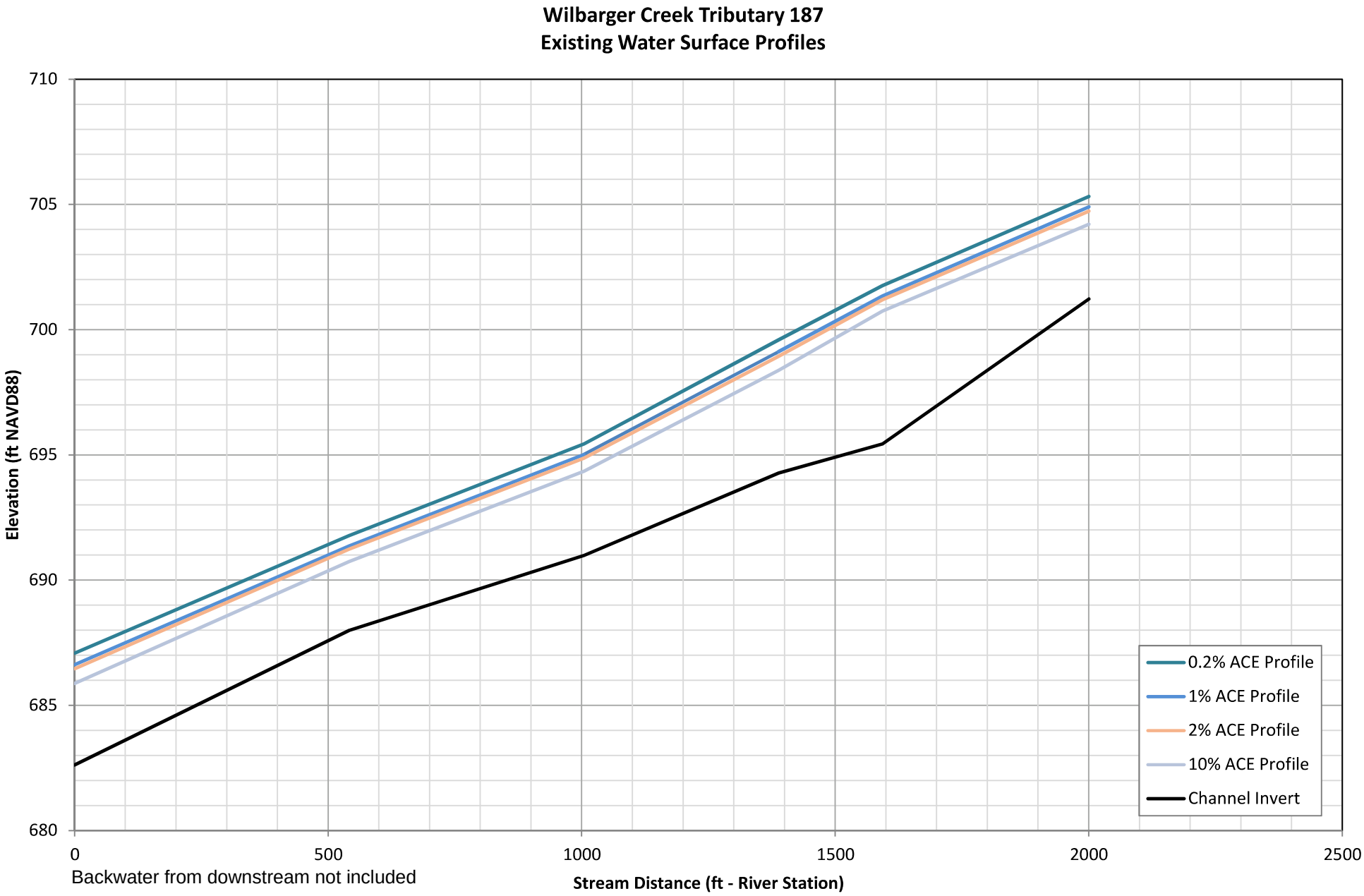

Wilbarger Creek Tributary 167
Existing Water Surface Profiles
Elevation (ft NAVD88)
550
540
530
520
510
500
490
480
0
2000
4000
6000
8000
10000
12000
Stream Distance (ft - River Station)
Railroad Bridge
Old Highway 20
Ring Rd
US 290
Private Driveway
Ralph Ritchie Rd
Private Driveway
Private Driveway
0.2% ACE Profile
1% ACE Profile
2% ACE Profile
10% ACE Profile
Channel Invert
Backwater from downstream not included

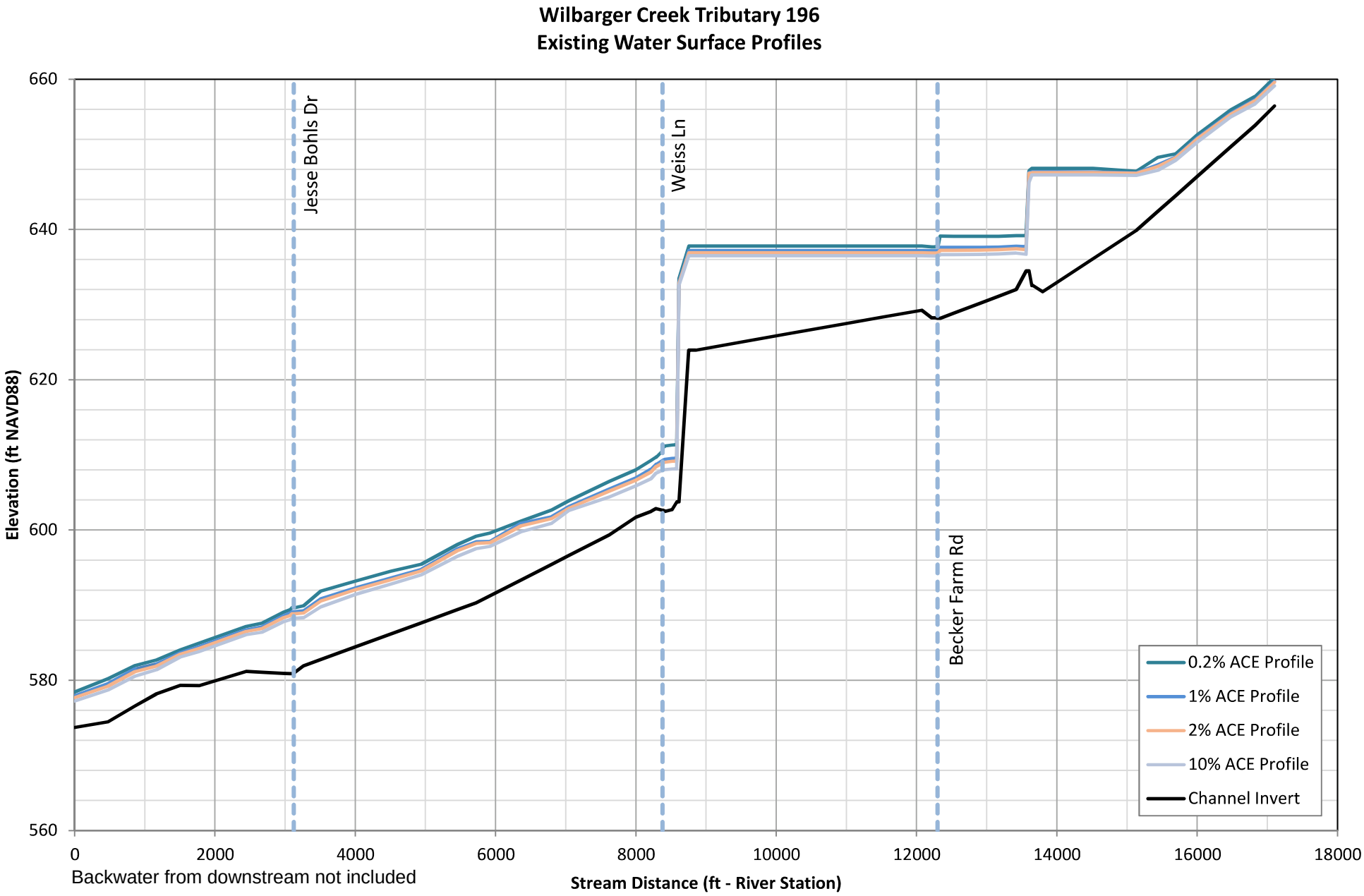

Wilbarger Creek Tributary 178
Existing Water Surface Profiles
Elevation (ft NAVD88)
652
650
648
646
644
642
640
638
636
634
0
500
1000
1500
2000
2500
Stream Distance (ft - River Station)
Backwater from downstream not included
0.2% ACE Profile
1% ACE Profile
2% ACE Profile
10% ACE Profile
Channel Invert

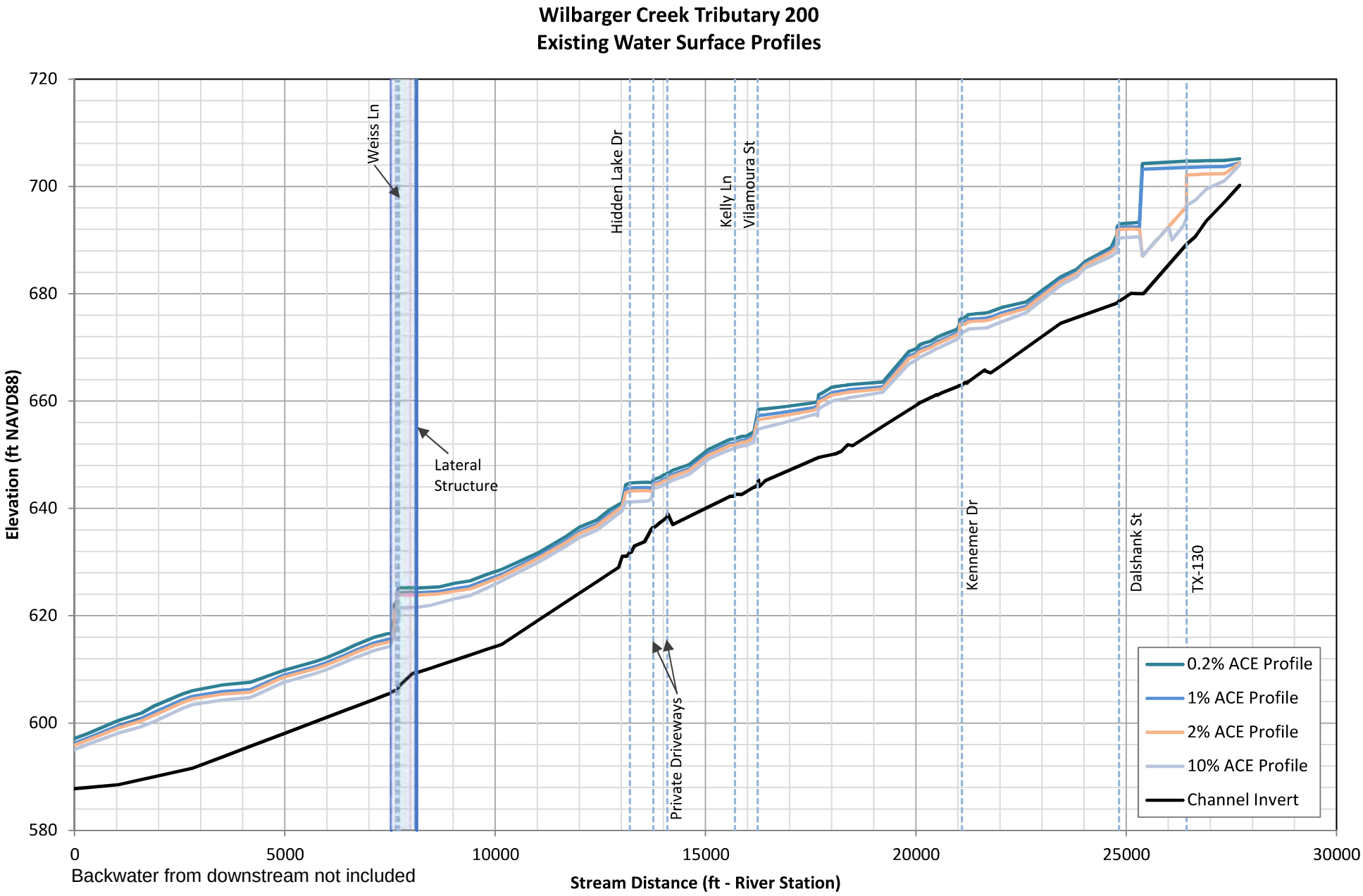

Wilbarger Creek Tributary 183
Existing Water Surface Profiles
744
743
742
741
740
739
738
737
736
Elevation (ft NAVD88)
0
100
200
300
400
500
600
700
Stream Distance (ft - River Station)
Backwater from downstream not included
0.2% ACE Profile
1% ACE Profile
2% ACE Profile
10% ACE Profile
Channel Invert


Wilbarger Creek Tributary 185
Existing Water Surface Profiles
Elevation (ft NAVD88)
744
742
740
738
736
734
732
730
728
726
724
Craters of the Moon Blvd
0
200
400
600
800
1000
1200
1400
1600
Backwater from downstream not included
Stream Distance (ft - River Station)
0.2% ACE Profile
1% ACE Profile
2% ACE Profile
10% ACE Profile
Channel Invert

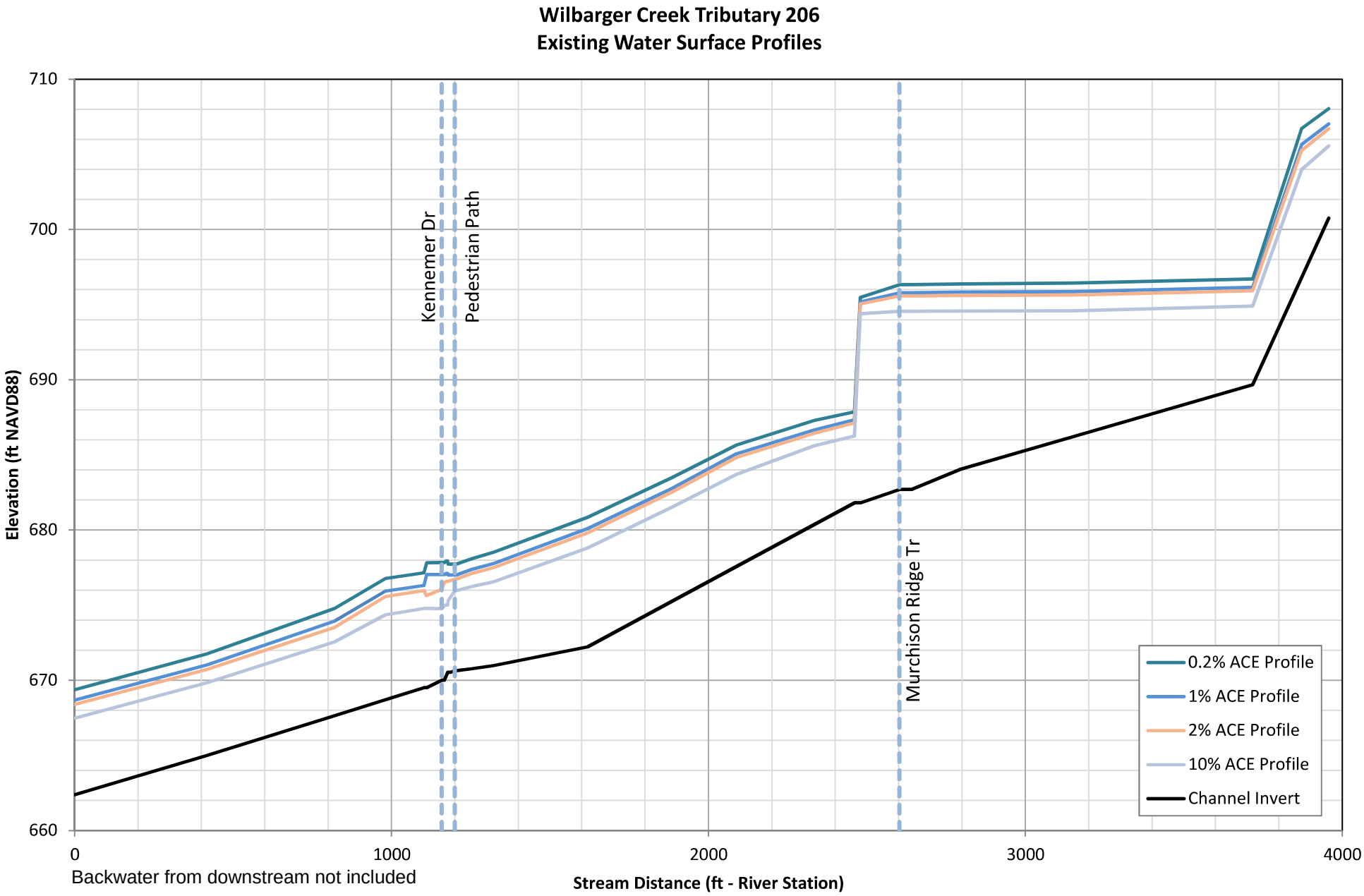

Wilbarger Creek Tributary 186
Existing Water Surface Profiles
Elevation (ft NAVD88)
740
730
720
710
700
690
680
Pfluger Farrm Ln
Town Center Dr
0.2% ACE Profile
1% ACE Profile
2% ACE Profile
10% ACE Profile
Channel Invert
0
1000
2000
3000
4000
5000
6000
Backwater from downstream not included
Stream Distance (ft - River Station)

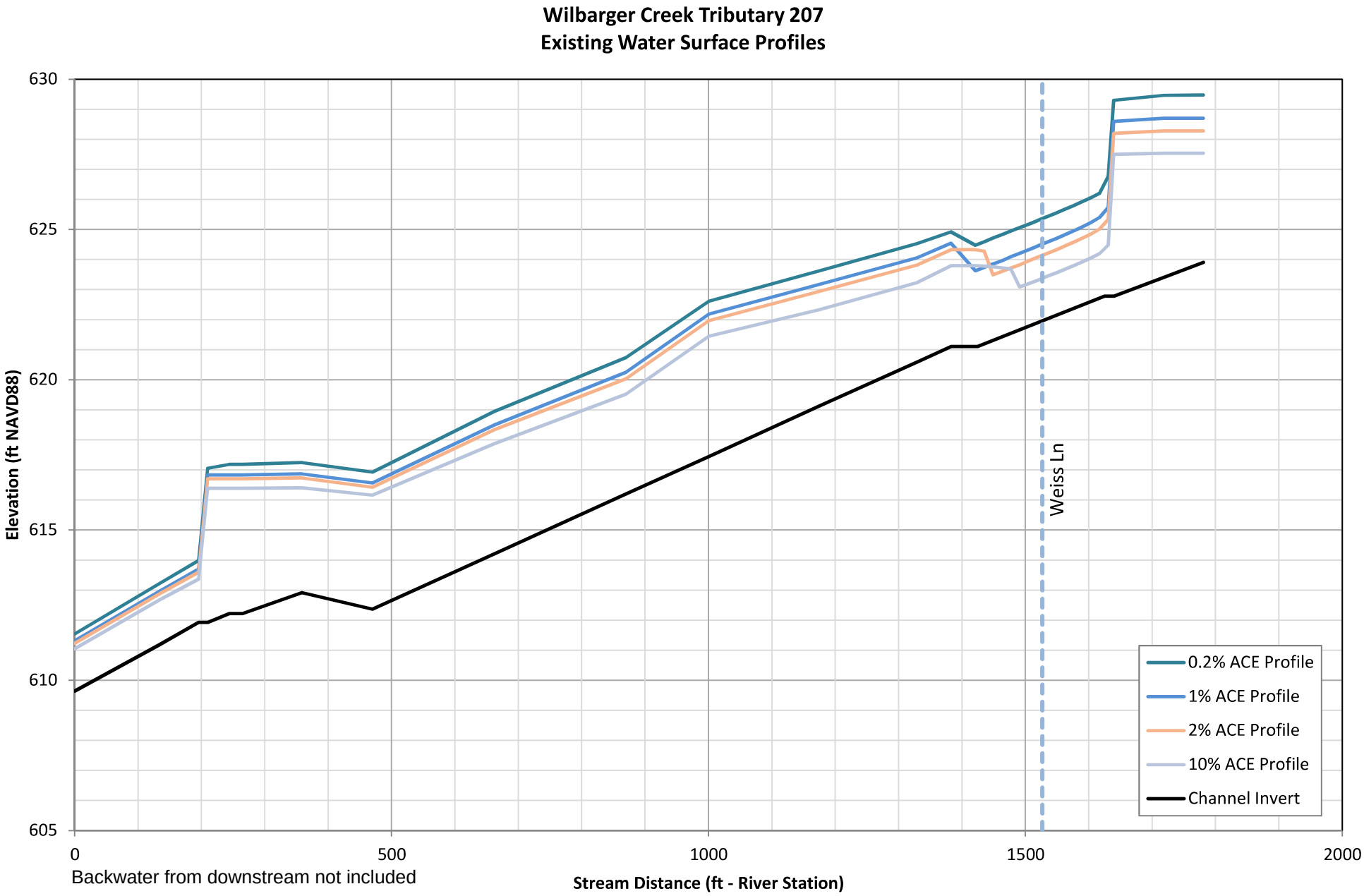

Wilbarger Creek Tributary 187
Existing Water Surface Profiles
710
705
700
695
690
685
680
Elevation (ft NAVD88)
0
500
1000
1500
2000
2500
Stream Distance (ft - River Station)
Backwater from downstream not included
0.2% ACE Profile
1% ACE Profile
2% ACE Profile
10% ACE Profile
Channel Invert

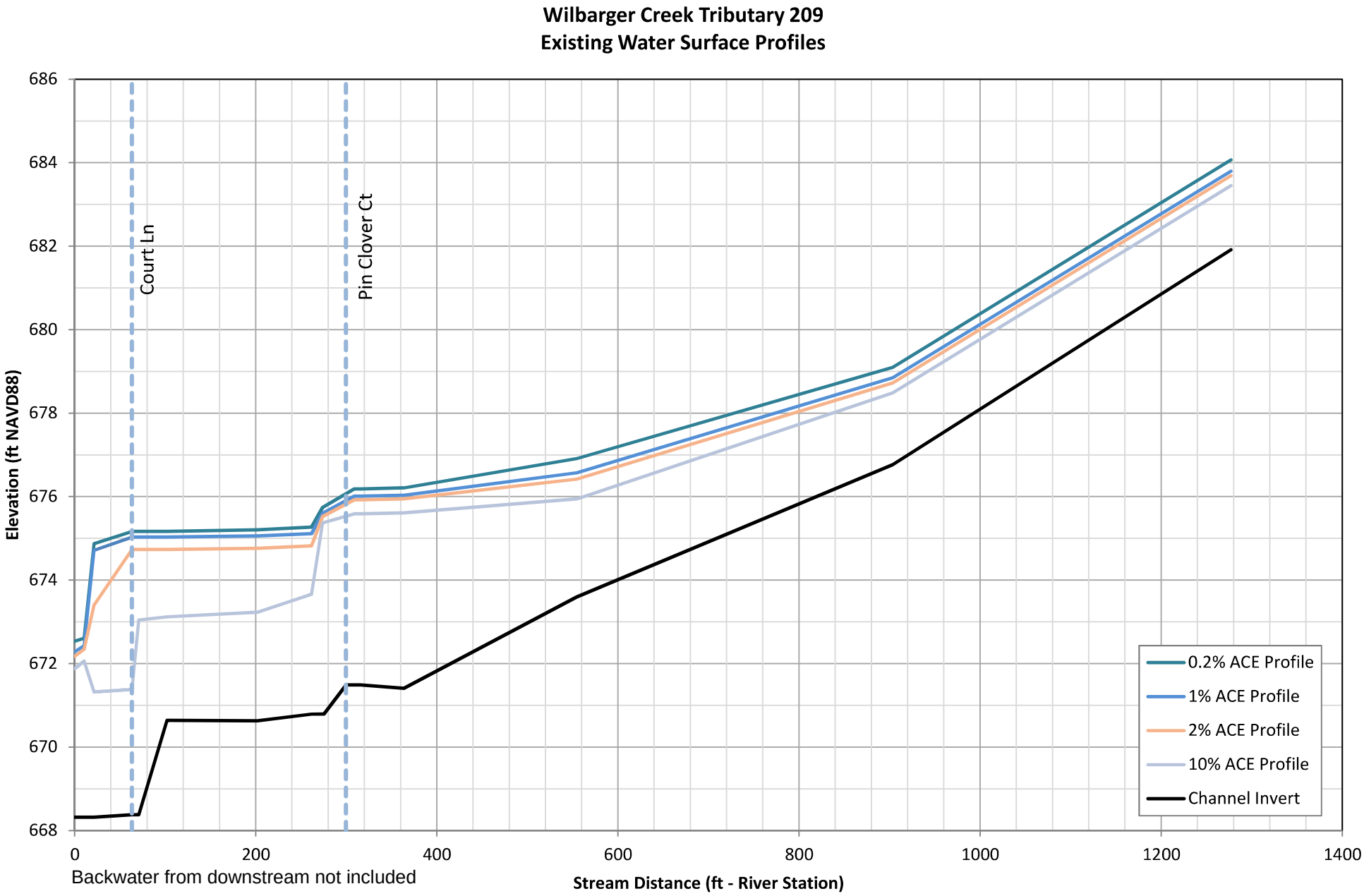

Wilbarger Creek Tributary 196
Existing Water Surface Profiles
Elevation (ft NAVD88)
660
640
620
600
580
560
Jesse Bohls Dr
Weiss Ln
Becker Farm Rd
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Backwater from downstream not included
Stream Distance (ft - River Station)
0.2% ACE Profile
1% ACE Profile
2% ACE Profile
10% ACE Profile
Channel Invert

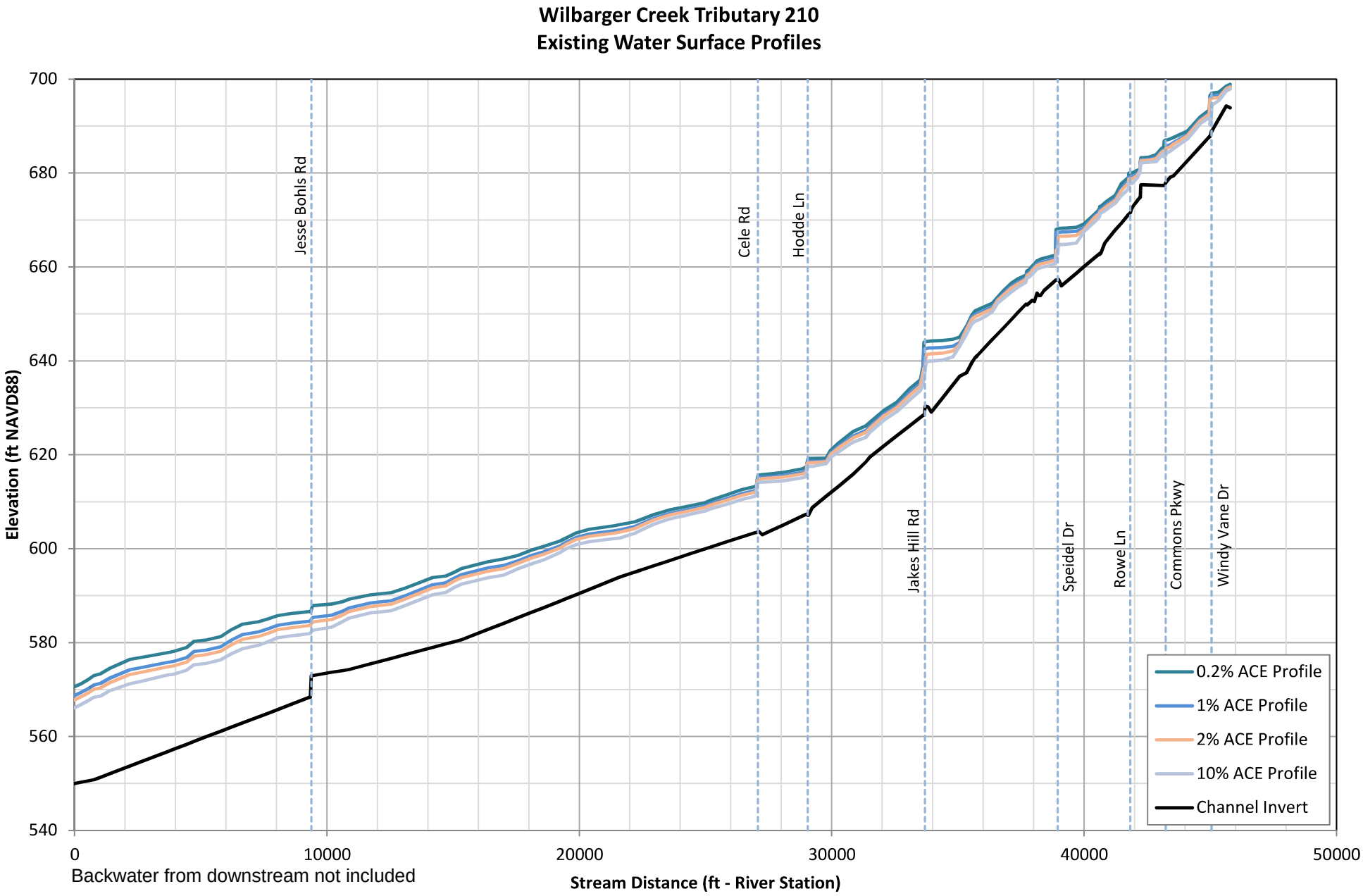


Pedestrian paths and golf cart paths are not shown in the plot

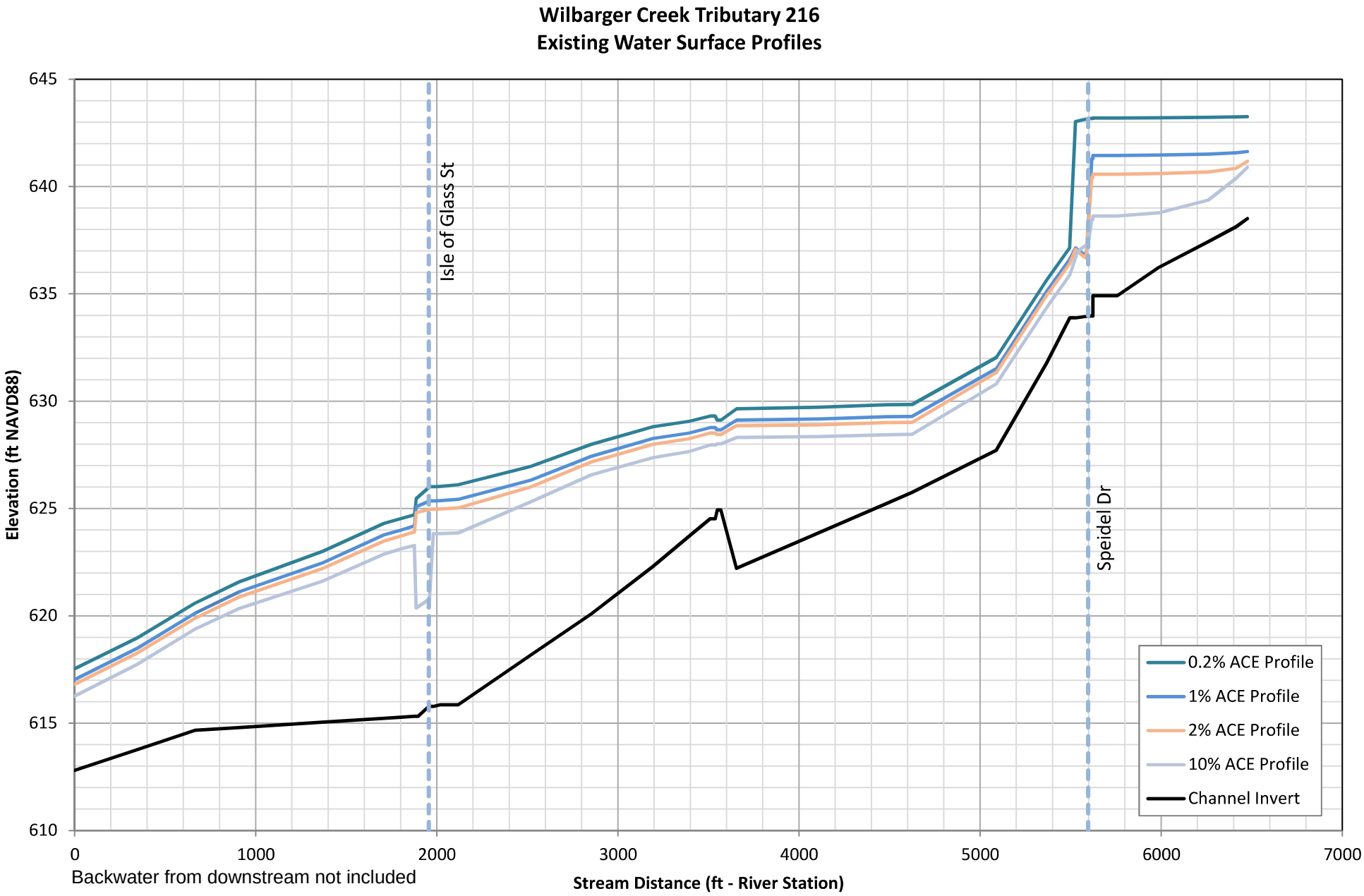

Wilbarger Creek Tributary 206
Existing Water Surface Profiles
Elevation (ft NAVD88)
710
700
690
680
670
660
0
1000
2000
3000
4000
Stream Distance (ft - River Station)
Kennemer Dr
Pedestrian Path
Murchison Ridge Tr
Backwater from downstream not included
0.2% ACE Profile
1% ACE Profile
2% ACE Profile
10% ACE Profile
Channel Invert

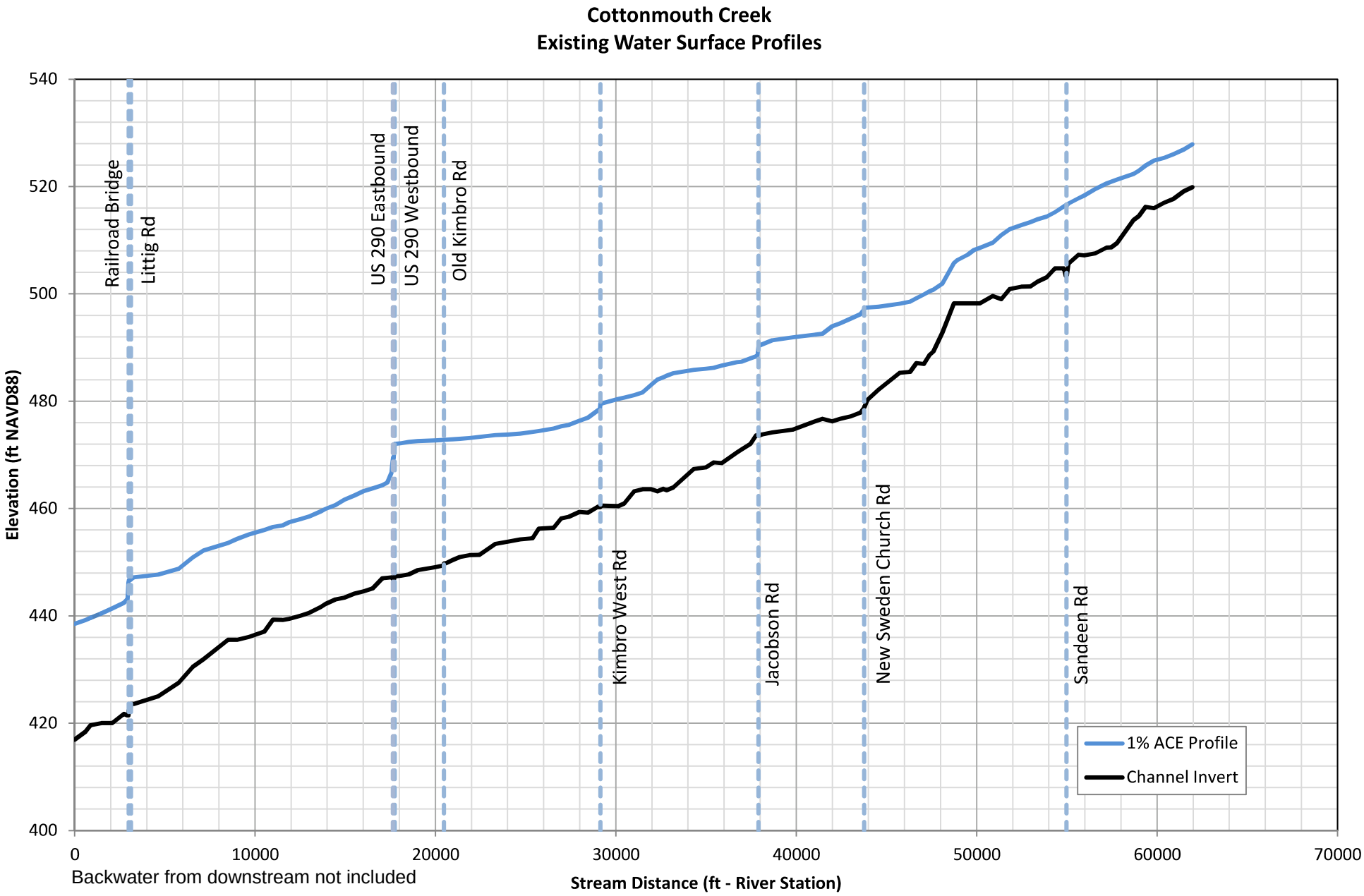

Wilbarger Creek Tributary 207
Existing Water Surface Profiles
630
625
620
615
610
605
Elevation (ft NAVD88)
0
500
1000
1500
2000
Stream Distance (ft - River Station)
Weiss Ln
0.2% ACE Profile
1% ACE Profile
2% ACE Profile
10% ACE Profile
Channel Invert
Backwater from downstream not included

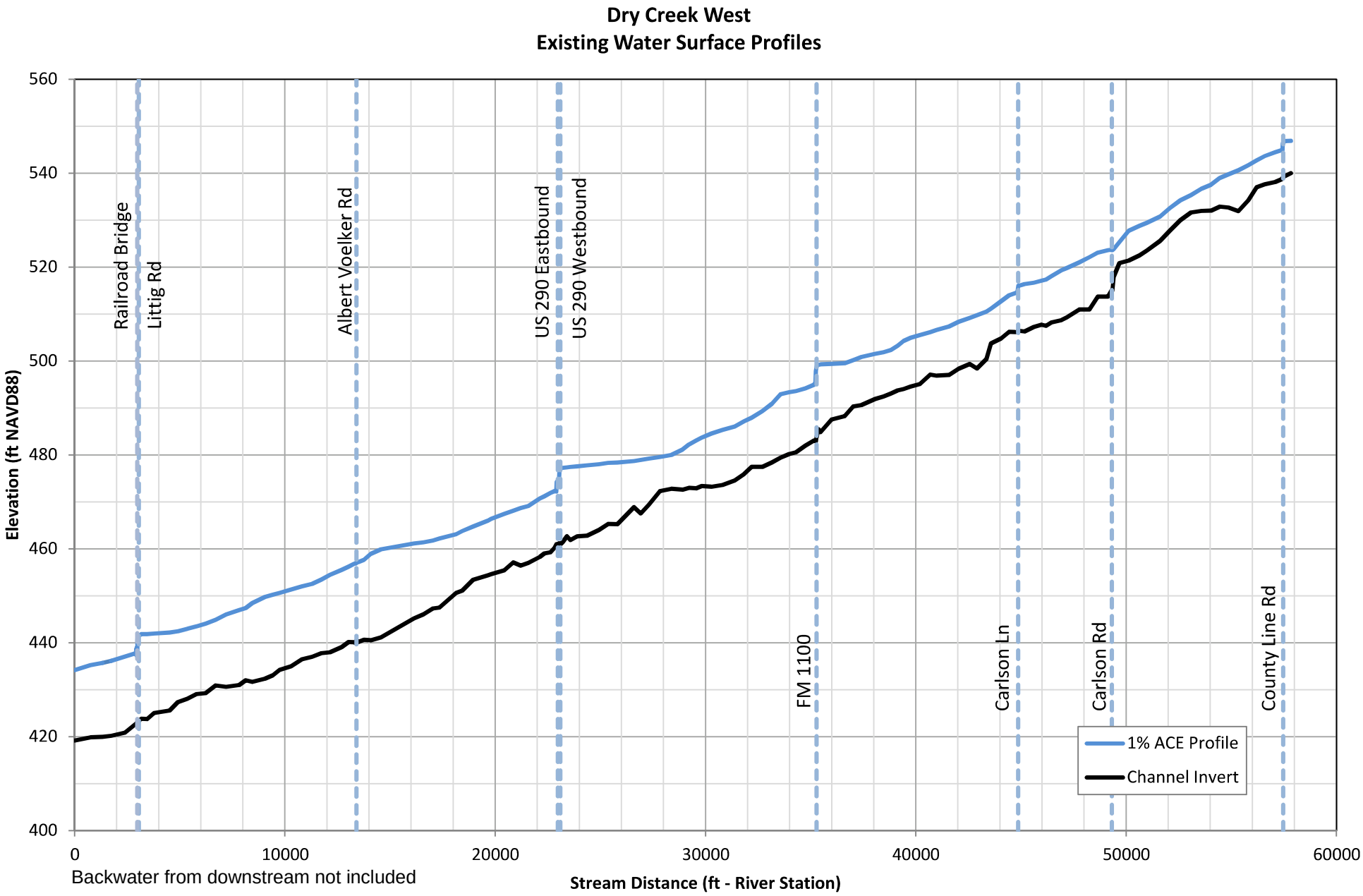

Wilbarger Creek Tributary 209
Existing Water Surface Profiles
Elevation (ft NAVD88)
686
684
682
680
678
676
674
672
670
668
Court Ln
Pin Clover Ct
0
200
400
600
800
1000
1200
1400
Backwater from downstream not included
Stream Distance (ft - River Station)
0.2% ACE Profile
1% ACE Profile
2% ACE Profile
10% ACE Profile
Channel Invert

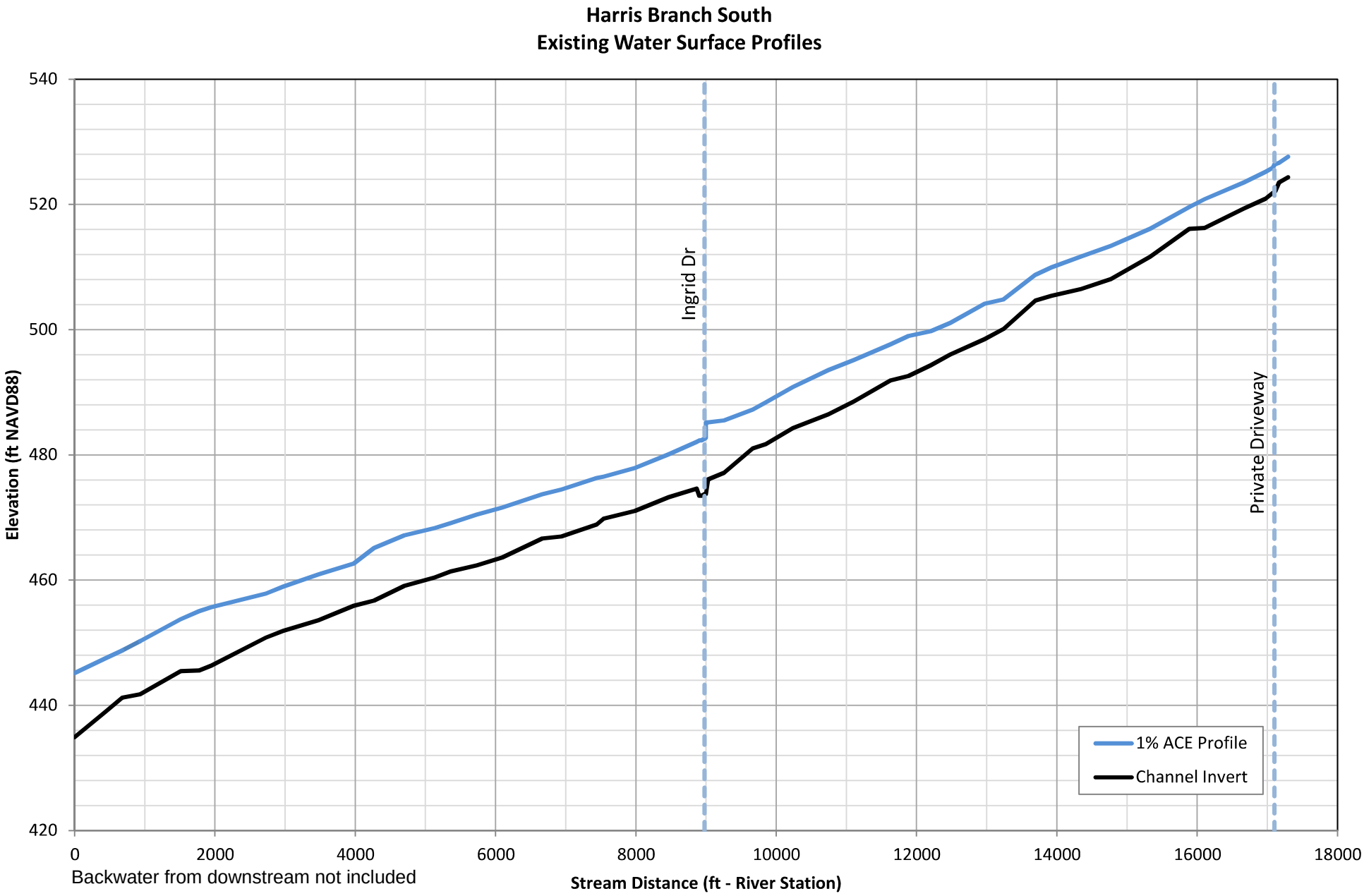


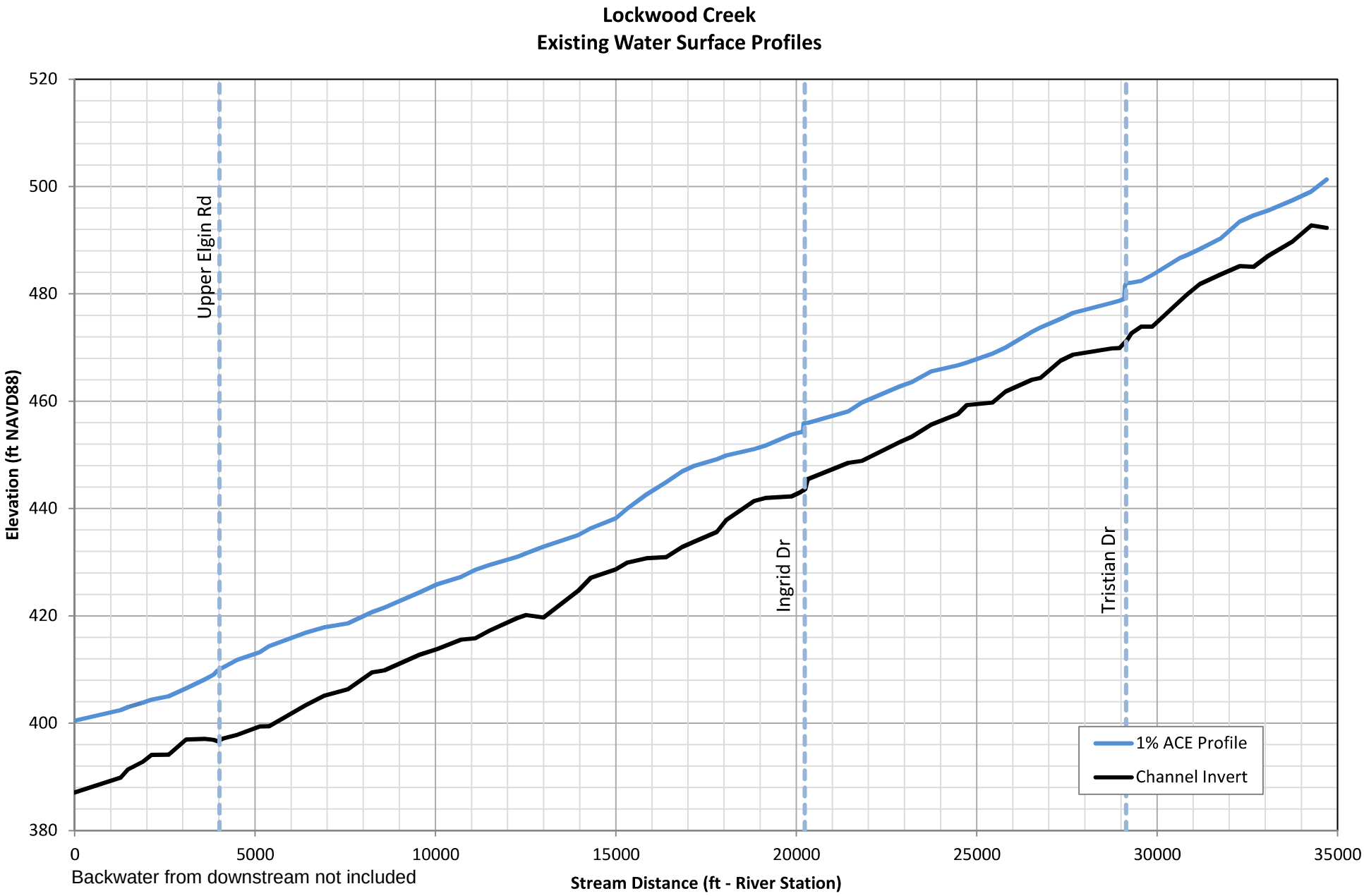
Pedestrian paths and golf cart paths are not shown in the plot

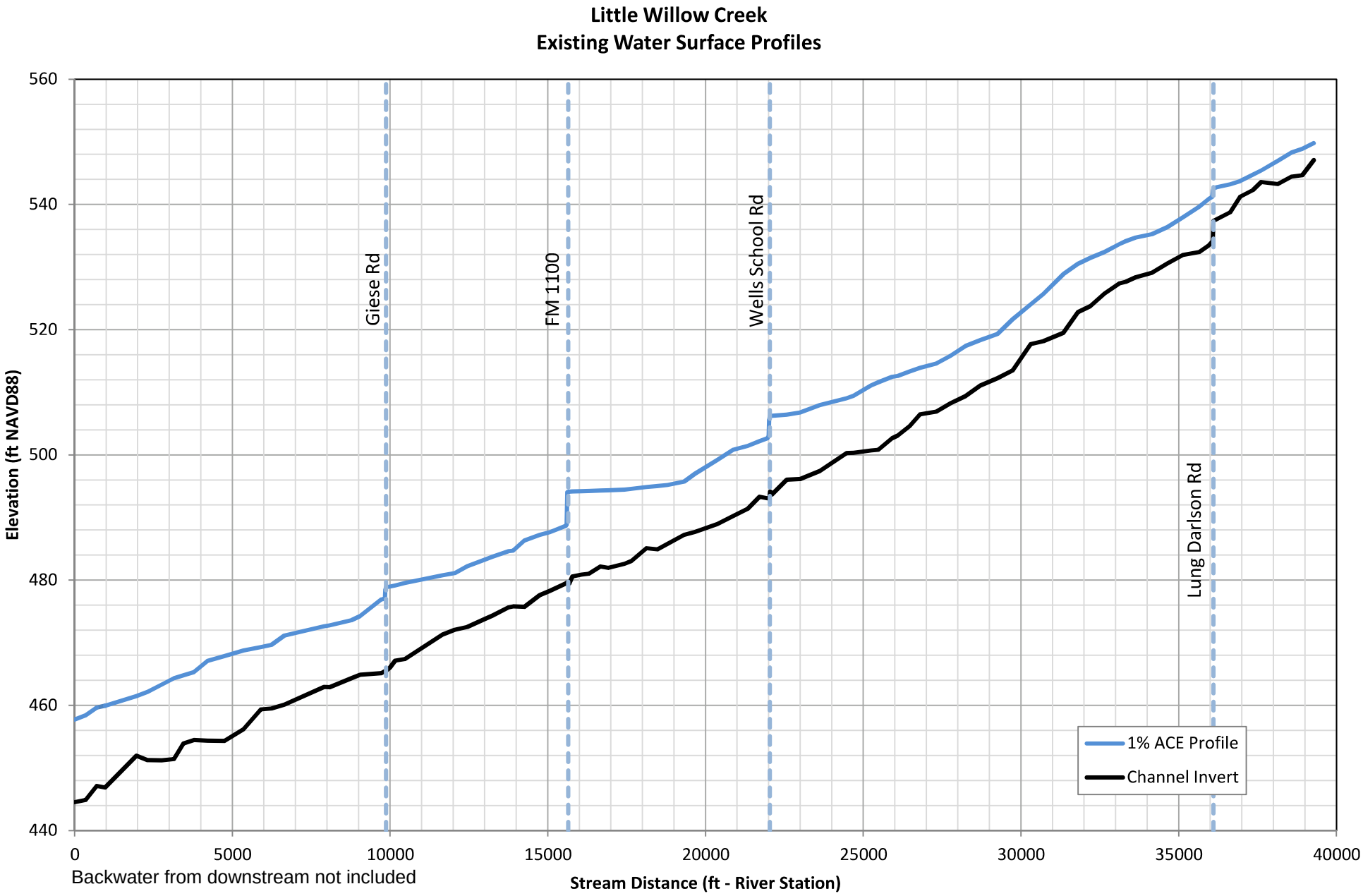

Wilbarger Creek Tributary 216
Existing Water Surface Profiles
Elevation (ft NAVD88)
645
640
635
630
625
620
615
610
Isle of Glass St
Speidel Dr
0.2% ACE Profile
1% ACE Profile
2% ACE Profile
10% ACE Profile
Channel Invert
0
1000
2000
3000
4000
5000
6000
7000
Backwater from downstream not included
Stream Distance (ft - River Station)

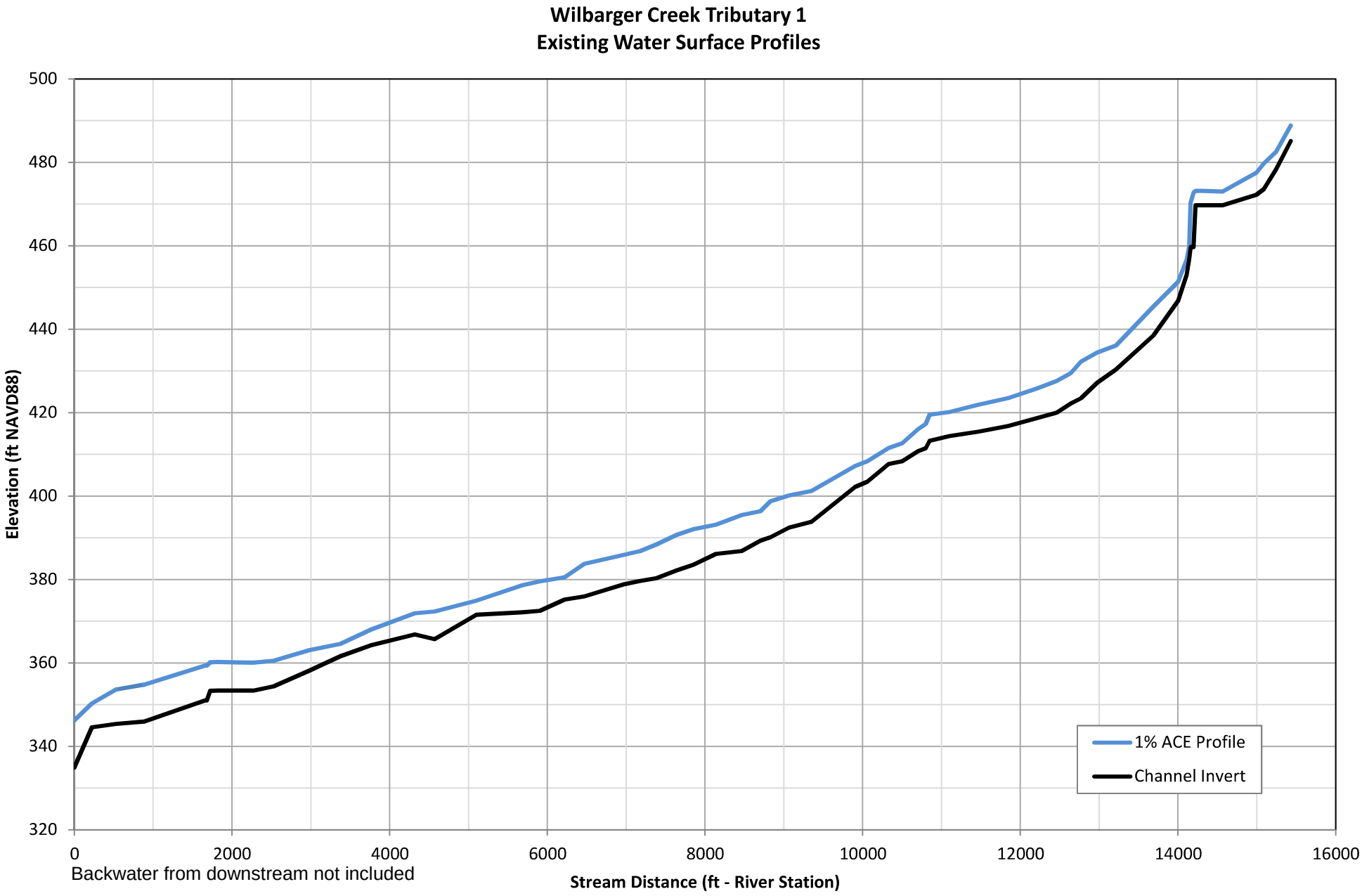

Cottonmouth Creek
Existing Water Surface Profiles
Elevation (ft NAVD88)
540
520
500
480
460
440
420
400
0
10000
20000
30000
40000
50000
60000
70000
Stream Distance (ft - River Station)
Railroad Bridge
Littig Rd
US 290 Eastbound
US 290 Westbound
Old Kimbro Rd
Kimbro West Rd
Jacobson Rd
New Sweden Church Rd
Sandeen Rd
1% ACE Profile
Channel Invert
Backwater from downstream not included

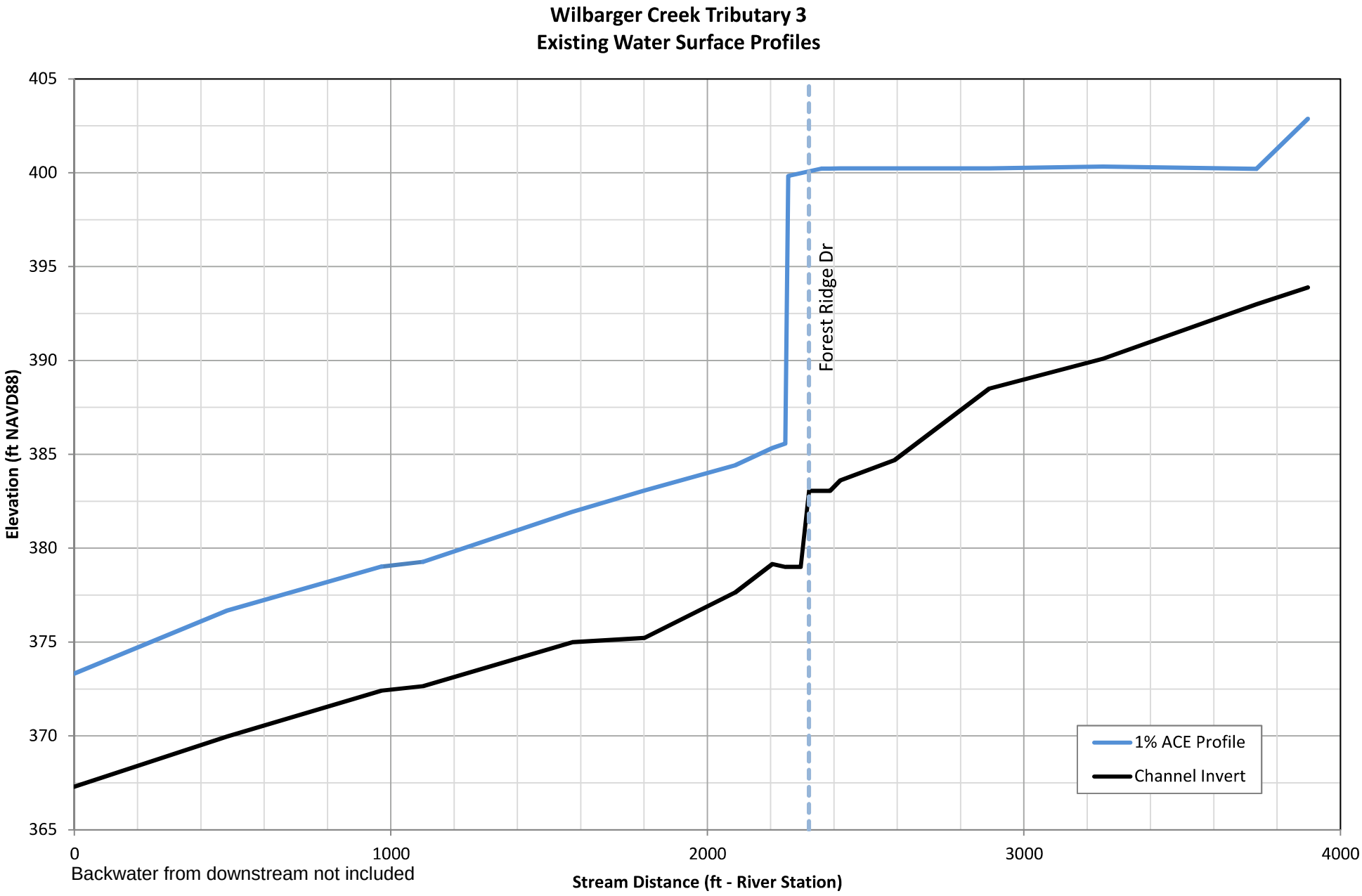

Dry Creek West
Existing Water Surface Profiles
Elevation (ft NAVD88)
560
540
520
500
480
460
440
420
400
0
10000
20000
30000
40000
50000
60000
Stream Distance (ft - River Station)
Railroad Bridge
Littig Rd
Albert Voelker Rd
US 290 Eastbound
US 290 Westbound
FM 1100
Carlson Ln
Carlson Rd
County Line Rd
1% ACE Profile
Channel Invert
Backwater from downstream not included

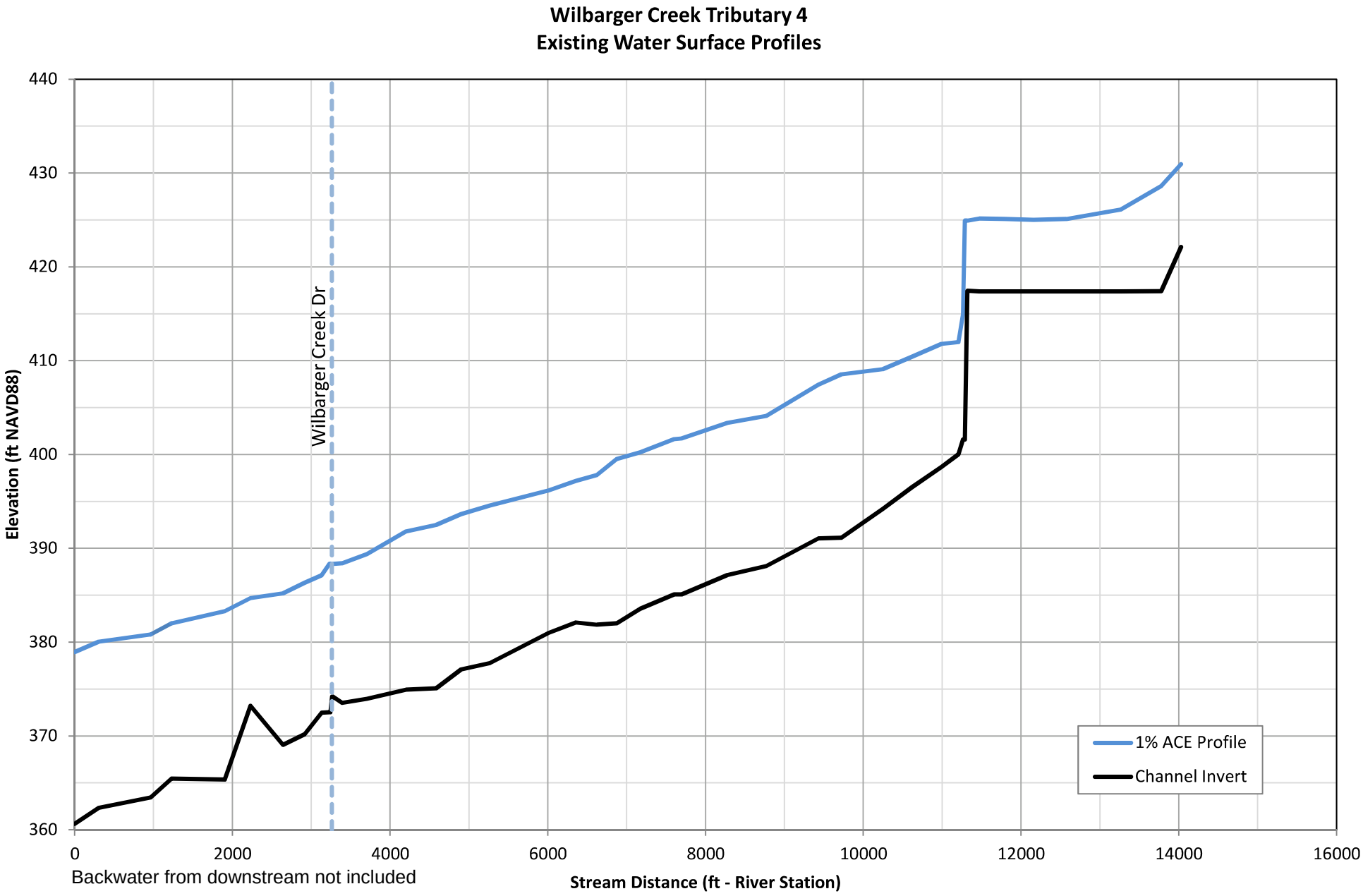

Harris Branch South
Existing Water Surface Profiles
Elevation (ft NAVD88)
540
520
500
480
460
440
420
Ingrid Dr
Private Driveway
1% ACE Profile
Channel Invert
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Backwater from downstream not included
Stream Distance (ft - River Station)

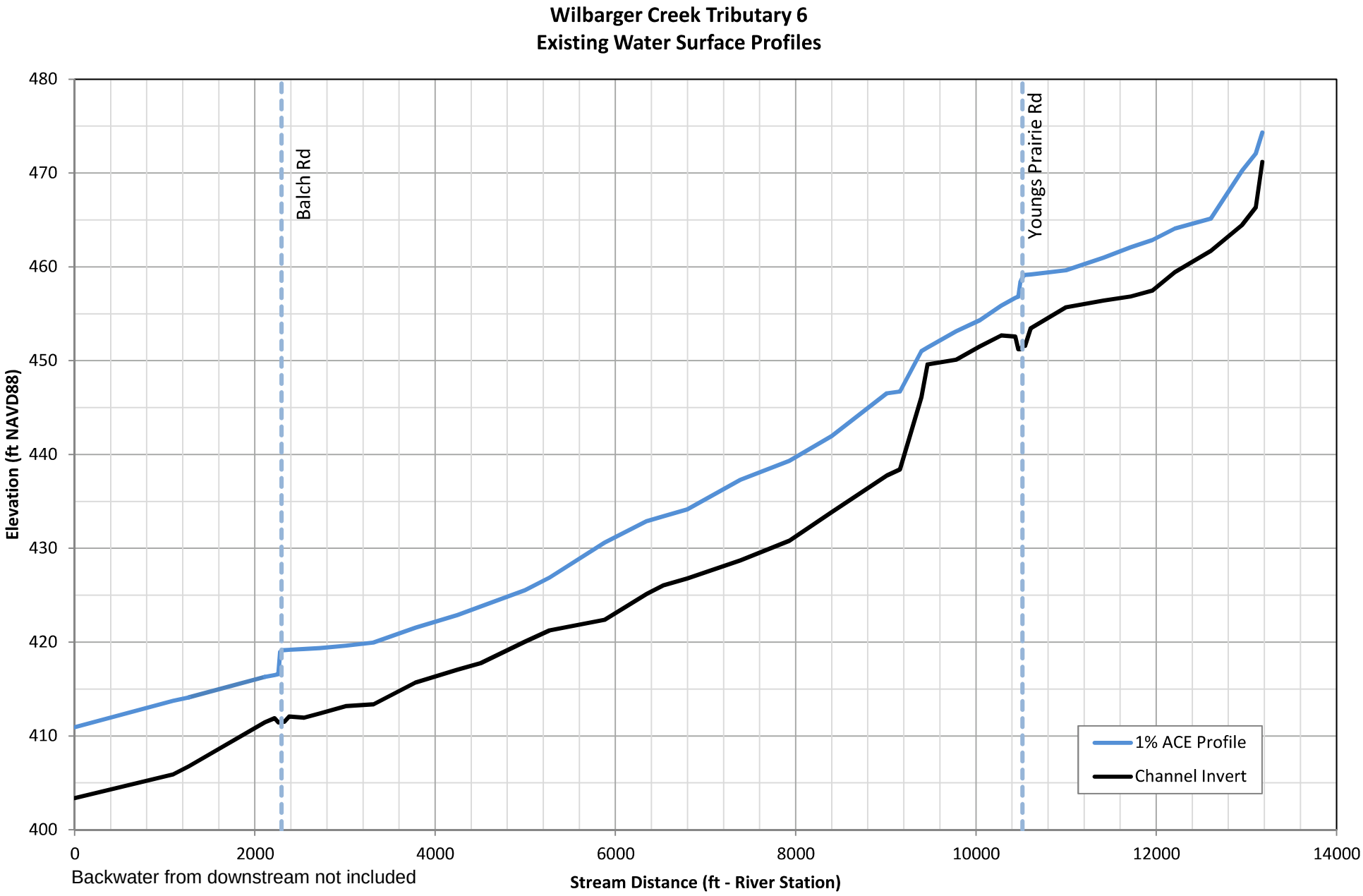

Lockwood Creek
Existing Water Surface Profiles
Elevation (ft NAVD88)
520
500
480
460
440
420
400
380
Upper Elgin Rd
Ingrid Dr
Tristian Dr
1% ACE Profile
Channel Invert
0
5000
10000
15000
20000
25000
30000
35000
Backwater from downstream not included
Stream Distance (ft - River Station)

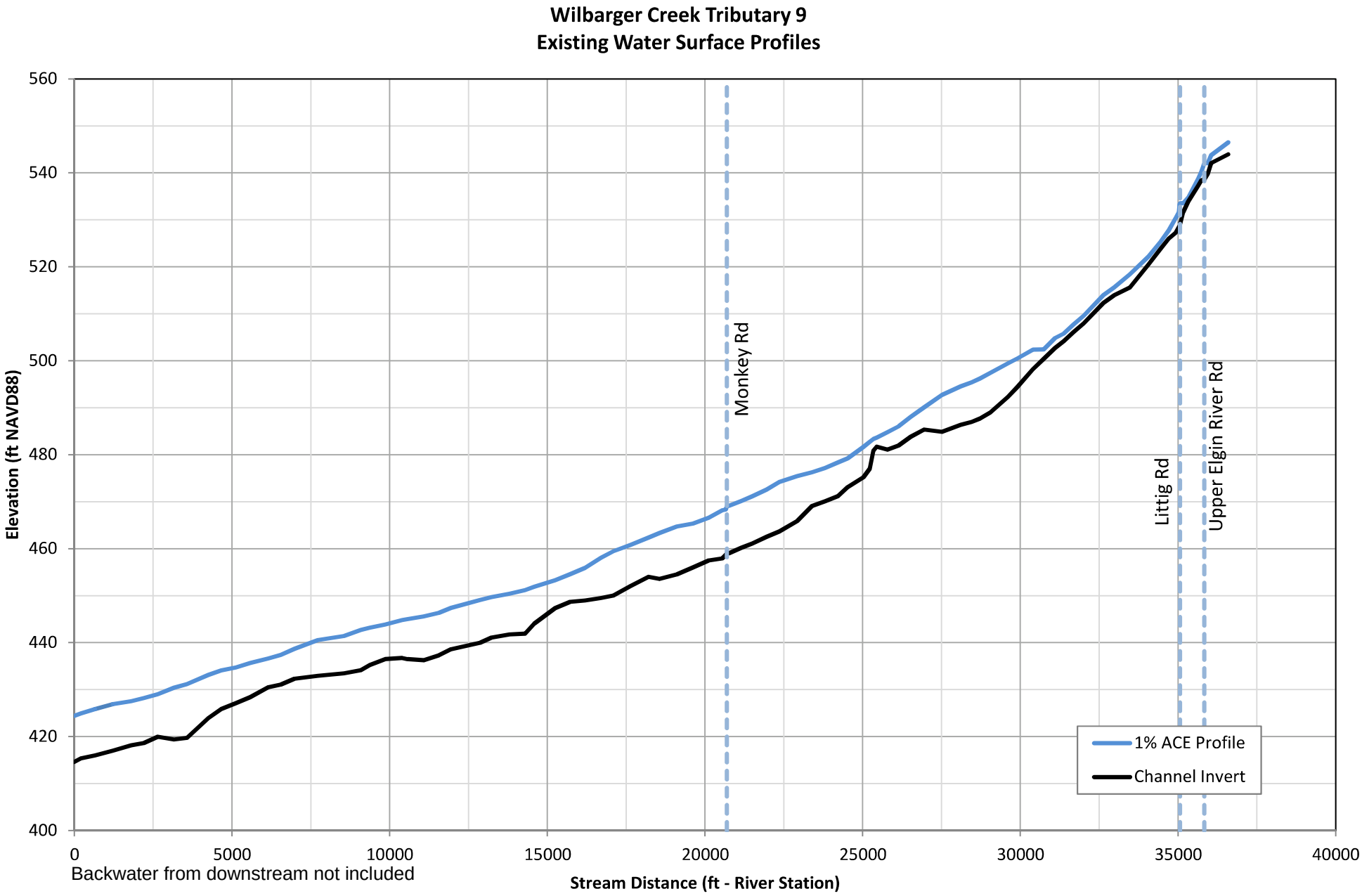

Little Willow Creek
Existing Water Surface Profiles
Elevation (ft NAVD88)
560
540
520
500
480
460
440
Giese Rd
FM 1100
Wells School Rd
Lung Darlson Rd
1% ACE Profile
Channel Invert
0
5000
10000
15000
20000
25000
30000
35000
40000
Backwater from downstream not included
Stream Distance (ft - River Station)

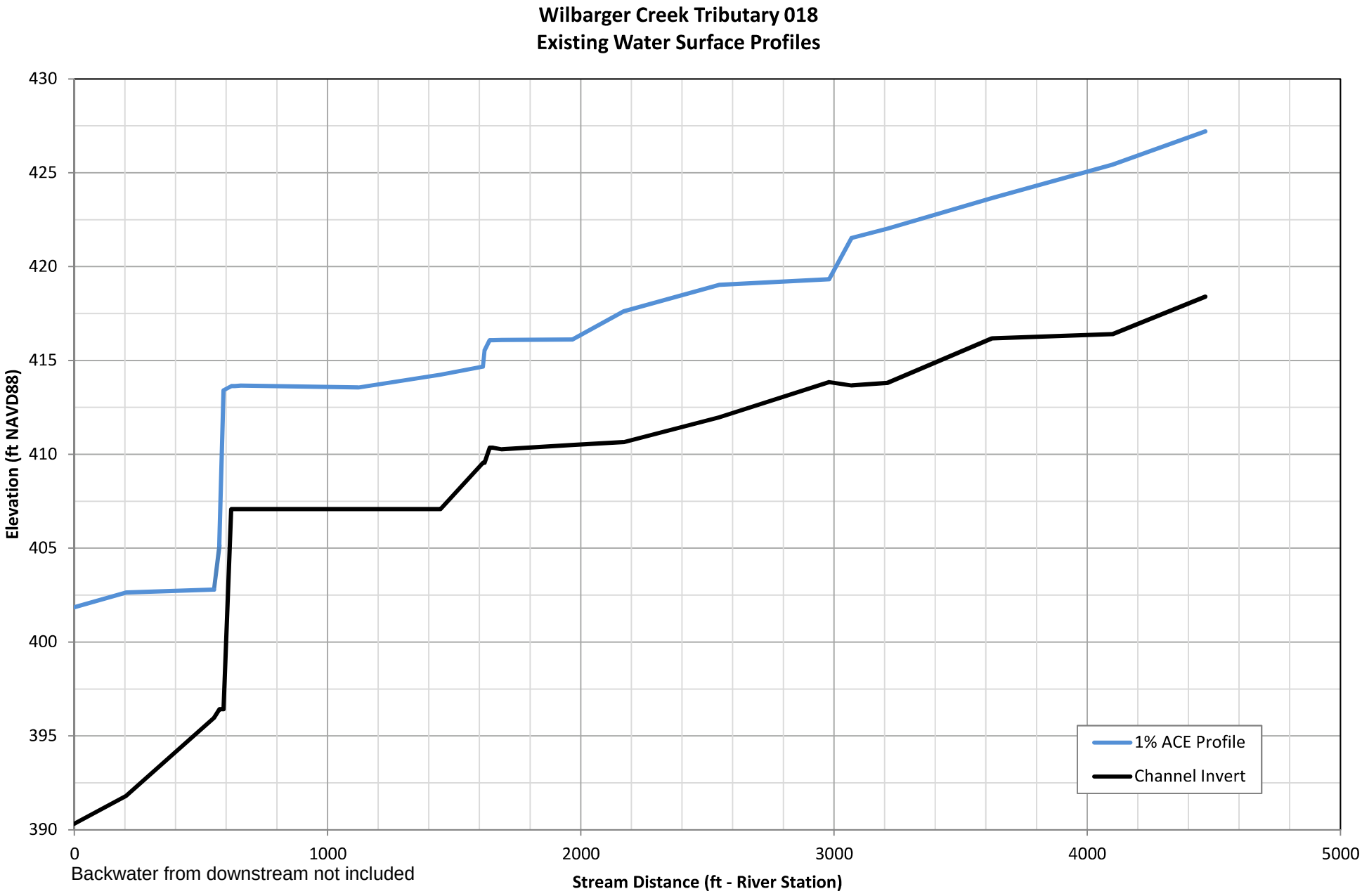

Wilbarger Creek Tributary 1
Existing Water Surface Profiles
Elevation (ft NAVD88)
500
480
460
440
420
400
380
360
340
320
0
2000
4000
6000
8000
10000
12000
14000
16000
Backwater from downstream not included
Stream Distance (ft - River Station)
1% ACE Profile
Channel Invert

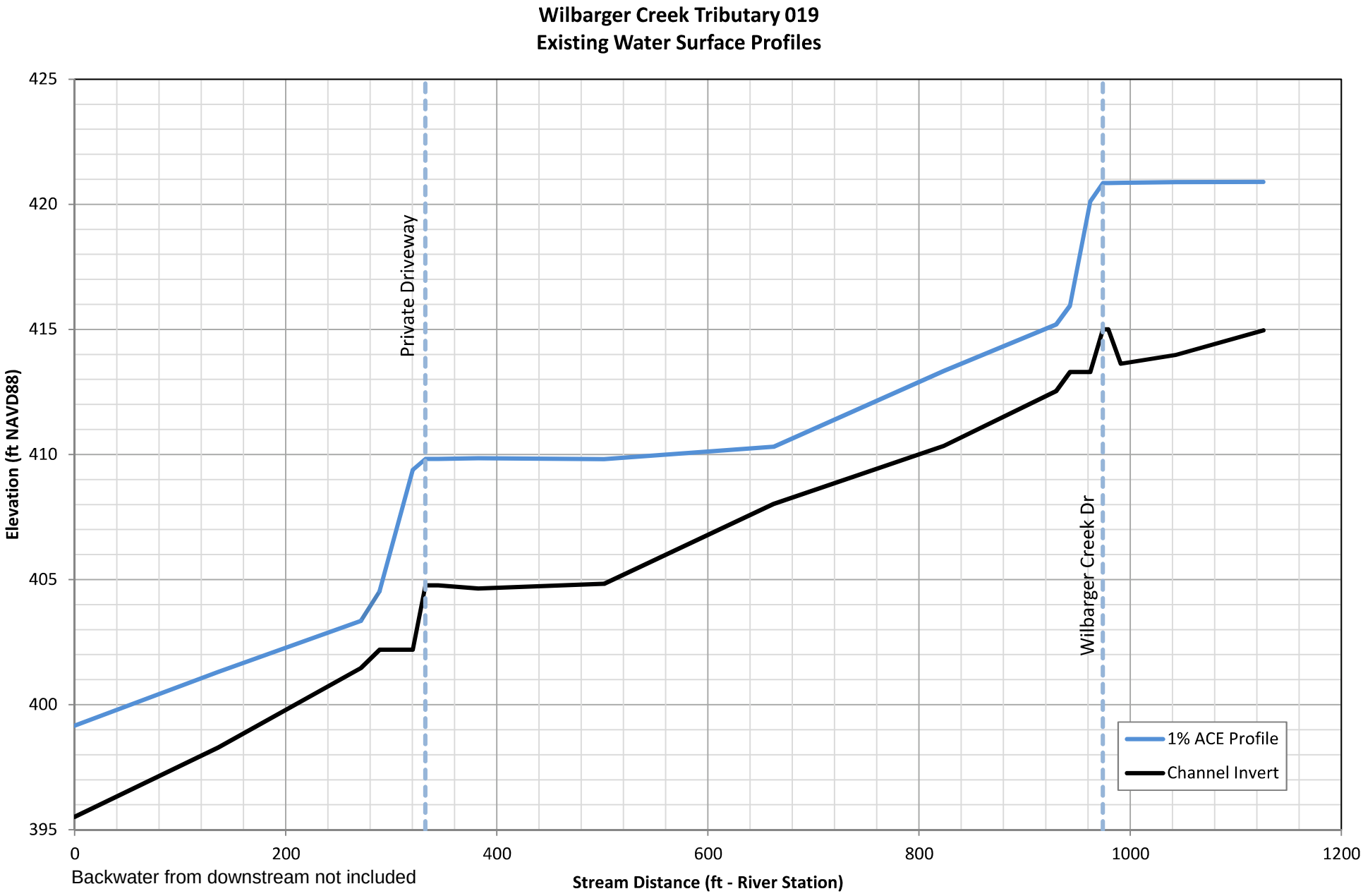

Wilbarger Creek Tributary 3
Existing Water Surface Profiles
Elevation (ft NAVD88)
405
400
395
390
385
380
375
370
365
Forest Ridge Dr
1% ACE Profile
Channel Invert
0
1000
2000
3000
4000
Backwater from downstream not included
Stream Distance (ft - River Station)

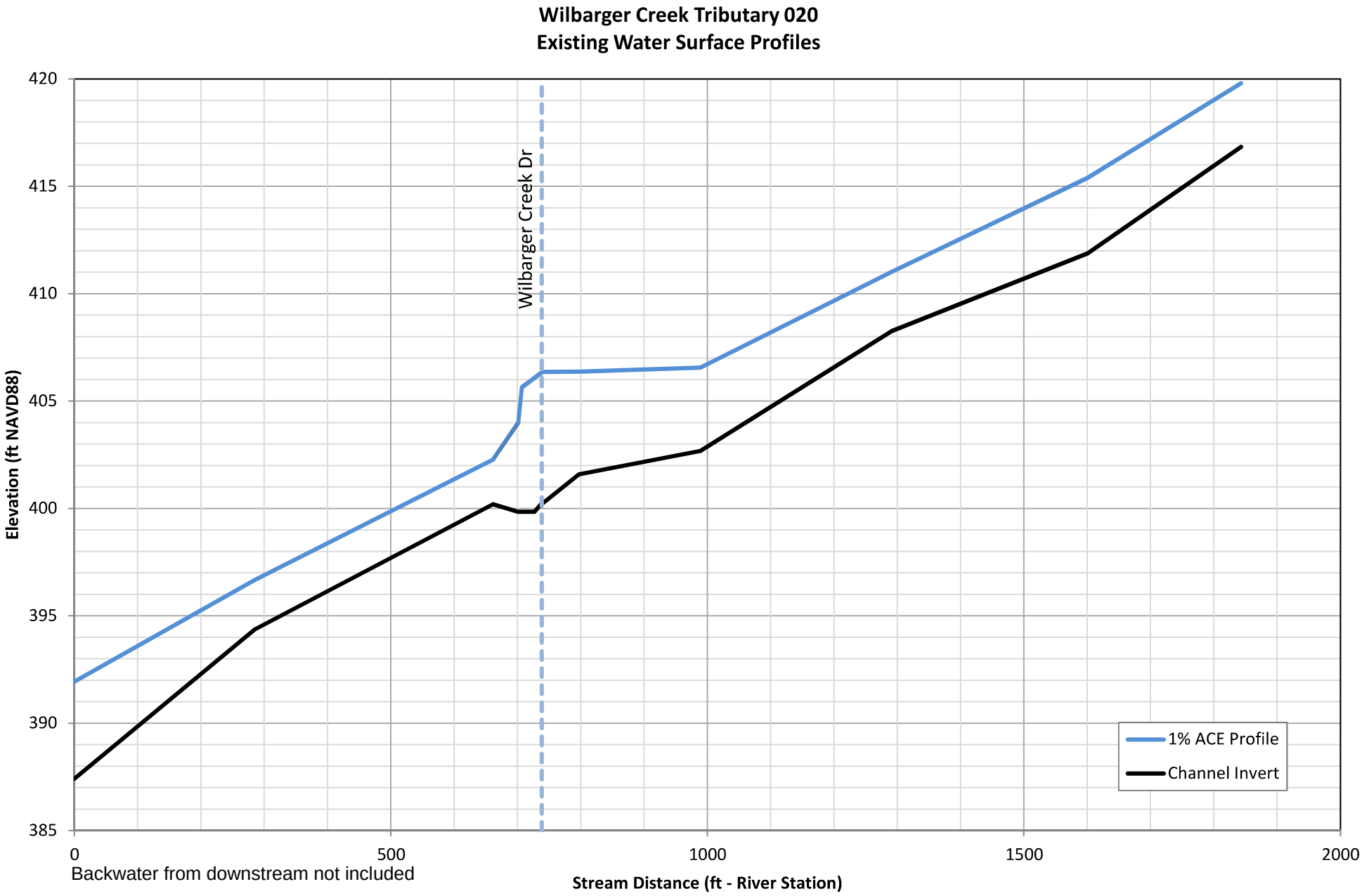

Wilbarger Creek Tributary 4
Existing Water Surface Profiles
Elevation (ft NAVD88)
440
430
420
410
400
390
380
370
360
Wilbarger Creek Dr
0
2000
4000
6000
8000
10000
12000
14000
16000
Backwater from downstream not included
Stream Distance (ft - River Station)
1% ACE Profile
Channel Invert

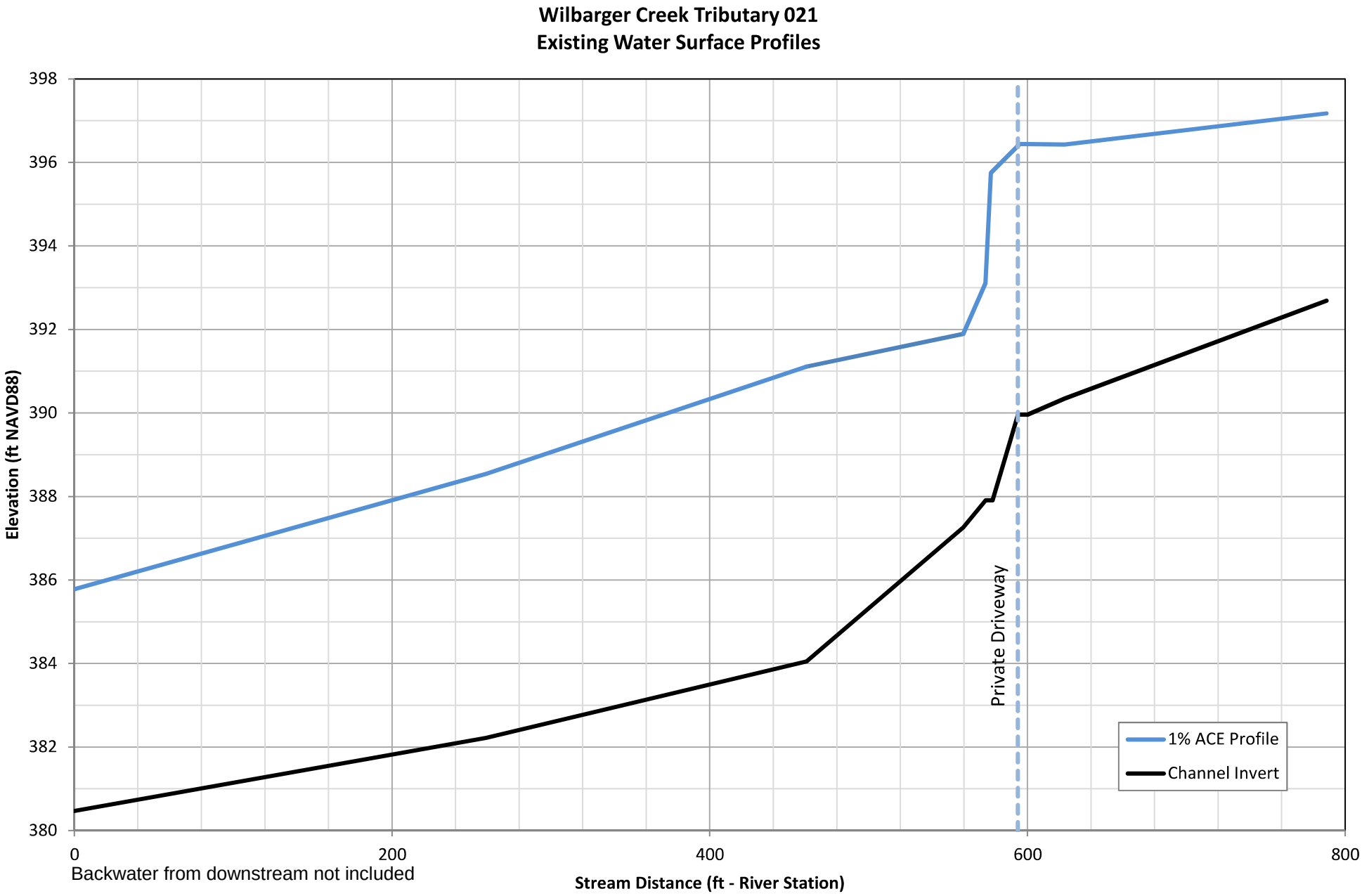

Wilbarger Creek Tributary 6
Existing Water Surface Profiles
Elevation (ft NAVD88)
480
470
460
450
440
430
420
410
400
Balch Rd
Youngs Prairie Rd
1% ACE Profile
Channel Invert
0
2000
4000
6000
8000
10000
12000
14000
Backwater from downstream not included
Stream Distance (ft - River Station)

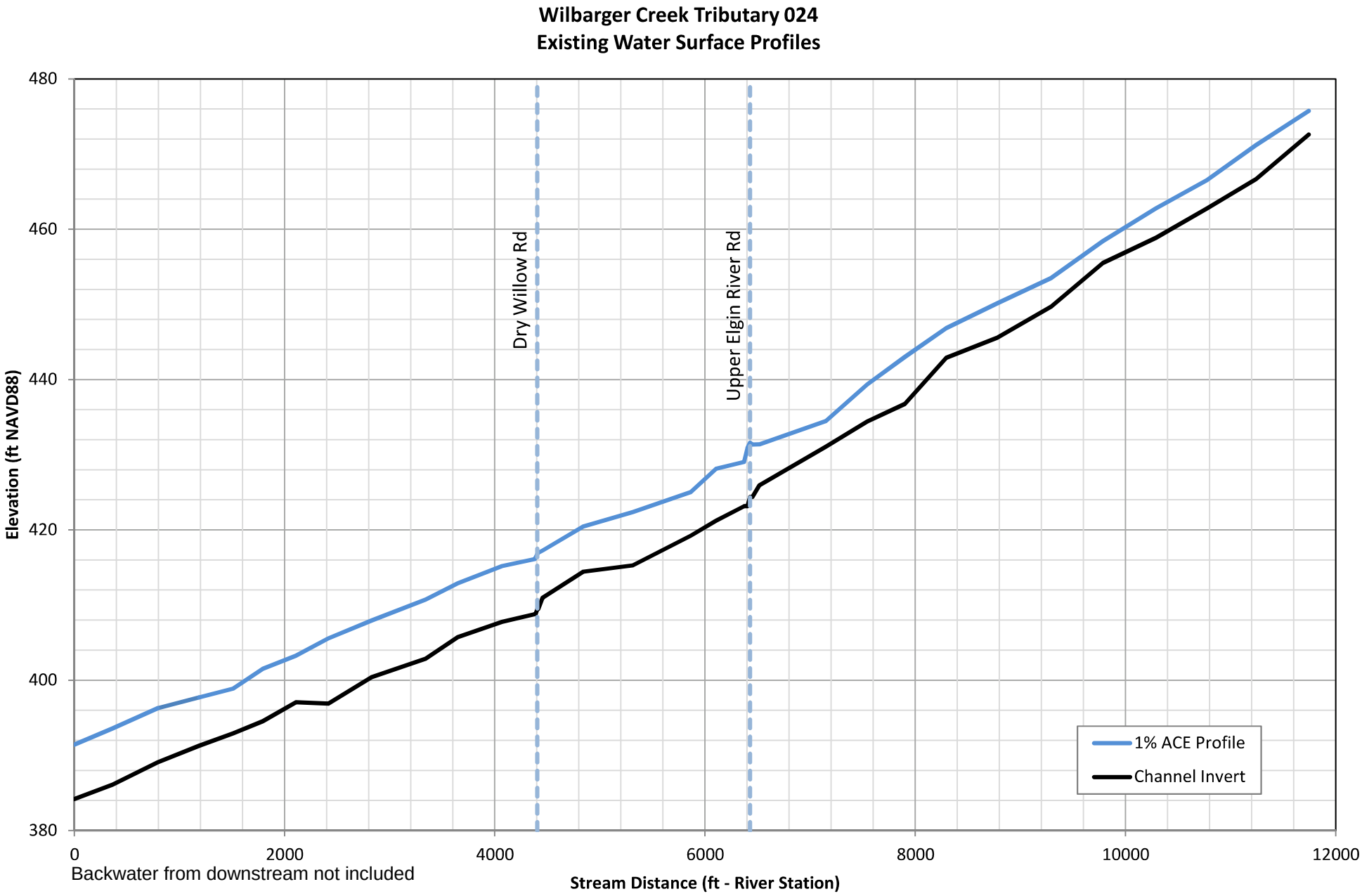

Wilbarger Creek Tributary 9
Existing Water Surface Profiles
Elevation (ft NAVD88)
560
540
520
500
480
460
440
420
400
0
5000
10000
15000
20000
25000
30000
35000
40000
Backwater from downstream not included
Stream Distance (ft - River Station)
Monkey Rd
Littig Rd
Upper Elgin River Rd
1% ACE Profile
Channel Invert

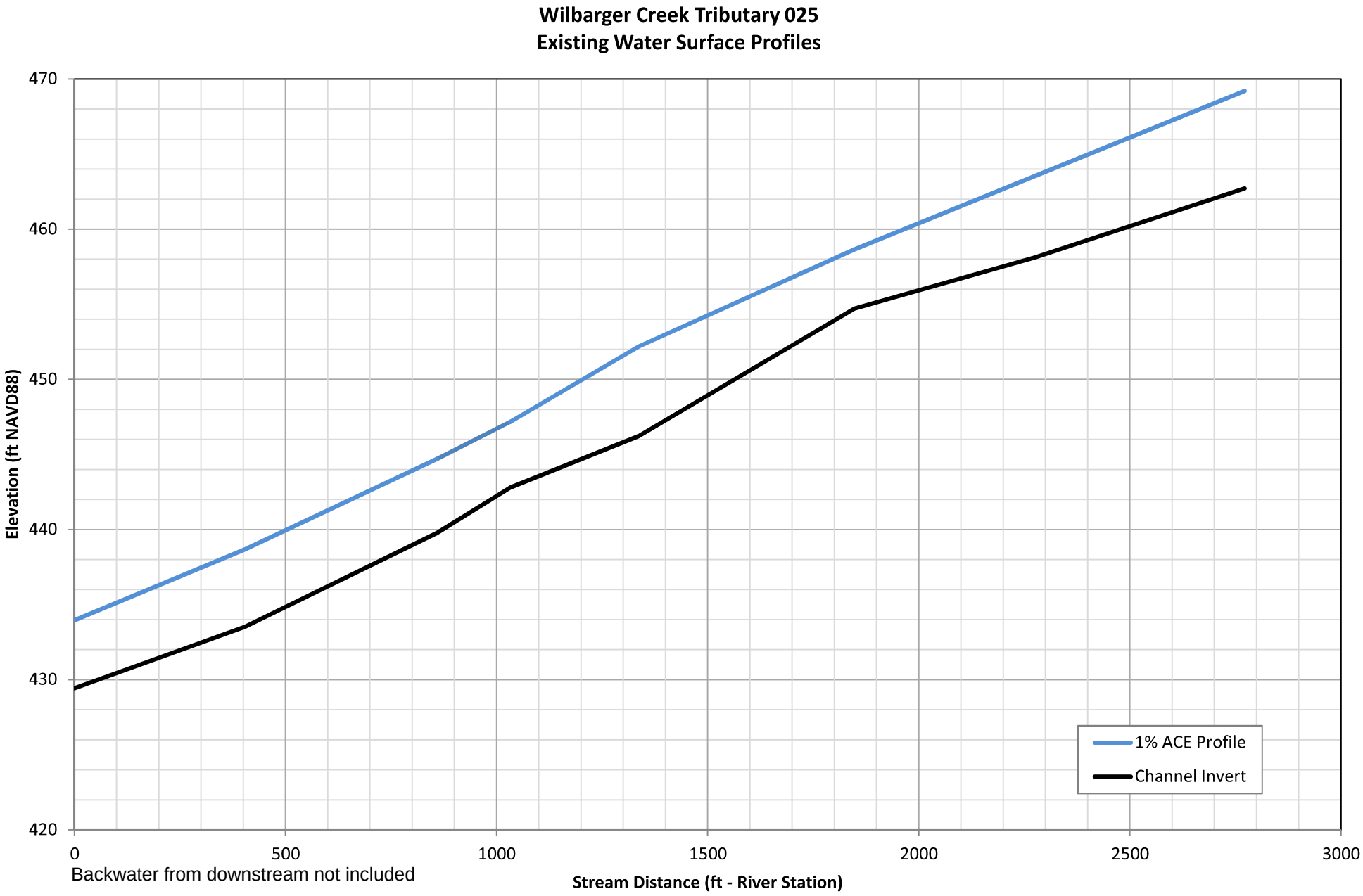

Wilbarger Creek Tributary 018
Existing Water Surface Profiles
Elevation (ft NAVD88)
430
425
420
415
410
405
400
395
390
0
1000
2000
3000
4000
5000
Backwater from downstream not included
Stream Distance (ft - River Station)
1% ACE Profile
Channel Invert

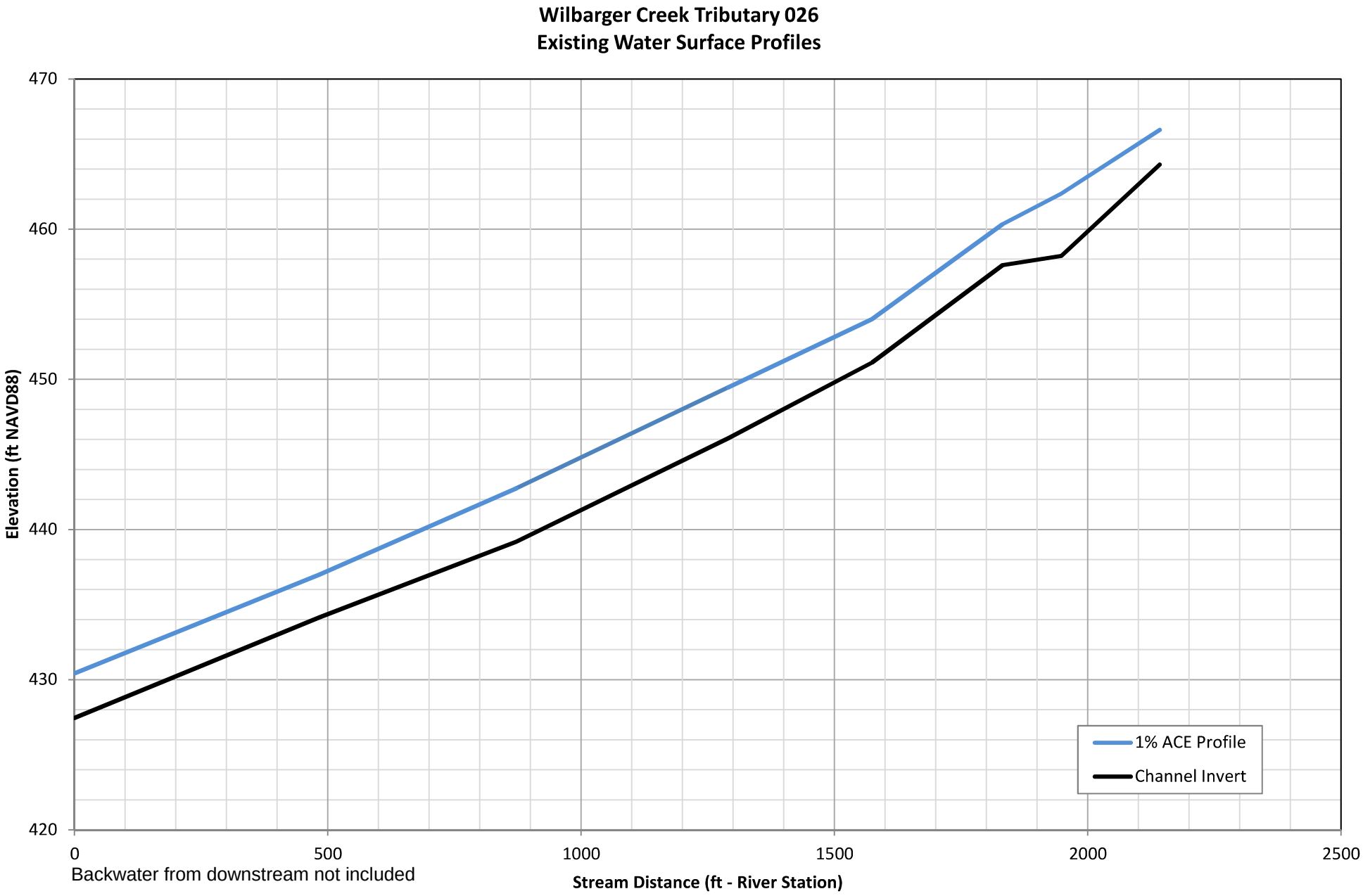

Wilbarger Creek Tributary 019
Existing Water Surface Profiles
Elevation (ft NAVD88)
425
420
415
410
405
400
395
Private Driveway
Wilbarger Creek Dr
1% ACE Profile
Channel Invert
0
200
400
600
800
1000
1200
Backwater from downstream not included
Stream Distance (ft - River Station)

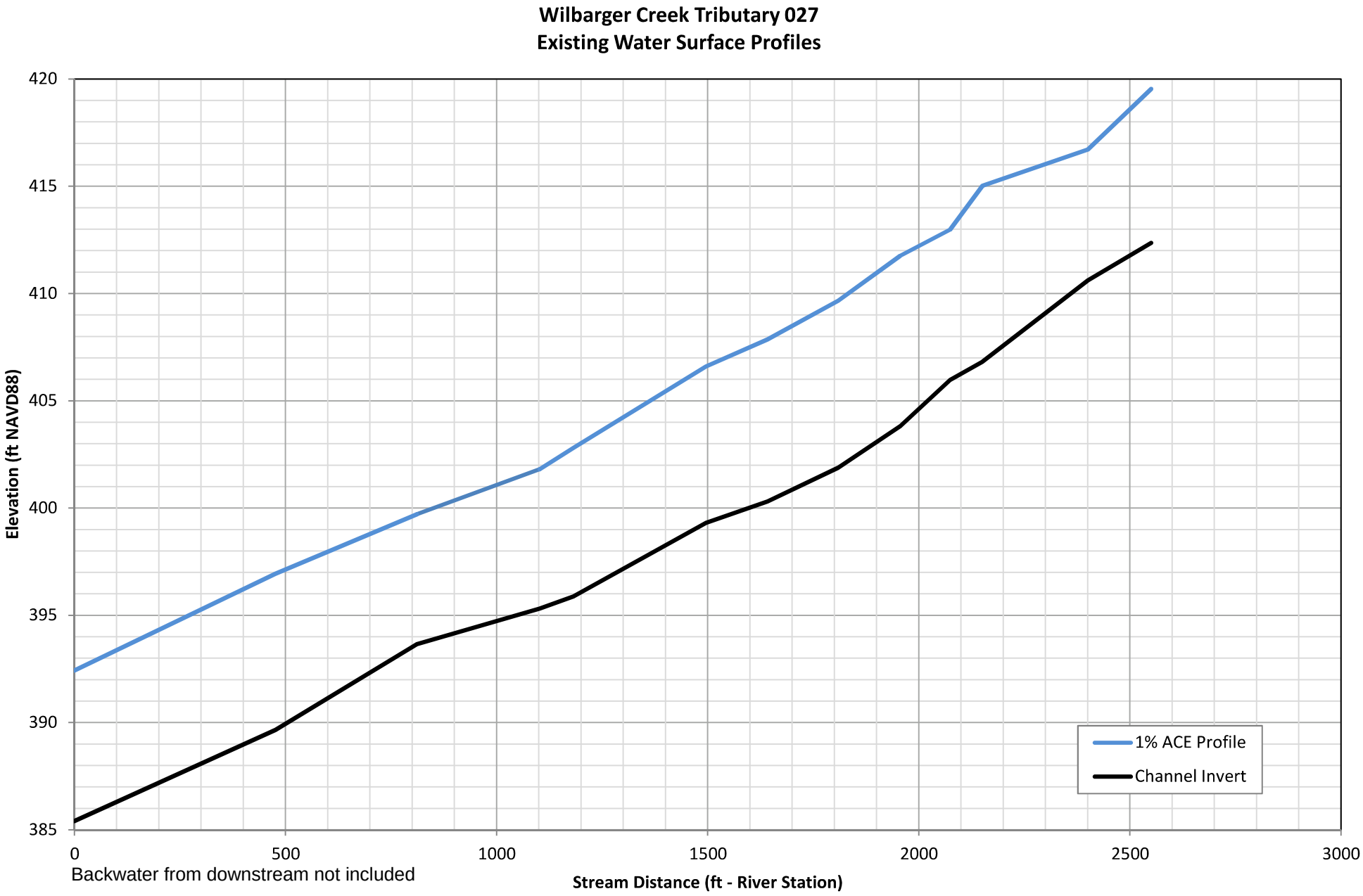

Wilbarger Creek Tributary 020
Existing Water Surface Profiles
Wilbarger Creek Dr
Elevation (ft NAVD88)
420
415
410
405
400
395
390
385
0
500
1000
1500
2000
Backwater from downstream not included
Stream Distance (ft - River Station)
1% ACE Profile
Channel Invert

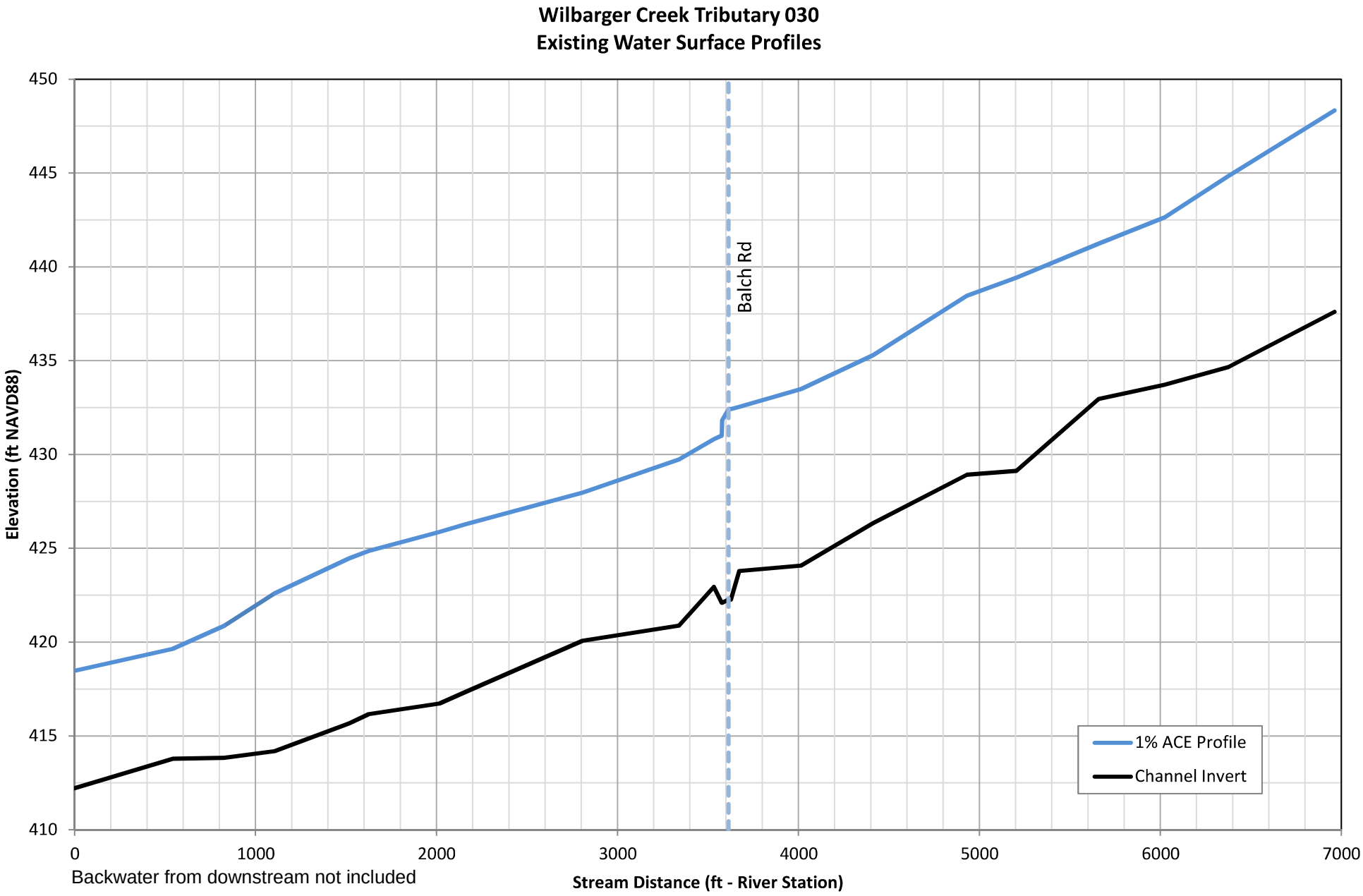

Wilbarger Creek Tributary 021
Existing Water Surface Profiles
Elevation (ft NAVD88)
398
396
394
392
390
388
386
384
382
380
0
200
400
600
800
Backwater from downstream not included
Stream Distance (ft - River Station)
Private Driveway
1% ACE Profile
Channel Invert

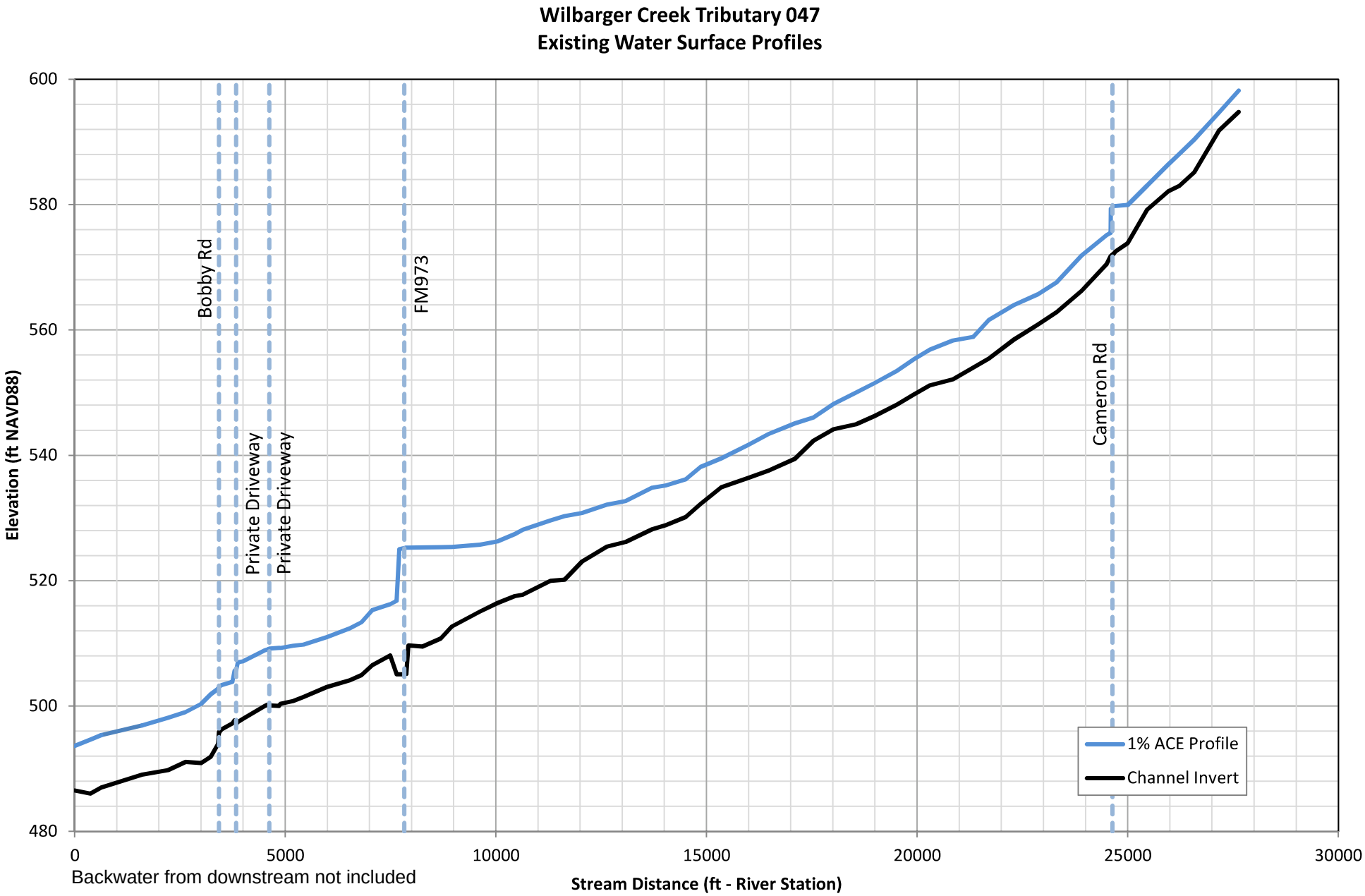

Wilbarger Creek Tributary 024
Existing Water Surface Profiles
480
460
440
420
400
380
Elevation (ft NAVD88)
Dry Willow Rd
Upper Elgin River Rd
1% ACE Profile
Channel Invert
0
2000
4000
6000
8000
10000
12000
Backwater from downstream not included
Stream Distance (ft - River Station)

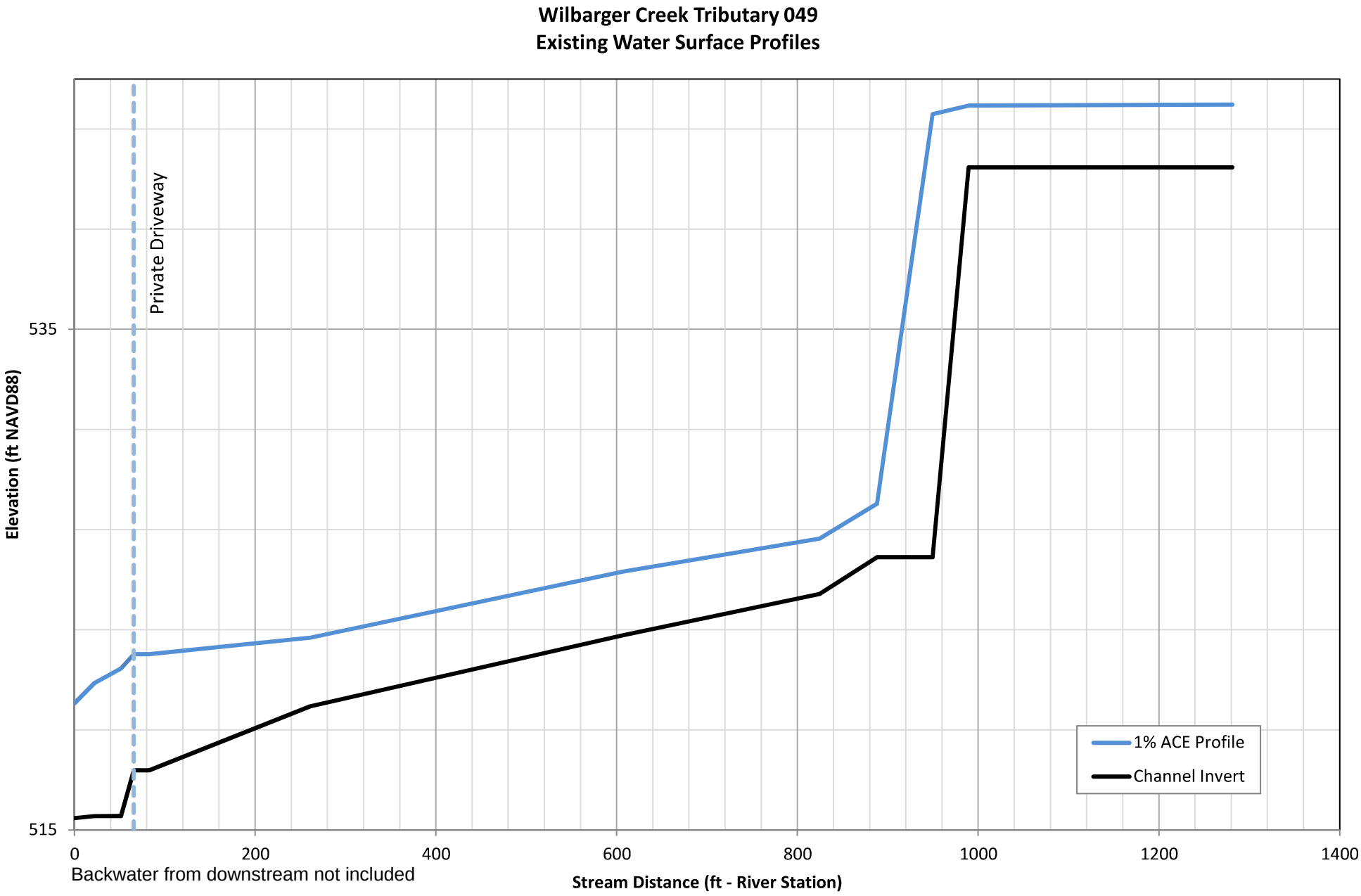

Wilbarger Creek Tributary 025
Existing Water Surface Profiles
Elevation (ft NAVD88)
470
460
450
440
430
420
0
500
1000
1500
2000
2500
3000
Stream Distance (ft - River Station)
1% ACE Profile
Channel Invert
Backwater from downstream not included

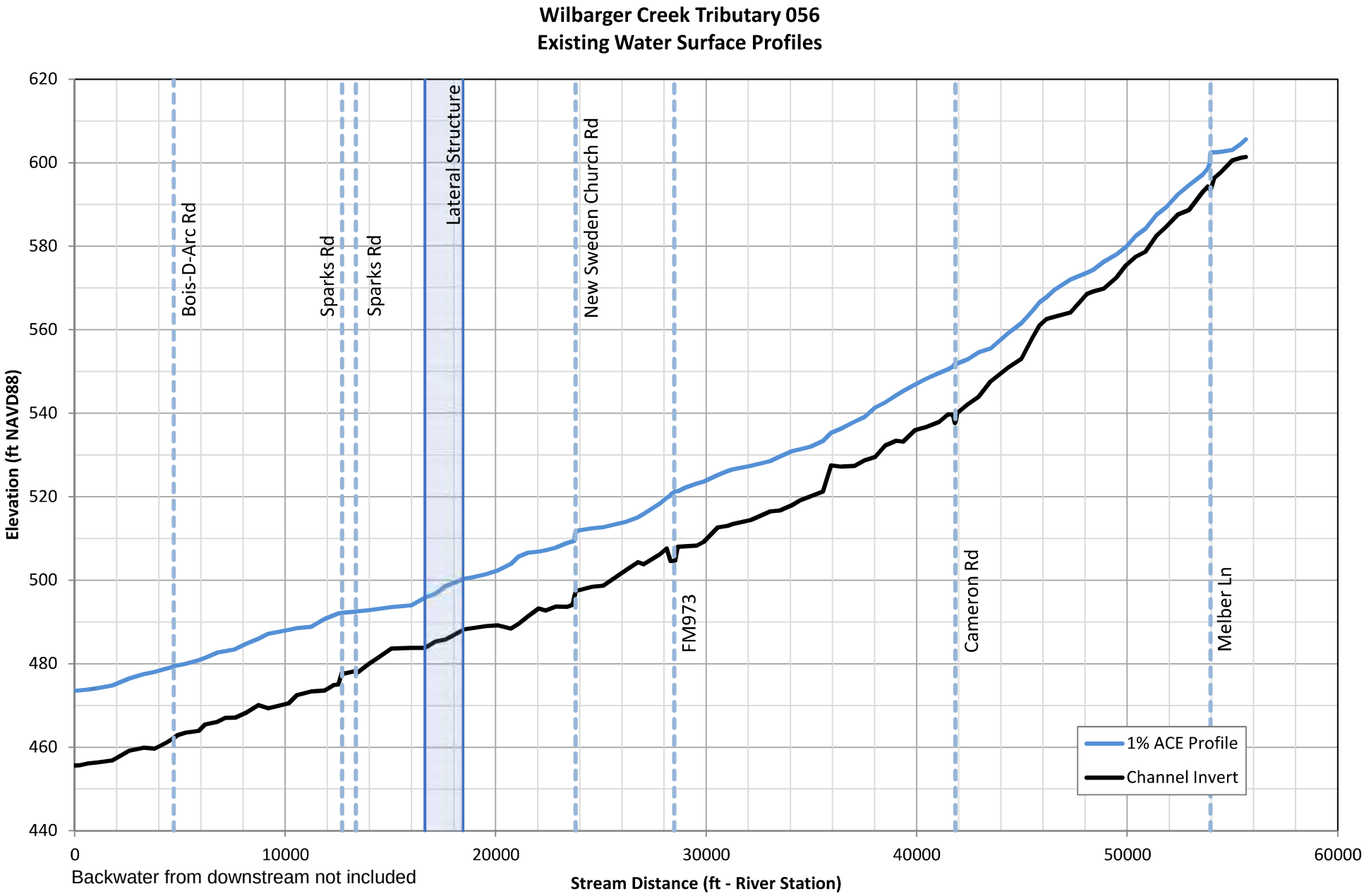

Wilbarger Creek Tributary 026
Existing Water Surface Profiles
470
460
450
440
430
420
Elevation (ft NAVD88)
0
500
1000
1500
2000
2500
Stream Distance (ft - River Station)
1% ACE Profile
Channel Invert
Backwater from downstream not included

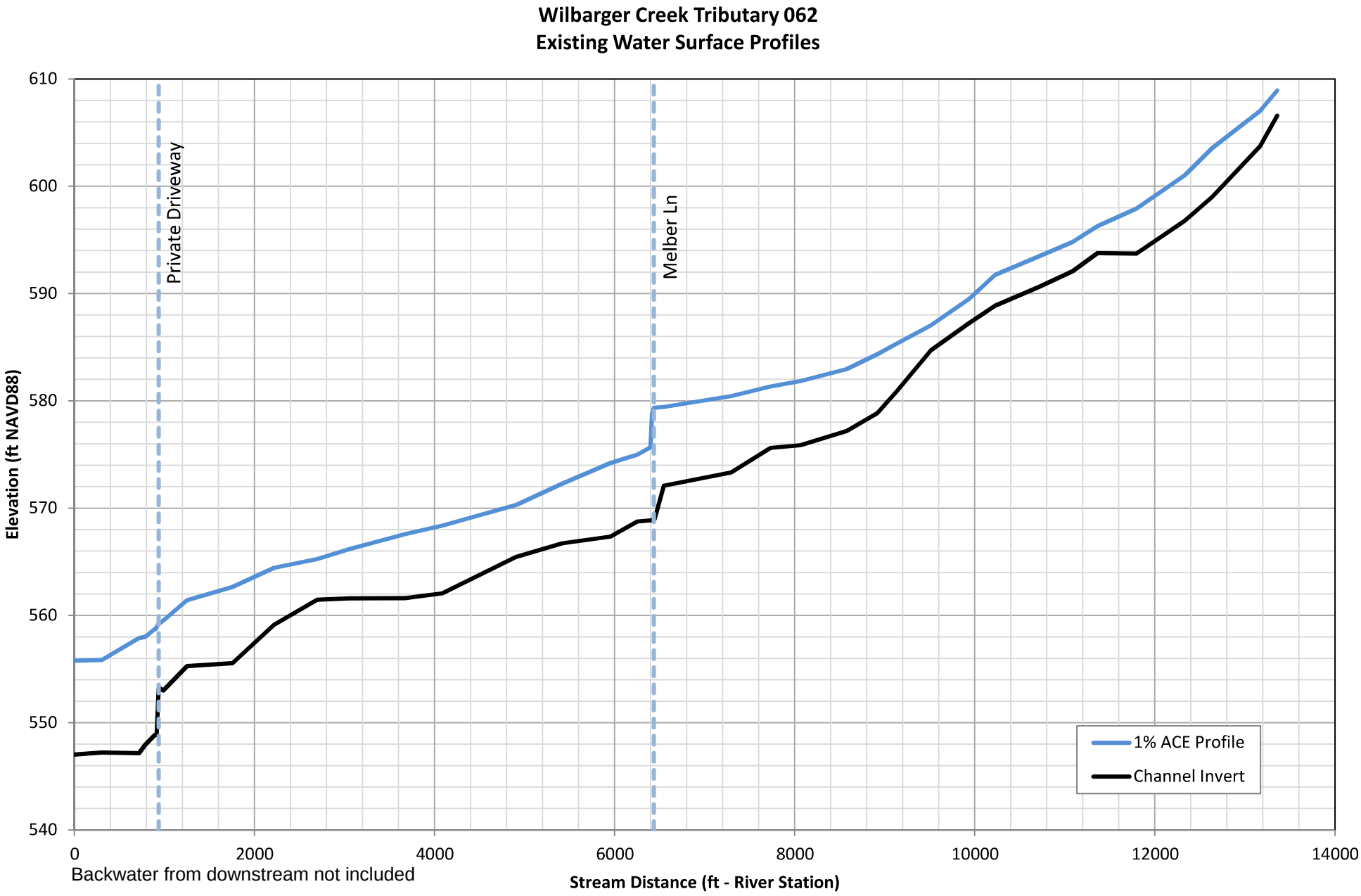

Wilbarger Creek Tributary 027
Existing Water Surface Profiles
Elevation (ft NAVD88)
420
415
410
405
400
395
390
385
0
500
1000
1500
2000
2500
3000
Backwater from downstream not included
Stream Distance (ft - River Station)
1% ACE Profile
Channel Invert

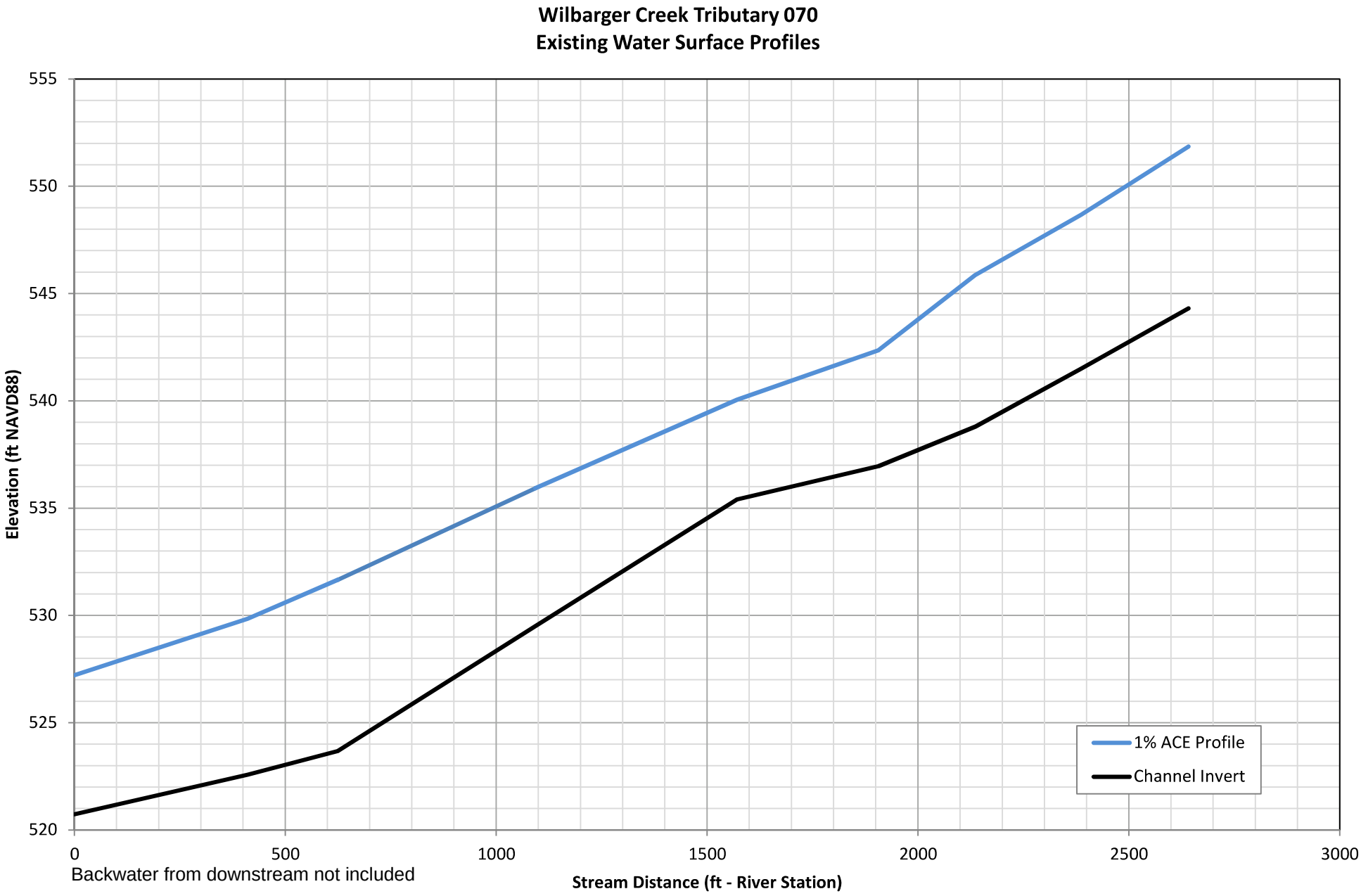

Wilbarger Creek Tributary 030
Existing Water Surface Profiles
Elevation (ft NAVD88)
450
445
440
435
430
425
420
415
410
Balch Rd
1% ACE Profile
Channel Invert
0
1000
2000
3000
4000
5000
6000
7000
Backwater from downstream not included
Stream Distance (ft - River Station)

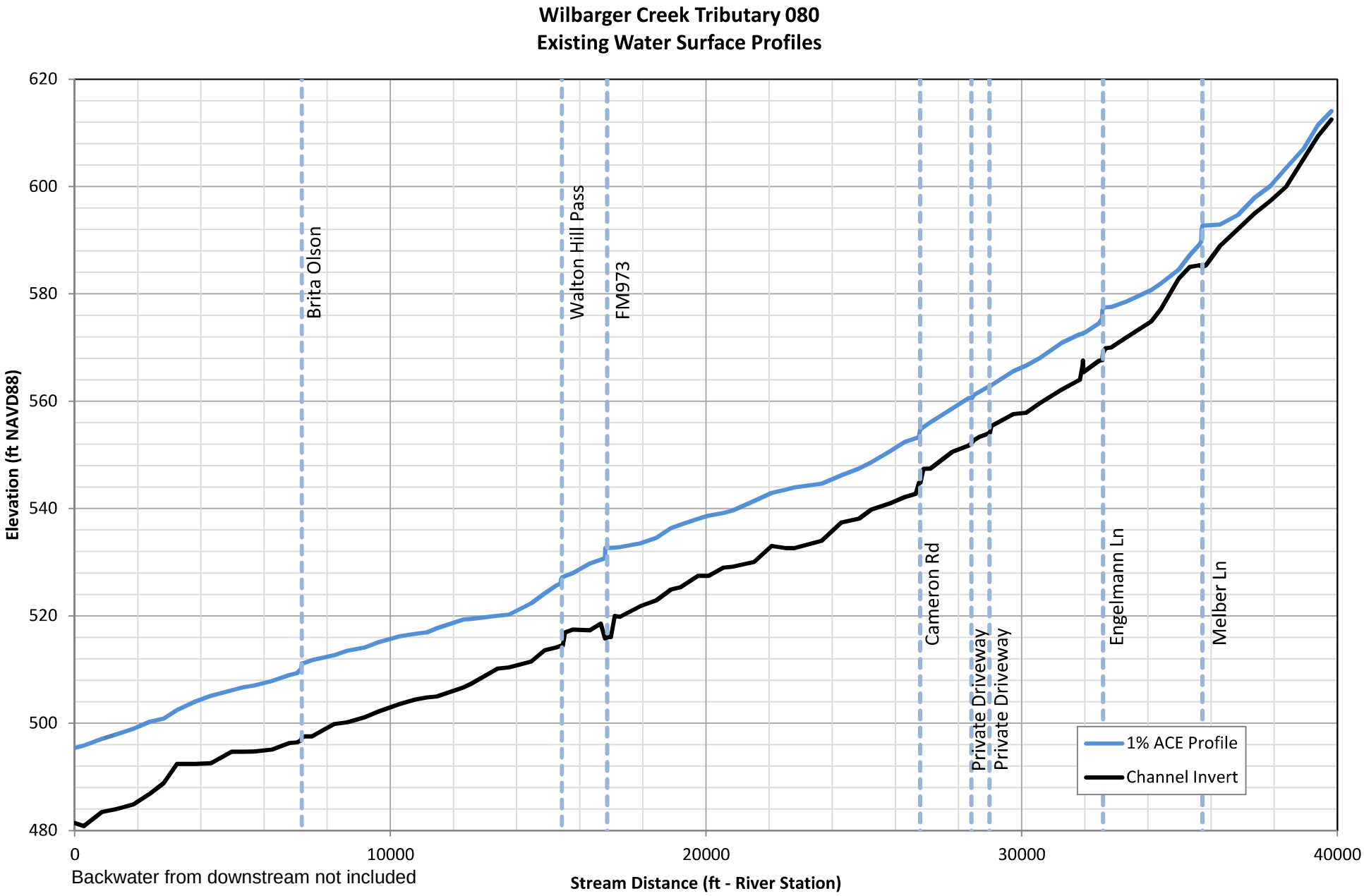

Wilbarger Creek Tributary 047
Existing Water Surface Profiles
Elevation (ft NAVD88)
600
580
560
540
520
500
480
Bobby Rd
Private Driveway
Private Driveway
FM973
Cameron Rd
1% ACE Profile
Channel Invert
0
5000
10000
15000
20000
25000
30000
Backwater from downstream not included
Stream Distance (ft - River Station)

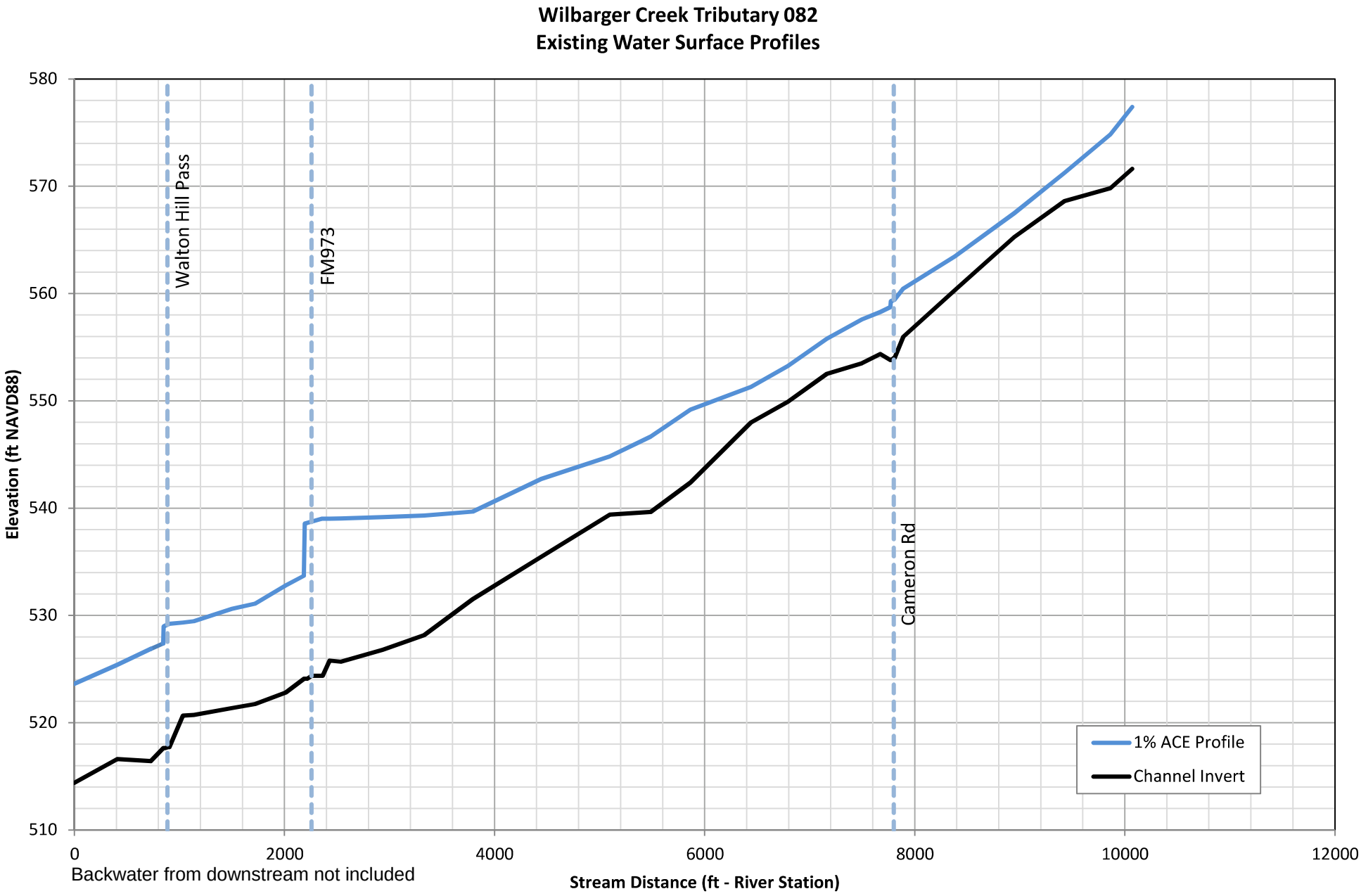

Wilbarger Creek Tributary 049
Existing Water Surface Profiles
Private Driveway
535
515
Elevation (ft NAVD88)
0
200
400
600
800
1000
1200
1400
Backwater from downstream not included
Stream Distance (ft - River Station)
1% ACE Profile
Channel Invert

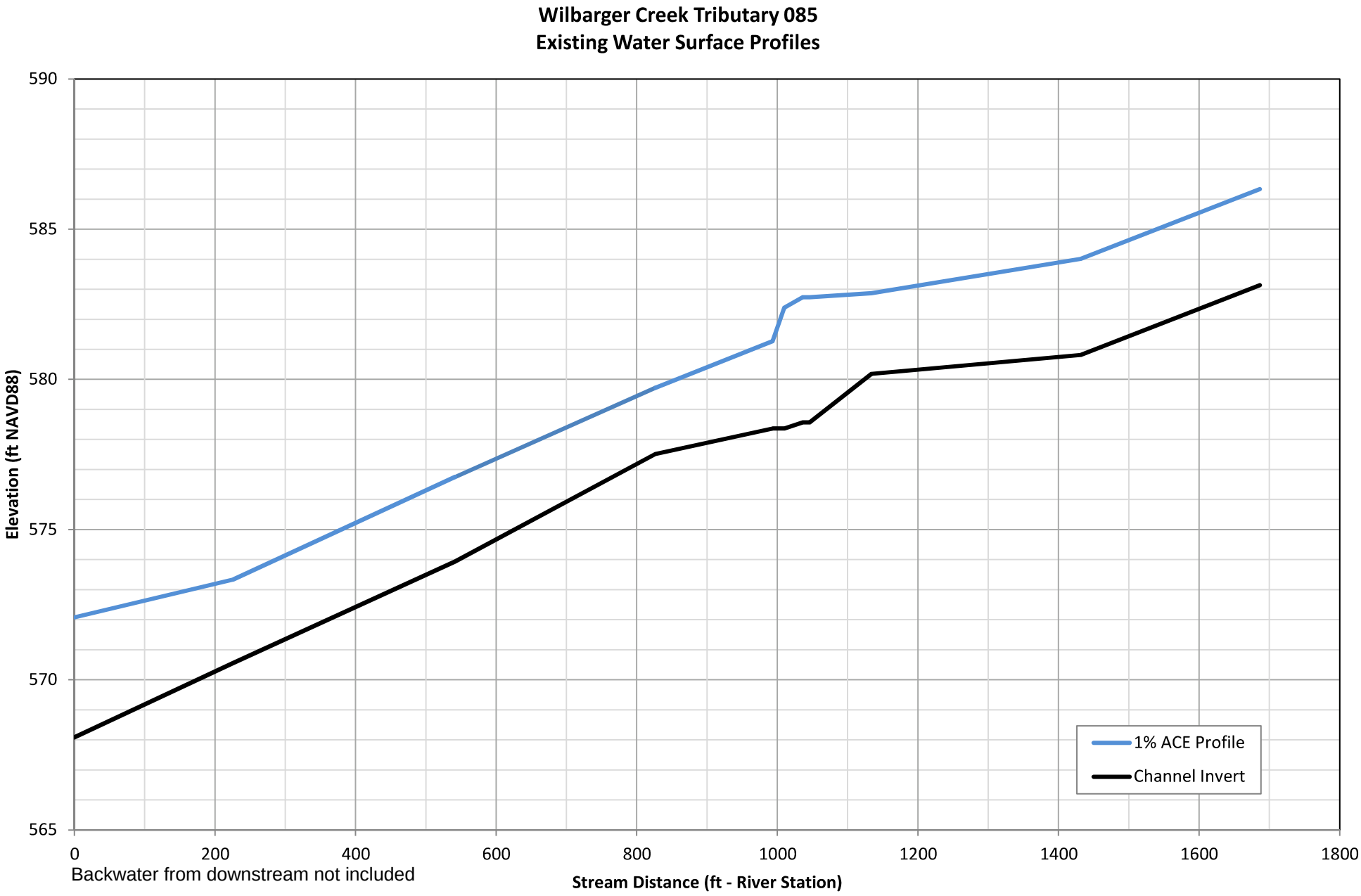

Wilbarger Creek Tributary 056
Existing Water Surface Profiles
Elevation (ft NAVD88)
620
600
580
560
540
520
500
480
460
440
Bois-D-Arc Rd
Sparks Rd
Sparks Rd
Lateral Structure
New Sweden Church Rd
FM973
Cameron Rd
Melber Ln
1% ACE Profile
Channel Invert
0
10000
20000
30000
40000
50000
60000
Backwater from downstream not included
Stream Distance (ft - River Station)

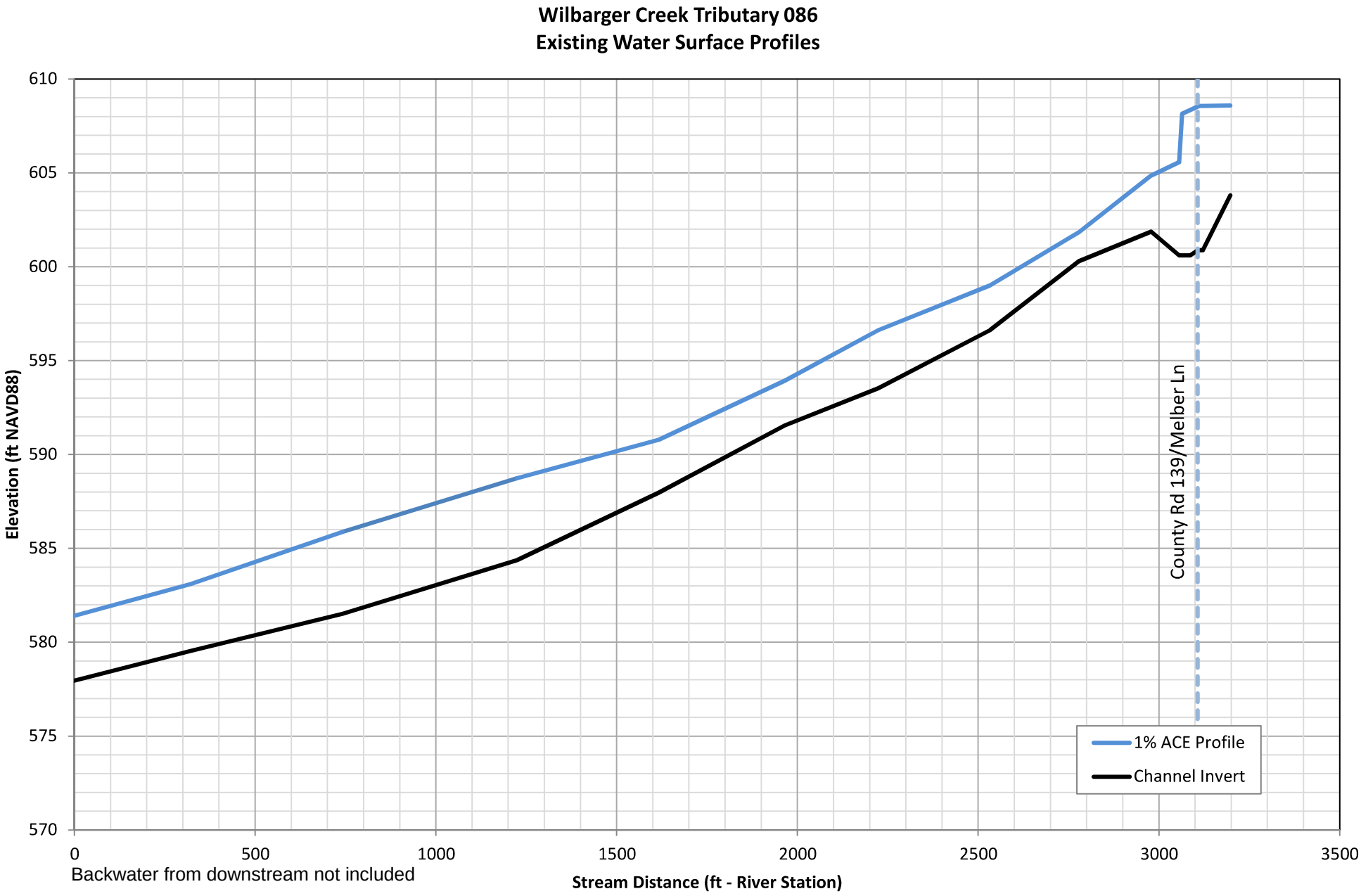

Wilbarger Creek Tributary 062
Existing Water Surface Profiles
Elevation (ft NAVD88)
610
600
590
580
570
560
550
540
Private Driveway
Melber Ln
0
2000
4000
6000
8000
10000
12000
14000
Backwater from downstream not included
Stream Distance (ft - River Station)
1% ACE Profile
Channel Invert

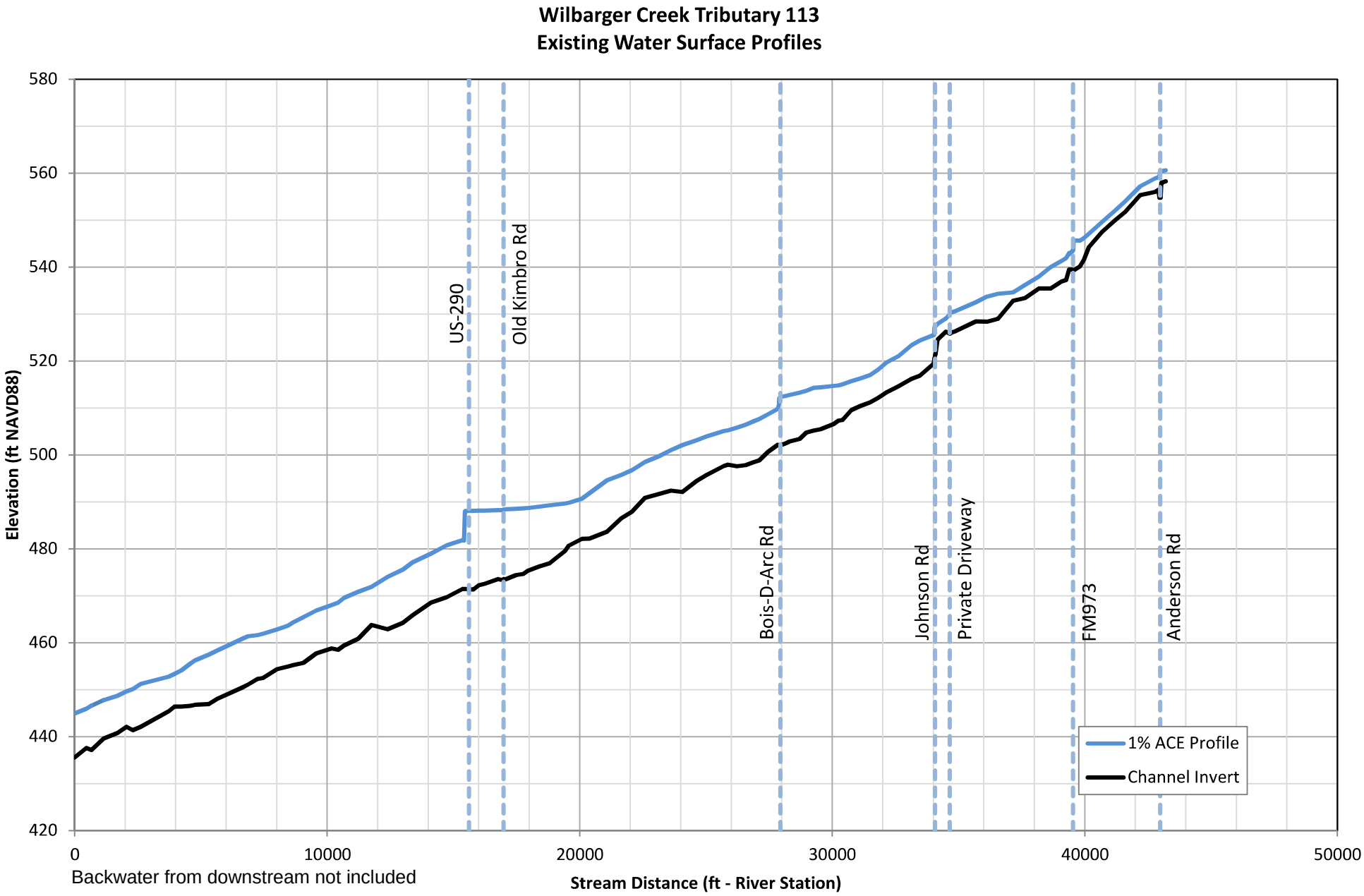

Wilbarger Creek Tributary 070
Existing Water Surface Profiles
555
550
545
540
535
530
525
520
Elevation (ft NAVD88)
0
500
1000
1500
2000
2500
3000
Backwater from downstream not included
Stream Distance (ft - River Station)
1% ACE Profile
Channel Invert

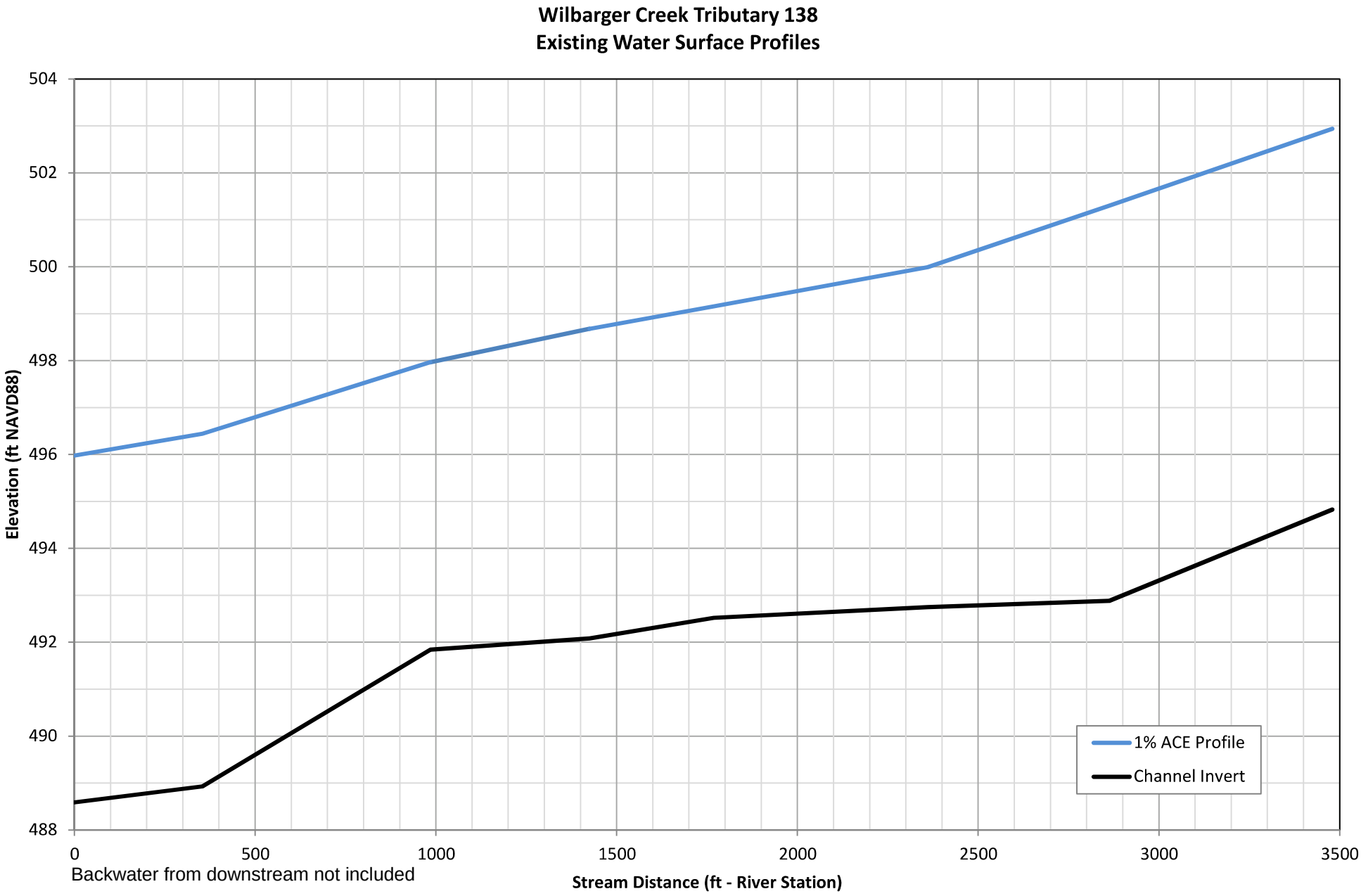

Wilbarger Creek Tributary 080
Existing Water Surface Profiles
Elevation (ft NAVD88)
620
600
580
560
540
520
500
480
Brita Olson
Walton Hill Pass
FM973
Cameron Rd
Private Driveway
Private Driveway
Engelmann Ln
Melber Ln
1% ACE Profile
Channel Invert
0
10000
20000
30000
40000
Backwater from downstream not included
Stream Distance (ft - River Station)

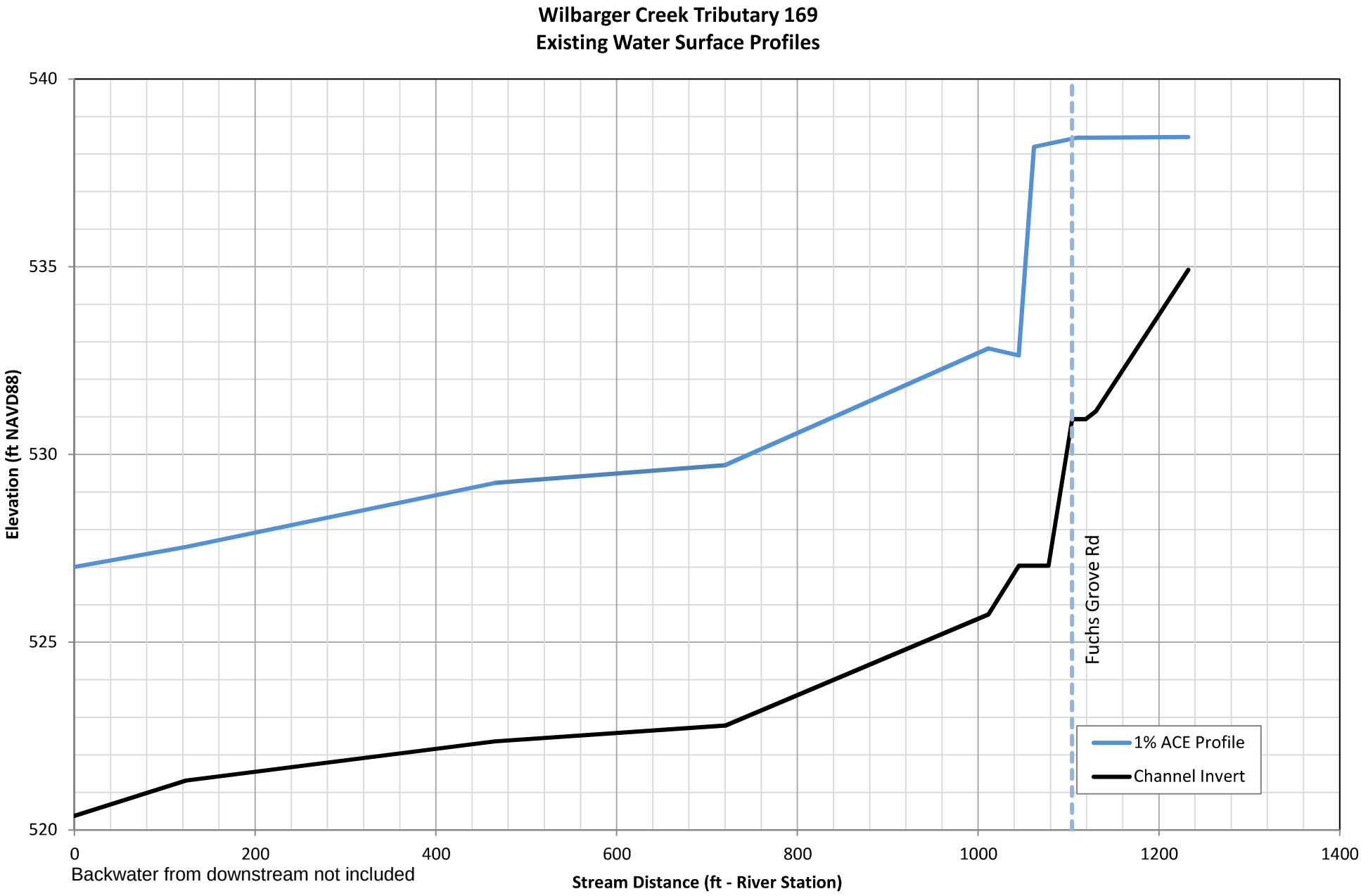

Wilbarger Creek Tributary 082
Existing Water Surface Profiles
Elevation (ft NAVD88)
580
570
560
550
540
530
520
510
Walton Hill Pass
FM973
Cameron Rd
1% ACE Profile
Channel Invert
0
2000
4000
6000
8000
10000
12000
Backwater from downstream not included
Stream Distance (ft - River Station)

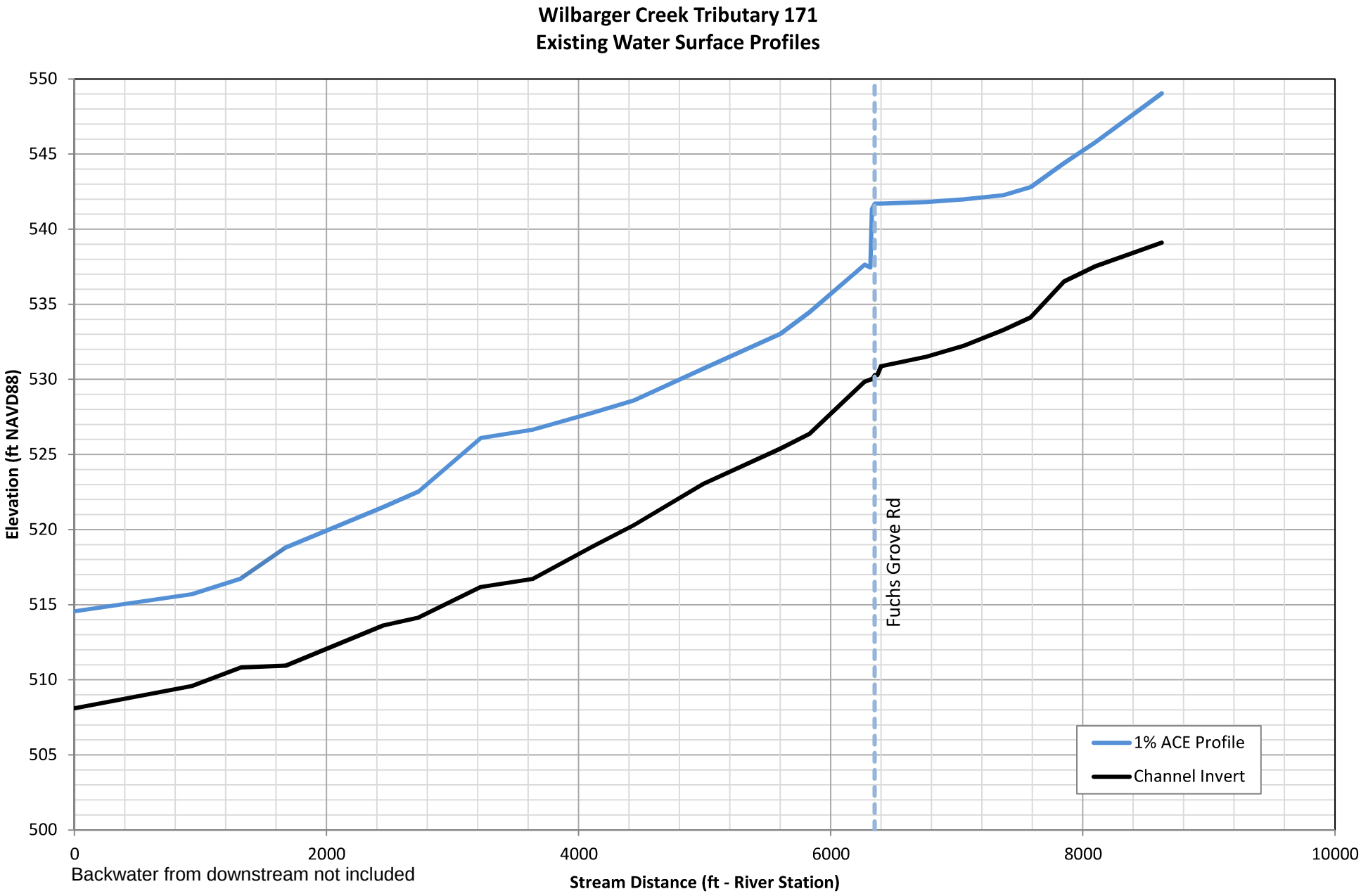

Wilbarger Creek Tributary 085
Existing Water Surface Profiles
590
585
580
575
570
565
Elevation (ft NAVD88)
0
200
400
600
800
1000
1200
1400
1600
1800
Stream Distance (ft - River Station)
1% ACE Profile
Channel Invert
Backwater from downstream not included

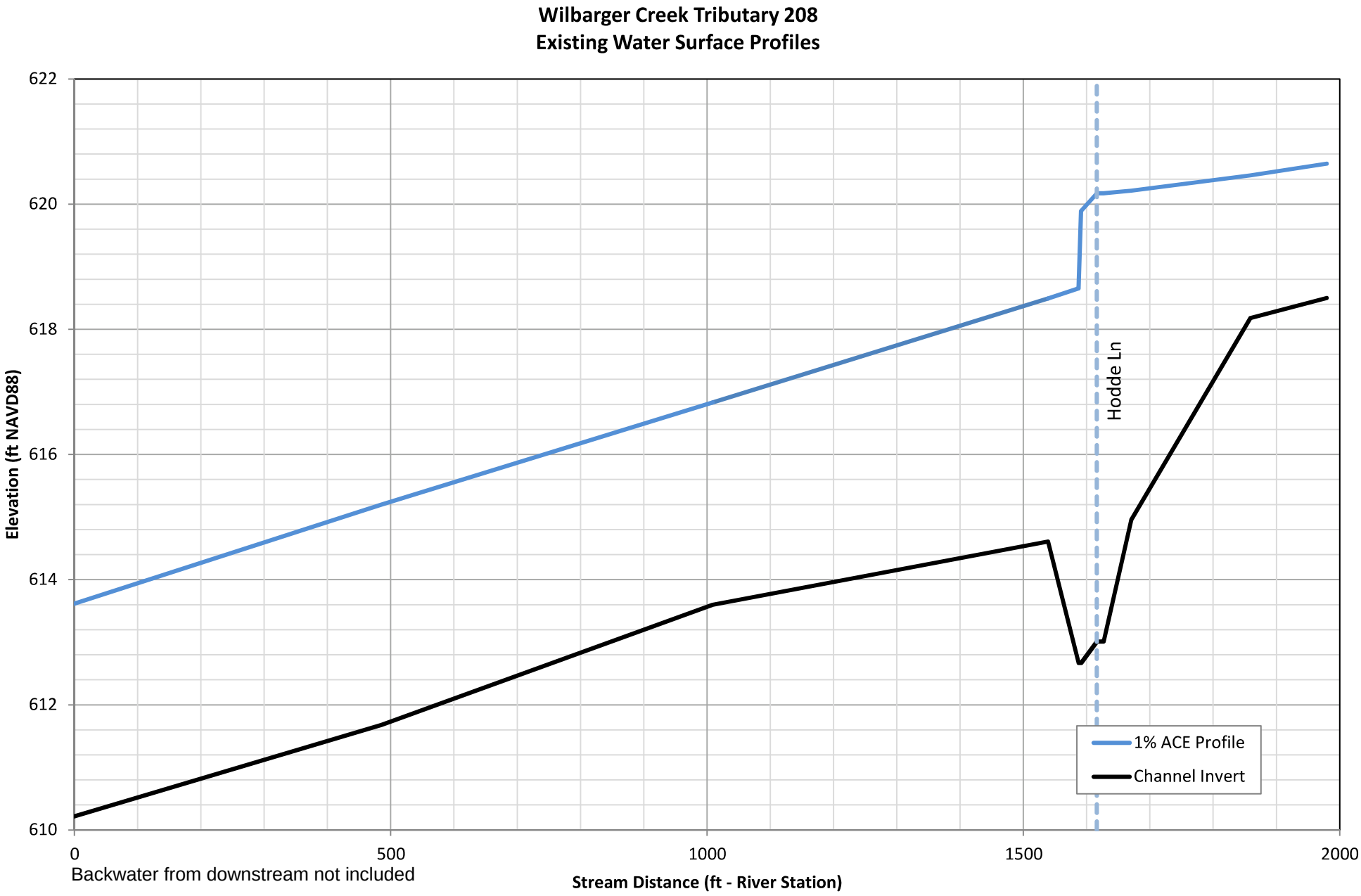

Wilbarger Creek Tributary 086
Existing Water Surface Profiles
Elevation (ft NAVD88)
610
605
600
595
590
585
580
575
570
0
500
1000
1500
2000
2500
3000
3500
Backwater from downstream not included
Stream Distance (ft - River Station)
County Rd 139/Melber Ln
1% ACE Profile
Channel Invert

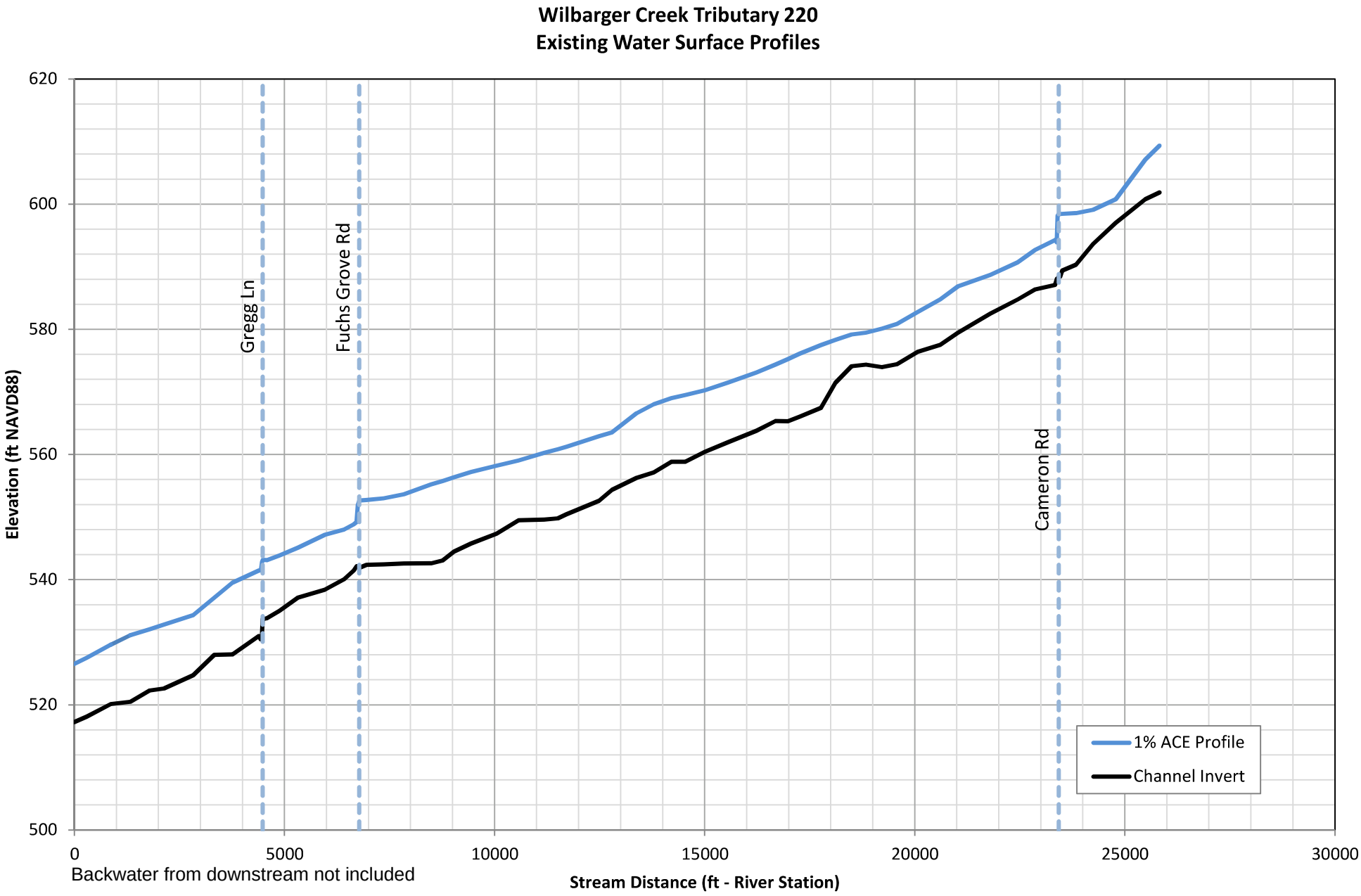

Wilbarger Creek Tributary 113
Existing Water Surface Profiles
Elevation (ft NAVD88)
580
560
540
520
500
480
460
440
420
0
10000
20000
30000
40000
50000
Stream Distance (ft - River Station)
US-290
Old Kimbro Rd
Bois-D-Arc Rd
Johnson Rd
Private Driveway
FM973
Anderson Rd
1% ACE Profile
Channel Invert
Backwater from downstream not included

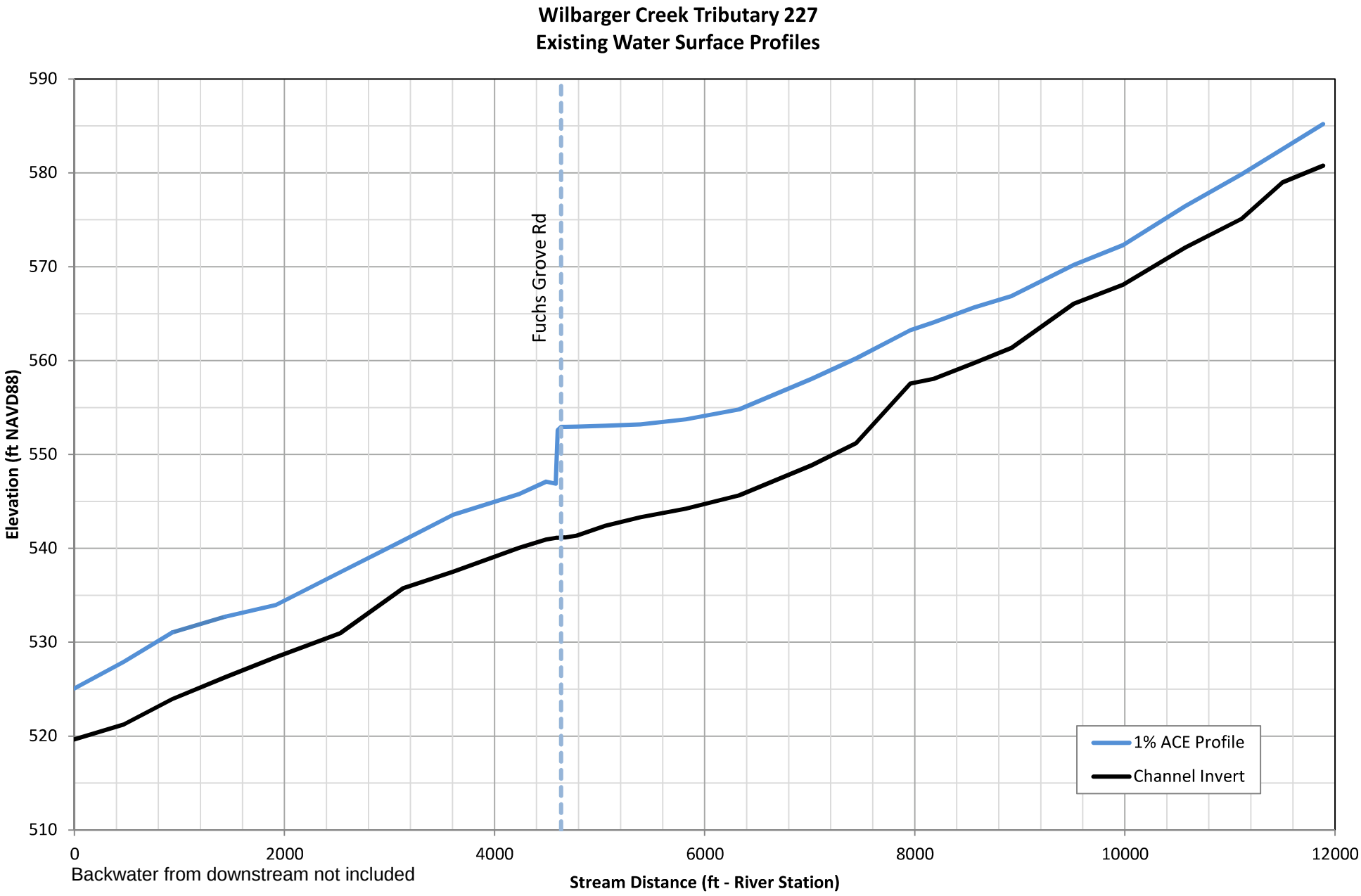

Wilbarger Creek Tributary 138
Existing Water Surface Profiles
Elevation (ft NAVD88)
504
502
500
498
496
494
492
490
488
0
500
1000
1500
2000
2500
3000
3500
Backwater from downstream not included
Stream Distance (ft - River Station)
1% ACE Profile
Channel Invert

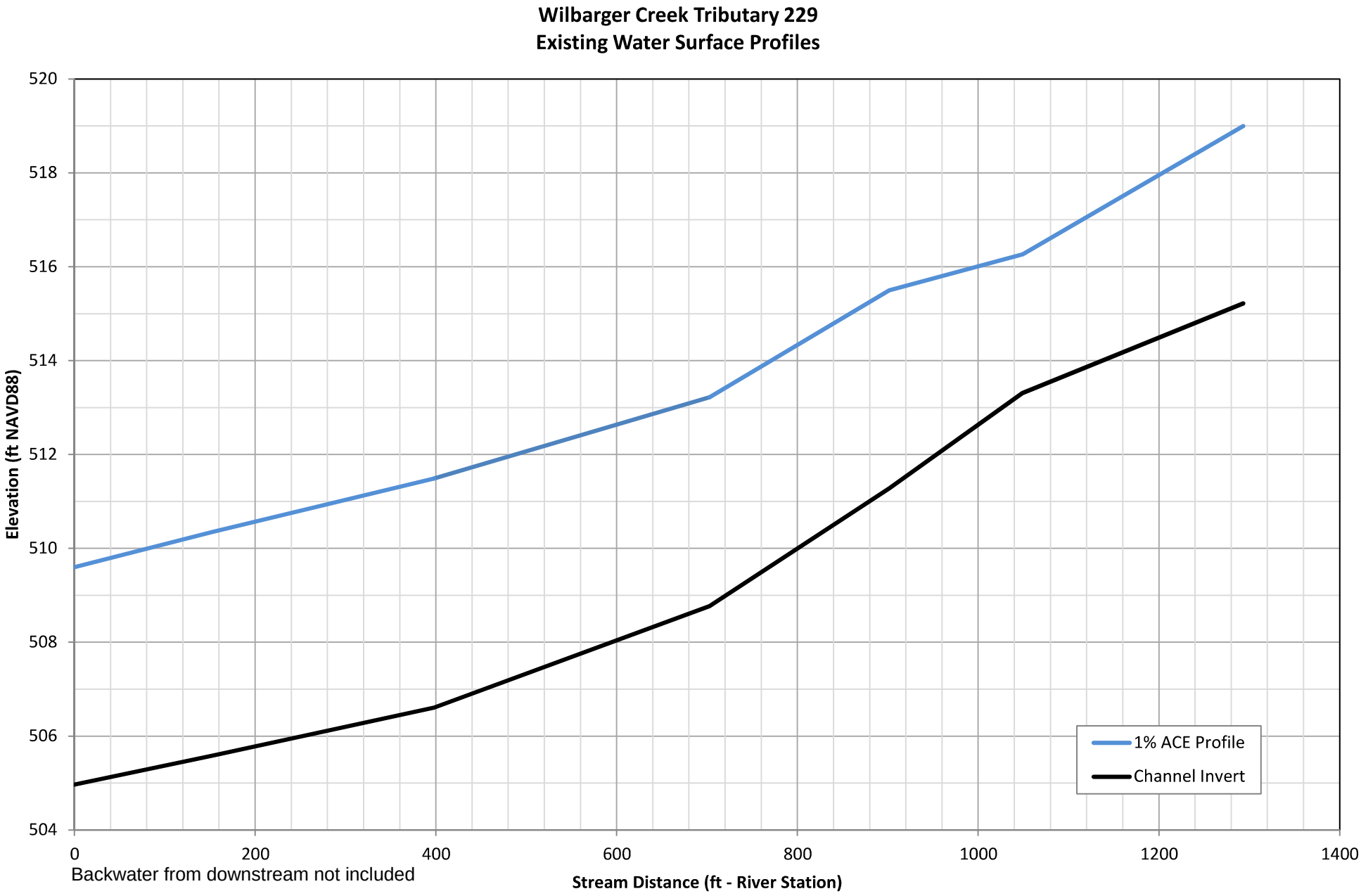

Wilbarger Creek Tributary 169
Existing Water Surface Profiles
540
535
530
525
520
Elevation (ft NAVD88)
0
200
400
600
800
1000
1200
1400
Backwater from downstream not included
Stream Distance (ft - River Station)
Fuchs Grove Rd
1% ACE Profile
Channel Invert

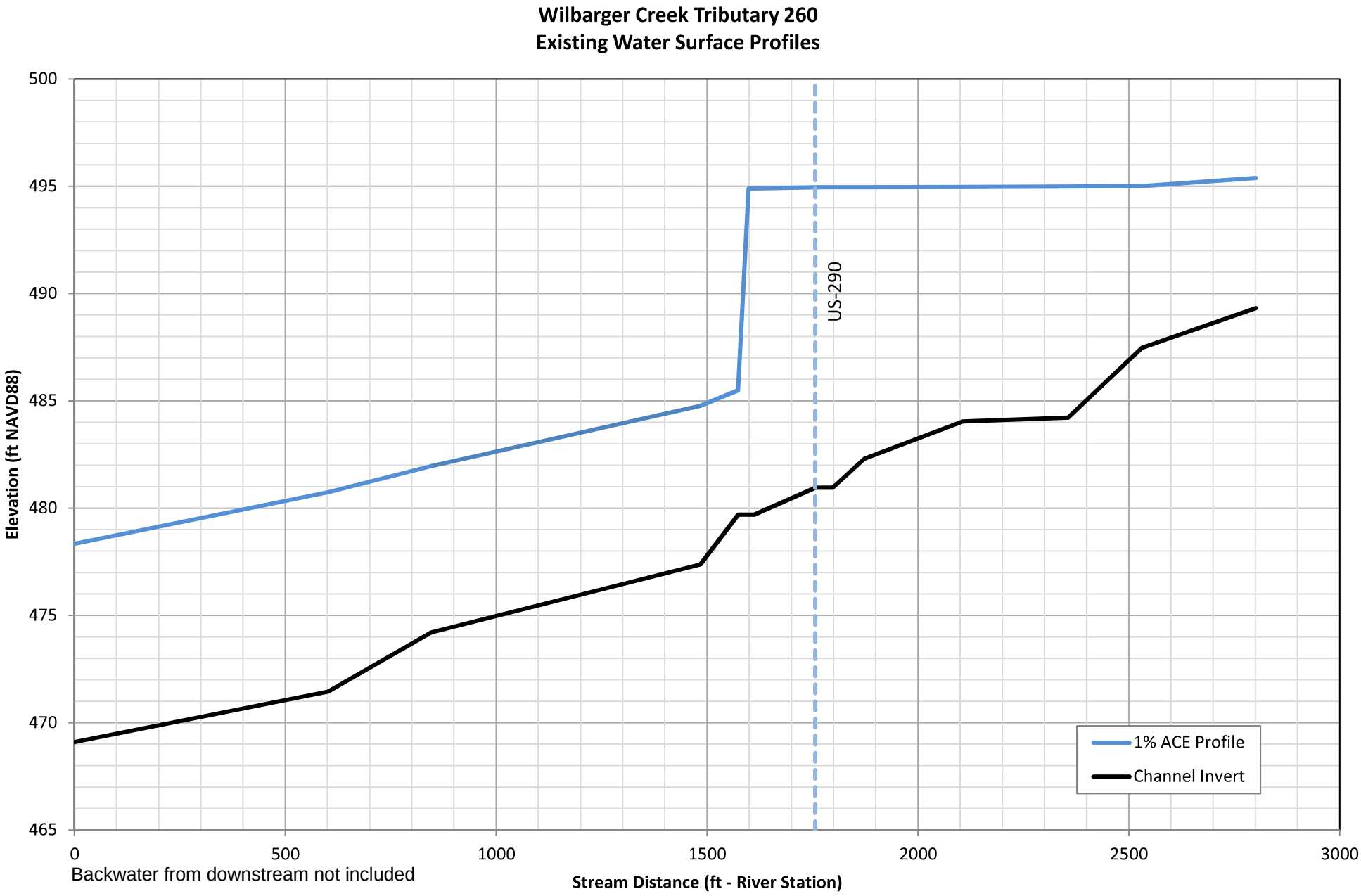

Wilbarger Creek Tributary 171
Existing Water Surface Profiles
Elevation (ft NAVD88)
550
545
540
535
530
525
520
515
510
505
500
0
2000
4000
6000
8000
10000
Backwater from downstream not included
Stream Distance (ft - River Station)
Fuchs Grove Rd
1% ACE Profile
Channel Invert

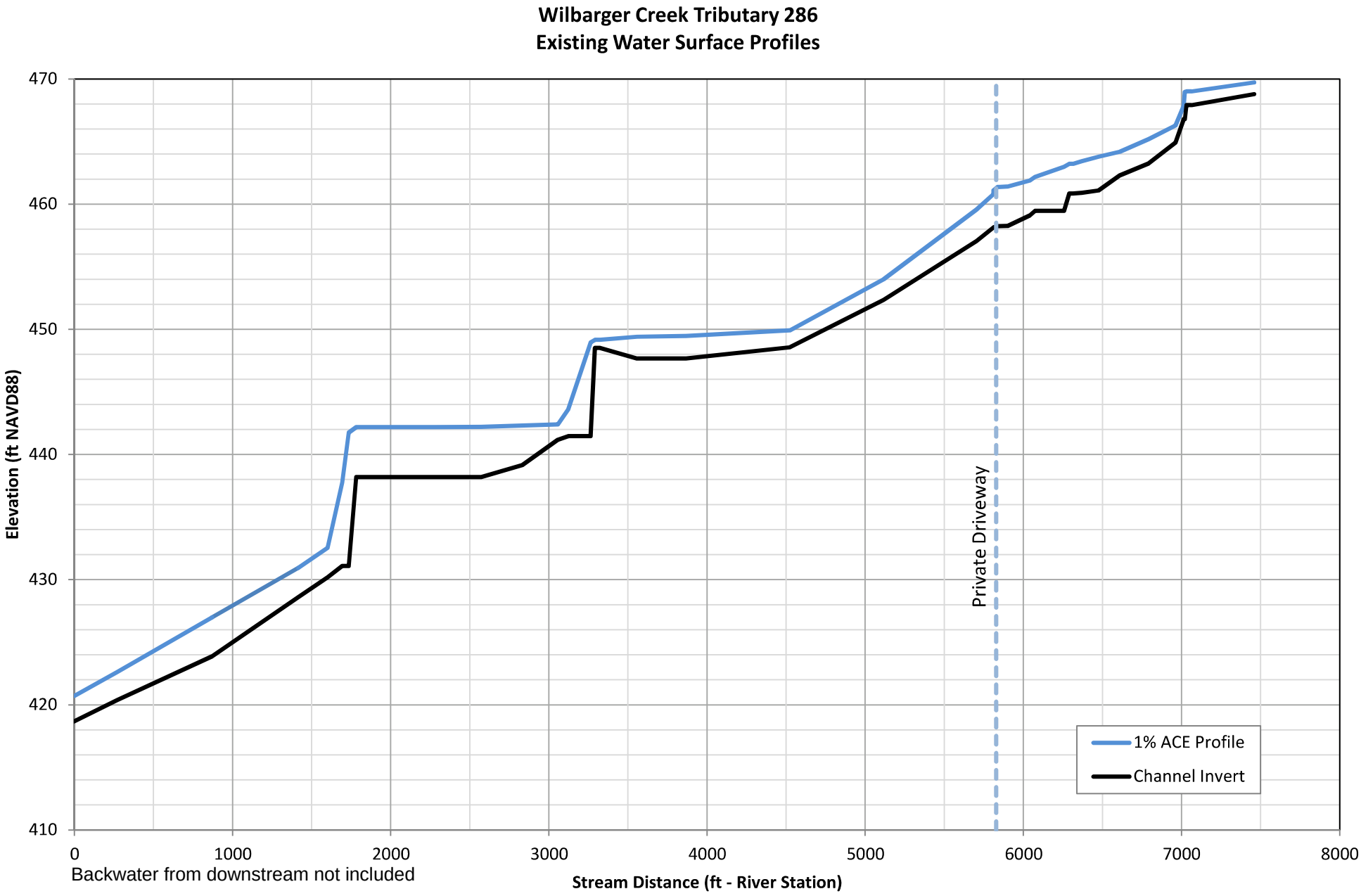

Wilbarger Creek Tributary 208
Existing Water Surface Profiles
Elevation (ft NAVD88)
622
620
618
616
614
612
610
0
500
1000
1500
2000
Backwater from downstream not included
Stream Distance (ft - River Station)
Hodde Ln
1% ACE Profile
Channel Invert

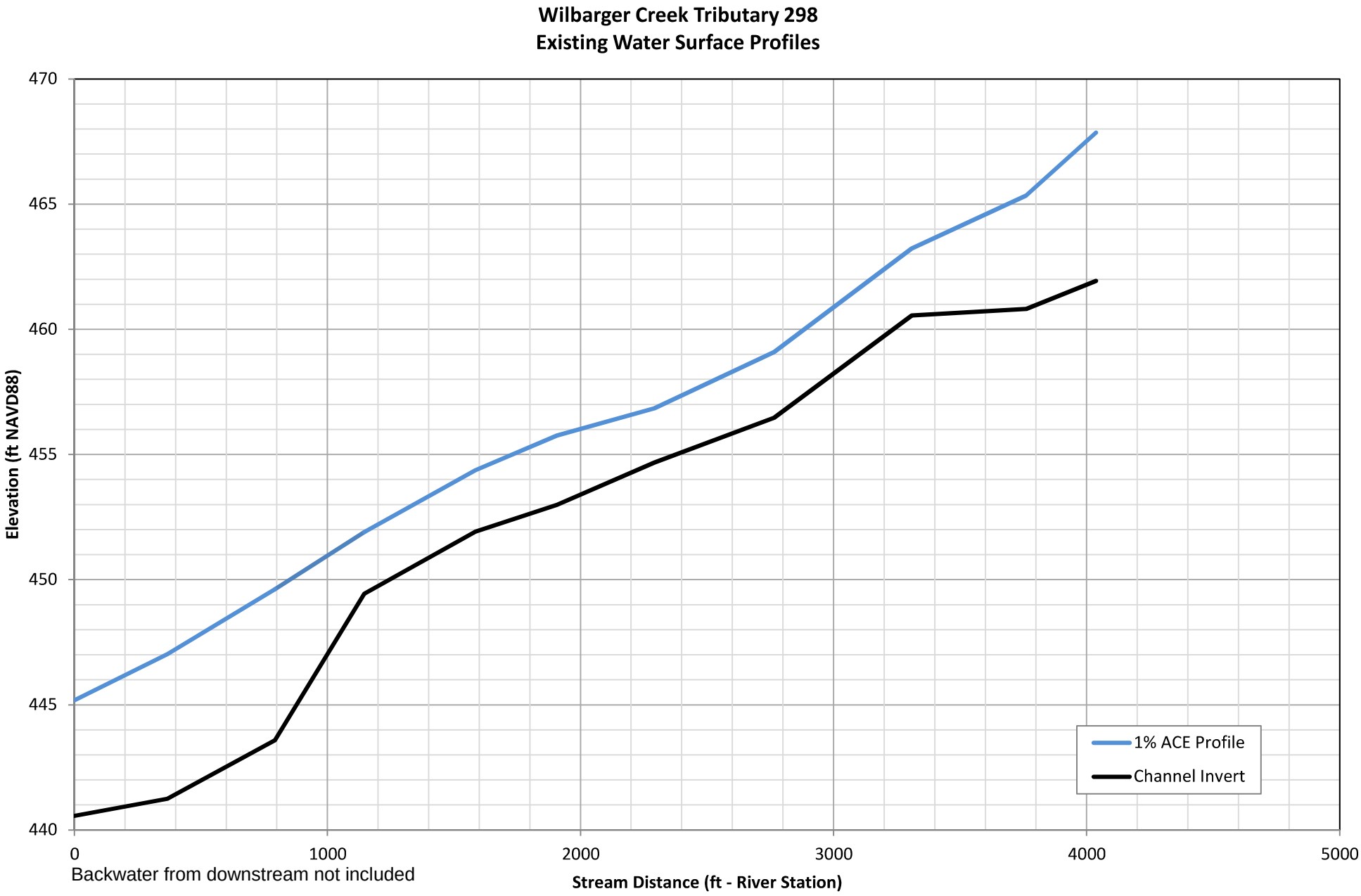

Wilbarger Creek Tributary 220
Existing Water Surface Profiles
Elevation (ft NAVD88)
620
600
580
560
540
520
500
Gregg Ln
Fuchs Grove Rd
Cameron Rd
1% ACE Profile
Channel Invert
0
5000
10000
15000
20000
25000
30000
Backwater from downstream not included
Stream Distance (ft - River Station)

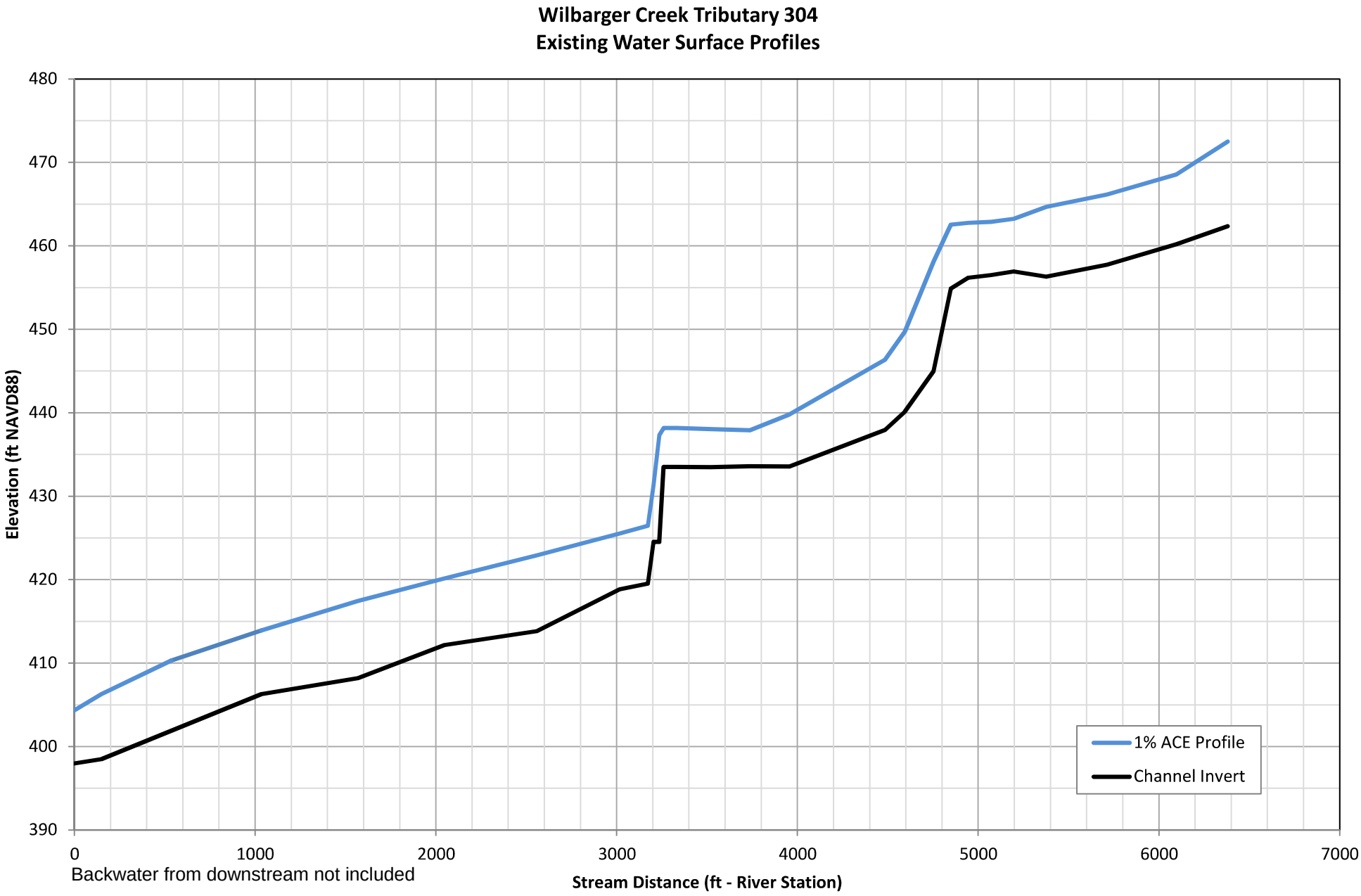

Wilbarger Creek Tributary 227
Existing Water Surface Profiles
590
580
570
560
550
540
530
520
510
Elevation (ft NAVD88)
Fuchs Grove Rd
0
2000
4000
6000
8000
10000
12000
Backwater from downstream not included
Stream Distance (ft - River Station)
1% ACE Profile
Channel Invert

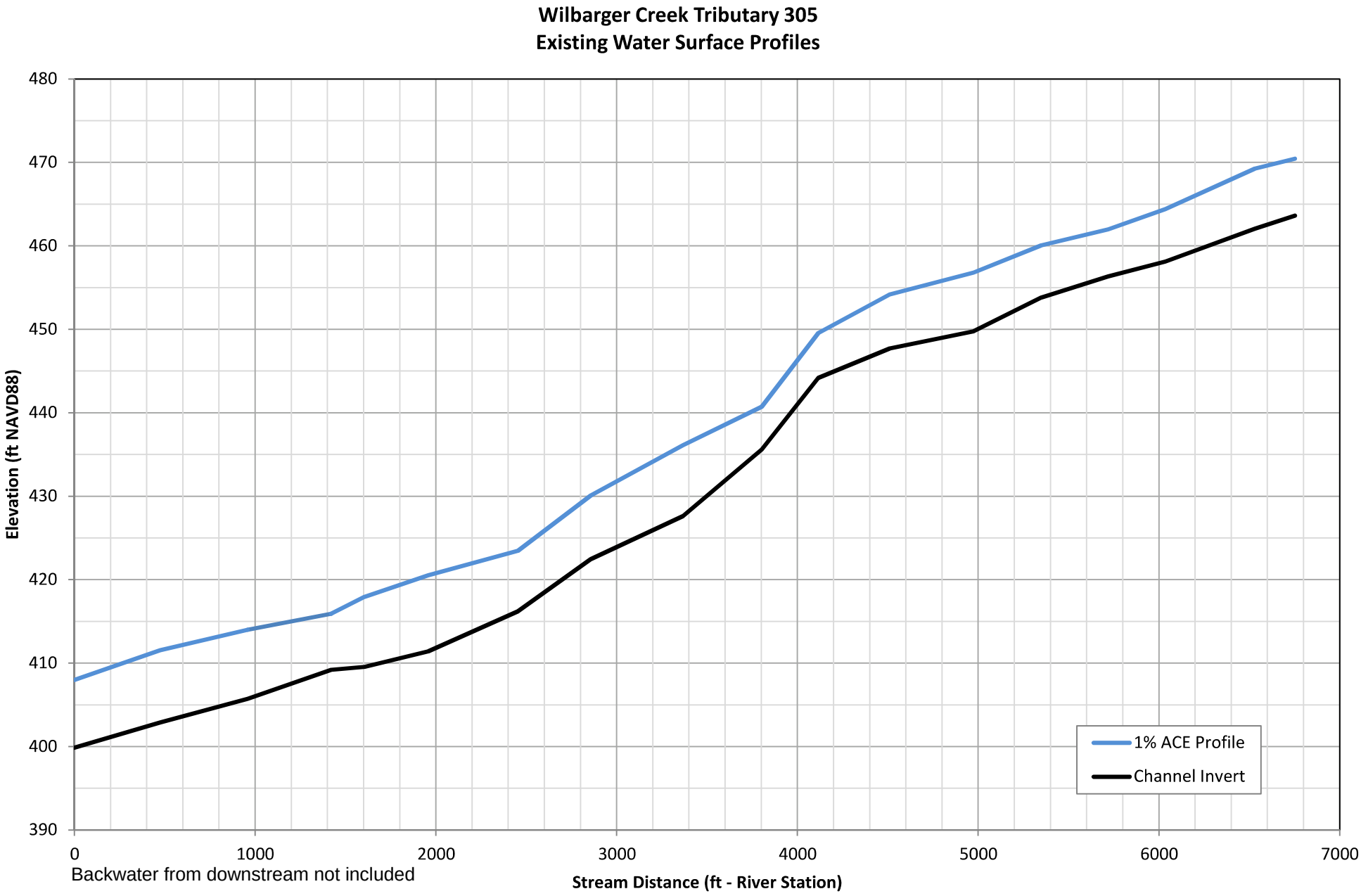

Wilbarger Creek Tributary 229
Existing Water Surface Profiles
Elevation (ft NAVD88)
520
518
516
514
512
510
508
506
504
0
200
400
600
800
1000
1200
1400
Backwater from downstream not included
Stream Distance (ft - River Station)
1% ACE Profile
Channel Invert

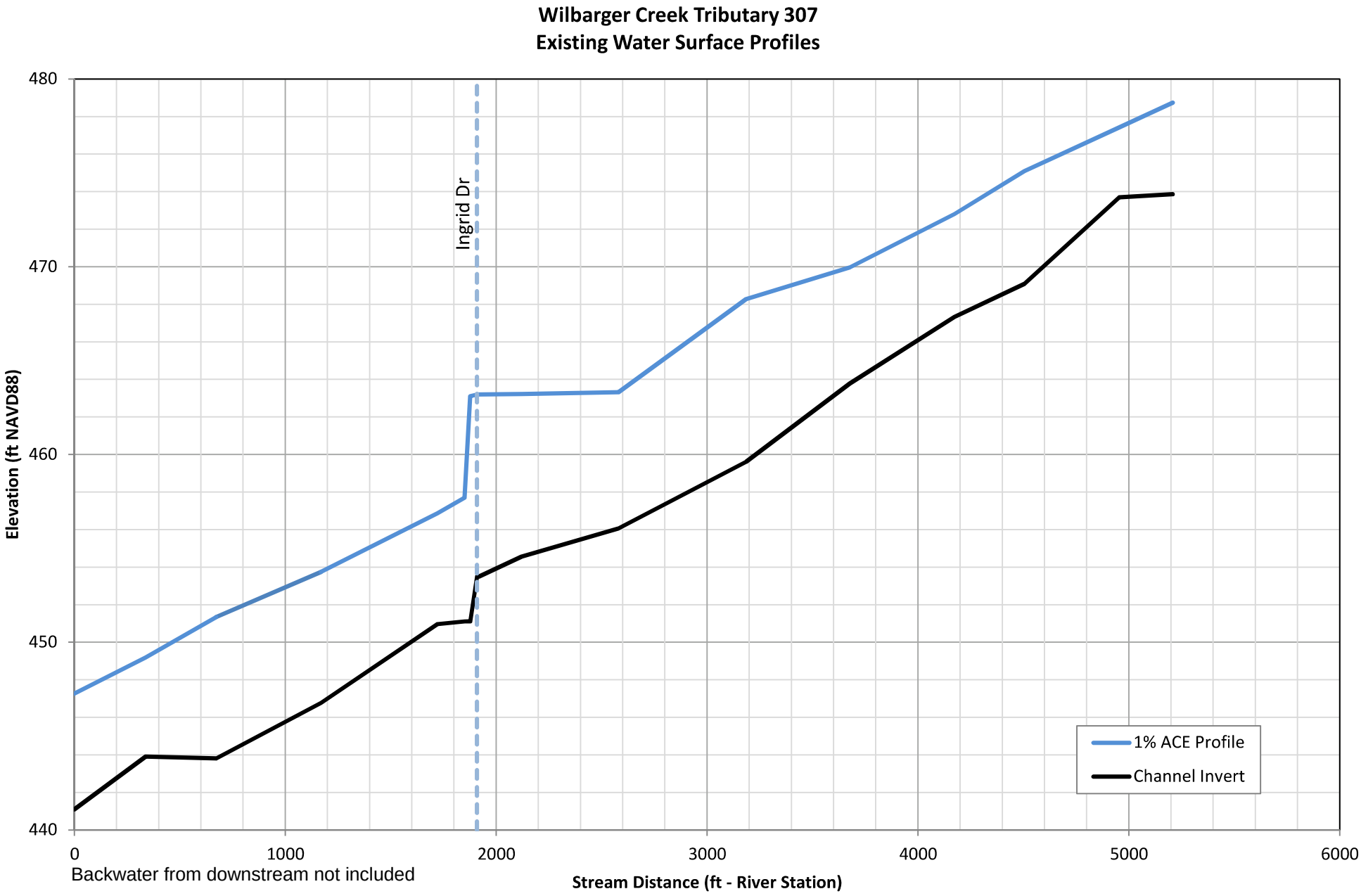

Wilbarger Creek Tributary 260
Existing Water Surface Profiles
500
495
490
485
480
475
470
465
Elevation (ft NAVD88)
US-290
1% ACE Profile
Channel Invert
0
500
1000
1500
2000
2500
3000
Backwater from downstream not included
Stream Distance (ft - River Station)

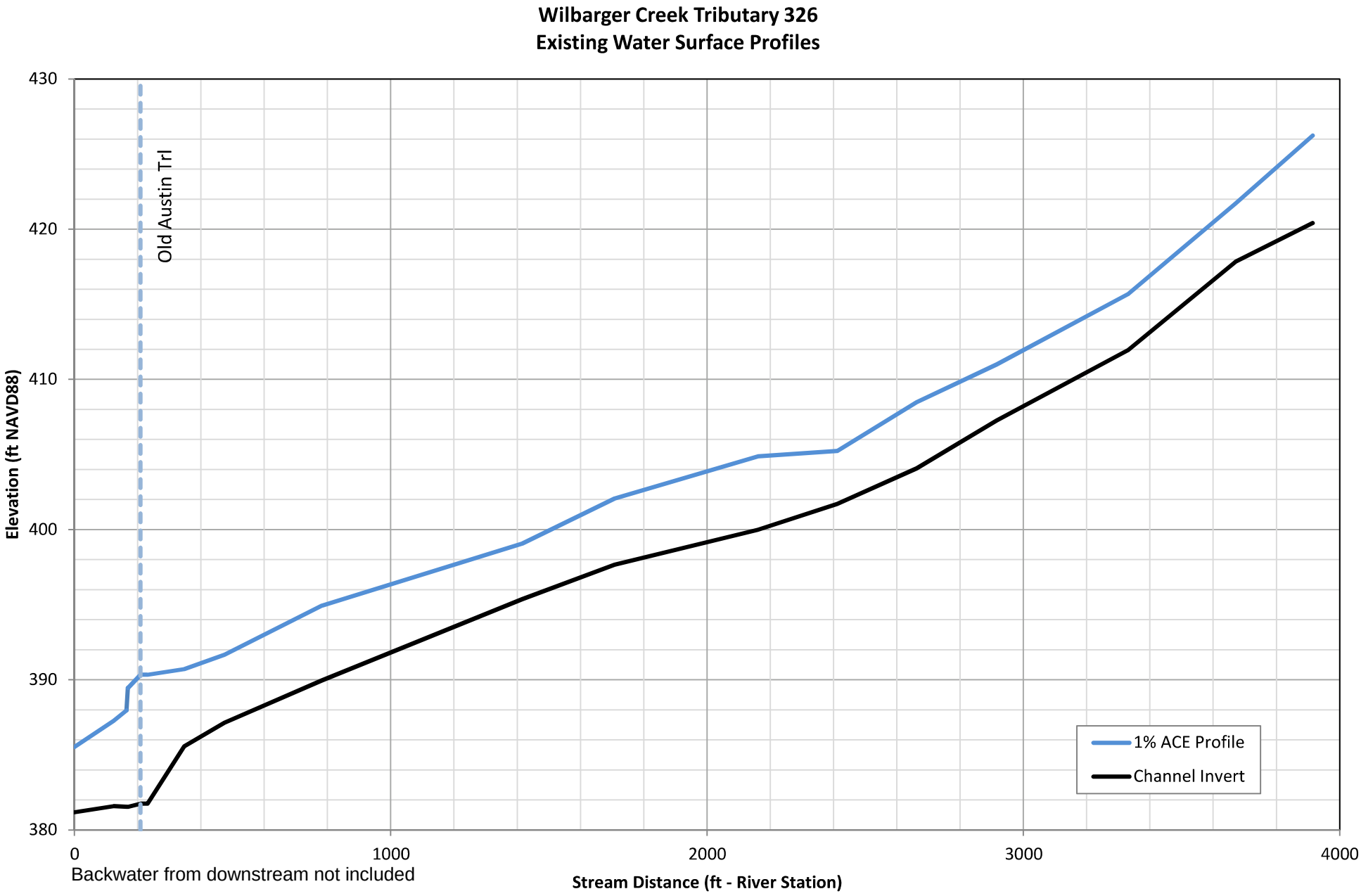

Wilbarger Creek Tributary 286
Existing Water Surface Profiles
Elevation (ft NAVD88)
470
460
450
440
430
420
410
0
1000
2000
3000
4000
5000
6000
7000
8000
Backwater from downstream not included
Stream Distance (ft - River Station)
Private Driveway
1% ACE Profile
Channel Invert

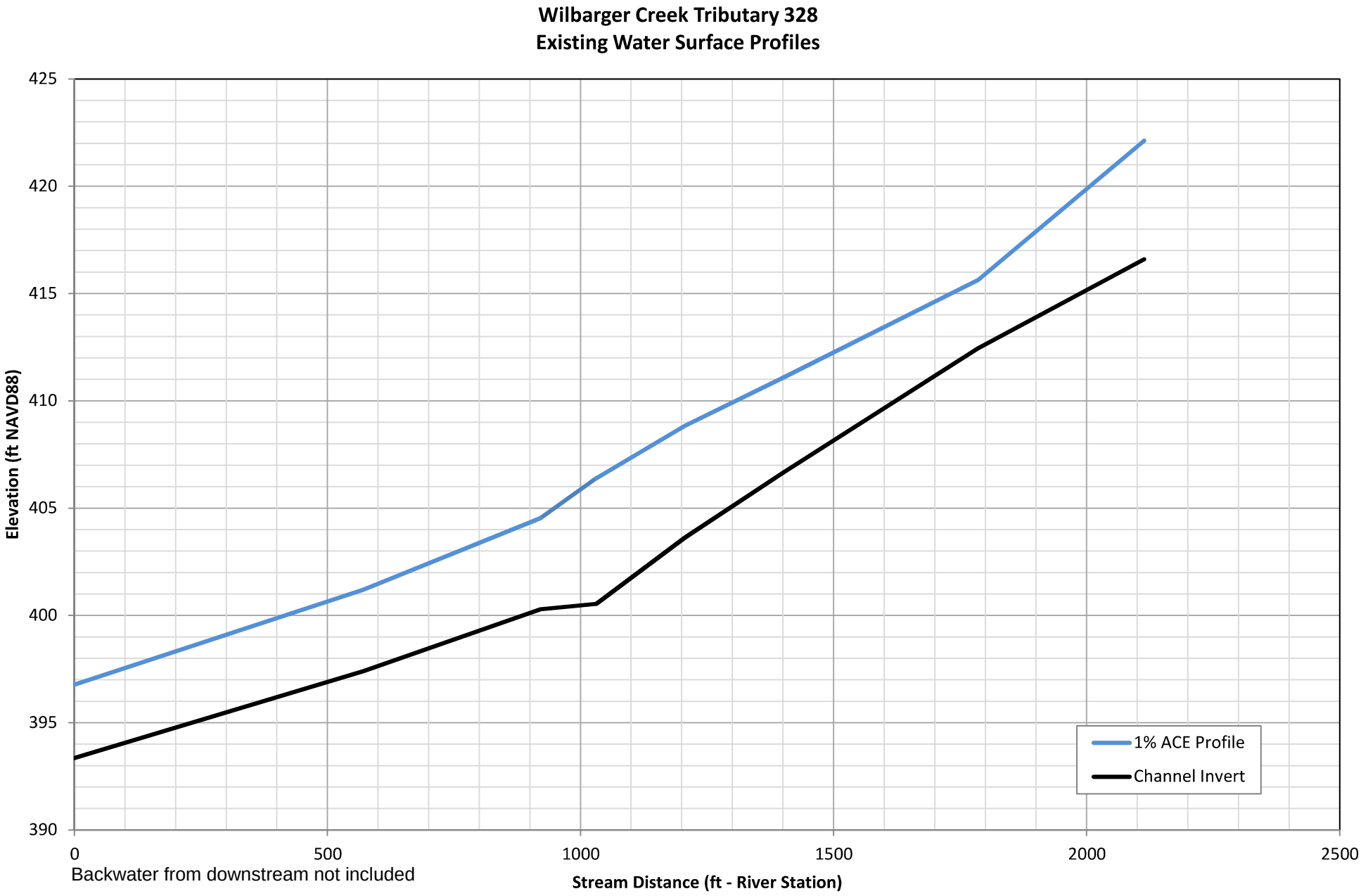

Wilbarger Creek Tributary 298
Existing Water Surface Profiles
Elevation (ft NAVD88)
470
465
460
455
450
445
440
0
1000
2000
3000
4000
5000
Backwater from downstream not included
Stream Distance (ft - River Station)
1% ACE Profile
Channel Invert

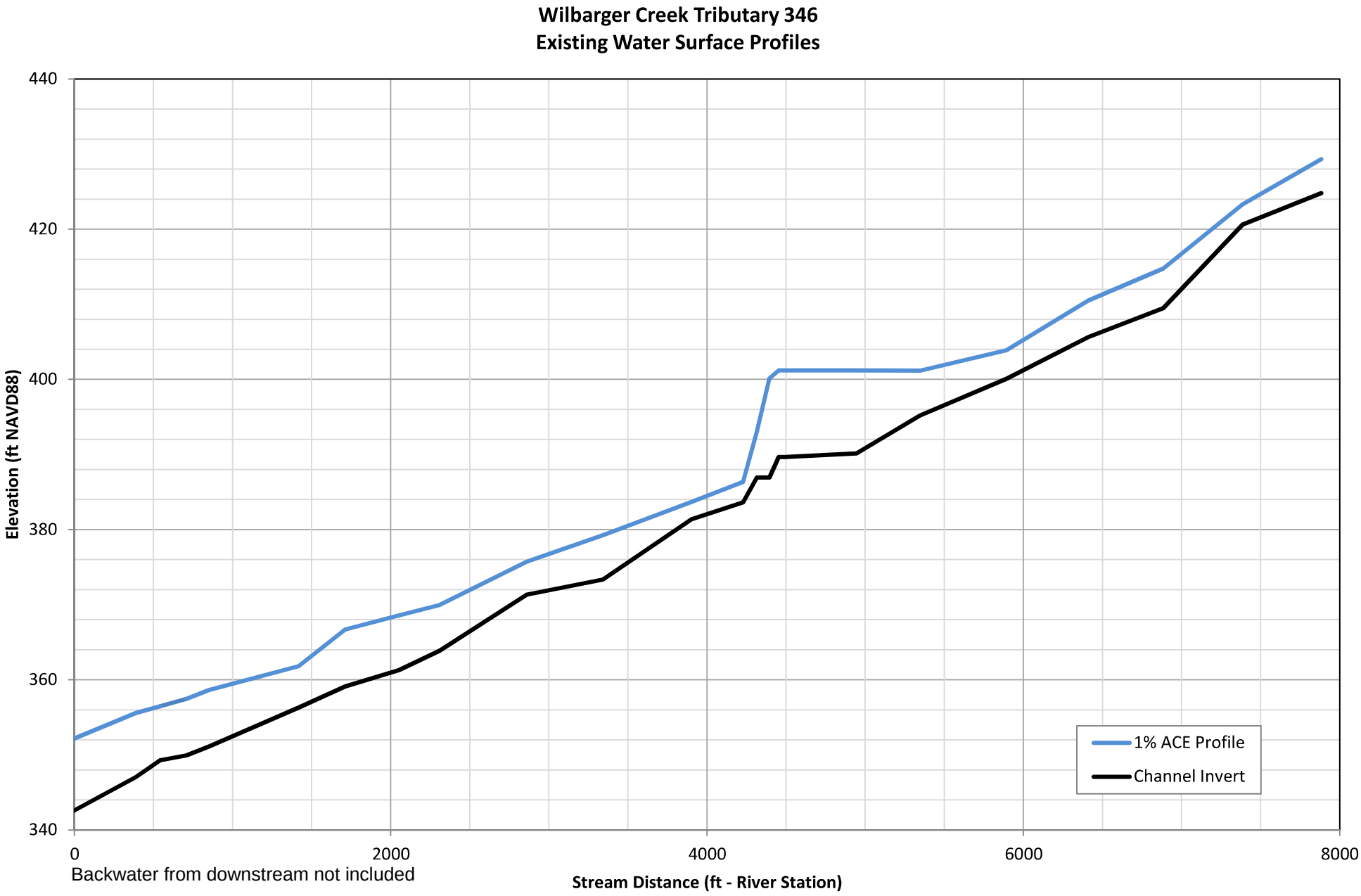

Wilbarger Creek Tributary 304
Existing Water Surface Profiles
480
470
460
450
440
430
420
410
400
390
Elevation (ft NAVD88)
0
1000
2000
3000
4000
5000
6000
7000
Stream Distance (ft - River Station)
1% ACE Profile
Channel Invert
Backwater from downstream not included

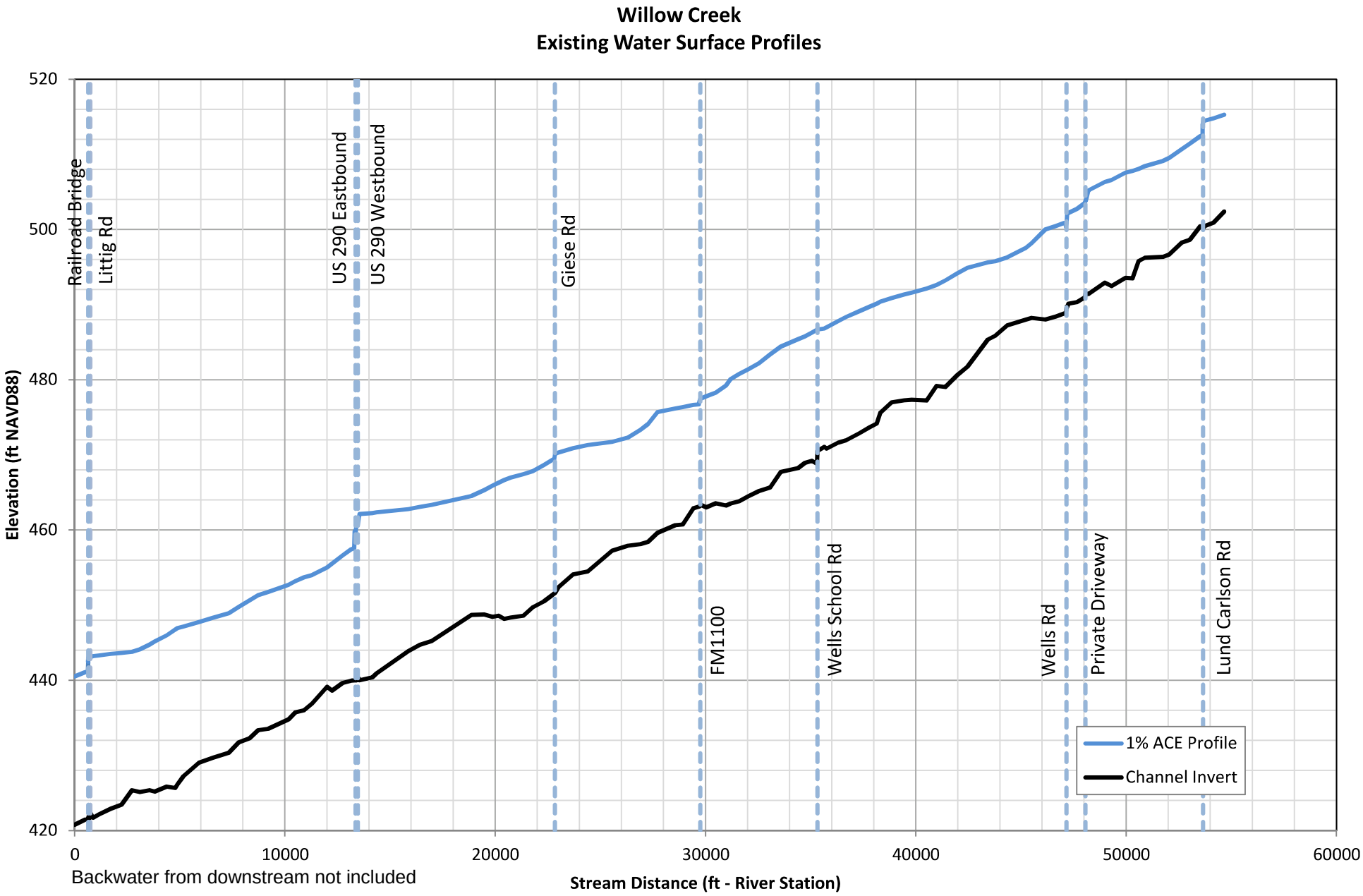

Wilbarger Creek Tributary 305
Existing Water Surface Profiles
480
470
460
450
440
430
420
410
400
390
Elevation (ft NAVD88)
0
1000
2000
3000
4000
5000
6000
7000
Stream Distance (ft - River Station)
1% ACE Profile
Channel Invert
Backwater from downstream not included


Wilbarger Creek Tributary 307
Existing Water Surface Profiles
480
470
460
450
440
Elevation (ft NAVD88)
Ingrid Dr
0
1000
2000
3000
4000
5000
6000
Backwater from downstream not included
Stream Distance (ft - River Station)
1% ACE Profile
Channel Invert


Wilbarger Creek Tributary 326
Existing Water Surface Profiles
Elevation (ft NAVD88)
430
420
410
400
390
380
Old Austin Trl
0
1000
2000
3000
4000
Backwater from downstream not included
Stream Distance (ft - River Station)
1% ACE Profile
Channel Invert


Wilbarger Creek Tributary 328
Existing Water Surface Profiles
425
420
415
410
405
400
395
390
Elevation (ft NAVD88)
0
500
1000
1500
2000
2500
Stream Distance (ft - River Station)
1% ACE Profile
Channel Invert
Backwater from downstream not included


Wilbarger Creek Tributary 346
Existing Water Surface Profiles
440
420
400
380
360
340
Elevation (ft NAVD88)
0
2000
4000
6000
8000
Backwater from downstream not included
Stream Distance (ft - River Station)
1% ACE Profile
Channel Invert


Willow Creek
Existing Water Surface Profiles
Elevation (ft NAVD88)
520
500
480
460
440
420
0
10000
20000
30000
40000
50000
60000
Stream Distance (ft - River Station)
Backwater from downstream not included
Railroad Bridge
Littig Rd
US 290 Eastbound
US 290 Westbound
Giese Rd
FM1100
Wells School Rd
Wells Rd
Private Driveway
Lund Carlson Rd
1% ACE Profile
Channel Invert

Appendix F: Hydraulic Model Analysis

F-3 Hydraulics Results – Floodways

Wilbarger Creek Floodway #1

HEC-RAS Plan: FW River: WC Reach: 1

Reach	River Sta	Profile	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
			(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
1	237925	1%	165.66	877.17	5.15	734.67	734.67	
1	237925	1%FW	157.51	781.20	5.01	734.80	734.67	0.14
1	237765	1%	201.57	1144.36	3.31	734.15	734.15	
1	237765	1%FW	196.43	1164.72	3.13	734.38	734.15	0.23
1	237122	1%	847.12	1610.67	3.09	730.98	730.98	
1	237122	1%FW	480.00	1173.06	3.58	731.89	730.98	0.91
1	236890	1%	981.96	1901.82	2.21	730.07	730.07	
1	236890	1%FW	485.00	1467.55	2.86	731.05	730.07	0.98
1	236150	1%	840.70	2158.68	2.08	728.83	728.83	
1	236150	1%FW	604.79	1706.68	2.64	729.19	728.83	0.36
1	235286	1%	473.82	1051.77	5.61	724.40	724.40	
1	235286	1%FW	280.00	1079.74	5.46	725.07	724.40	0.68
1	235116	1%	686.52	1547.04	3.81	723.70	723.70	
1	235116	1%FW	290.00	1337.08	4.41	724.54	723.70	0.85
1	234981	1%	677.82	1611.93	3.66	723.11	723.11	
1	234981	1%FW	263.00	1217.99	4.84	723.92	723.11	0.80
1	234926	1%	538.59	1095.79	5.38	721.91	721.91	
1	234926	1%FW	258.00	812.62	7.26	722.18	721.91	0.27
1	234908		Culvert					
1	234891	1%	594.89	1392.28	4.24	722.07	722.07	
1	234891	1%FW	250.00	1093.73	5.39	722.84	722.07	0.78
1	234831	1%	606.51	1419.32	4.16	721.68	721.68	
1	234831	1%FW	250.00	1103.89	5.34	722.48	721.68	0.80
1	234616	1%	690.52	1904.68	3.10	720.90	720.90	
1	234616	1%FW	282.39	1317.17	4.48	721.53	720.90	0.63
1	234390	1%	538.36	1293.27	4.58	719.37	719.37	
1	234390	1%FW	253.07	1204.58	4.90	720.37	719.37	1.00
1	233777	1%	700.69	2265.13	2.62	717.56	717.56	
1	233777	1%FW	280.00	1435.05	4.11	718.05	717.56	0.48
1	233580	1%	563.00	1591.94	3.71	716.75	716.75	
1	233580	1%FW	305.00	1459.66	4.04	717.35	716.75	0.60
1	233473	1%	473.79	1478.08	4.33	715.74	715.74	
1	233473	1%FW	293.00	1501.76	4.26	716.73	715.74	0.98
1	233211	1%	799.93	2381.03	2.69	715.26	715.26	
1	233211	1%FW	332.00	1607.69	3.98	715.94	715.26	0.67
1	232880	1%	663.09	1870.63	3.42	714.05	714.05	
1	232880	1%FW	300.35	1572.67	4.07	714.78	714.05	0.73

HEC-RAS Plan: FW River: WC Reach: 1 (Continued)

Reach	River Sta	Profile	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
			(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
1	232618	1%	428.08	1286.09	4.98	712.53	712.53	
1	232618	1%FW	160.68	864.87	7.40	712.95	712.53	0.42
1	232416	1%	355.26	847.63	7.55	709.77	709.77	
1	232416	1%FW	118.87	705.27	9.07	710.75	709.77	0.98
1	232376	1%	377.57	1959.83	3.27	710.43	710.43	
1	232376	1%FW	170.00	1322.61	4.84	711.20	710.43	0.77
1	232336	1%	240.06	2031.60	3.29	710.41	710.41	
1	232336	1%FW	182.72	1954.96	3.27	711.30	710.41	0.89
1	232259		Culvert					
1	232183	1%	204.14	1984.96	3.53	709.55	709.55	
1	232183	1%FW	204.14	2130.05	3.21	710.44	709.55	0.89
1	232136	1%	425.46	2605.91	2.47	709.57	709.57	
1	232136	1%FW	280.00	2630.39	2.43	710.45	709.57	0.89
1	231902	1%	404.95	1503.93	4.42	708.90	708.90	
1	231902	1%FW	220.00	1233.31	5.19	709.76	708.90	0.86
1	231622	1%	520.19	1526.12	4.19	707.72	707.72	
1	231622	1%FW	190.00	1053.82	6.07	708.39	707.72	0.67
1	231116	1%	583.47	1485.41	4.31	705.52	705.52	
1	231116	1%FW	176.00	921.92	6.94	705.56	705.52	0.04

HEC-RAS Plan: FW River: WC Reach: 1

Reach	River Sta	Profile	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
			(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
1	203727	1%	651.27	3110.22	4.08	614.32	614.32	
1	203727	1%FW	651.64	3113.99	4.08	614.33	614.32	0.01
1	202822	1%	705.63	3584.00	3.54	612.95	612.95	
1	202822	1%FW	706.15	3594.60	3.53	612.96	612.95	0.02
1	202597	1%	675.46	3663.25	3.47	612.32	612.32	
1	202597	1%FW	677.40	3677.41	3.45	612.34	612.32	0.02
1	201998	1%	862.23	4091.27	3.10	611.23	611.23	
1	201998	1%FW	866.07	4123.77	3.08	611.27	611.23	0.04
1	201393	1%	1015.19	4917.46	2.58	610.57	610.57	
1	201393	1%FW	1018.58	4976.78	2.55	610.63	610.57	0.06
1	201312	1%	1101.78	5744.34	2.21	610.53	610.53	
1	201312	1%FW	1111.46	5809.77	2.19	610.59	610.53	0.06
1	201276 BR U	1%	13.87	1081.33	6.76	609.49	609.49	
1	201276 BR U	1%FW	0.30	1081.70	6.60	609.54	609.49	0.05
1	201276 BR D	1%	118.26	955.14	7.65	608.04	608.04	
1	201276 BR D	1%FW	119.57	999.61	7.14	608.41	608.04	0.37
1	201252	1%	933.26	4308.05	2.95	608.71	608.71	
1	201252	1%FW	955.60	4583.01	2.77	609.01	608.71	0.29
1	201167	1%	941.37	5699.54	2.23	608.67	608.67	
1	201167	1%FW	947.51	5976.98	2.12	608.96	608.67	0.29
1	201110	1%	911.57	5541.81	2.29	608.60	608.60	
1	201110	1%FW	927.12	5819.02	2.18	608.90	608.60	0.30
1	200472	1%	439.90	2777.31	4.57	607.20	607.20	
1	200472	1%FW	353.00	2849.81	4.46	607.67	607.20	0.46
1	200108	1%	522.52	2588.88	4.91	605.37	605.37	
1	200108	1%FW	326.00	2562.60	4.96	606.13	605.37	0.76
1	199360	1%	610.32	3744.69	3.39	604.03	604.03	
1	199360	1%FW	383.15	3249.90	3.91	604.77	604.03	0.74
1	198912	1%	445.40	3115.24	4.08	603.09	603.09	
1	198912	1%FW	299.68	2704.90	4.70	603.71	603.09	0.61
1	198488	1%	487.77	2678.33	4.74	601.67	601.67	
1	198488	1%FW	288.08	2489.80	5.10	602.45	601.67	0.78
1	198116	1%	548.64	2498.83	5.08	599.76	599.76	
1	198116	1%FW	274.01	1929.06	6.58	600.45	599.76	0.69
1	197672	1%	707.75	3702.10	3.43	598.62	598.62	
1	197672	1%FW	430.00	3057.71	4.15	599.24	598.62	0.62
1	197107	1%	976.35	5352.28	2.37	598.32	598.32	

HEC-RAS Plan: FW River: WC Reach: 1 (Continued)

Reach	River Sta	Profile	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
			(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
1	197107	1%FW	699.23	4787.63	2.65	598.95	598.32	0.63
1	196645	1%	792.44	5004.02	2.54	598.15	598.15	
1	196645	1%FW	537.00	4383.33	2.90	598.78	598.15	0.63
1	196097	1%	471.38	2630.30	4.83	597.07	597.07	
1	196097	1%FW	349.46	2744.48	4.63	597.93	597.07	0.86
1	195622	1%	658.03	3494.52	3.63	596.36	596.36	
1	195622	1%FW	272.17	2678.01	4.74	597.21	596.36	0.86
1	195199	1%	663.32	2621.43	4.84	595.13	595.13	
1	195199	1%FW	270.00	2235.53	5.68	596.11	595.13	0.98
1	194701	1%	764.13	3802.56	3.37	594.52	594.52	
1	194701	1%FW	309.91	2827.29	4.53	595.46	594.52	0.94
1	194119	1%	574.01	3170.30	4.04	593.44	593.44	
1	194119	1%FW	269.25	2581.25	4.96	594.32	593.44	0.88
1	193698	1%	722.34	4106.43	3.12	592.89	592.89	
1	193698	1%FW	388.01	3633.49	3.52	593.85	592.89	0.97
1	193058	1%	560.26	3066.47	4.17	591.74	591.74	
1	193058	1%FW	248.92	2407.72	5.32	592.56	591.74	0.82
1	192287	1%	482.88	3304.10	3.87	590.33	590.33	
1	192287	1%FW	281.90	3058.35	4.19	591.28	590.33	0.94
1	191908	1%	548.16	2669.35	4.80	588.98	588.98	
1	191908	1%FW	228.86	2106.59	6.08	589.82	588.98	0.84
1	191643	1%	687.90	3504.50	3.65	588.50	588.50	
1	191643	1%FW	258.59	2632.82	4.86	589.38	588.50	0.88
1	191118	1%	630.60	3414.55	3.84	587.29	587.29	
1	191118	1%FW	256.59	2562.32	5.11	588.11	587.29	0.82
1	190719	1%	514.40	2629.80	4.98	586.14	586.14	
1	190719	1%FW	216.78	2276.81	5.75	587.05	586.14	0.91
1	189874	1%	606.43	3138.34	4.17	584.24	584.24	
1	189874	1%FW	241.27	2323.24	5.64	584.94	584.24	0.69
1	189255	1%	620.46	3577.40	3.66	582.85	582.85	
1	189255	1%FW	287.92	2865.97	4.57	583.55	582.85	0.70
1	188857	1%	546.95	2714.18	5.06	581.16	581.16	
1	188857	1%FW	228.42	1974.43	6.63	581.77	581.16	0.61
1	188072	1%	771.54	3174.51	4.13	578.24	578.24	
1	188072	1%FW	475.48	2735.70	4.79	578.98	578.24	0.74
1	187688	1%	934.27	3940.80	3.32	577.52	577.52	
1	187688	1%FW	638.18	3487.72	3.76	578.26	577.52	0.74

HEC-RAS Plan: FW River: WC Reach: 1 (Continued)

Reach	River Sta	Profile	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
			(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
1	187368	1%	1197.13	6521.12	2.01	577.23	577.23	
1	187368	1%FW	813.06	5530.95	2.37	577.91	577.23	0.68
1	185570	1%	839.35	4509.70	2.95	575.57	575.57	
1	185570	1%FW	606.47	4449.90	2.99	576.33	575.57	0.76
1	184720	1%	735.94	3908.61	3.40	574.34	574.34	
1	184720	1%FW	373.52	3150.58	4.22	575.05	574.34	0.71
1	184111	1%	806.94	5798.34	2.29	573.87	573.87	
1	184111	1%FW	510.98	4794.67	2.77	574.55	573.87	0.68
1	183008	1%	915.88	6410.57	2.07	573.23	573.23	
1	183008	1%FW	670.50	6046.64	2.20	573.95	573.23	0.72
1	182498	1%	933.50	7178.69	1.85	573.08	573.08	
1	182498	1%FW	635.78	6458.55	2.06	573.80	573.08	0.72
1	181779	1%	860.72	7873.06	1.69	572.83	572.83	
1	181779	1%FW	531.63	6989.33	1.90	573.52	572.83	0.69
1	180880	1%	1016.75	8518.99	4.03	571.49	571.49	
1	180880	1%FW	644.01	8059.71	4.26	572.26	571.49	0.77
1	179856	1%	1008.42	6212.85	5.52	569.11	569.11	
1	179856	1%FW	495.00	5563.06	6.17	570.05	569.11	0.94
1	179110	1%	1390.21	8260.74	4.15	567.80	567.80	
1	179110	1%FW	550.00	6244.75	5.49	568.64	567.80	0.84
1	178445	1%	1410.31	11414.59	3.00	567.28	567.28	
1	178445	1%FW	947.97	10037.85	3.42	568.19	567.28	0.91
1	177353	1%	882.25	7116.03	4.82	565.70	565.70	
1	177353	1%FW	557.40	6256.29	5.48	566.47	565.70	0.78
1	177012	1%	1006.94	5926.30	5.79	564.20	564.20	
1	177012	1%FW	476.00	4575.83	7.50	564.43	564.20	0.23
1	176632	1%	1311.17	8881.78	3.86	563.60	563.60	
1	176632	1%FW	516.70	6051.19	5.67	563.69	563.60	0.08
1	176338	1%	1224.11	11076.92	3.10	563.39	563.39	
1	176338	1%FW	678.62	8291.98	4.14	563.42	563.39	0.02
1	175311	1%	1188.40	9496.10	3.61	562.63	562.63	
1	175311	1%FW	894.00	8479.33	4.05	562.61	562.63	-0.02

Wilbarger Creek Tributary 185 Floodway

HEC-RAS Plan: FW River: WC_T185 Reach: Reach_1

Reach	River Sta	Profile	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
			(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
Reach_1	2352	1%	292.42	508.83	3.34	742.34	742.34	
Reach_1	2352	1%FW	135.86	449.34	3.78	742.91	742.34	0.57
Reach_1	2053	1%	293.77	401.49	4.84	739.56	739.56	
Reach_1	2053	1%FW	100.80	216.95	7.84	739.80	739.56	0.23
Reach_1	1873	1%	300.49	553.85	3.07	737.98	737.98	
Reach_1	1873	1%FW	111.50	433.53	3.92	738.96	737.98	0.98
Reach_1	1540	1%	279.07	316.07	5.38	734.98	734.98	
Reach_1	1540	1%FW	97.84	227.84	7.46	735.79	734.98	0.81
Reach_1	1422	1%	986.51	2559.88	0.66	735.13	735.13	
Reach_1	1422	1%FW	196.55	948.53	1.79	735.61	735.13	0.48
Reach_1	1353		Mult Open					
Reach_1	1278	1%	643.77	1127.93	1.51	732.92	732.92	
Reach_1	1278	1%FW	172.69	529.33	3.21	733.41	732.92	0.49
Reach_1	1165	1%	336.57	1357.16	3.61	732.19	732.19	
Reach_1	1165	1%FW	180.00	436.62	4.12	732.69	732.19	0.51
Reach_1	769	1%	563.23	1036.66	2.56	729.80	729.80	
Reach_1	769	1%FW	170.00	434.71	4.14	730.45	729.80	0.65

Wilbarger Creek Tributary 196 Floodway

HEC-RAS Plan: FW River: WC_T196 Reach: Reach_1

Reach	River Sta	Profile	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
			(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
Reach_1	3758	1%	142.29	261.15	5.36	589.28	589.28	
Reach_1	3758	1%FW	138.59	257.92	5.43	589.26	589.28	-0.02
Reach_1	3627	1%	254.81	550.96	2.54	589.13	589.13	
Reach_1	3627	1%FW	250.95	544.23	2.57	589.11	589.13	-0.03
Reach_1	3594		Culvert					
Reach_1	3565	1%	328.77	504.85	2.77	588.93	588.93	
Reach_1	3565	1%FW	328.26	500.43	2.80	588.91	588.93	-0.01
Reach_1	3471	1%	211.14	432.47	4.16	588.58	588.58	
Reach_1	3471	1%FW	210.65	427.36	4.21	588.55	588.58	-0.02
Reach_1	3168	1%	335.70	511.04	3.52	587.14	587.14	
Reach_1	3168	1%FW	336.87	545.60	3.30	587.24	587.14	0.10
Reach_1	2940	1%	427.48	806.14	2.23	586.73	586.73	
Reach_1	2940	1%FW	442.35	893.95	2.01	586.93	586.73	0.20
Reach_1	2269	1%	293.55	410.59	4.38	584.48	584.48	
Reach_1	2269	1%FW	155.00	413.48	4.35	585.37	584.48	0.89
Reach_1	2001	1%	313.39	700.83	2.57	583.64	583.64	
Reach_1	2001	1%FW	125.00	474.07	3.80	584.56	583.64	0.92
Reach_1	1666	1%	406.12	570.60	3.15	582.19	582.19	
Reach_1	1666	1%FW	181.00	400.24	4.50	582.93	582.19	0.74
Reach_1	1357	1%	408.05	1095.63	1.64	581.51	581.51	
Reach_1	1357	1%FW	193.88	625.95	2.88	581.91	581.51	0.40
Reach_1	974	1%	170.74	378.49	5.35	579.57	579.57	
Reach_1	974	1%FW	136.00	356.94	5.04	579.83	579.57	0.26
Reach_1	498	1%	584.21	1266.83	1.42	577.95	577.95	
Reach_1	498	1%FW	332.77	1082.26	1.66	578.88	577.95	0.93

Wilbarger Creek Tributary 207 Floodway

HEC-RAS Plan: FW River: WC_T207 Reach: Reach_1

Reach	River Sta	Profile	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
			(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
Reach_1	1504	1%	27.88	75.97	6.39	624.54	624.54	
Reach_1	1504	1%FW	22.14	64.80	6.33	624.89	624.54	0.34
Reach_1	1450	1%	80.63	101.09	4.06	624.06	624.06	
Reach_1	1450	1%FW	29.27	71.35	5.75	624.32	624.06	0.26
Reach_1	1295	1%	97.10	124.15	3.30	623.17	623.17	
Reach_1	1295	1%FW	32.95	92.88	4.41	623.44	623.17	0.27
Reach_1	1122	1%	110.38	117.60	3.49	622.19	622.19	
Reach_1	1122	1%FW	35.93	84.53	4.85	622.31	622.19	0.12
Reach_1	991	1%	59.99	69.61	5.89	620.25	620.25	
Reach_1	991	1%FW	32.71	64.13	6.39	620.49	620.25	0.24
Reach_1	783	1%	100.81	140.92	2.91	618.50	618.50	
Reach_1	783	1%FW	34.50	93.34	4.39	618.86	618.50	0.36
Reach_1	591	1%	127.25	185.06	4.23	616.57	616.57	
Reach_1	591	1%FW	70.91	149.83	5.32	616.68	616.57	0.11
Reach_1	480	1%	273.17	839.92	0.88	616.87	616.87	
Reach_1	480	1%FW	148.00	476.74	1.77	616.94	616.87	0.08
Reach_1	386	1%	244.11	646.14	1.19	616.83	616.83	
Reach_1	386	1%FW	163.34	540.96	1.48	616.94	616.83	0.10
Reach_1	351		Inl Struct					
Reach_1	317	1%	97.48	210.33	4.64	613.70	613.70	
Reach_1	317	1%FW	72.56	212.74	4.86	614.09	613.70	0.39
Reach_1	255	1%	137.39	155.49	4.12	612.96	612.96	
Reach_1	255	1%FW	72.09	118.13	5.42	613.22	612.96	0.26
Reach_1	121	1%	174.84	159.92	4.00	611.31	611.31	
Reach_1	121	1%FW	83.14	123.00	5.20	611.48	611.31	0.17

HEC-RAS Plan: FW River: WC_T210 Reach: Reach_1

Reach	River Sta	Profile	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
			(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
Reach_1	38592	1%	531.49	1050.58	4.19	657.60	657.60	
Reach_1	38592	1%FW	532.59	1054.64	4.17	657.61	657.60	0.01
Reach_1	38264	1%	637.07	1629.46	2.70	656.67	656.67	
Reach_1	38264	1%FW	641.17	1681.62	2.62	656.75	656.67	0.08
Reach_1	38030	1%	420.91	1220.00	3.61	655.90	655.90	
Reach_1	38030	1%FW	435.18	1298.73	3.39	656.09	655.90	0.18
Reach_1	37725	1%	369.84	1059.77	4.15	654.40	654.40	
Reach_1	37725	1%FW	440.72	1412.70	3.11	655.27	654.40	0.88
Reach_1	37487	1%	441.17	1124.32	3.91	653.15	653.15	
Reach_1	37487	1%FW	170.00	682.69	6.45	653.67	653.15	0.52
Reach_1	37274	1%	572.78	1003.40	4.39	651.48	651.48	
Reach_1	37274	1%FW	215.00	818.76	5.37	652.38	651.48	0.89
Reach_1	37011	1%	564.64	1740.98	2.53	650.85	650.85	
Reach_1	37011	1%FW	285.00	1201.83	3.66	651.64	650.85	0.79
Reach_1	36742	1%	515.65	1709.40	2.57	650.23	650.23	
Reach_1	36742	1%FW	285.00	1338.23	3.29	650.91	650.23	0.68
Reach_1	36677	1%	530.10	1881.33	2.34	650.06	650.06	
Reach_1	36677	1%FW	280.00	1440.85	3.05	650.72	650.06	0.66
Reach_1	36662		Culvert					
Reach_1	36650	1%	524.33	1857.89	2.37	650.04	650.04	
Reach_1	36650	1%FW	270.00	1374.34	3.20	650.59	650.04	0.55
Reach_1	36581	1%	598.62	1761.39	2.50	649.85	649.85	
Reach_1	36581	1%FW	260.00	1313.16	3.35	650.40	649.85	0.56
Reach_1	36460	1%	553.07	1672.81	3.35	649.26	649.26	
Reach_1	36460	1%FW	273.42	1386.08	4.04	649.81	649.26	0.55
Reach_1	36251	1%	390.53	1245.08	5.30	647.04	647.04	
Reach_1	36251	1%FW	258.61	887.62	6.31	647.28	647.04	0.24
Reach_1	35979	1%	393.59	1007.26	5.56	643.88	643.88	
Reach_1	35979	1%FW	294.13	972.15	5.76	644.48	643.88	0.61
Reach_1	35713	1%	469.66	1810.22	3.09	643.15	643.15	
Reach_1	35713	1%FW	292.08	1468.71	3.81	643.71	643.15	0.56
Reach_1	35276	1%	599.83	3429.55	1.63	642.85	642.85	
Reach_1	35276	1%FW	324.70	2254.34	2.48	643.24	642.85	0.38
Reach_1	34851	1%	745.72	4784.19	1.17	642.74	642.74	
Reach_1	34851	1%FW	380.00	2964.43	1.89	643.03	642.74	0.28
Reach_1	34728	1%	780.41	5516.09	1.02	642.72	642.72	
Reach_1	34728	1%FW	370.00	3000.87	1.87	642.97	642.72	0.25
Reach_1	34662	1%	762.59	3868.21	1.45	642.66	642.66	

HEC-RAS Plan: FW River: WC_T210 Reach: Reach_1 (Continued)

Reach	River Sta	Profile	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
			(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
Reach_1	34662	1%FW	250.00	2023.47	2.77	642.82	642.66	0.16
Reach_1	34586		Mult Open					
Reach_1	34529	1%	203.30	834.19	7.57	638.10	638.10	
Reach_1	34529	1%FW	163.02	742.46	8.42	638.10	638.10	0.00
Reach_1	34418	1%	229.31	903.57	6.20	635.06	635.06	
Reach_1	34418	1%FW	188.74	922.16	6.07	635.35	635.06	0.28
Reach_1	33991	1%	482.61	1077.02	5.20	633.23	633.23	
Reach_1	33991	1%FW	158.42	876.07	6.39	633.47	633.23	0.24
Reach_1	33488	1%	449.22	843.49	6.64	630.44	630.44	
Reach_1	33488	1%FW	149.78	763.34	7.34	630.75	630.44	0.31
Reach_1	32988	1%	528.00	1390.77	4.03	628.71	628.71	
Reach_1	32988	1%FW	209.53	1057.93	5.29	628.92	628.71	0.21
Reach_1	32415	1%	416.28	1208.08	4.64	626.02	626.02	
Reach_1	32415	1%FW	234.00	1065.94	5.25	626.44	626.02	0.42
Reach_1	32260	1%	410.43	1192.82	4.69	625.19	625.19	
Reach_1	32260	1%FW	231.00	1062.27	5.27	625.74	625.19	0.55
Reach_1	31765	1%	557.04	2160.91	2.73	624.03	624.03	
Reach_1	31765	1%FW	308.00	1714.55	3.44	624.62	624.03	0.59
Reach_1	31172	1%	471.11	1278.18	4.62	621.76	621.76	
Reach_1	31172	1%FW	300.00	1315.83	4.48	622.75	621.76	1.00
Reach_1	30870	1%	586.22	2040.75	2.89	620.40	620.40	
Reach_1	30870	1%FW	295.00	1360.77	4.34	621.08	620.40	0.68
Reach_1	30694	1%	705.94	1248.48	4.80	618.64	618.64	
Reach_1	30694	1%FW	376.00	1137.25	5.19	619.29	618.64	0.65
Reach_1	30140	1%	1346.20	5238.00	1.13	618.60	618.60	
Reach_1	30140	1%FW	670.00	3813.57	1.55	619.28	618.60	0.68
Reach_1	29984	1%	1413.44	7383.74	0.80	618.58	618.58	
Reach_1	29984	1%FW	576.15	4430.58	1.33	619.25	618.58	0.67
Reach_1	29951 BR U	1%	746.41	1431.92	4.12	618.58	618.58	
Reach_1	29951 BR U	1%FW	391.95	1136.31	5.19	619.25	618.58	0.67

HEC-RAS Plan: FW River: WC_T210 Reach: Reach_1

Reach	River Sta	Profile	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
			(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
Reach_1	15630	1%	1323.89	5177.37	3.86	592.76	592.76	
Reach_1	15630	1%FW	1325.13	5193.46	3.85	592.77	592.76	0.01
Reach_1	15098	1%	1472.25	6830.95	2.93	592.35	592.35	
Reach_1	15098	1%FW	1475.67	6856.41	2.92	592.36	592.35	0.02
Reach_1	14012	1%	911.62	4099.21	4.88	590.00	590.00	
Reach_1	14012	1%FW	917.80	4173.54	4.79	590.08	590.00	0.08
Reach_1	13459	1%	918.24	5008.89	3.99	588.93	588.93	
Reach_1	13459	1%FW	940.38	5157.83	3.88	589.09	588.93	0.16
Reach_1	12936	1%	980.96	6117.54	3.27	588.63	588.63	
Reach_1	12936	1%FW	993.24	6303.15	3.17	588.82	588.63	0.19
Reach_1	12626	1%	1067.16	6298.25	3.22	588.44	588.44	
Reach_1	12626	1%FW	1107.46	6520.74	3.11	588.64	588.44	0.20
Reach_1	11788	1%	867.20	4599.43	4.41	587.41	587.41	
Reach_1	11788	1%FW	923.65	4909.81	4.13	587.75	587.41	0.35
Reach_1	11534	1%	904.66	4883.02	4.16	586.72	586.72	
Reach_1	11534	1%FW	1052.58	5358.92	3.79	587.21	586.72	0.49
Reach_1	11094	1%	994.24	4532.53	4.48	585.86	585.86	
Reach_1	11094	1%FW	1267.41	5434.21	3.74	586.65	585.86	0.79
Reach_1	10350	1%	1089.30	6934.95	2.93	585.38	585.38	
Reach_1	10350	1%FW	1274.18	8060.49	2.52	586.33	585.38	0.96
Reach_1	10332	1%	723.48	5986.01	3.67	585.22	585.22	
Reach_1	10332	1%FW	723.48	7095.81	3.25	586.21	585.22	0.99
Reach_1	10294 BR U	1%	204.02	4577.57	4.43	585.06	585.06	
Reach_1	10294 BR U	1%FW	17.82	4684.73	4.33	586.03	585.06	0.97
Reach_1	10294 BR D	1%	300.84	4586.00	4.43	584.54	584.54	
Reach_1	10294 BR D	1%FW	123.85	4785.63	4.24	585.47	584.54	0.93
Reach_1	10235	1%	710.00	6336.93	3.68	584.57	584.57	
Reach_1	10235	1%FW	710.00	7270.14	3.27	585.53	584.57	0.96
Reach_1	10199	1%	877.12	6711.11	3.03	584.57	584.57	
Reach_1	10199	1%FW	1148.96	7722.38	2.63	585.53	584.57	0.97
Reach_1	9757	1%	1248.34	10170.32	2.00	584.26	584.26	
Reach_1	9757	1%FW	1010.00	9807.67	2.07	585.27	584.26	1.00
Reach_1	9522	1%	1460.63	12347.57	1.64	584.16	584.16	
Reach_1	9522	1%FW	1080.00	11297.97	1.80	585.15	584.16	0.99
Reach_1	8954	1%	1008.20	6715.88	3.10	583.71	583.71	
Reach_1	8954	1%FW	465.00	5210.54	3.99	584.52	583.71	0.81
Reach_1	8585	1%	1025.45	5754.61	3.61	582.98	582.98	
Reach_1	8585	1%FW	483.00	4936.79	4.21	583.79	582.98	0.81

HEC-RAS Plan: FW River: WC_T210 Reach: Reach_1 (Continued)

Reach	River Sta	Profile	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
			(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
Reach_1	8206	1%	1029.45	6225.57	3.34	582.32	582.32	
Reach_1	8206	1%FW	510.00	5261.81	3.95	583.20	582.32	0.88
Reach_1	7557	1%	858.73	5853.59	3.55	581.73	581.73	
Reach_1	7557	1%FW	400.00	4590.78	4.53	582.46	581.73	0.73
Reach_1	7118	1%	668.40	4162.18	5.00	580.52	580.52	
Reach_1	7118	1%FW	304.00	3525.38	5.90	581.38	580.52	0.85
Reach_1	6700	1%	610.71	4577.65	4.54	579.16	579.16	
Reach_1	6700	1%FW	305.00	3647.04	5.70	580.01	579.16	0.86
Reach_1	6127	1%	797.39	6050.41	3.44	578.44	578.44	
Reach_1	6127	1%FW	490.00	5299.38	3.92	579.32	578.44	0.88
Reach_1	5643	1%	758.61	5935.04	3.50	578.13	578.13	
Reach_1	5643	1%FW	446.00	5111.65	4.07	578.97	578.13	0.84
Reach_1	5357	1%	667.38	4588.59	4.53	576.85	576.85	
Reach_1	5357	1%FW	380.00	4057.36	5.13	577.79	576.85	0.94
Reach_1	4828	1%	726.79	5901.99	3.52	576.01	576.01	
Reach_1	4828	1%FW	460.00	5133.46	4.05	576.97	576.01	0.96
Reach_1	4557	1%	903.83	6660.66	3.12	575.76	575.76	
Reach_1	4557	1%FW	505.00	5944.44	3.50	576.76	575.76	1.00
Reach_1	3566	1%	869.62	5925.40	3.56	574.70	574.70	
Reach_1	3566	1%FW	550.00	5458.15	3.87	575.70	574.70	1.00
Reach_1	3109	1%	824.52	6247.02	3.38	574.25	574.25	
Reach_1	3109	1%FW	500.00	5642.49	3.74	575.25	574.25	1.00
Reach_1	2310	1%	641.64	4540.81	4.65	572.44	572.44	
Reach_1	2310	1%FW	280.00	3485.25	6.05	573.29	572.44	0.85
Reach_1	1944	1%	630.45	4379.53	4.82	571.34	571.34	
Reach_1	1944	1%FW	380.00	3884.45	5.43	572.20	571.34	0.85
Reach_1	1679	1%	789.78	5257.44	4.01	570.97	570.97	
Reach_1	1679	1%FW	422.00	4581.10	4.61	571.89	570.97	0.91
Reach_1	1453	1%	630.31	4257.20	4.96	570.22	570.22	
Reach_1	1453	1%FW	360.00	3790.25	5.57	571.17	570.22	0.95
Reach_1	1156	1%	672.81	4331.74	4.87	569.37	569.37	
Reach_1	1156	1%FW	400.00	3756.07	5.62	570.25	569.37	0.88
Reach_1	912	1%	834.24	4711.08	4.48	568.73	568.73	
Reach_1	912	1%FW	460.00	4092.99	5.16	569.62	568.73	0.89

HEC-RAS Plan: FW River: WC_T216 Reach: Reach_1

Reach	River Sta	Profile	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
			(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
Reach_1	5618	1%	90.47	197.87	8.59	631.50	631.50	
Reach_1	5618	1%FW	90.52	198.46	8.57	631.51	631.50	0.01
Reach_1	5151	1%	396.09	1287.52	1.79	629.29	629.29	
Reach_1	5151	1%FW	402.05	1511.95	1.52	629.85	629.29	0.56
Reach_1	5013	1%	448.99	1474.30	1.56	629.28	629.28	
Reach_1	5013	1%FW	456.75	1732.09	1.33	629.84	629.28	0.57
Reach_1	4638	1%	335.57	1078.25	2.13	629.17	629.17	
Reach_1	4638	1%FW	351.69	1285.51	1.79	629.78	629.17	0.61
Reach_1	4183	1%	375.10	1573.54	1.46	629.12	629.12	
Reach_1	4183	1%FW	398.45	1815.09	1.27	629.74	629.12	0.63
Reach_1	4096	1%	355.55	792.89	2.90	628.67	628.67	
Reach_1	4096	1%FW	385.26	1104.73	2.08	629.51	628.67	0.84
Reach_1	4068		Inl Struct					
Reach_1	4036	1%	366.03	737.81	3.12	628.78	628.78	
Reach_1	4036	1%FW	386.70	1040.93	2.21	629.59	628.78	0.81
Reach_1	3921	1%	380.74	1084.55	2.12	628.53	628.53	
Reach_1	3921	1%FW	396.05	1459.56	1.58	629.49	628.53	0.96
Reach_1	3720	1%	460.47	1326.32	1.73	628.27	628.27	
Reach_1	3720	1%FW	180.00	762.99	3.01	629.14	628.27	0.87
Reach_1	3380	1%	359.81	688.82	3.34	627.44	627.44	
Reach_1	3380	1%FW	118.58	534.80	4.30	628.22	627.44	0.78
Reach_1	3045	1%	286.15	655.58	3.51	626.32	626.32	
Reach_1	3045	1%FW	110.00	495.57	4.64	627.12	626.32	0.80
Reach_1	2645	1%	317.37	850.70	2.70	625.43	625.43	
Reach_1	2645	1%FW	115.00	627.23	3.67	626.31	625.43	0.88
Reach_1	2544	1%	312.10	1030.99	2.23	625.37	625.37	
Reach_1	2544	1%FW	184.00	1059.02	2.17	626.34	625.37	0.97
Reach_1	2509	1%	349.77	1239.34	1.86	625.36	625.36	
Reach_1	2509	1%FW	177.00	1219.55	1.89	626.33	625.36	0.97
Reach_1	2447		Culvert					
Reach_1	2404	1%	287.56	882.96	2.60	624.20	624.20	
Reach_1	2404	1%FW	186.00	1034.54	2.22	625.17	624.20	0.97
Reach_1	2333	1%	354.05	739.82	3.11	624.01	624.01	
Reach_1	2333	1%FW	117.00	660.28	3.48	624.98	624.01	0.97
Reach_1	2236	1%	362.08	763.95	3.01	623.78	623.78	

HEC-RAS Plan: FW River: WC_T216 Reach: Reach_1 (Continued)

Reach	River Sta	Profile	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
			(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
Reach_1	2236	1%FW	112.50	500.38	4.60	624.59	623.78	0.81
Reach_1	1896	1%	433.53	874.30	3.32	622.48	622.48	
Reach_1	1896	1%FW	146.00	659.23	4.40	623.36	622.48	0.88
Reach_1	1436	1%	638.14	1440.07	2.01	621.12	621.12	
Reach_1	1436	1%FW	257.79	1061.84	2.73	622.01	621.12	0.89
Reach_1	1191	1%	564.13	942.11	3.08	620.12	620.12	
Reach_1	1191	1%FW	148.00	550.51	5.27	620.66	620.12	0.54
Reach_1	874	1%	432.15	822.27	3.53	618.49	618.49	
Reach_1	874	1%FW	167.53	683.95	4.24	619.36	618.49	0.86
Reach_1	528	1%	588.12	976.80	2.97	617.04	617.04	
Reach_1	528	1%FW	138.00	612.68	4.73	617.98	617.04	0.94

Appendix G: Floodplain Mapping

G-1 Floodplain Work Maps

Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
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- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
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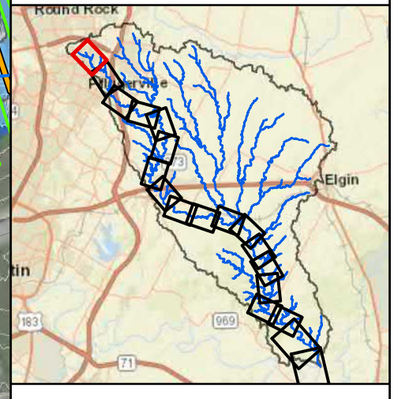
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Mainstem
& Tribs 3, 27, 165, 178, 183, 185, 186,187, 229, 326, 328

Panel 1 of 19



N

0 700 1,400 Feet

HALFF

SH 45
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WILBARGER CREEK TRIBUTARY 186
WILBARGER CREEK TRIBUTARY 183
WILBARGER CREEK
WC_T186_STR_2000
WC_STR_27000
WC_STR_29000
Heatherwilde
City of Pflugerville
TRAVIS
Mike Ridge
Pflugerville

Wilbarger Creek Watershed Study

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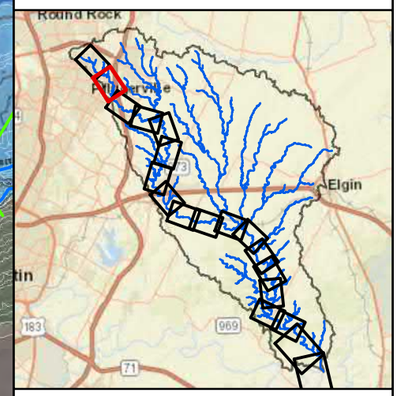
Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Mainstem
& Tribs 3, 27, 165, 178, 183, 185, 186,187, 229, 326, 328

Panel 2 of 19



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Pflugerville

WILBARGER CREEK TRIBUTARY 187

WILBARGER CREEK TRIBUTARY 186

WILBARGER CREEK

WILBARGER CREEK TRIBUTARY 178

WC_STR_24000

WC_STR_23000

WC_STR_23000_Drop

SH 130

FM 685

TRAVIS

City of Pflugerville

Wilbarger Creek Watershed Study

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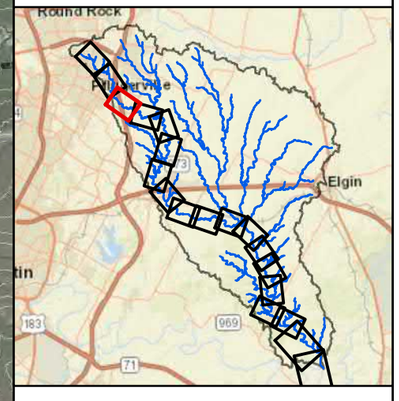
Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Mainstem
& Tribs 3, 27, 165, 178, 183,
185, 186,187, 229, 326, 328

Panel 3 of 19



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Wilbarger Creek Watershed Study

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Wilbarger Creek Watershed Hydraulic Workmap

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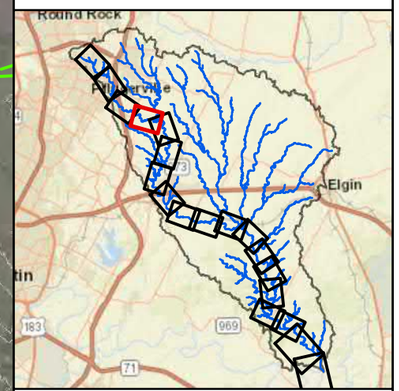
Panel 4 of 19



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Wilbarger Creek Watershed Study

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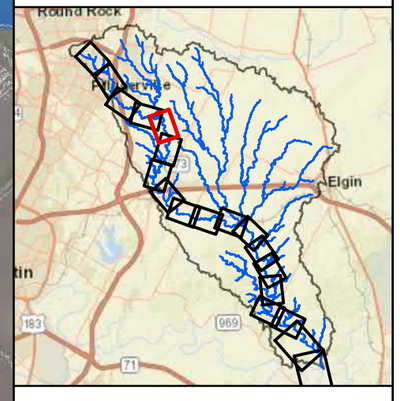
Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Mainstem
& Tribs 3, 27, 165, 178, 183, 185, 186,187, 229, 326, 328

Panel 5 of 19



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Wilbarger Creek Watershed Study

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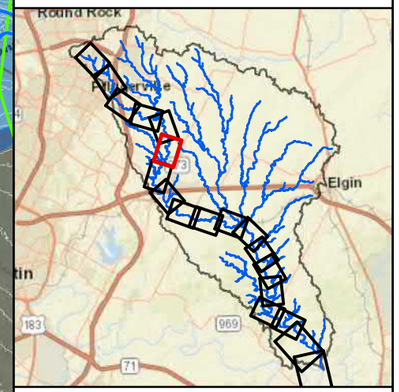
Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Mainstem
& Tribs 3, 27, 165, 178, 183, 185, 186,187, 229, 326, 328

Panel 6 of 19



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HALFF

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WC_STR_16000
WC_T220_STR_100
WILBARGER CREEK
WILBARGER CREEK TRIBUTARY 220
WILBARGER CREEK TRIBUTARY 227
City of Manor
City of Pflugerville
TRAVIS
Gregg
Anderson
Bennett Pokorney
Cameron
Fuchs Grove

Wilbarger Creek Watershed Study

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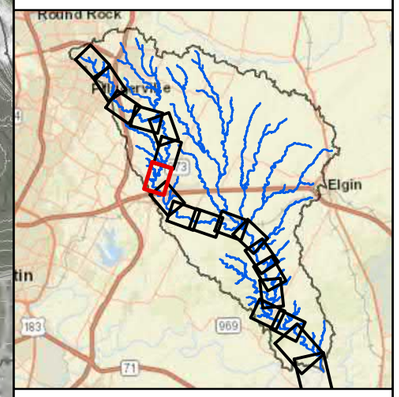
Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Mainstem
& Tribs 3, 27, 165, 178, 183, 185, 186,187, 229, 326, 328

Panel 7 of 19



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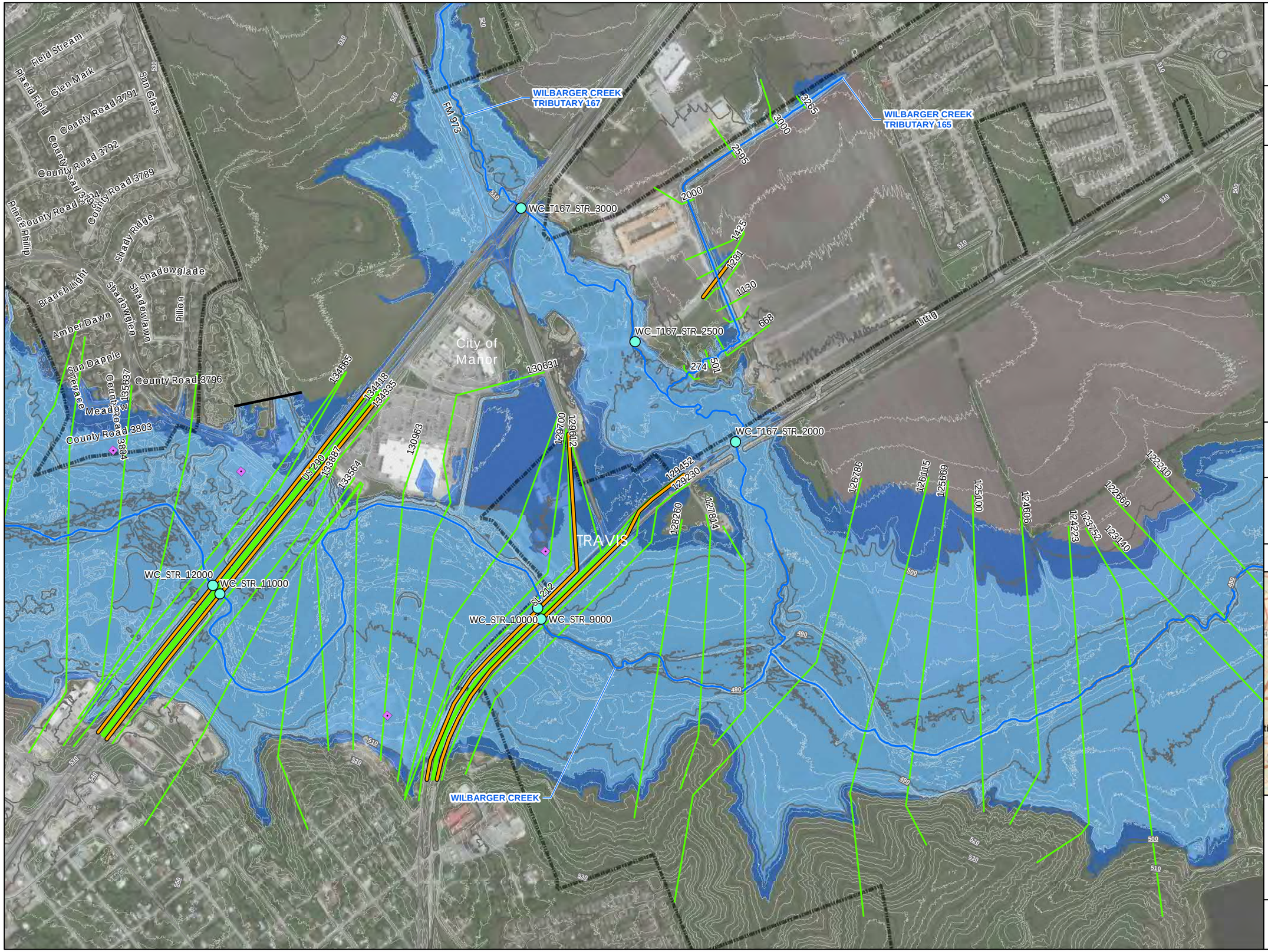

Wilbarger Creek Watershed Study

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Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Mainstem
& Tribs 3, 27, 165, 178, 183,
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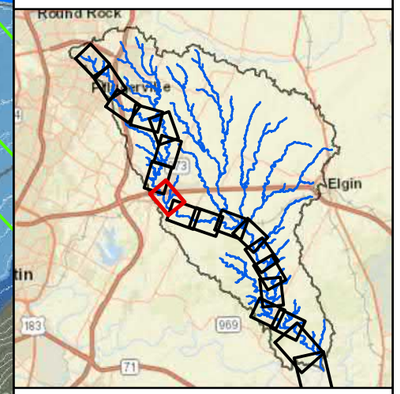
Panel 8 of 19



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Wilbarger Creek Watershed Study

- Roadway Improvements
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Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Mainstem
& Tribs 3, 27, 165, 178, 183,
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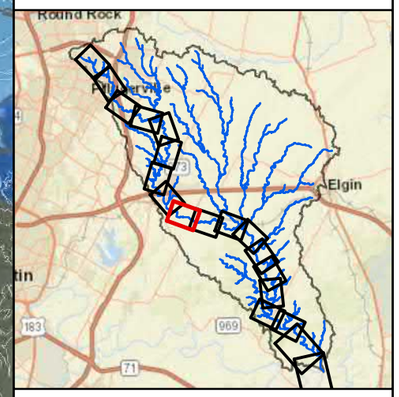
Panel 9 of 19



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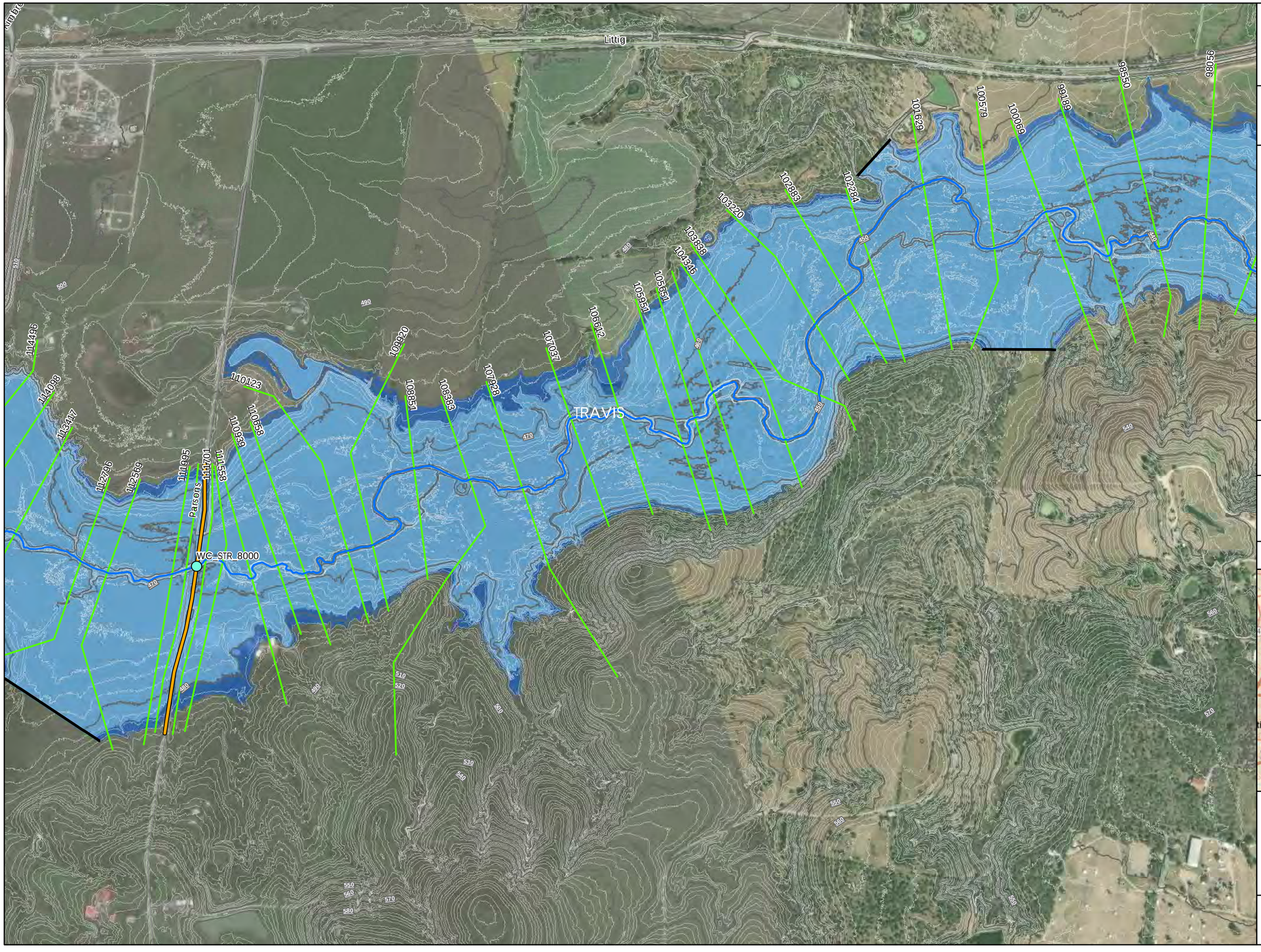

Wilbarger Creek Watershed Study

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Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Mainstem
& Tribs 3, 27, 165, 178, 183,
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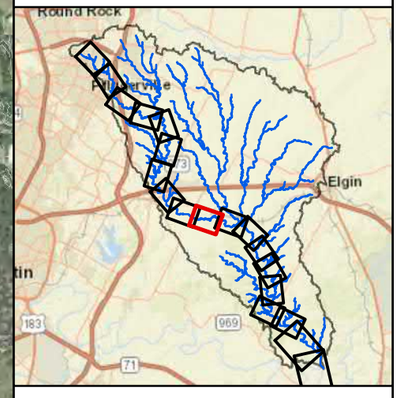
Panel 10 of 19



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HALFF

Wilbarger Creek Watershed Study

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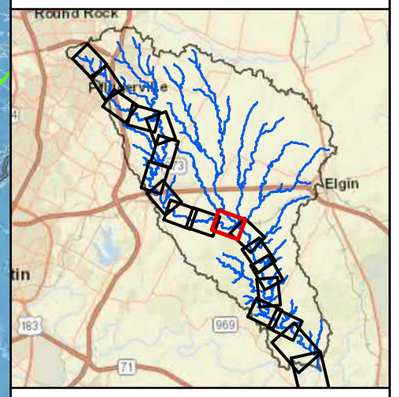
Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Mainstem
& Tribs 3, 27, 165, 178, 183,
185, 186,187, 229, 326, 328

Panel 11 of 19



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Wilbarger Creek Watershed Study

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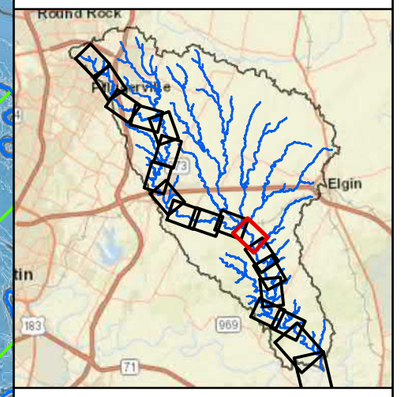
Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Mainstem
& Tribs 3, 27, 165, 178, 183, 185, 186,187, 229, 326, 328

Panel 12 of 19



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HALFF

WILBARGER CREEK TRIBUTARY 9

WILBARGER CREEK TRIBUTARY 286

WILBARGER CREEK TRIBUTARY 030

WILBARGER CREEK TRIBUTARY 6

WC_T030_STR_100

WC_T6_STR_100

Balch

BASTROP

TRAVIS

Upper Elgin

WC_STR_500

WC_STR_400

WILBARGER CREEK

Ingram

Morin

Alicia

Christina

Hog Eye

75555

75088

74628

74152

72636

72108

71591

70682

70361

69151

68442

68220

67960

67746

66100

65291

65689

76595

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Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Mainstem
& Tribs 3, 27, 165, 178, 183,
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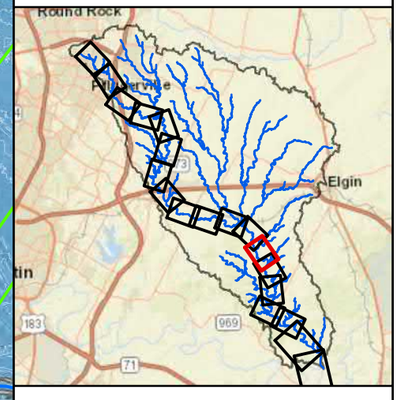
Panel 13 of 19



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HALFF

WILBARGER CREEK TRIBUTARY 6

WILBARGER CREEK TRIBUTARY 030

WILBARGER CREEK TRIBUTARY 304

Batch

WC_T6_STR_100

WC_STR_400

WC_STR_500

BASTROP

WILBARGER CREEK

Upper Elgin

Hog Eye

Ethan

Urah

66100

65669

63628

63234

62747

62209

61600

60481

59898

59259

58519

57454

54801

54540

53573

52297

51792

51010

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Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Mainstem
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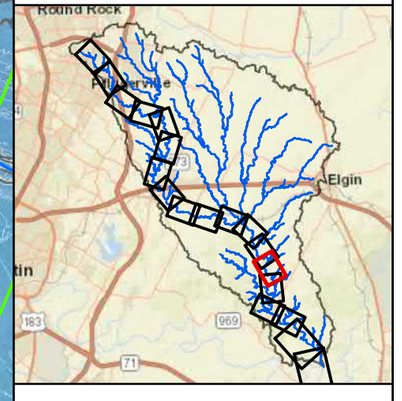
Panel 14 of 19



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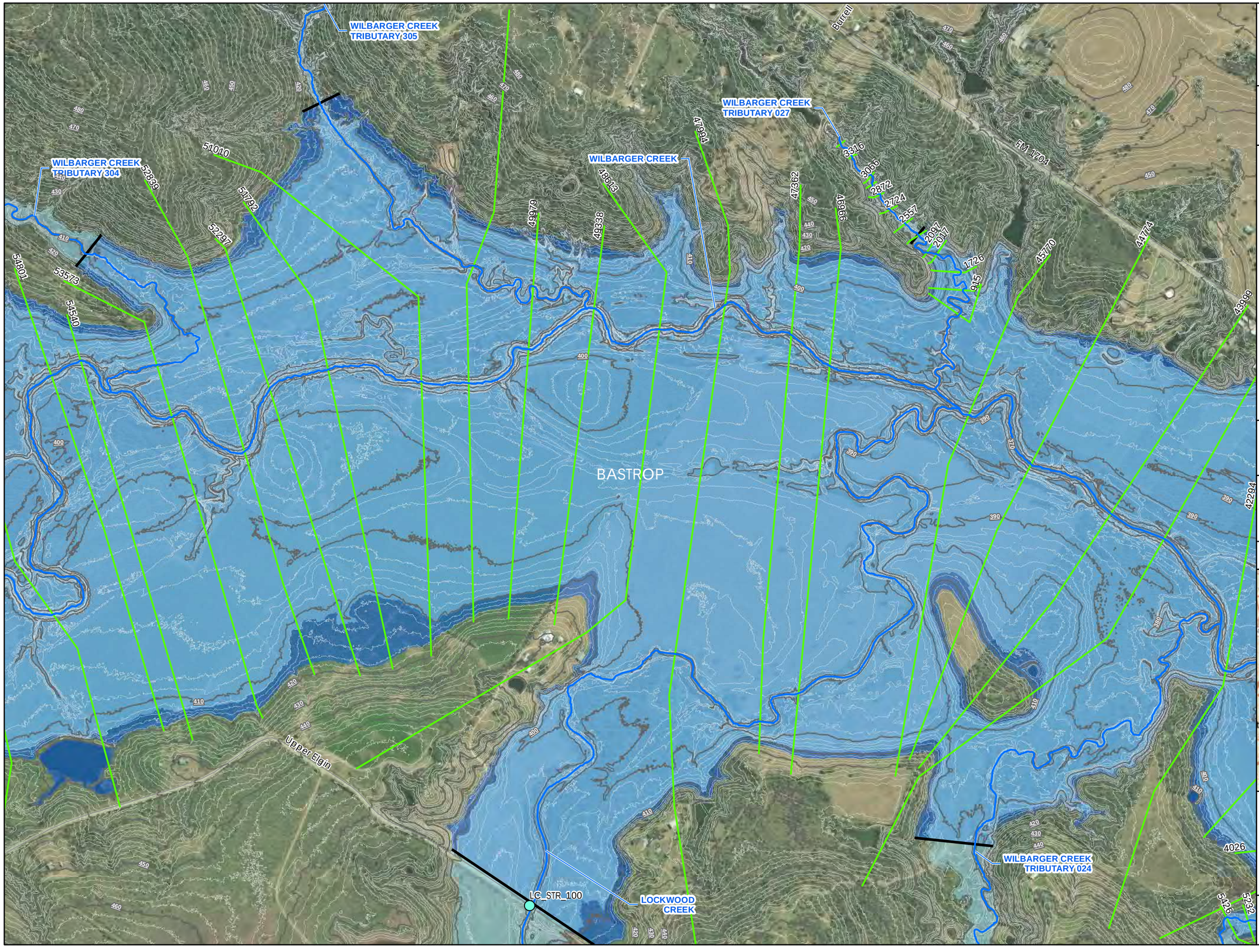

Wilbarger Creek Watershed Study

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Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Mainstem
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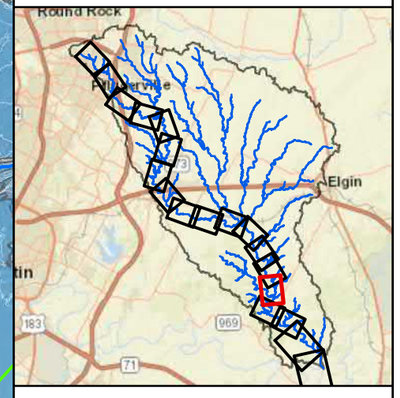
185, 186,187, 229, 326, 328

Panel 15 of 19



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0 700 1,400 Feet

HALFF

Wilbarger Creek Watershed Study

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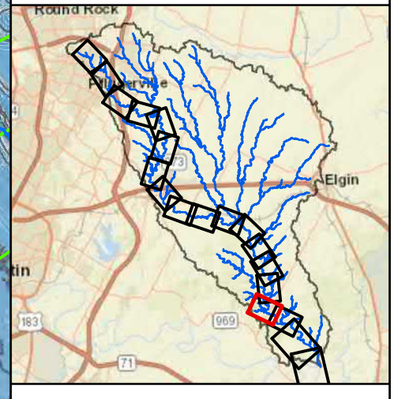
Panel 16 of 19



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HALFF

WC_T024_STR_200
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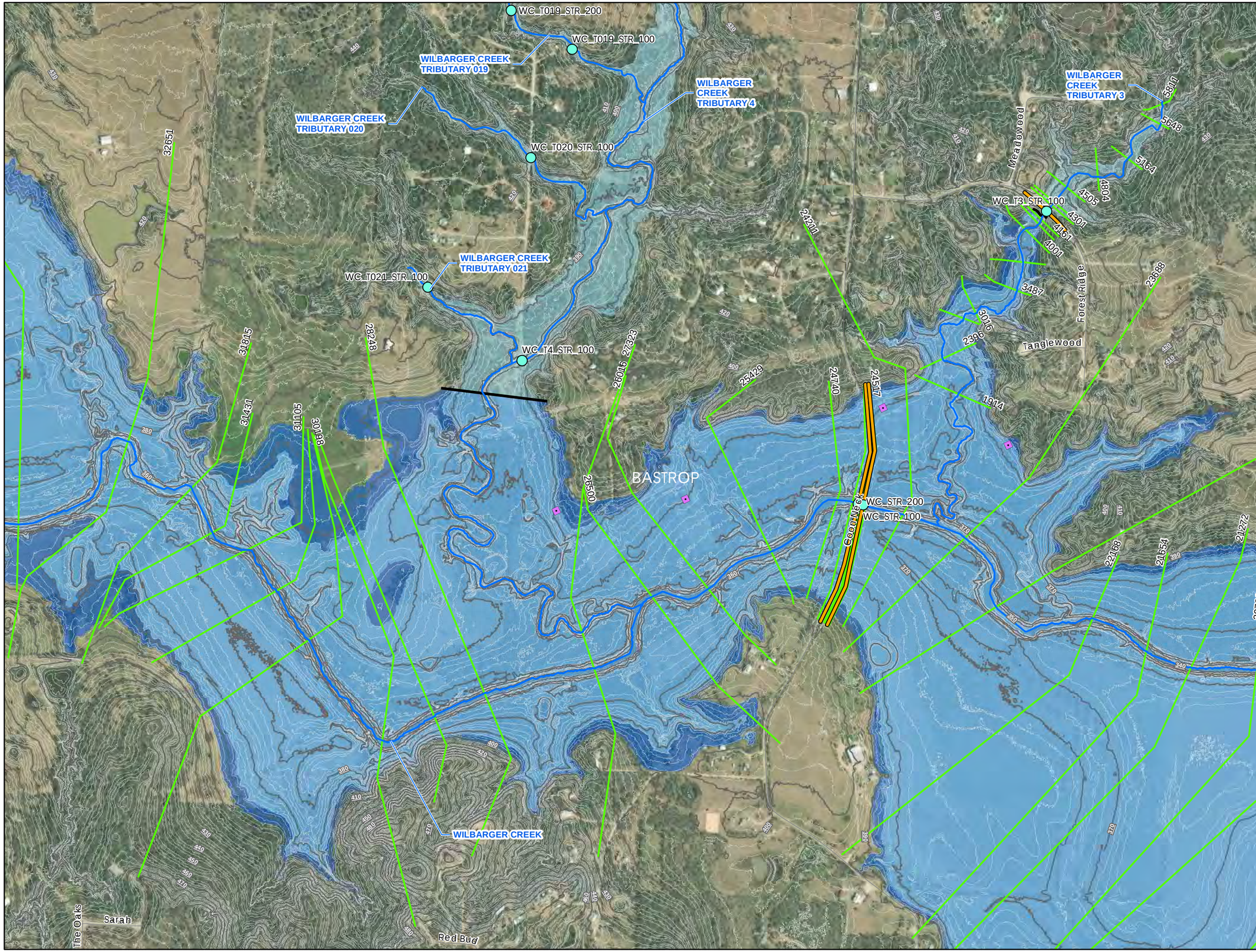
Elbow
Dry Willow
WILBARGER CREEK TRIBUTARY 328
BASTROP
Old Austin
Settlers
WC_T326_STR_100
WC_STR_300
WILBARGER CREEK
WILBARGER CREEK TRIBUTARY 326
FM 1704
43999
43530
42294
41944
41514
37425
35553
35171
34854
34618
33918
32651
31815
31437
4026
5426
5232
4947
4597
5810
3092
3206
3313
4498
4790
5242
5744
5998
6413
6753
6997



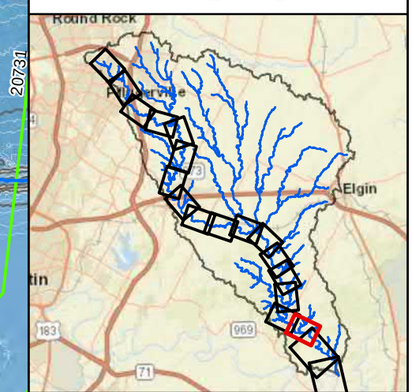
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- Lateral Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodway
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Mainstem & Tribs 3, 27, 165, 178, 183, 185, 186,187, 229, 326, 328

Panel 17 of 19



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0 700 1,400 Feet

HALFF

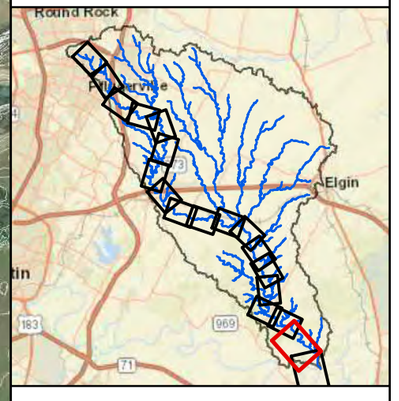
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Roadway Structures
- Inline Structures
- Cross Sections
- 500-Year Limit of Study
- Lateral Structures
- City Boundary
- County Boundary
- Contours - 2-ft
- Contours - 10-ft
- 100-Year Floodway
- 100-Year Floodplain
- 500-Year Floodplain

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Mainstem & Tribs 3, 27, 165, 178, 183, 185, 186,187, 229, 326, 328

Panel 18 of 19



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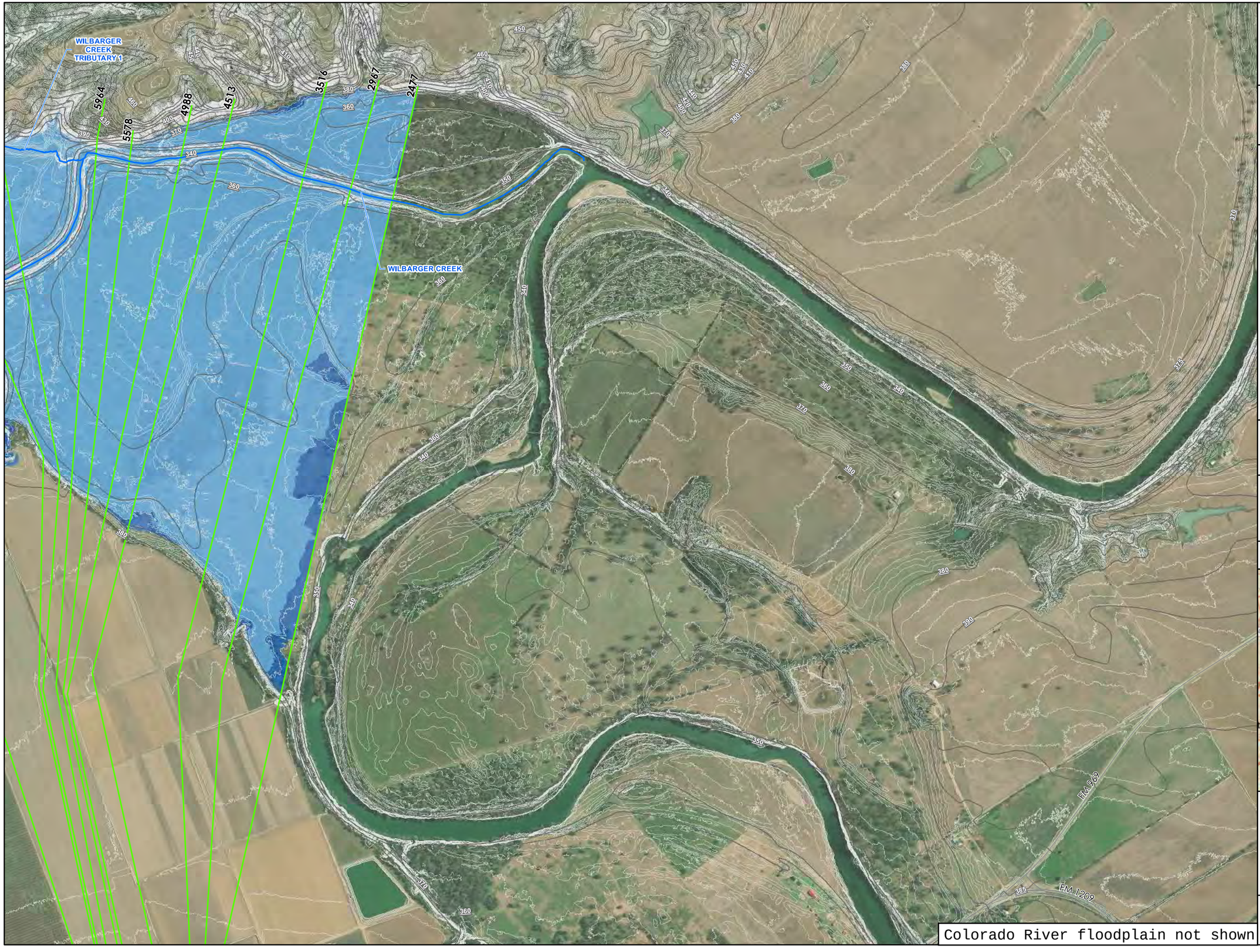
Colorado River floodplain not shown



Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Roadway Structures
- Inline Structures
- Cross Sections
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- Contours - 2-ft
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- 100-Year Floodplain
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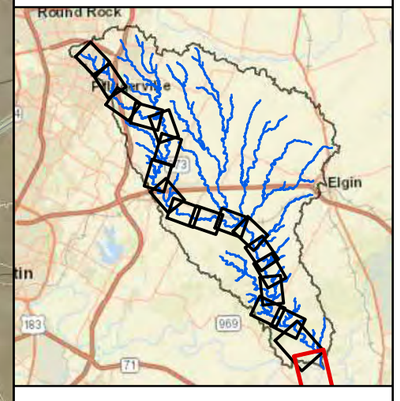
Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Mainstem & Tribs 3, 27, 165, 178, 183, 185, 186,187, 229, 326, 328

Panel 19 of 19



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Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
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- Stream Centerlines
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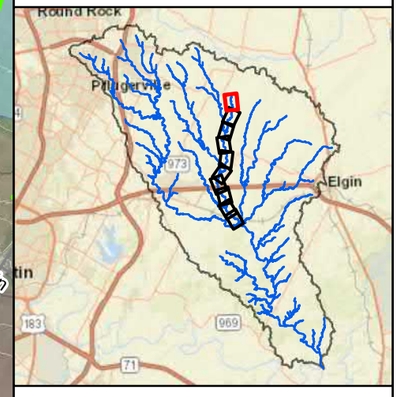
- 500-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Cottonmouth Creek

Panel 1 of 10



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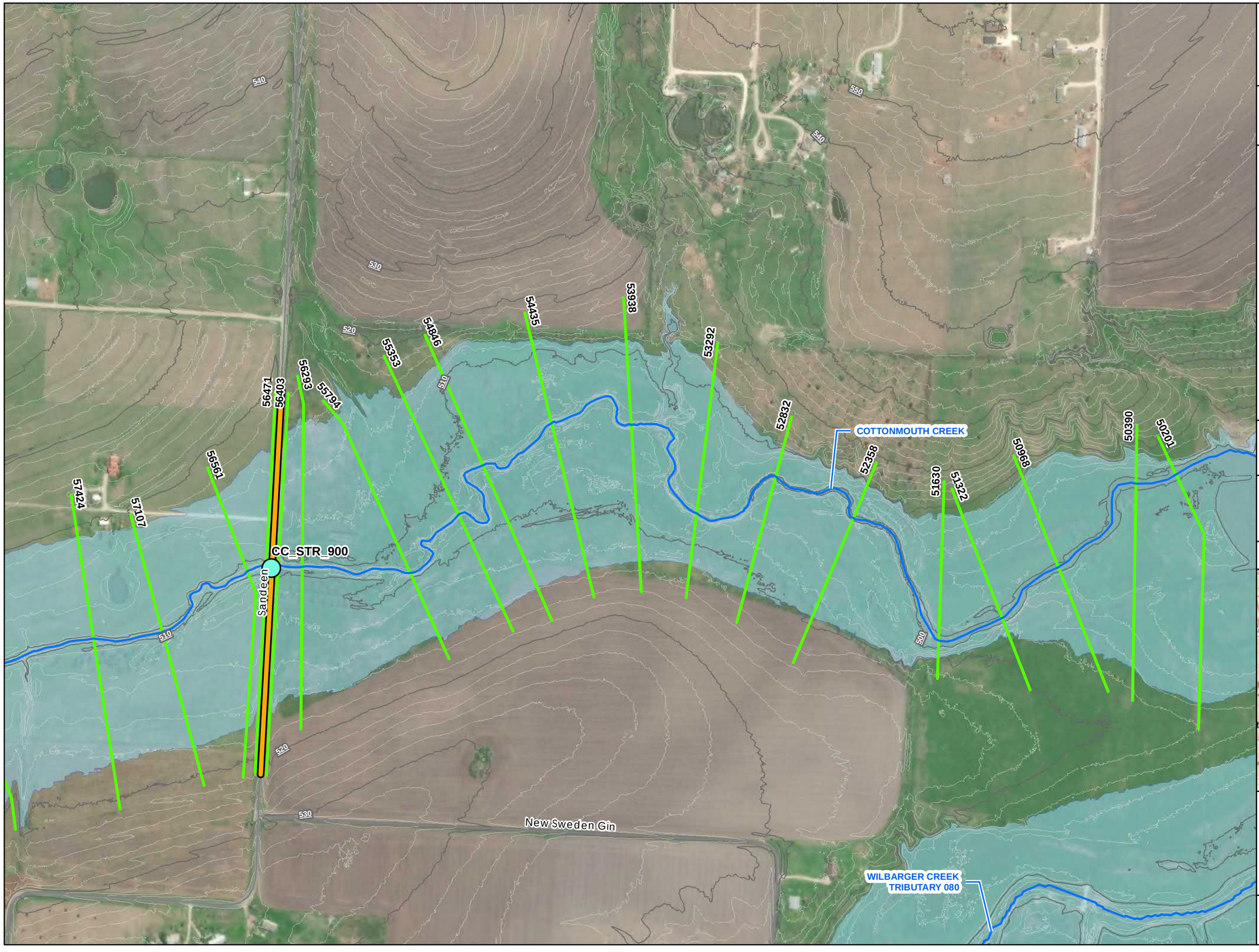
HALFF

63420
62938
62370
61858
61297
60832
60453
60164
59250
58913
58652
58037
540
530
520
510
550
560
COTTONMOUTH CREEK
Mccurry
Sandeen
New Sweden Gin



Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
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- 500-Year Limit of Study
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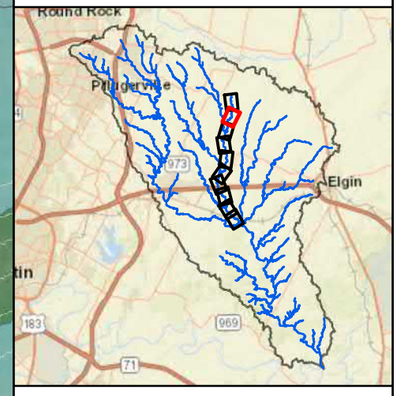
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Cottonmouth Creek

Panel 2 of 10



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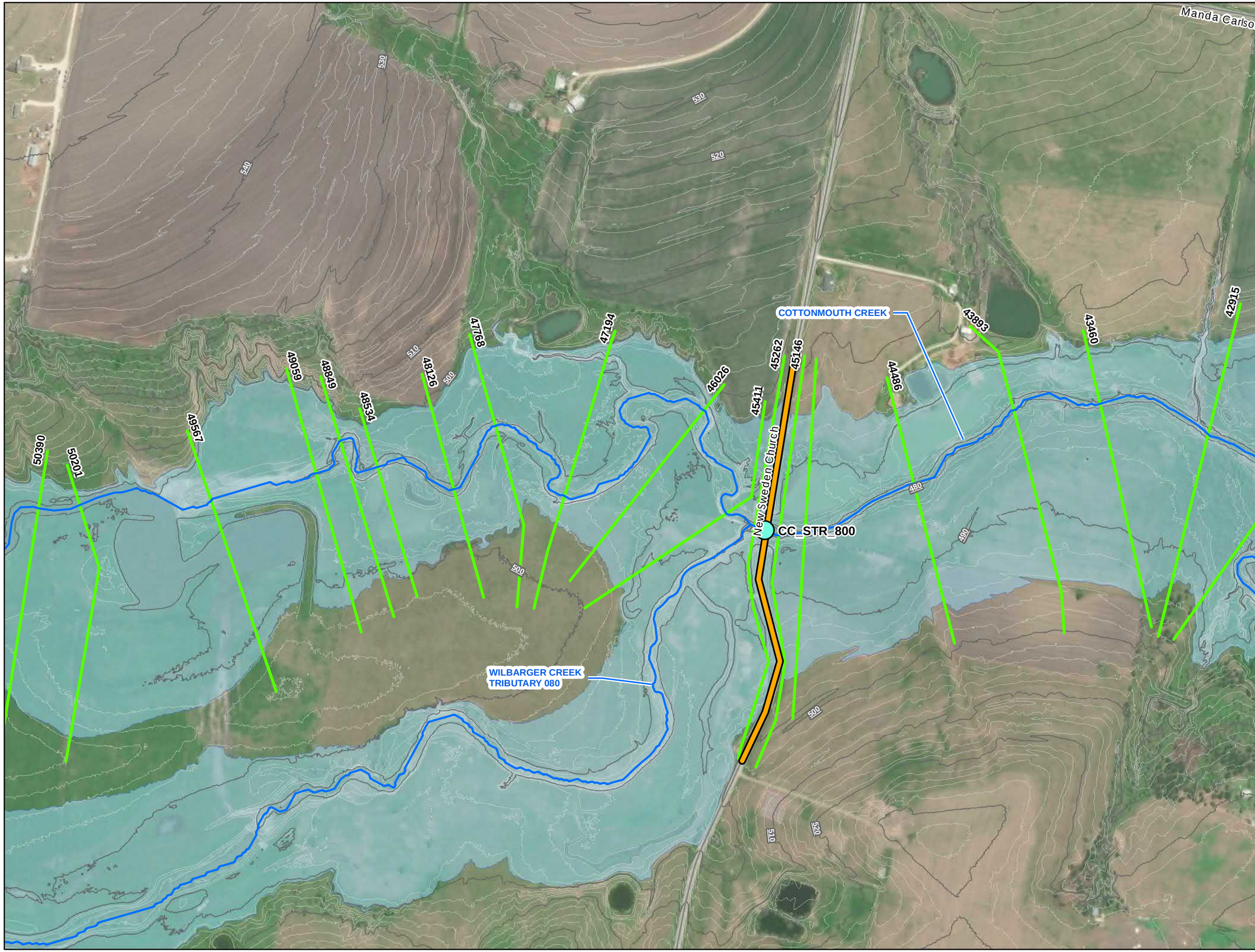

Wilbarger Creek Watershed Study

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- Structures in 100-Yr Floodplain
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- 500-Year Floodplain
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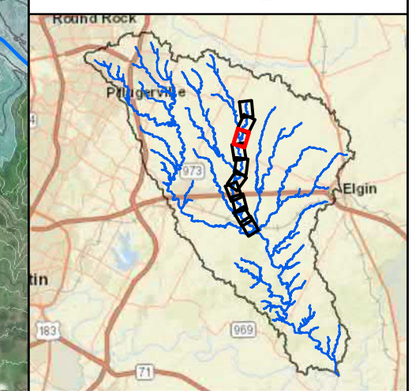
Wilbarger Creek Watershed Hydraulic Workmap

Cottonmouth Creek

Panel 3 of 10



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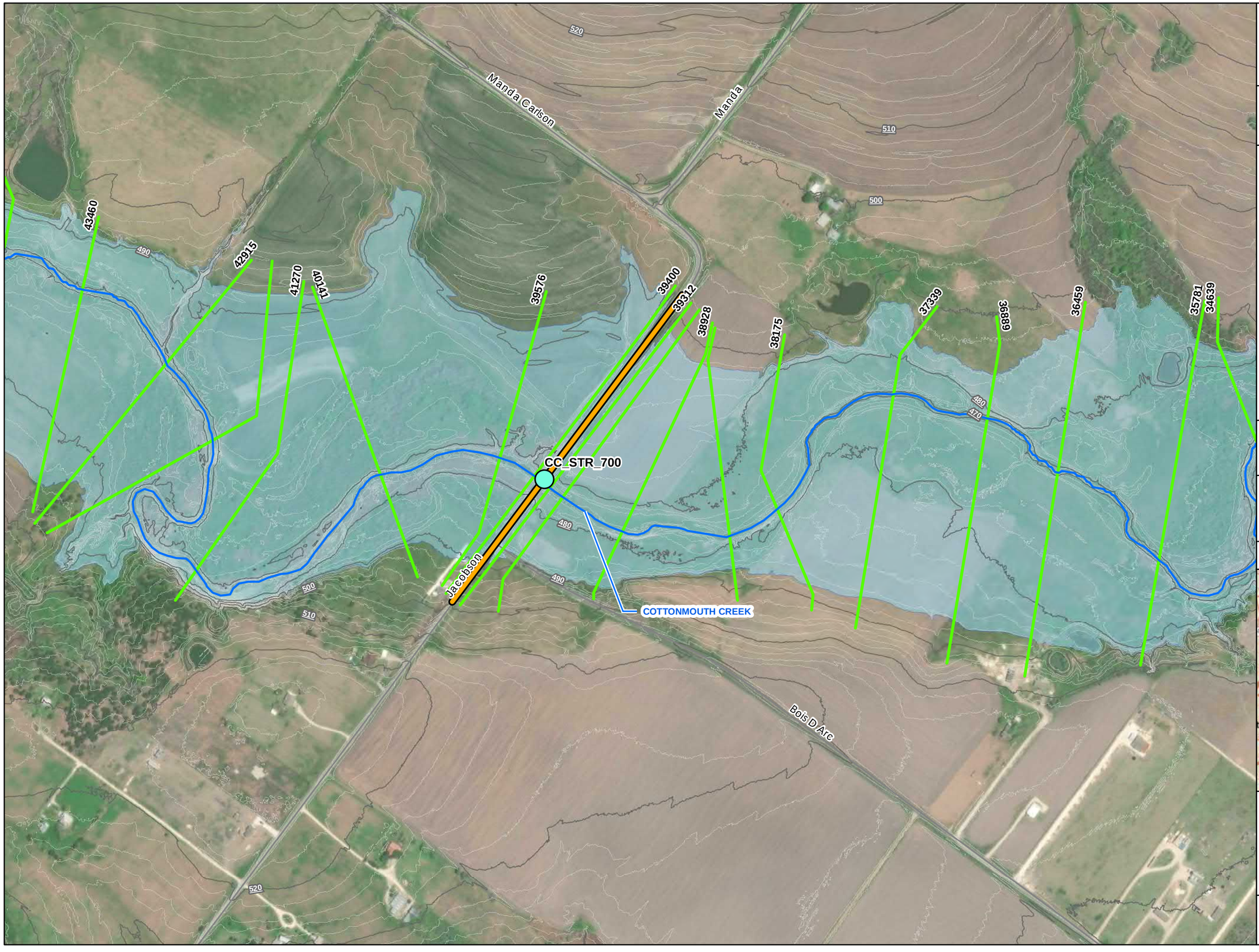

Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
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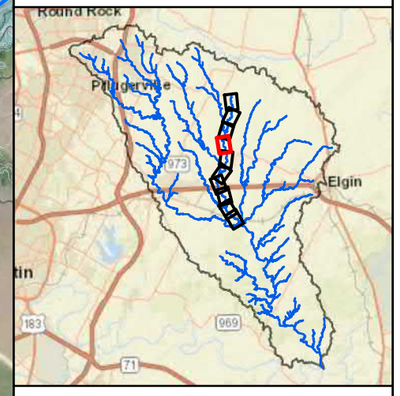
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Cottonmouth Creek

Panel 4 of 10



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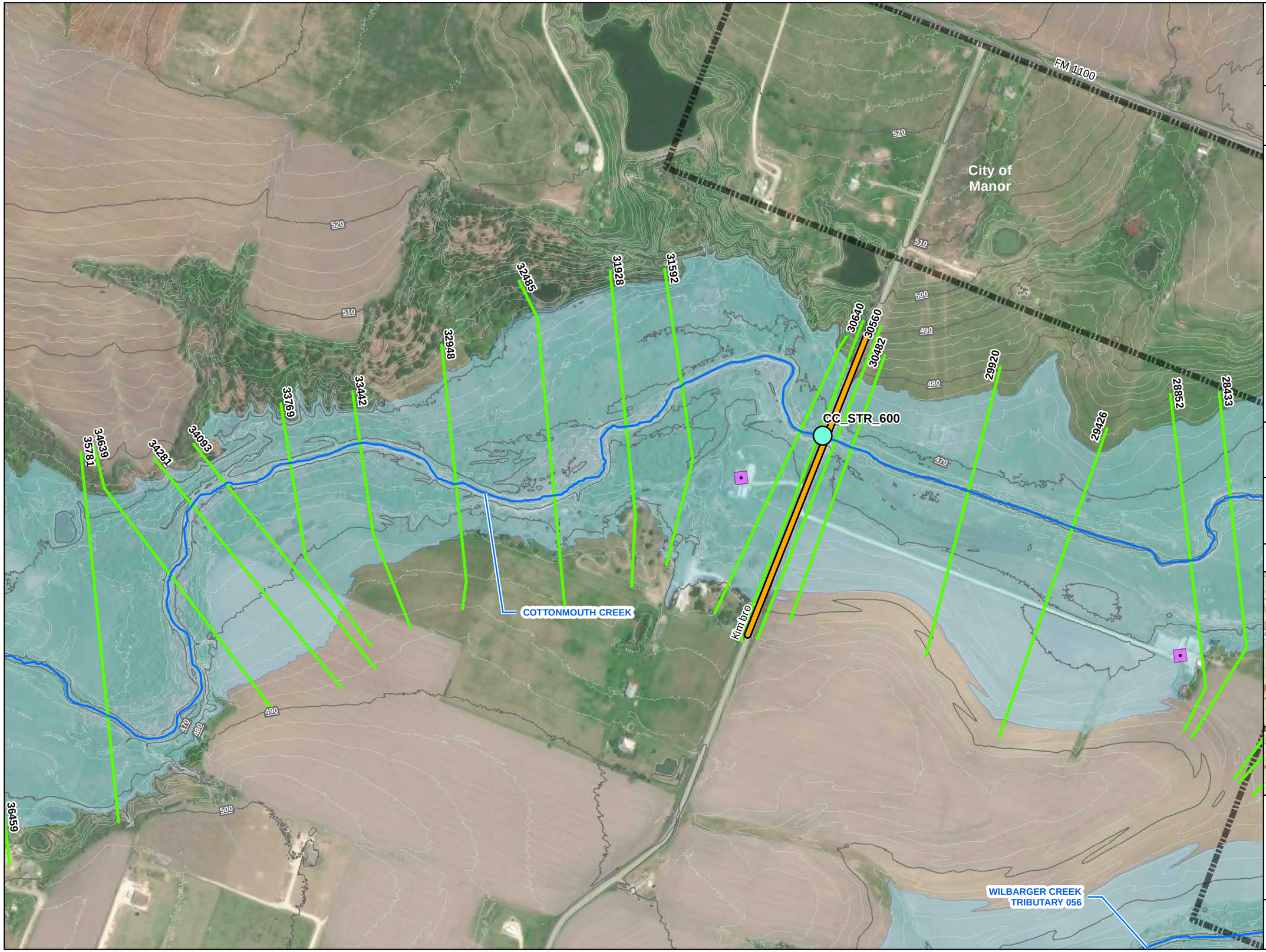
HALFF



Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
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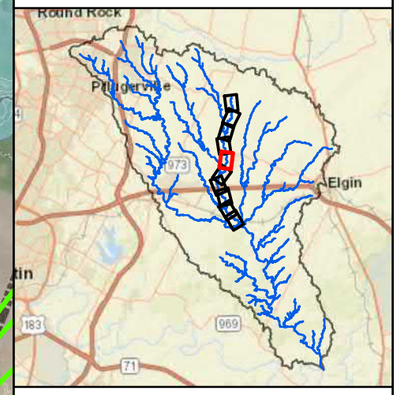
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Cottonmouth Creek

Panel 5 of 10



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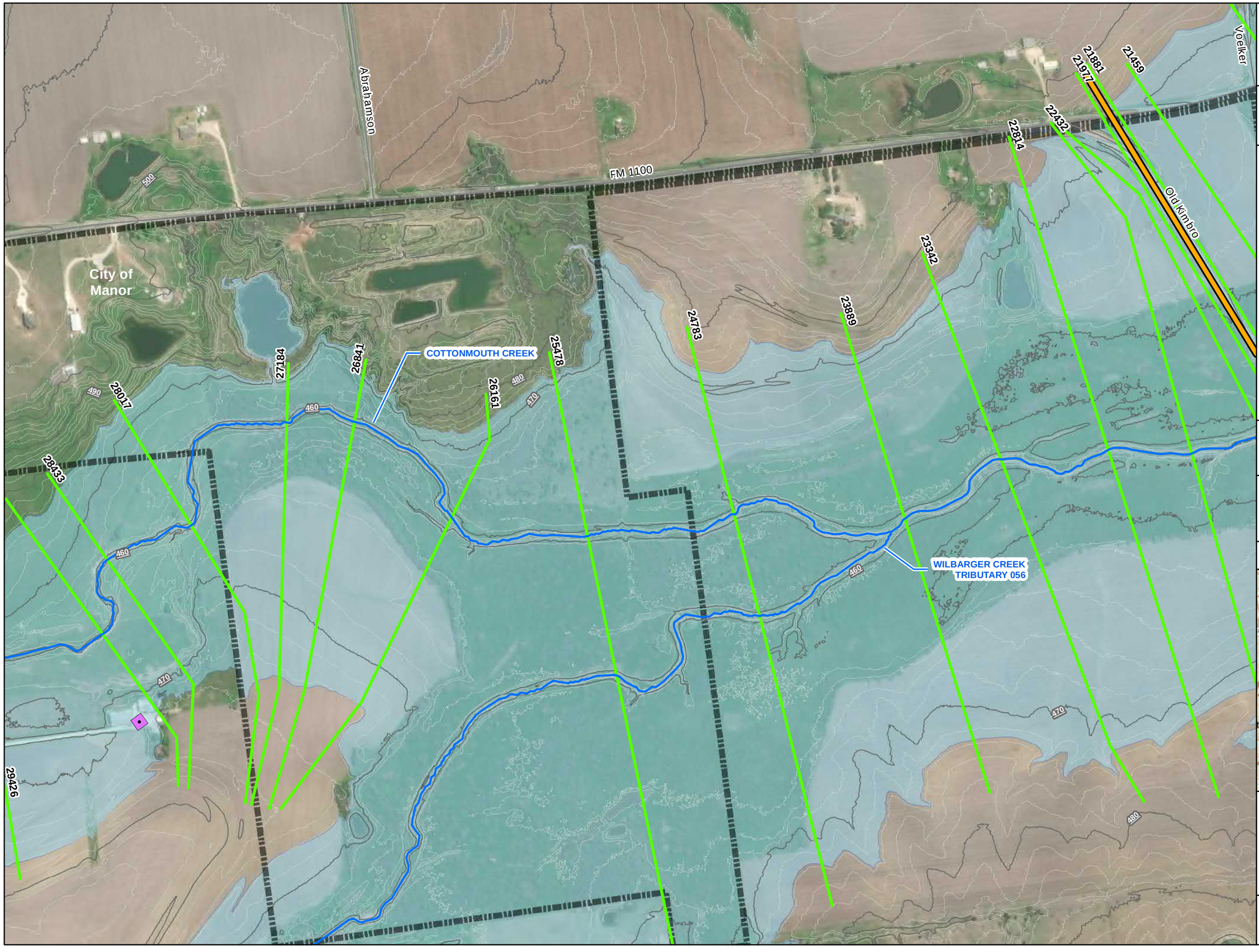
0 400 800 Feet

HALFF



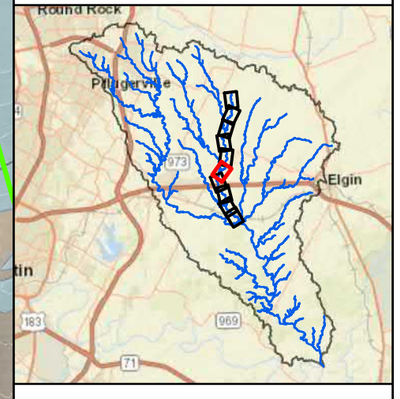
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Cottonmouth Creek

Panel 6 of 10



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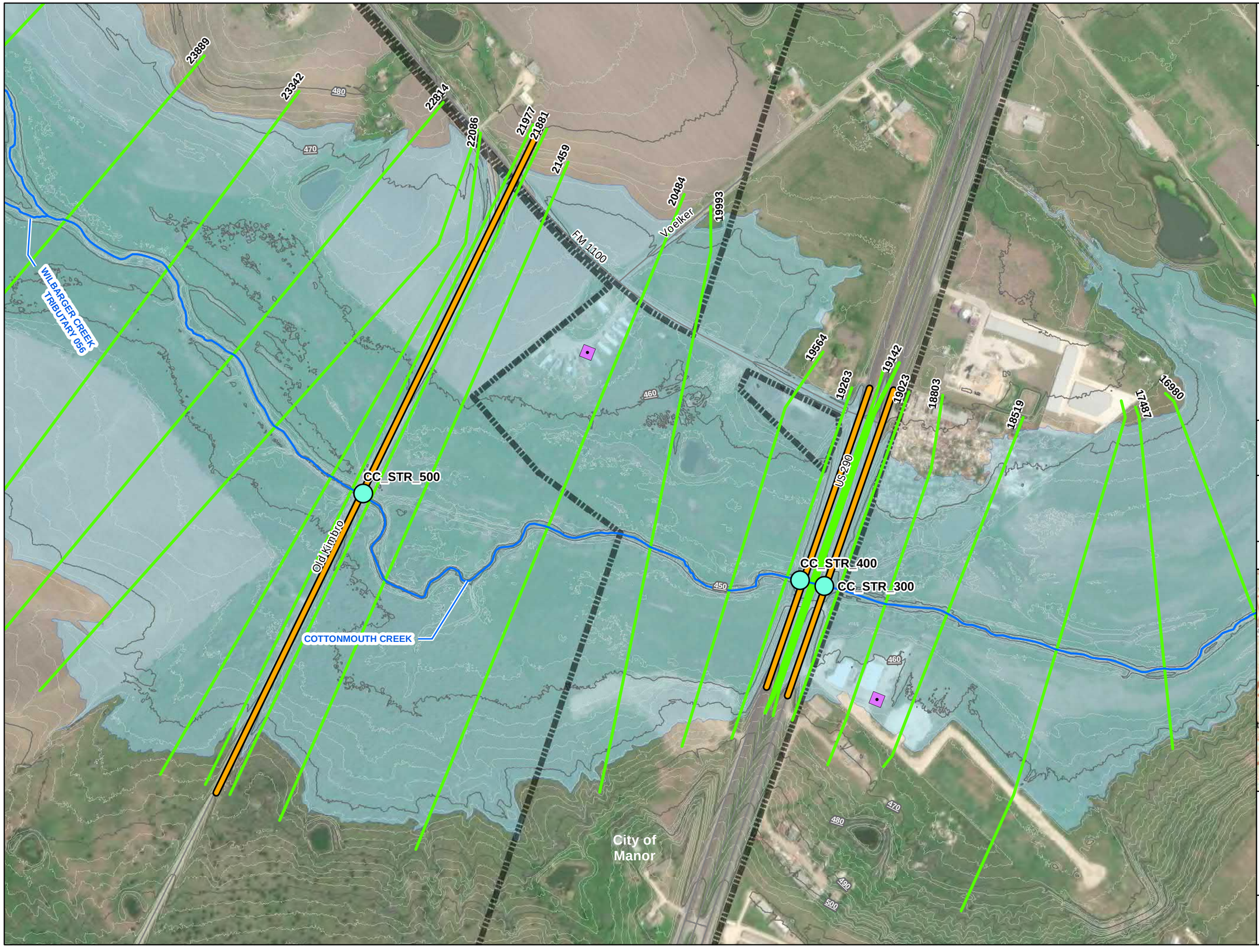
HALFF



Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
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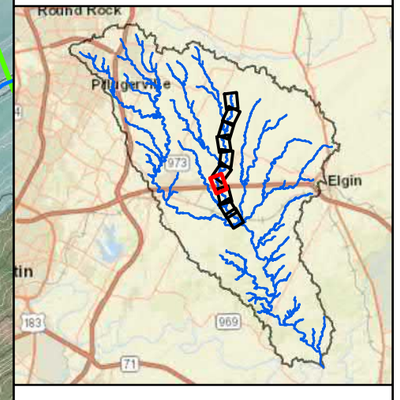
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Cottonmouth Creek

Panel 7 of 10



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0 400 800 Feet

HALFF

Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
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- Contours 10-ft
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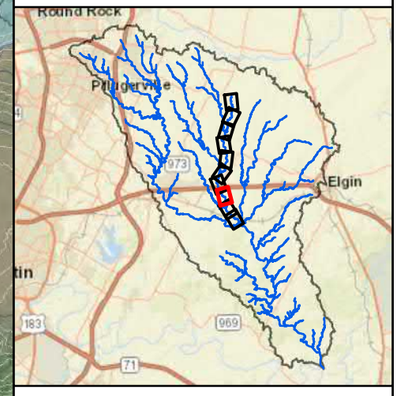
Wilbarger Creek Watershed Hydraulic Workmap

Cottonmouth Creek

Panel 8 of 10



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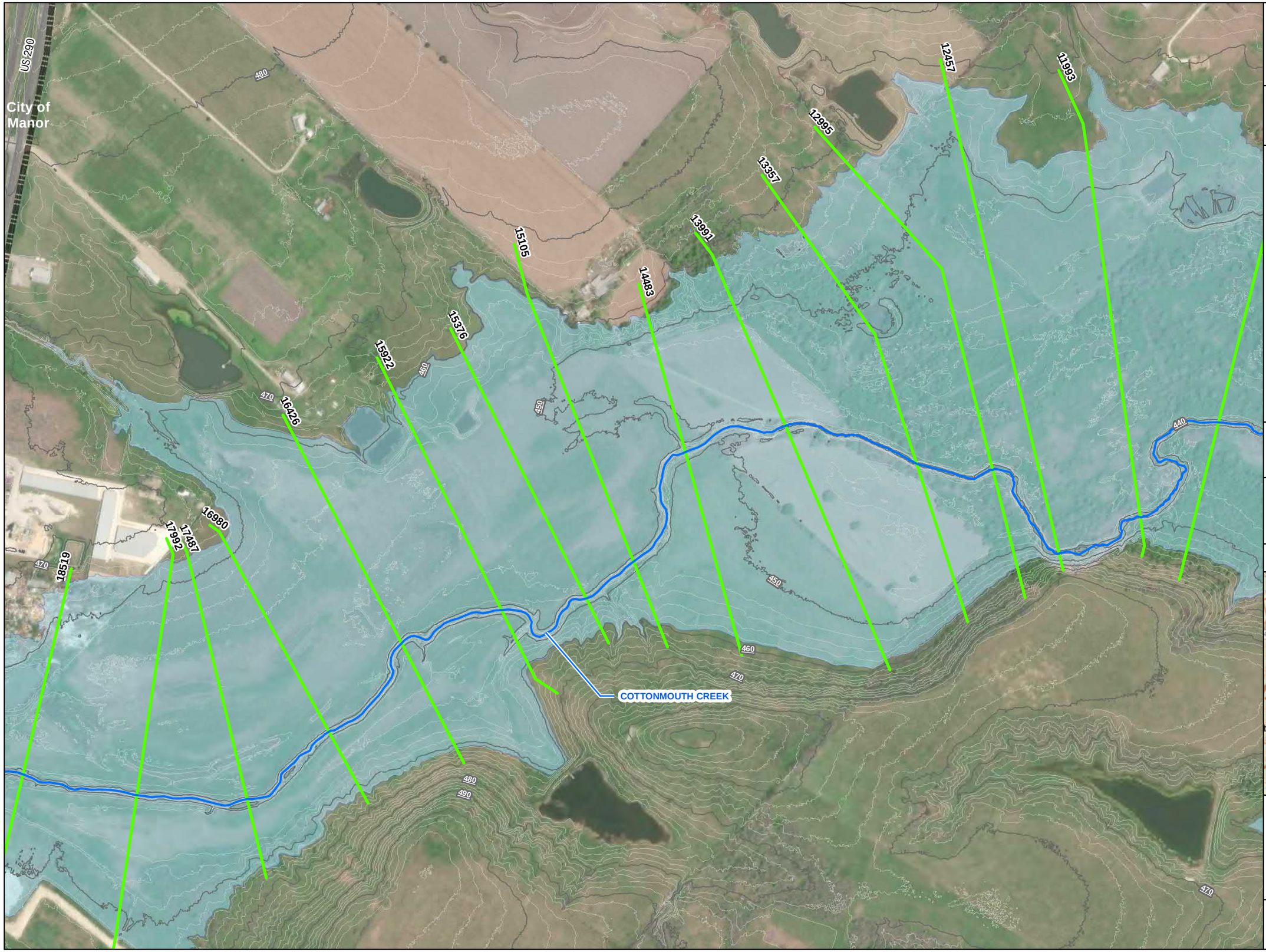

Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
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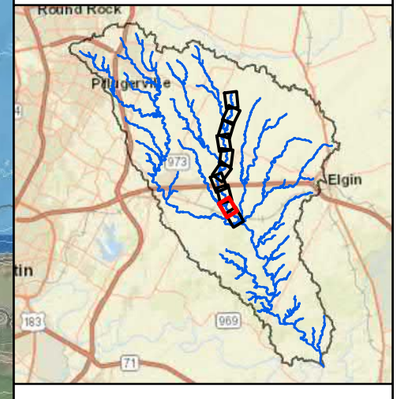
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Cottonmouth Creek

Panel 9 of 10



0 400 800 Feet

HALFF

11132
10461
9969
8616
8005
7235
6094
460
450
440
430
470
COTTONMOUTH CREEK
WILBARGER CREEK TRIBUTARY 113
Ballerstedt
Littig
Jones

WILLOW CREEK

DRY CREEK WEST

COTTONMOUTH CREEK

WILBARGER CREEK

CC_STR_200

CC_STR_100

Ballerstedt

Jones

1470
2080
2943
2358
3537
6094
4620
4513
4189
4744

460
450
440
430
420
480
470

Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
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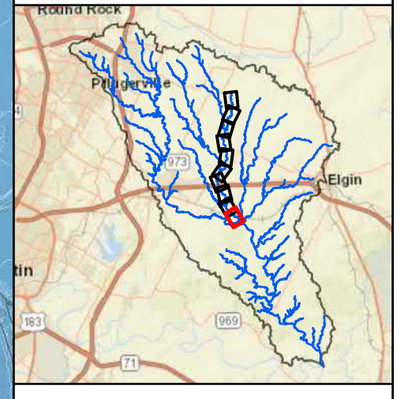
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Cottonmouth Creek

Panel 10 of 10



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0 400 800 Feet

HALFF

Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
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- 100-Year Floodplain
- 500-Year Floodplain
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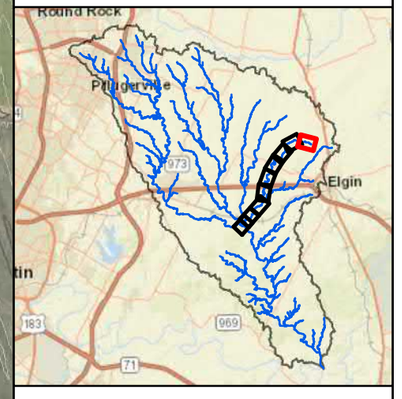
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Dry Creek West

Panel 1 of 9



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0 400 800 Feet

HALFF

Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
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- Contours 10-ft
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- 500-Year Floodplain
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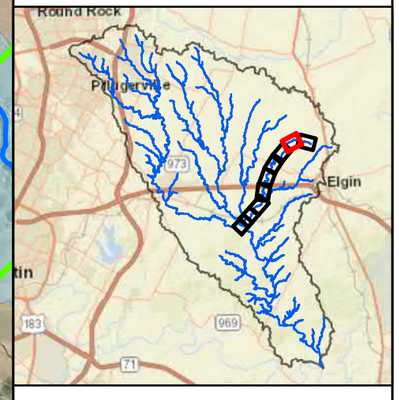
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Dry Creek West

Panel 2 of 9



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HALFF

DRY CREEK WEST

DCW_STR_800

Harry Lind

Carlson

540 53674 53607 53943 54387 54894 55246 55873 56347 56837 57344 57843 58303

520 52514 52917 53397 52036 51439 51188 50716 50451 50242 49877

540 550 560 570 570 530

Wilbarger Creek Watershed Study

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- Overtopped Road Crossings
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- Contours 10-ft
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- 500-Year Floodplain
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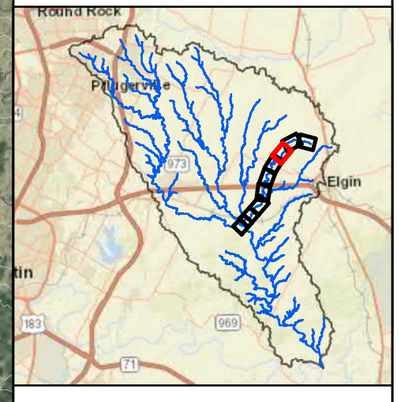
Wilbarger Creek Watershed Hydraulic Workmap

Dry Creek West

Panel 3 of 9



0 400 800 Feet

HALFF

Harry Lind

Carlson

DRY CREEK WEST

DCW_STR_700

530
520
500
510
540

45842
46296
46823
47166
47616
47839
48323
48996
49087
49265
49436
49877
50242
50451
50716
51188
51439

Wilbarger Creek Watershed Study

- Roadway Improvements
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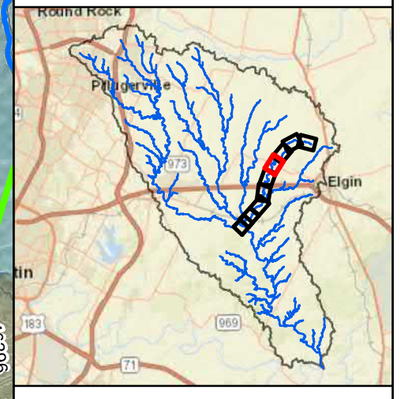
Wilbarger Creek Watershed Hydraulic Workmap

Dry Creek West

Panel 4 of 9



N

0 400 800 Feet

HALFF

DCW_STR_600

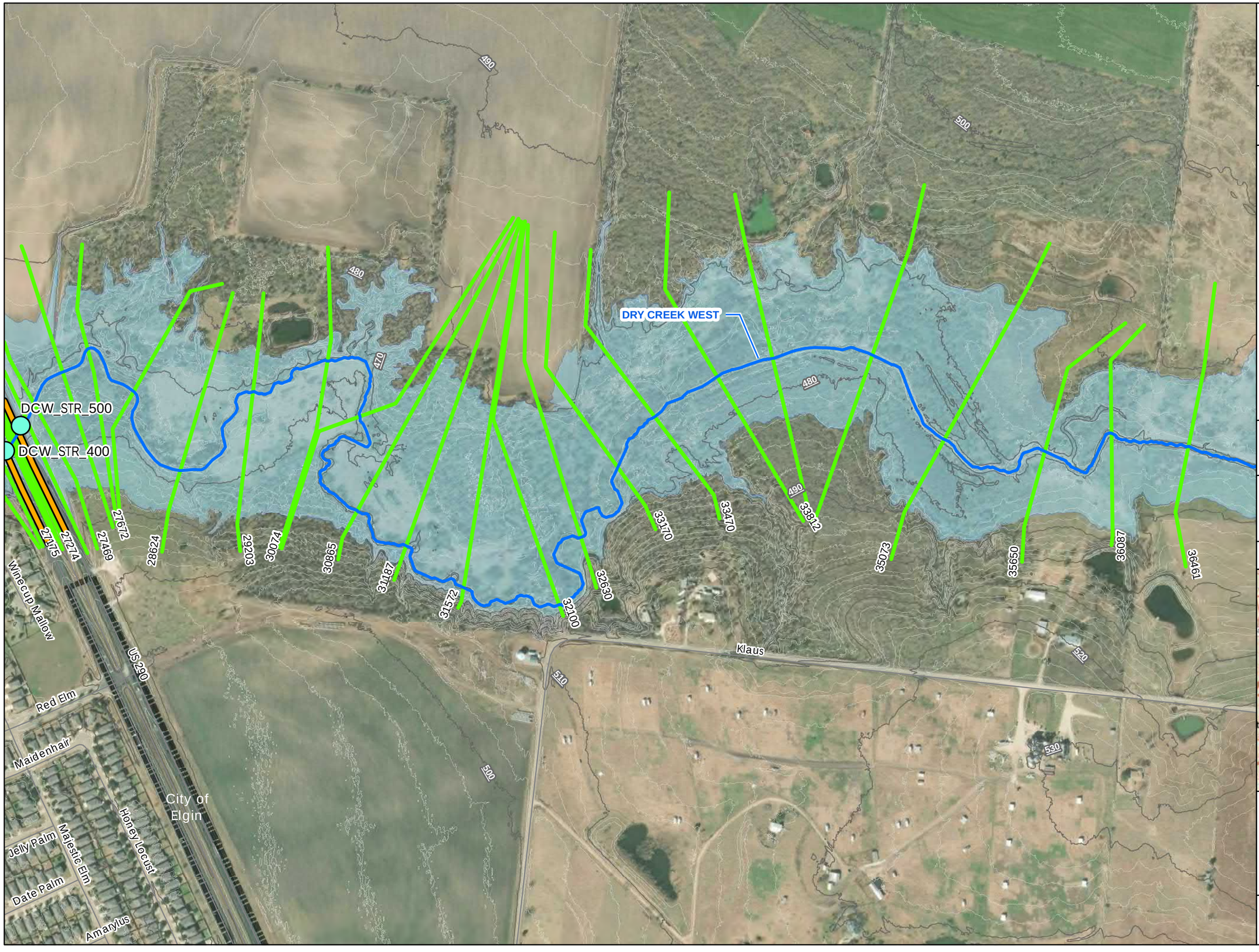
FM 1100

DRY CREEK WEST

490 480 500 510 520 530 540 550

36461 36960 37427 37831 38239 39491 39555 39694 40875 40259 41291 41670 42723 44008 45253 45842 46396

Klaus



Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
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- 500-Year Floodplain
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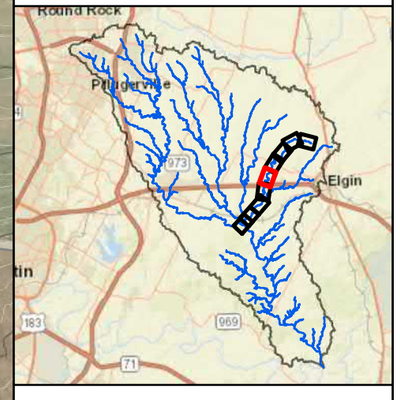
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Dry Creek West

Panel 5 of 9



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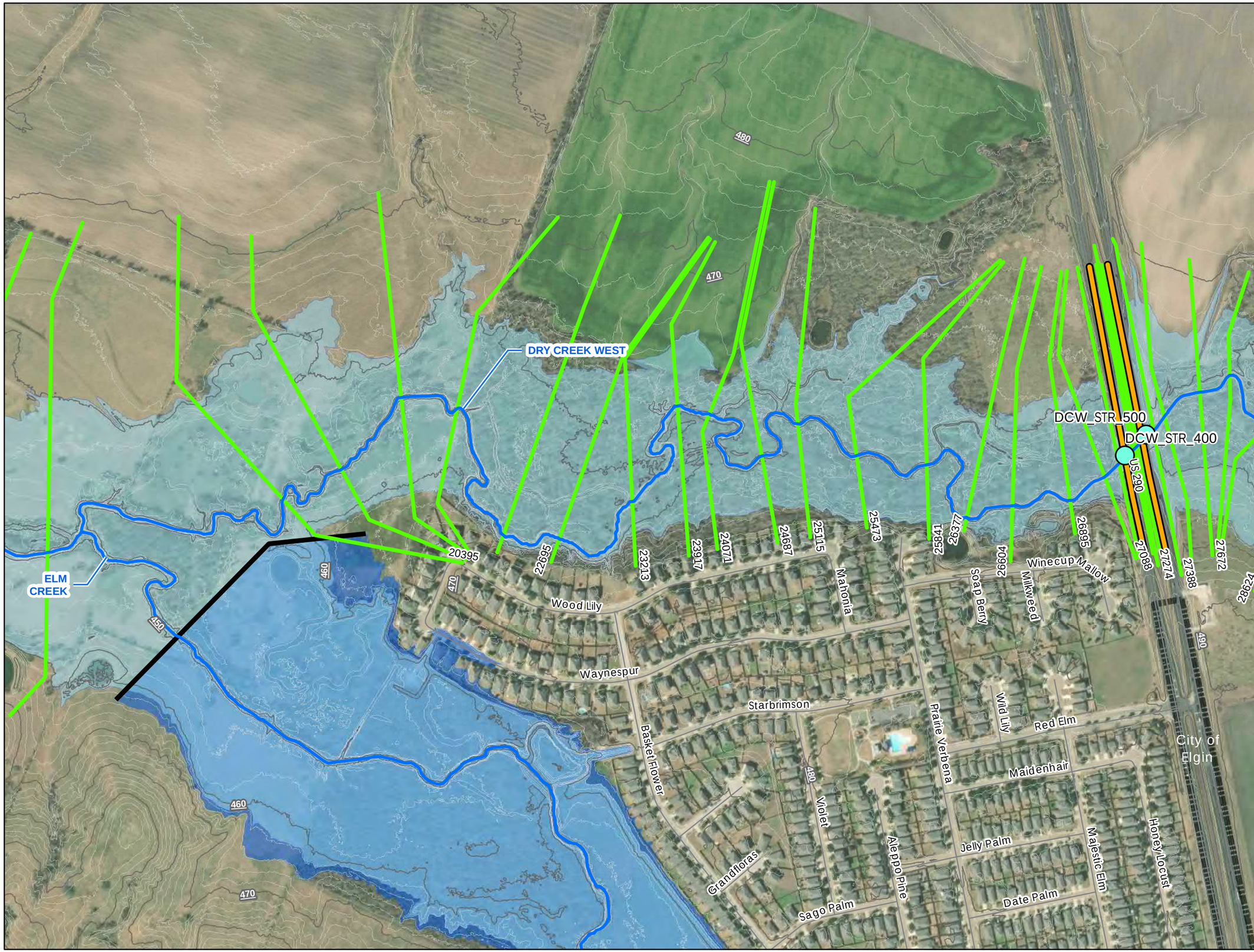

Wilbarger Creek Watershed Study

- Roadway Improvements
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- Structures in 100-Yr Floodplain
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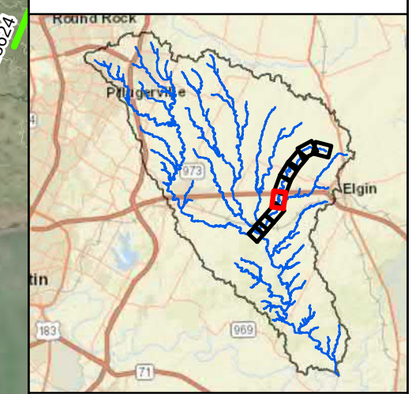
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Dry Creek West

Panel 6 of 9



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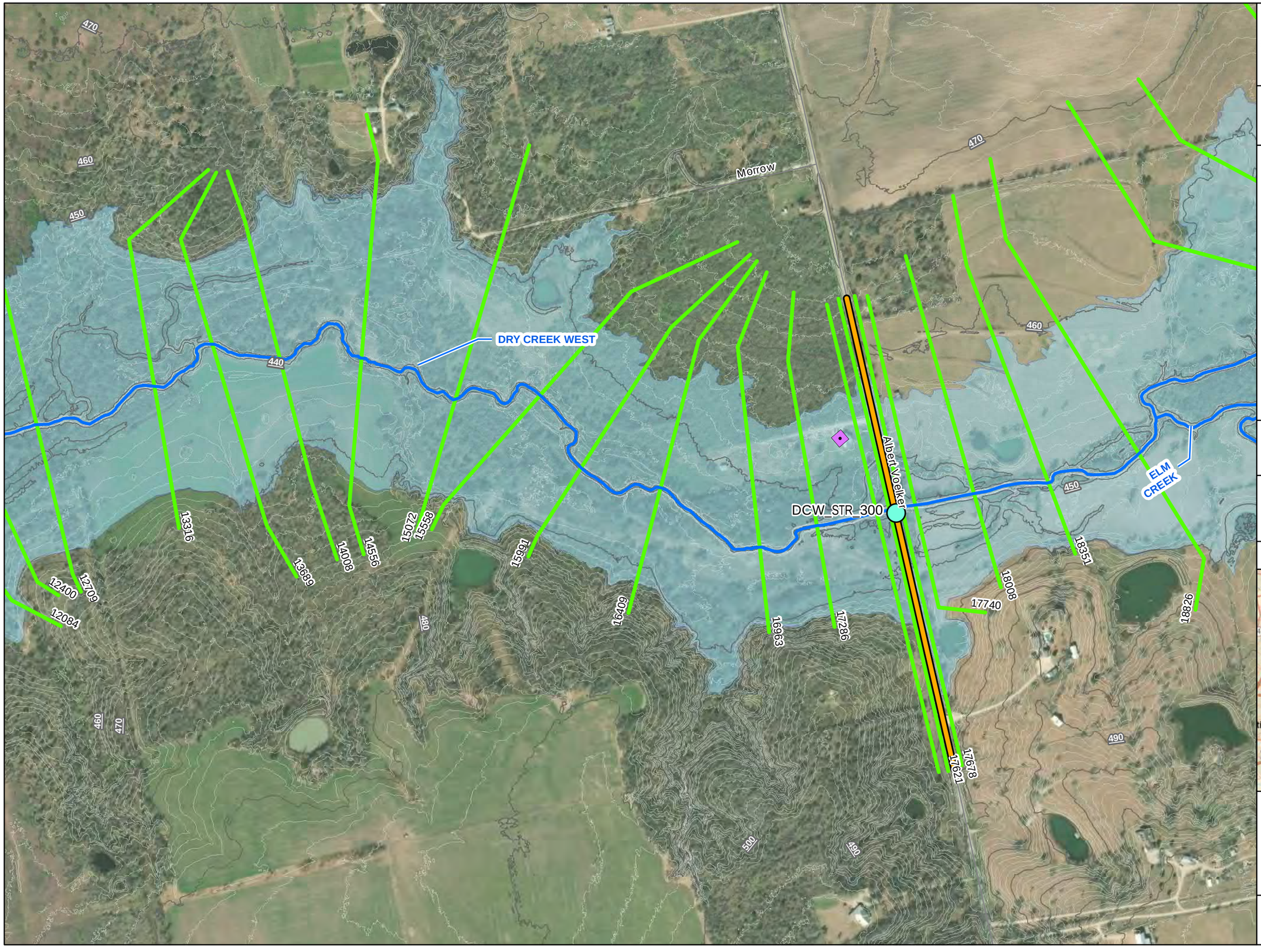

Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
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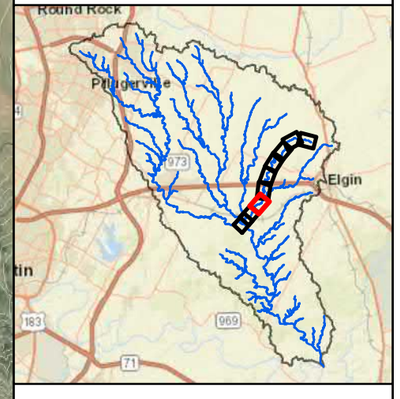
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Dry Creek West

Panel 7 of 9



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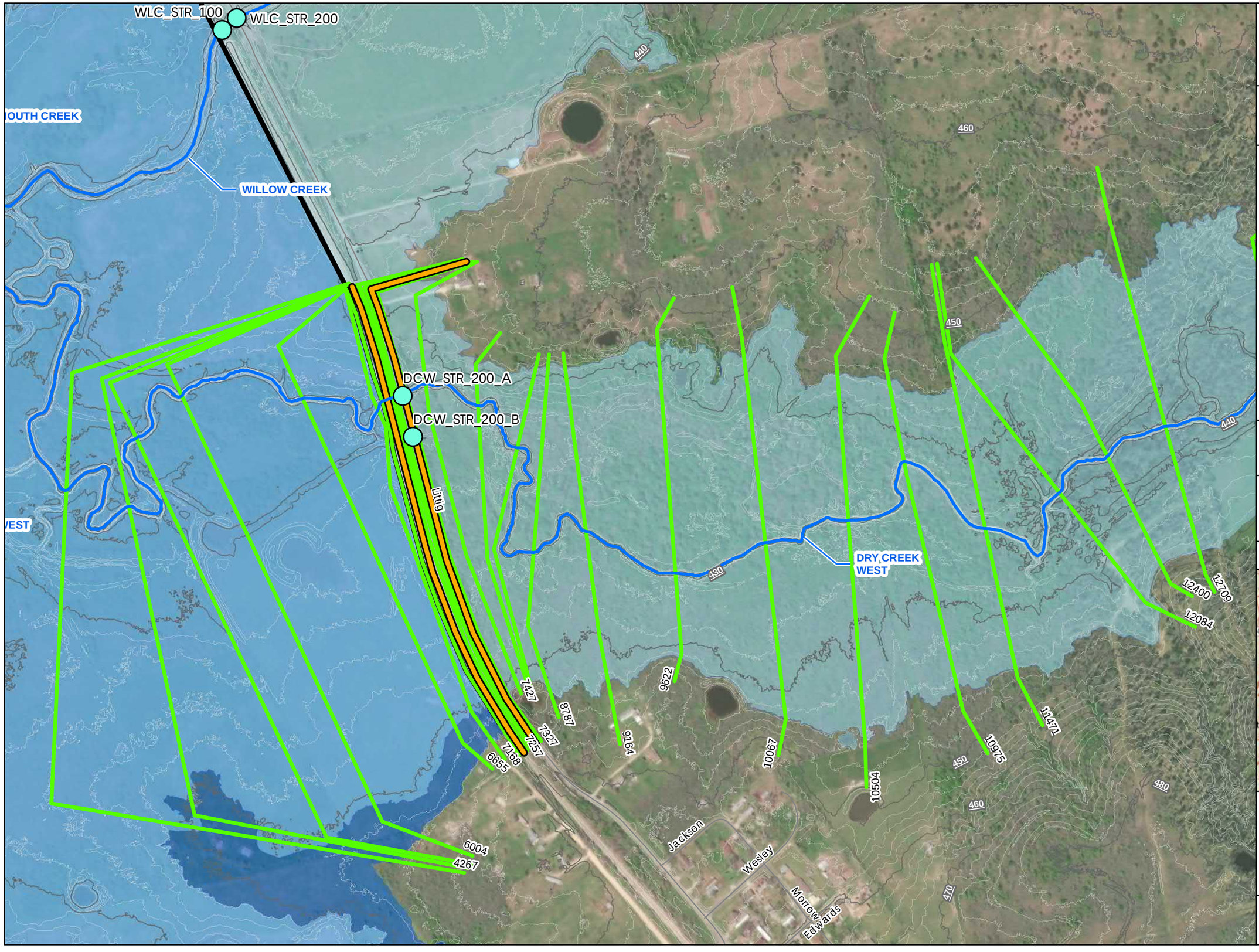


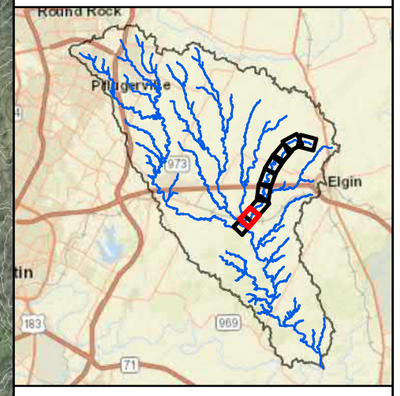
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Dry Creek West

Panel 8 of 9



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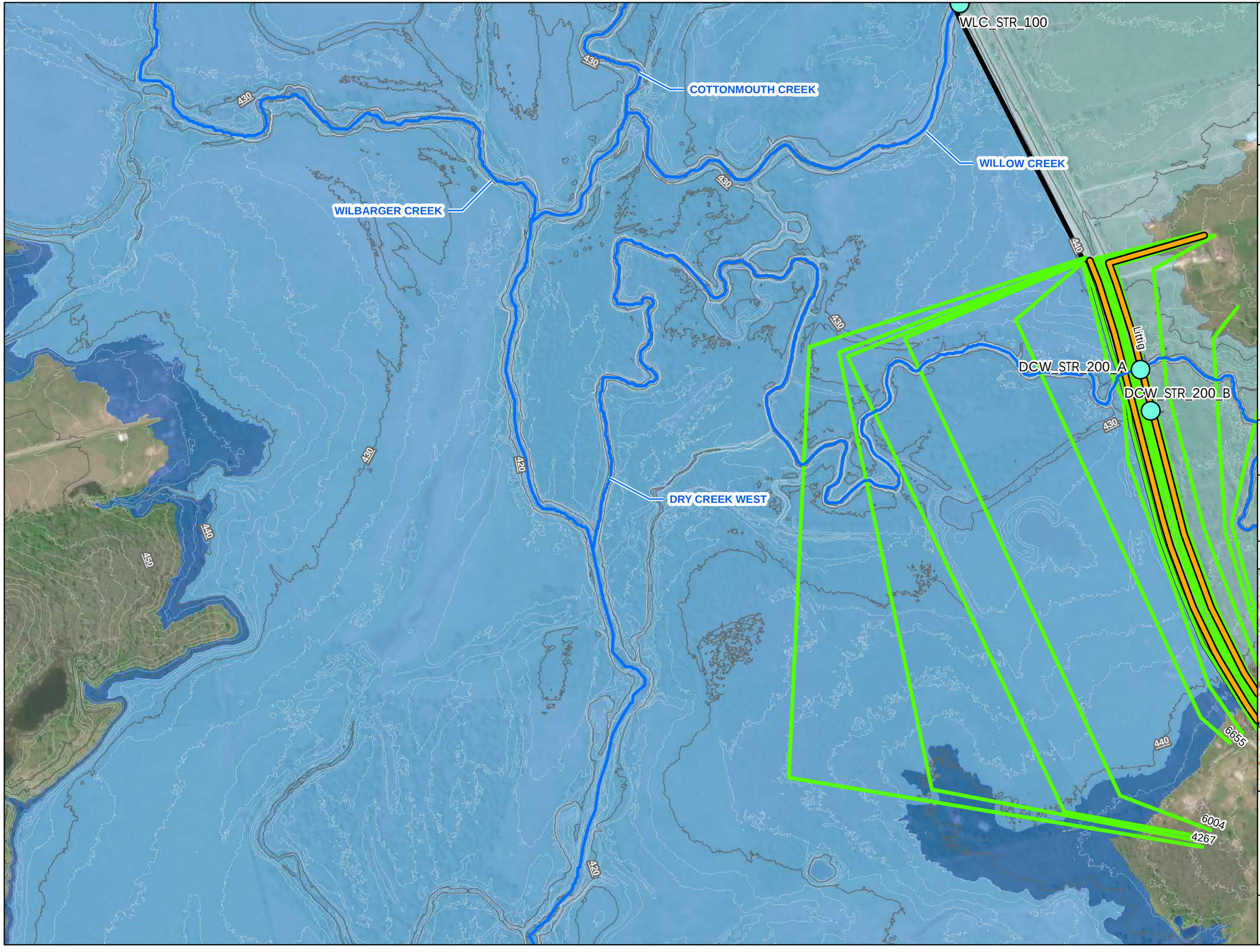


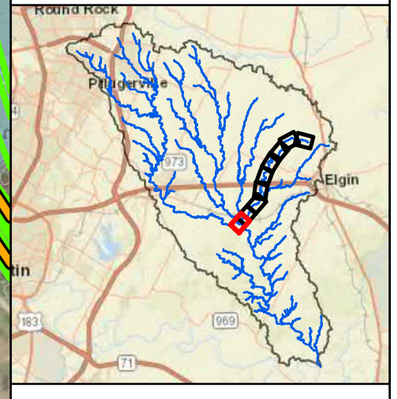
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Dry Creek West

Panel 9 of 9



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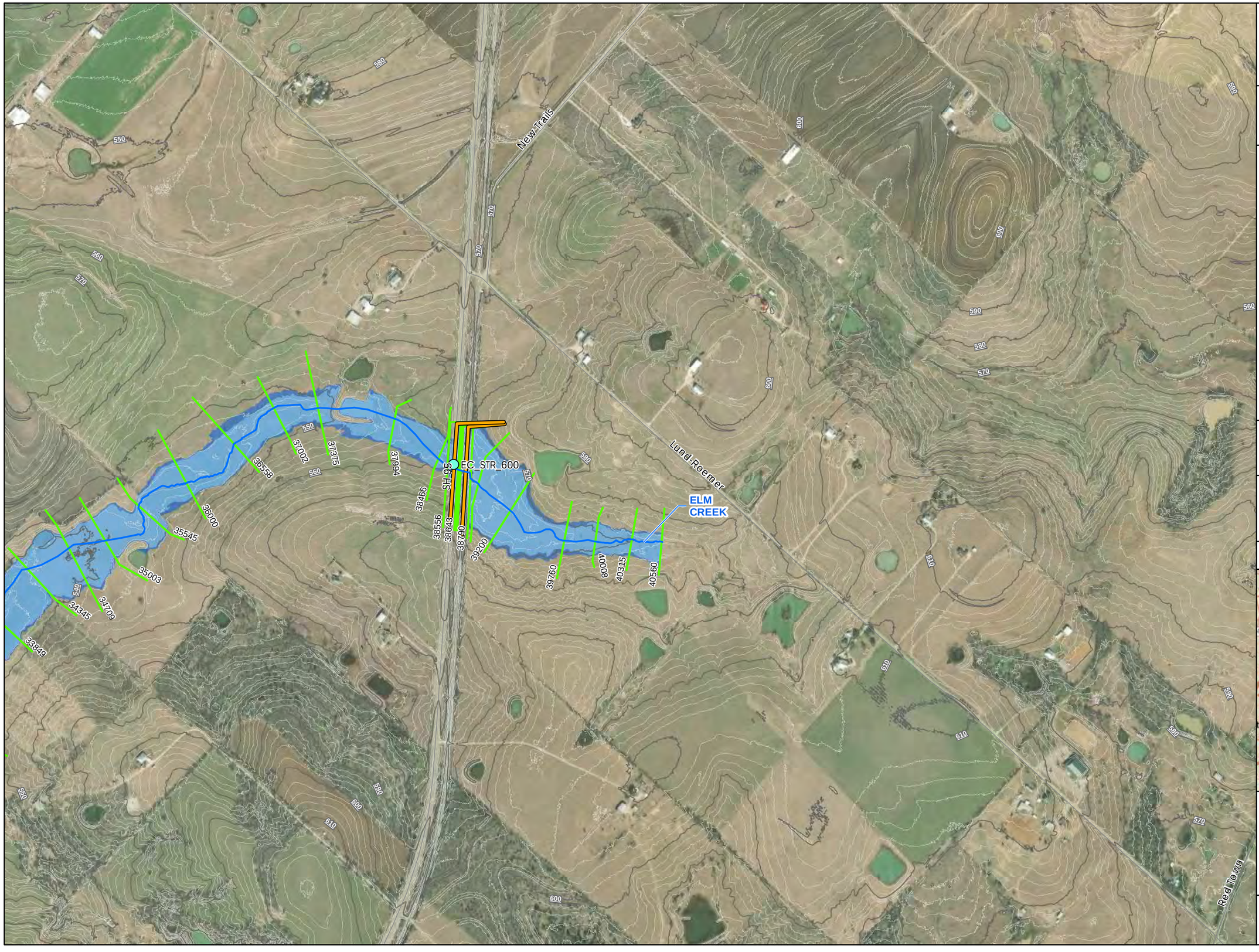


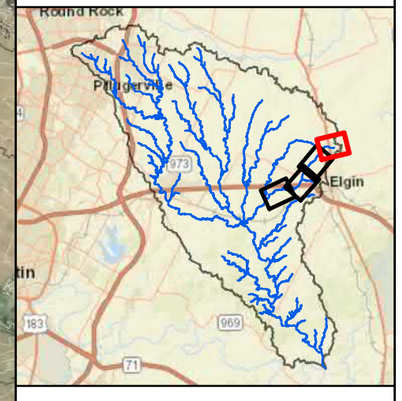
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Roadway Structures
- 500-Year Limit of Study
- Cross Sections
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Elm Creek, Elm Creek Tributary 1, & Wilbarger Creek Tributary 260

Panel 1 of 4



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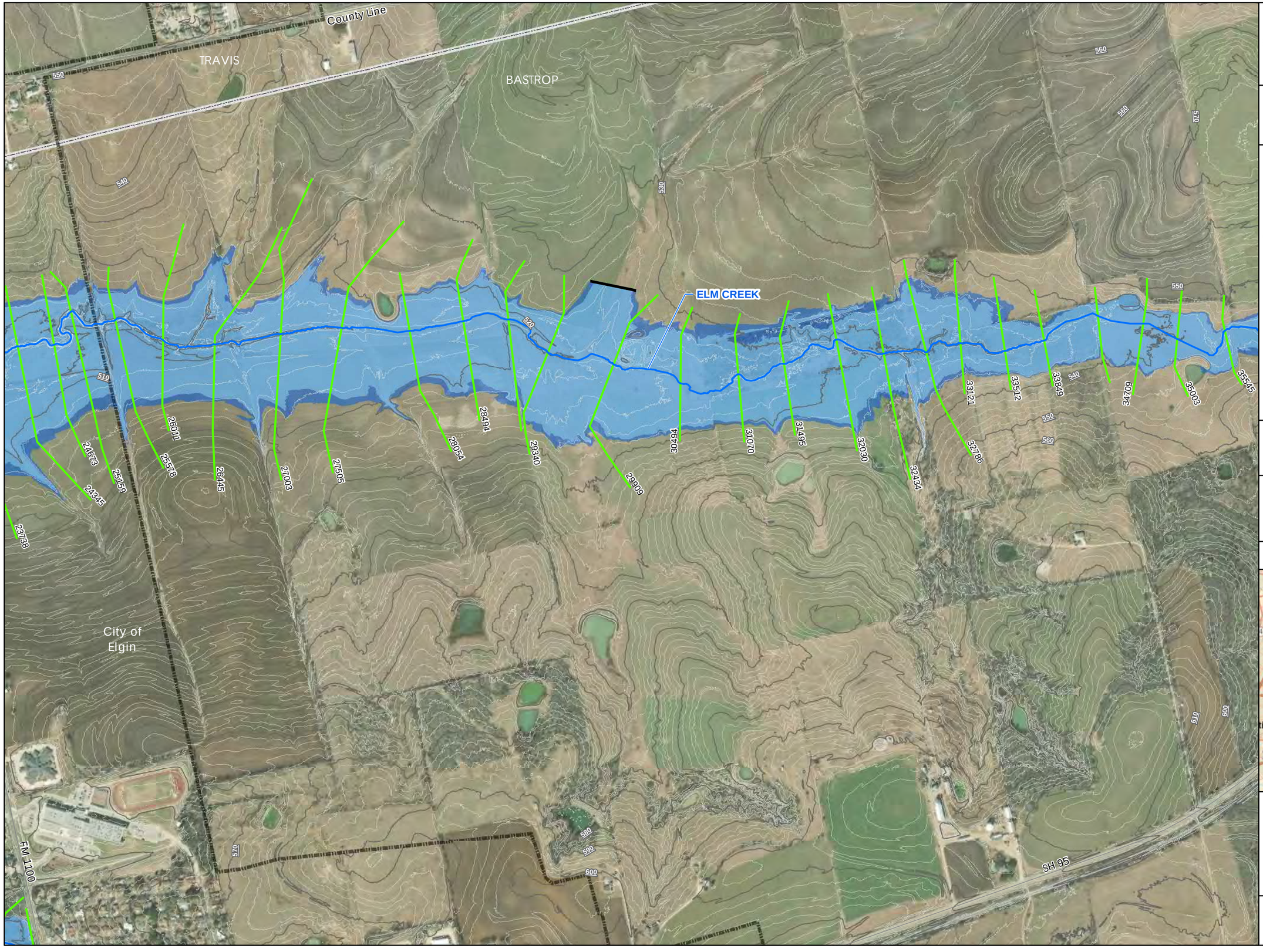


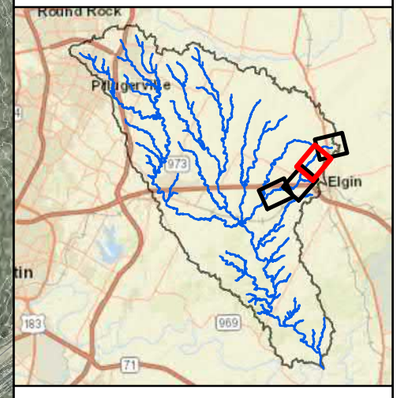
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Roadway Structures
- 500-Year Limit of Study
- Cross Sections
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Elm Creek, Elm Creek Tributary 1, & Wilbarger Creek Tributary 260

Panel 2 of 4



0 700 1,400 Feet

HALFF

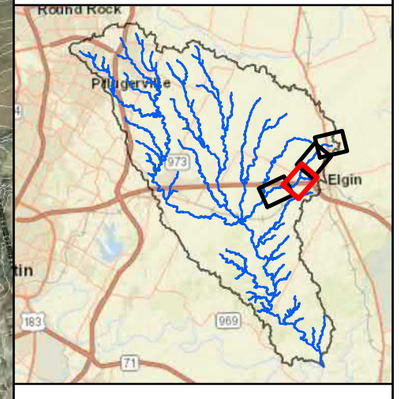
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Roadway Structures
- 500-Year Limit of Study
- Cross Sections
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Elm Creek, Elm Creek Tributary 1, & Wilbarger Creek Tributary 260

Panel 3 of 4



0 700 1,400 Feet

HALFF

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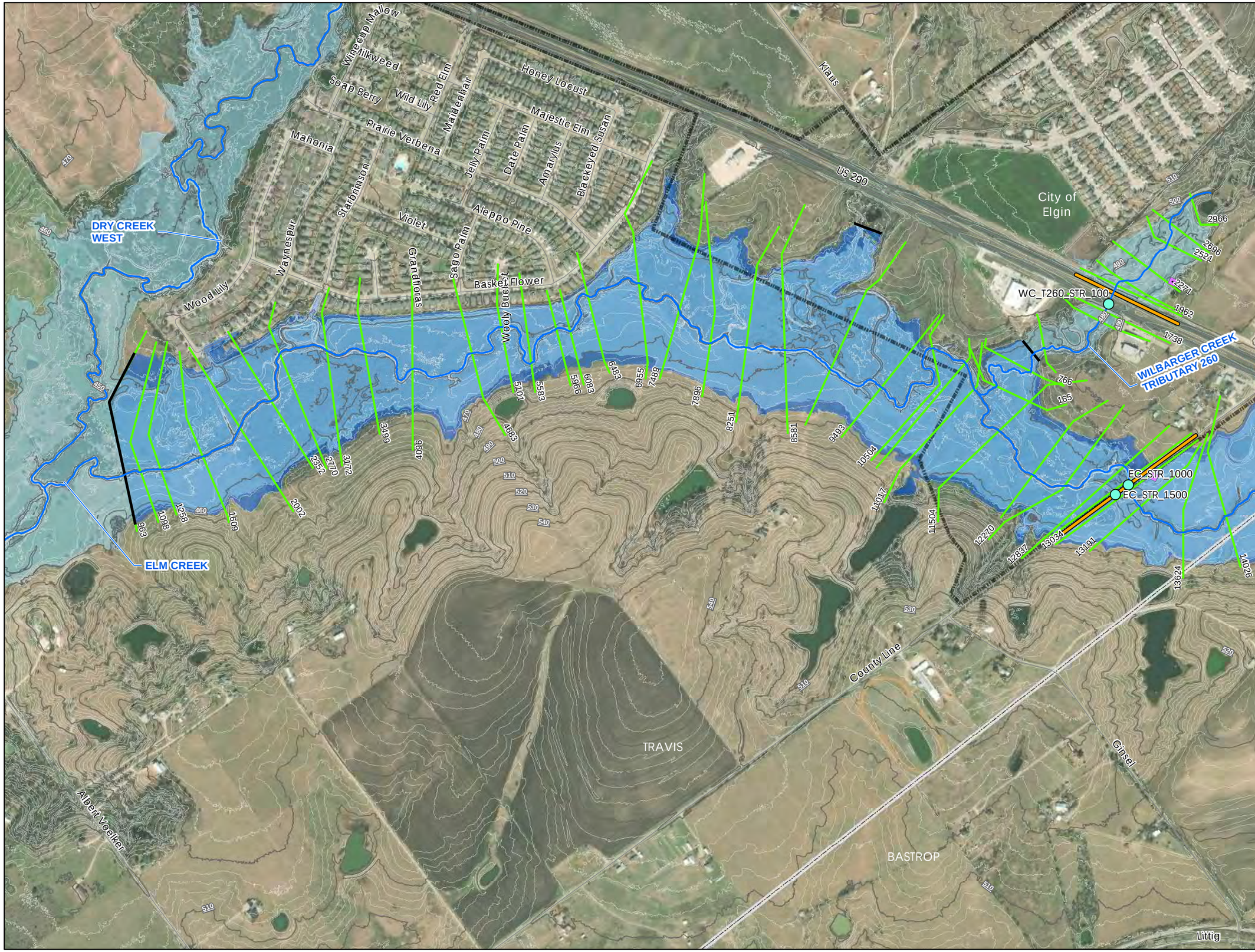
WILBARGER CREEK TRIBUTARY 260
EC_STR_1000
EC_STR_1500
EC_STR_2000
EC_STR_3000
EC_STR_4000
ELM CREEK
ELM CREEK TRIBUTARY 1
WILBARGER CREEK TRIBUTARY 9
TRAVIS
BASTROP
County Line
Ave C
City of Elgin
US-290
FM 1100
SH 95
Littig



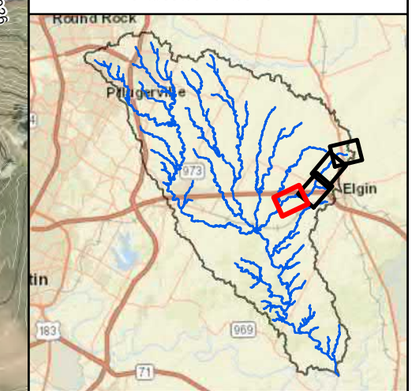
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Roadway Structures
- 500-Year Limit of Study
- Cross Sections
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Elm Creek, Elm Creek Tributary 1, & Wilbarger Creek Tributary 260

Panel 4 of 4



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0 700 1,400 Feet

HALFF

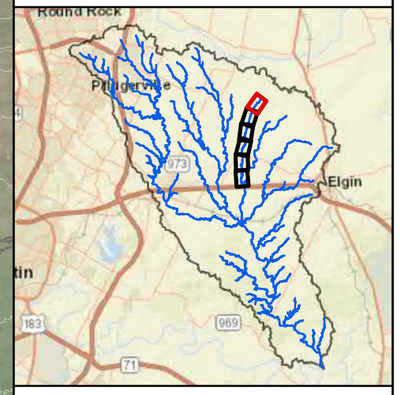
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Little Willow Creek

Panel 1 of 6



0 400 800 Feet

HALFF

TRAVIS

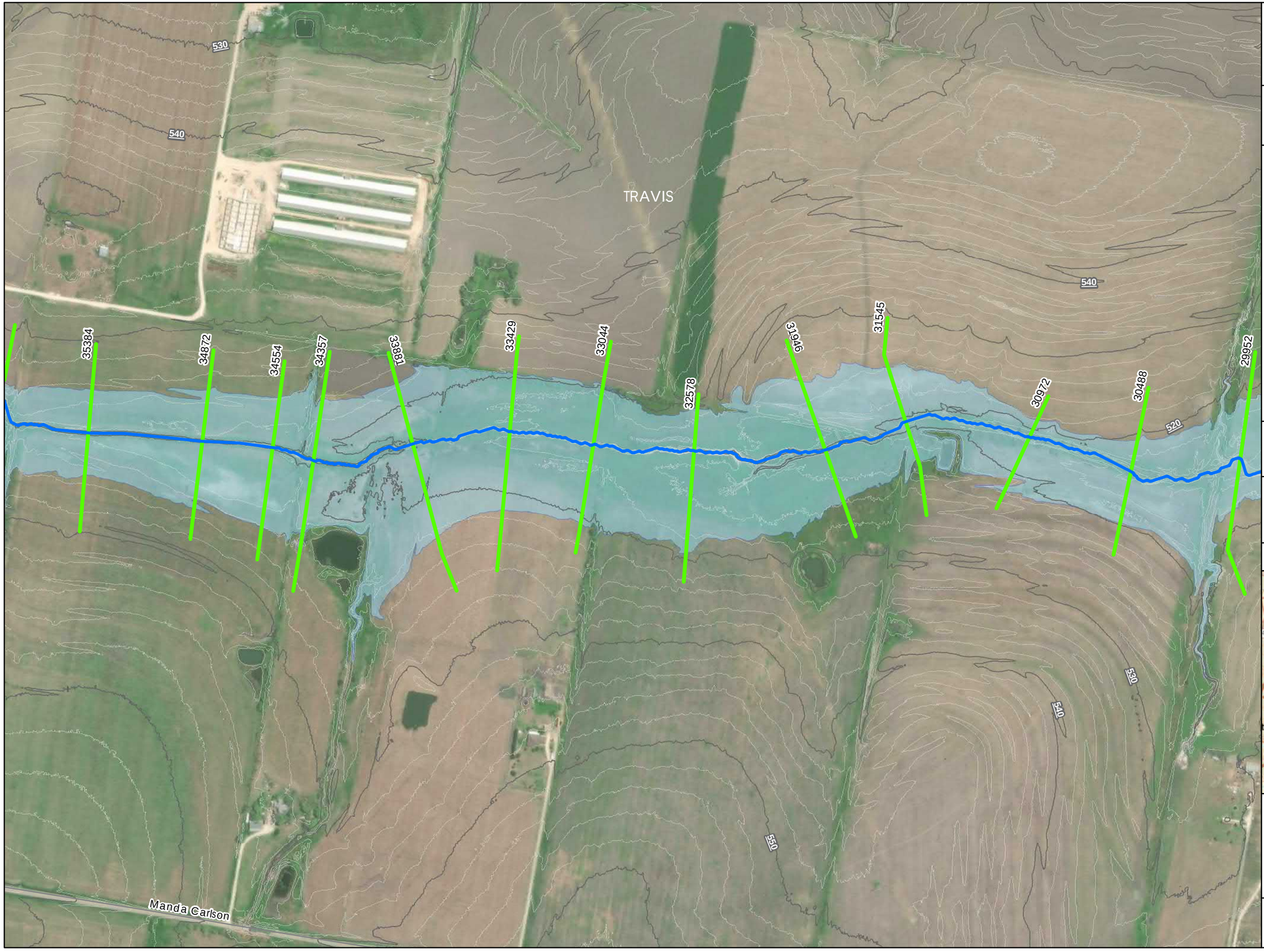
Lund Carlson

Manda Carlson

LWC_STR_400

40149
40517
39814
39377
38852
38588
38184
37868
37438
37349
37294
36890
36377
35869
35384

540
550
560



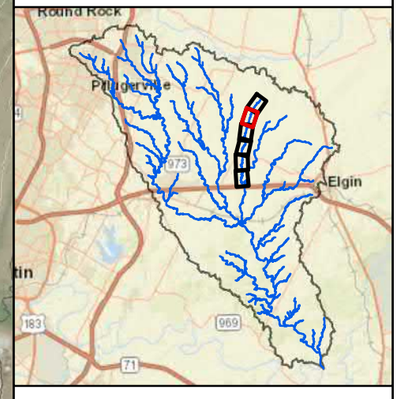
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Little Willow Creek

Panel 2 of 6



N

0 400 800 Feet

HALFF

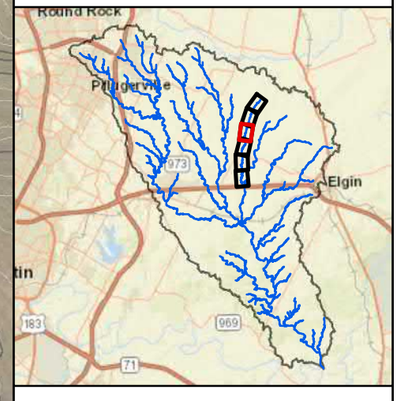
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Little Willow Creek

Panel 3 of 6



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0 400 800 Feet

HALFF

Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
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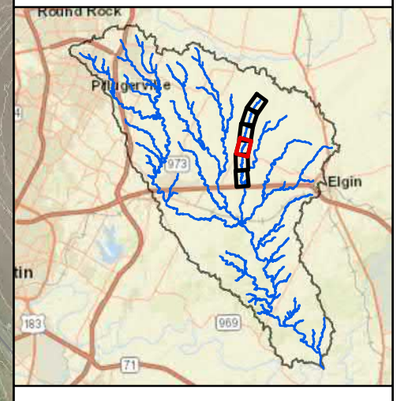
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Little Willow Creek

Panel 4 of 6



N

0 400 800 Feet

HALFF

TRAVIS

Wells School

Wells

Manda

LWC_STR_300

LWC_STR_200

FM 1100

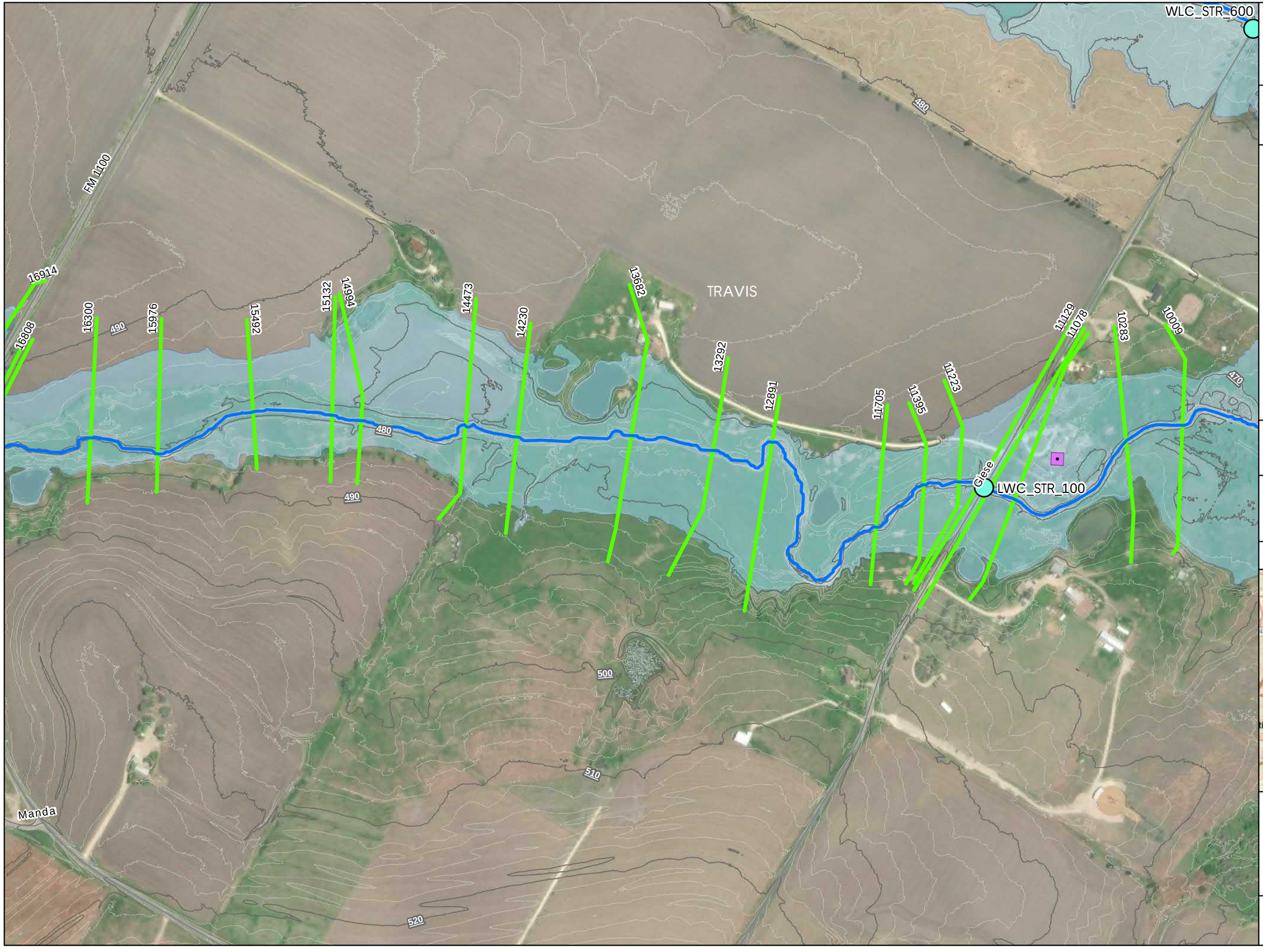
520

510

500

490

23301 23244 23195 22951 22571 22109 21611 20901 20559 20029 19714 19362 19881 18671 18150 17903 17535 17305 17013 16914 16839 16300



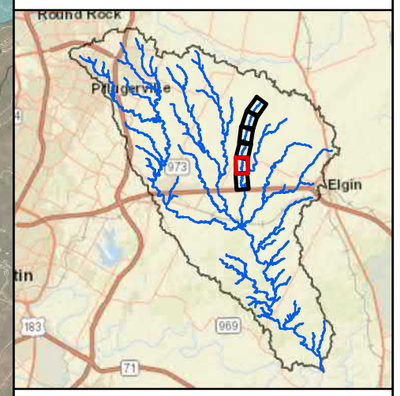
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Little Willow Creek

Panel 5 of 6



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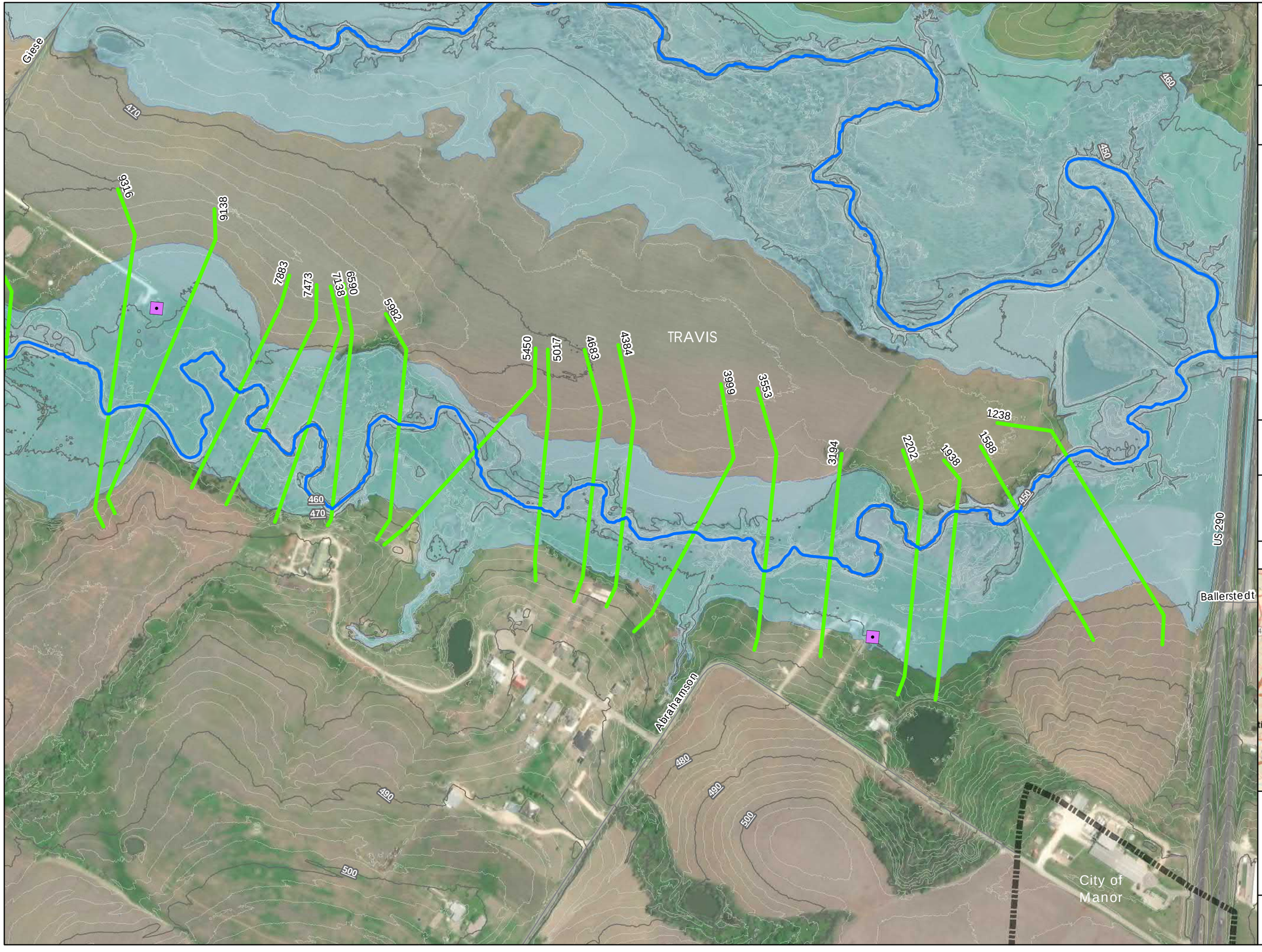


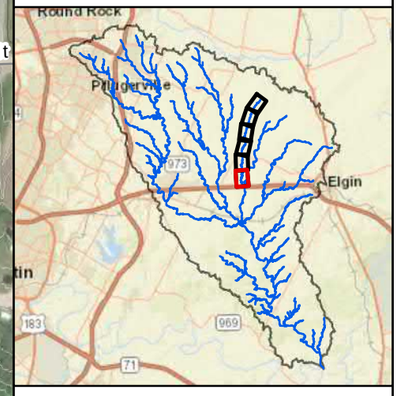
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Little Willow Creek

Panel 6 of 6



N

0 400 800 Feet

HALFF

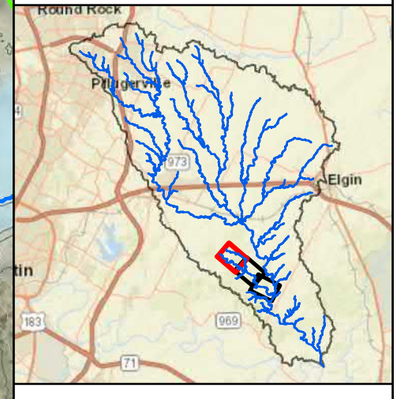
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Lockwood Creek & Harris Branch South

Panel 1 of 3



N

0 600 1,200 Feet

HALFF

Hibbs
Hog Eye
Ingrid
Tristam
Showers
Ann Showers
Unice
Sigrid
HARRIS BRANCH SOUTH
LOCKWOOD CREEK
HBS_STR_300

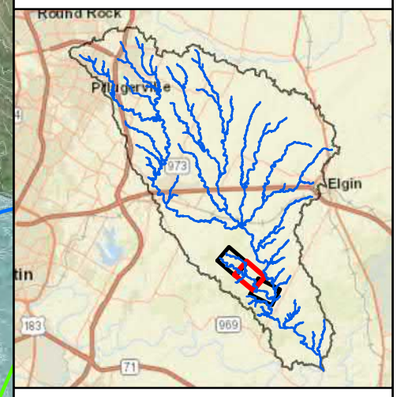
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Lockwood Creek &
Harris Branch South

Panel 2 of 3



N

0 600 1,200 Feet

HALFF

TRAVIS

BASTROP

HARRIS BRANCH SOUTH

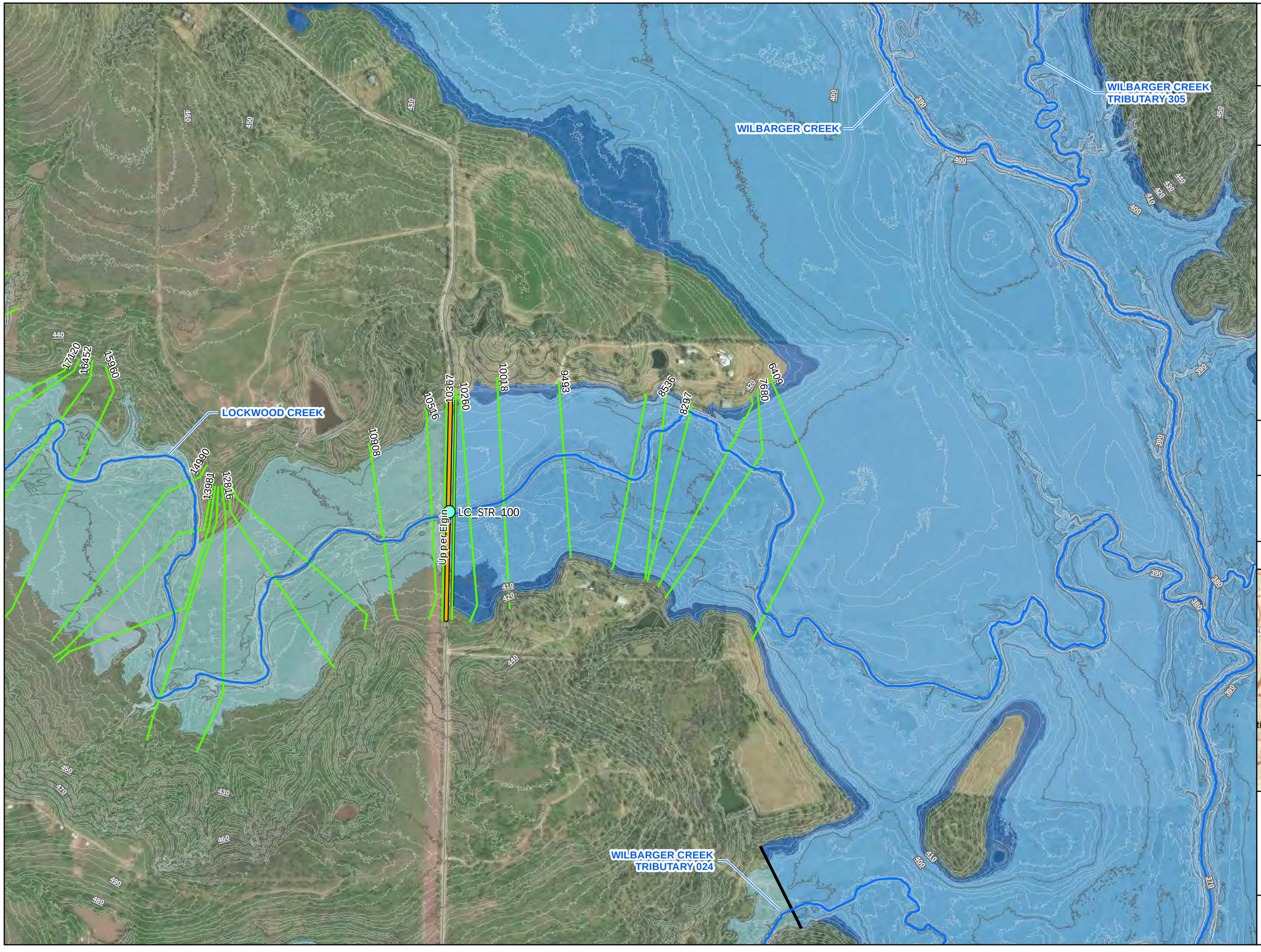
LOCKWOOD CREEK

WILBARGER CREEK TRIBUTARY 307

LC_STR_200

WC_T307_STR_100

Hog Eye
Ethan
Susette
Uriah
Upper Elgin
Beth
Viola
Lucinda
Vivian
Showers
Annabelle
Ingrid
Giesla
Derdra
Ann Showers
Sigrid



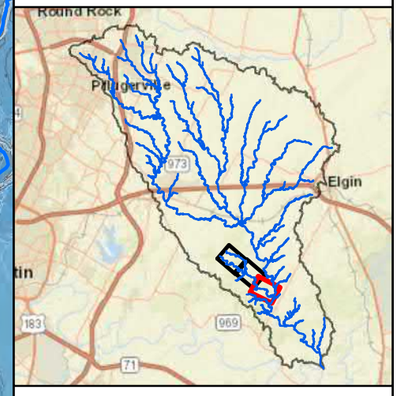
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Lockwood Creek & Harris Branch South

Panel 3 of 3



N

0 600 1,200 Feet

HALFF

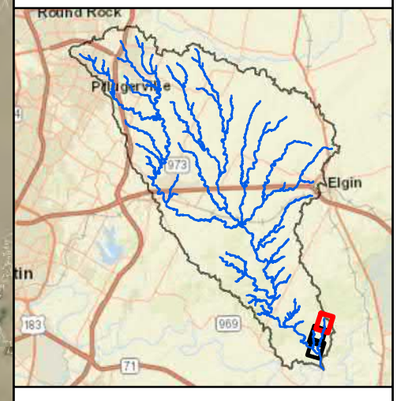
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 1 & 346

Panel 1 of 3



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0 400 800
Feet

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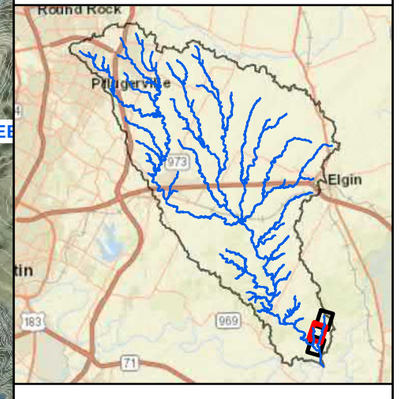
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 1 & 346

Panel 2 of 3



0 400 800 Feet

HALFF

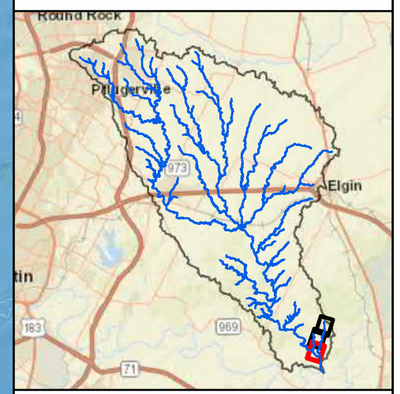
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 1 & 346

Panel 3 of 3



0 400 800 Feet

HALFF

WILBARGER CREEK

WILBARGER CREEK TRIBUTARY 1

WILBARGER CREEK TRIBUTARY 346

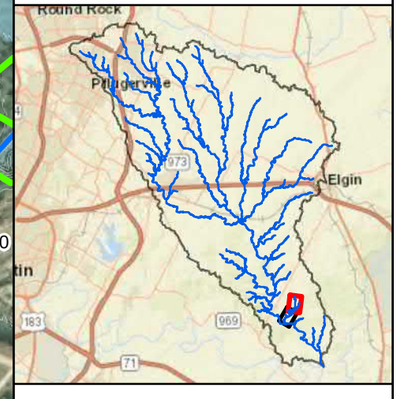
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Roadway Structures
- Inline Structures
- Cross Sections
- 500-Year Limit of Study
- Contours 10-ft
- Contours 2-ft
- 100-Year Floodplain
- 500-Year Floodplain

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek Tributaries
4, 018, 019, 020, & 021

Panel 1 of 2



N

0 400 800 Feet

HALFF

WILBARGER CREEK TRIBUTARY 018

WILBARGER CREEK TRIBUTARY 4

WILBARGER CREEK TRIBUTARY 019

WILBARGER CREEK TRIBUTARY 020

WC_T019_STR_100

WC_T019_STR_200

Dickerson

Coon Neck

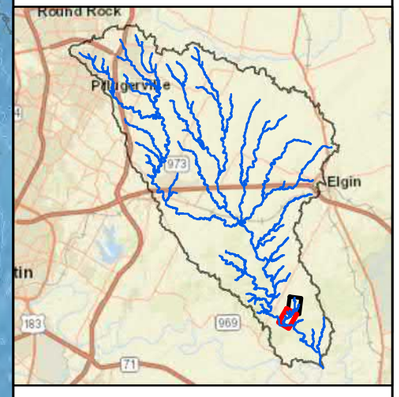
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Roadway Structures
- Inline Structures
- Cross Sections
- 500-Year Limit of Study
- Contours 10-ft
- Contours 2-ft
- 100-Year Floodplain
- 500-Year Floodplain

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek Tributaries
4, 018, 019, 020, & 021

Panel 2 of 2



N

0 400 800 Feet

HALFF

Coon Neck

WILBARGER CREEK

WILBARGER CREEK TRIBUTARY 4

WILBARGER CREEK TRIBUTARY 019

WILBARGER CREEK TRIBUTARY 020

WILBARGER CREEK TRIBUTARY 021

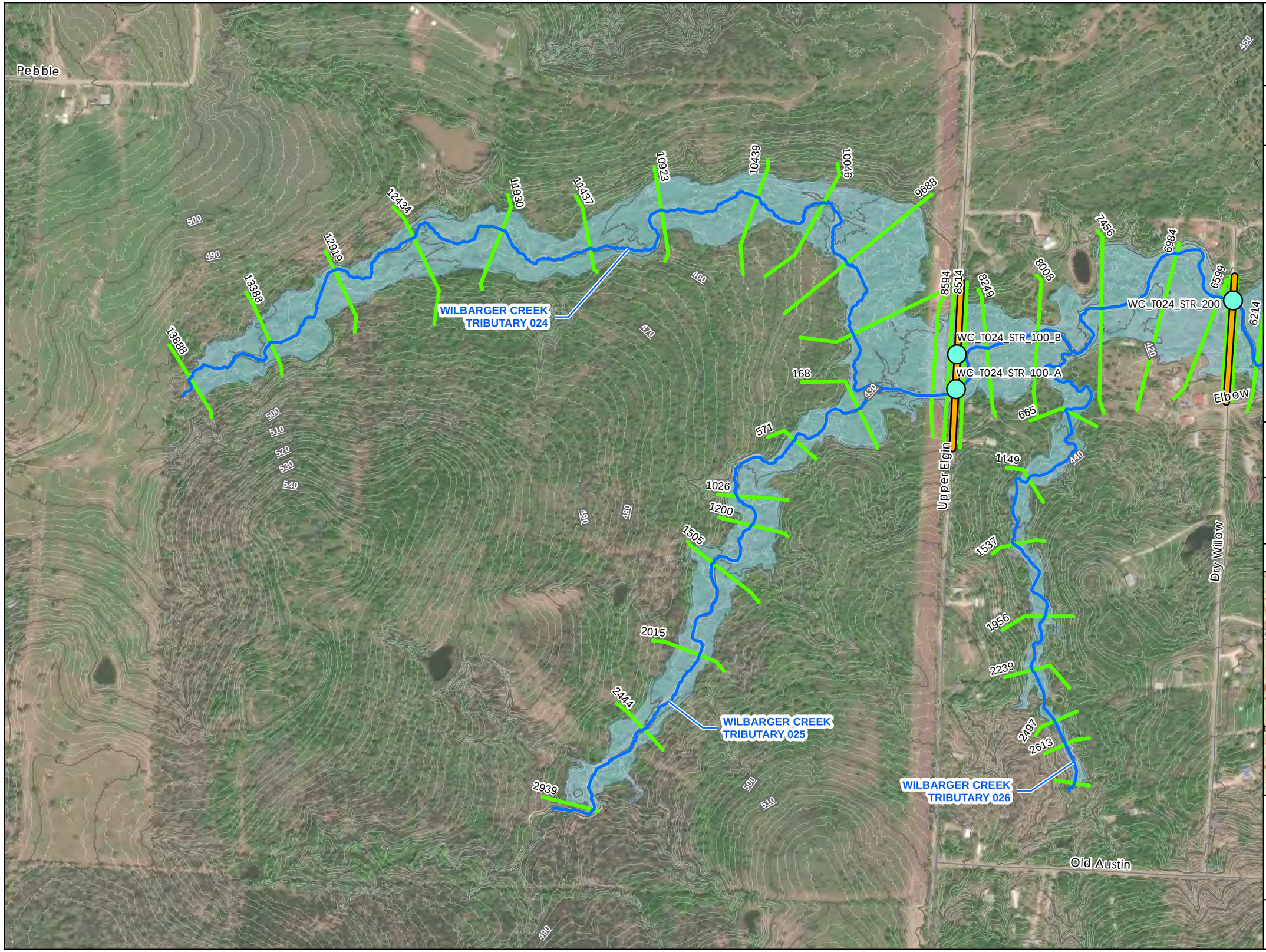
WC_T019_STR_100

WC_T020_STR_100

WC_T4_STR_100

WC_T019_STR_200

WC_T021_STR_100



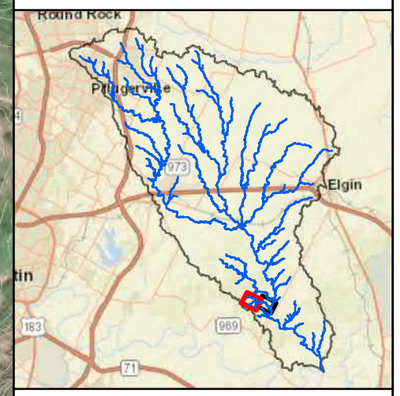
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 10-ft
- Contours 2-ft
- 100-Year Floodplain
- 500-Year Floodplain

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek Tributaries 024, 025, & 026

Panel 1 of 2



N

0 400 800 Feet

HALFF

LOCKWOOD CREEK

WILBARGER CREEK

WILBARGER CREEK TRIBUTARY 024

WC_T024_STR_200

WILBARGER CREEK TRIBUTARY 328

Dry Willow

Elbow

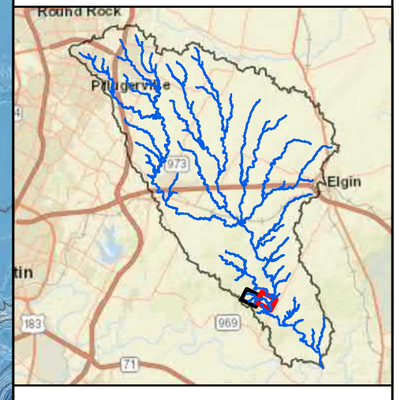
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 10-ft
- Contours 2-ft
- 100-Year Floodplain
- 500-Year Floodplain

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek Tributaries 024, 025, & 026

Panel 2 of 2



N

0 400 800 Feet

HALFF

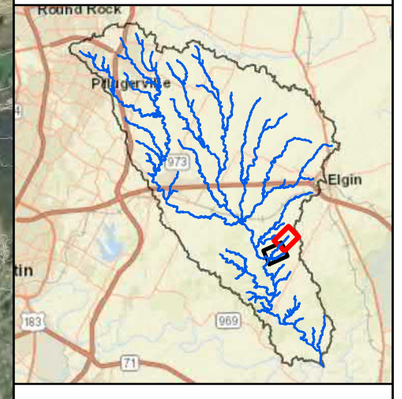
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 6 & 30

Panel 1 of 2



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0 500 1,000 Feet

HALFF

Upper Elgin
Crooked Hollow
Long Hollow
Youngs Prairie
WILBARGER CREEK TRIBUTARY 6
WC_T6_STR_200
11901
12513
12959
12887
13283
13545
13780
13971
14047
14499
14918
15218
15458
15710
16106
16455
16679
440
450
460
470
480
490
500
510
520
530
540

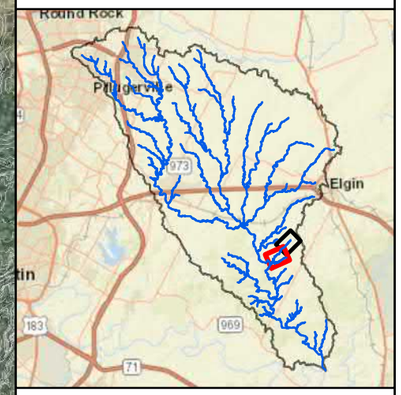
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 6 & 30

Panel 2 of 2



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0 500 1,000 Feet

HALFF

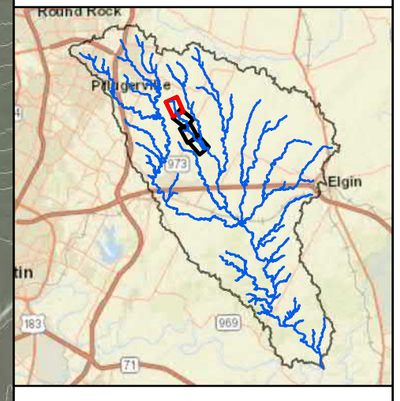
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 47 & 49

Panel 1 of 4



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0 400 800
Feet

HALFF

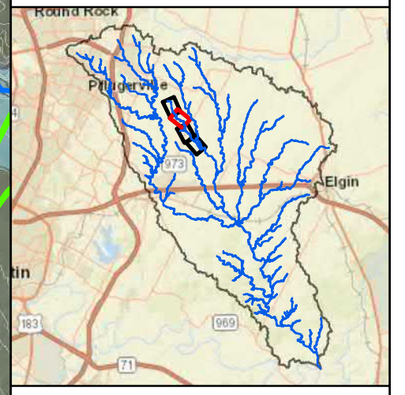
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 47 & 49

Panel 2 of 4



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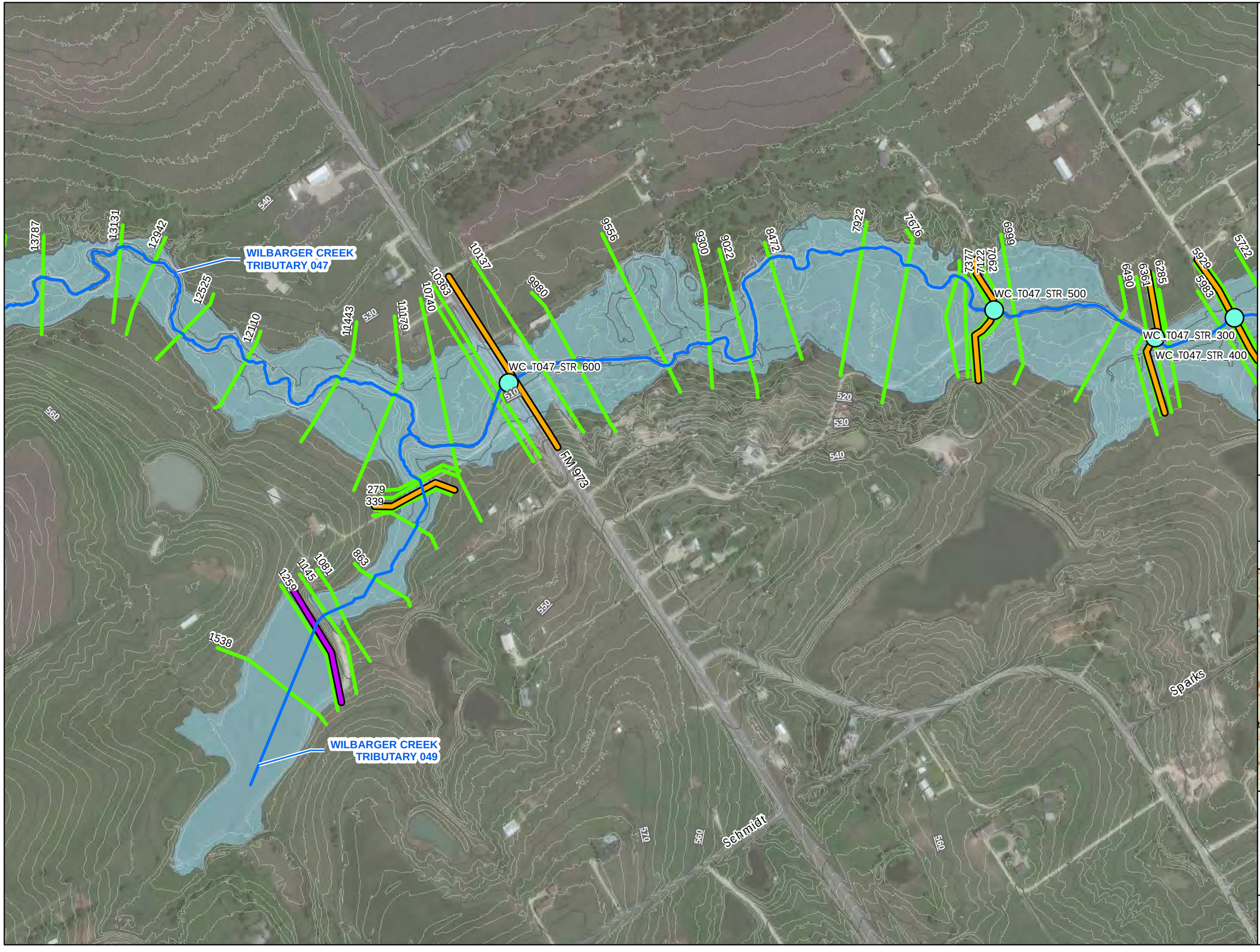
0 400 800 Feet

HALFF

Saint Therese
Saint Raguel
Steger
590
580
570
560
550
540
530
WILBARGER CREEK
TRIBUTARY 047
Magnolia Ranch
22787
22415
22004
21485
20502
20028
19591
18966
18438
17842
17349
16994
16522
16203
15577
15125
14535
14117
13787



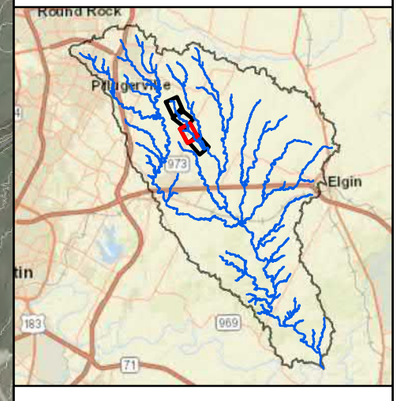
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 47 & 49

Panel 3 of 4



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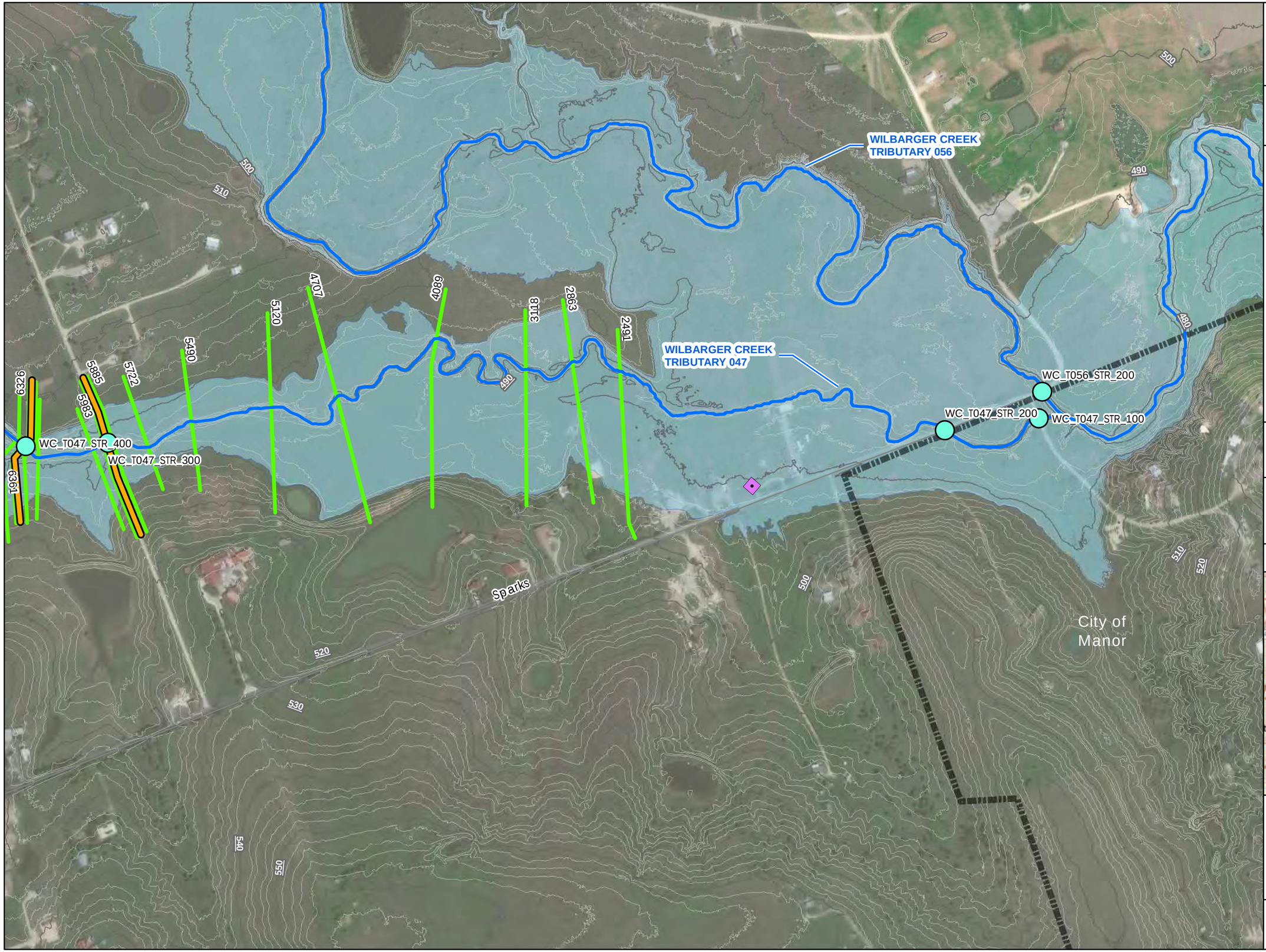


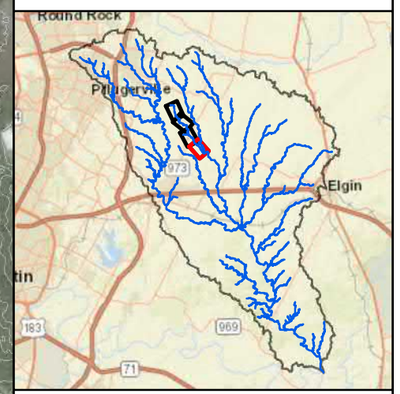
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 47 & 49

Panel 4 of 4



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0 400 800 Feet

HALFF

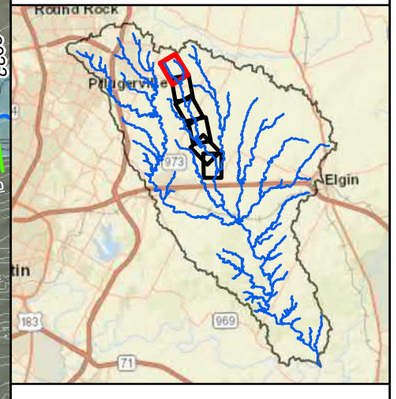
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Lateral Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 56, 62, & 70

Panel 1 of 6



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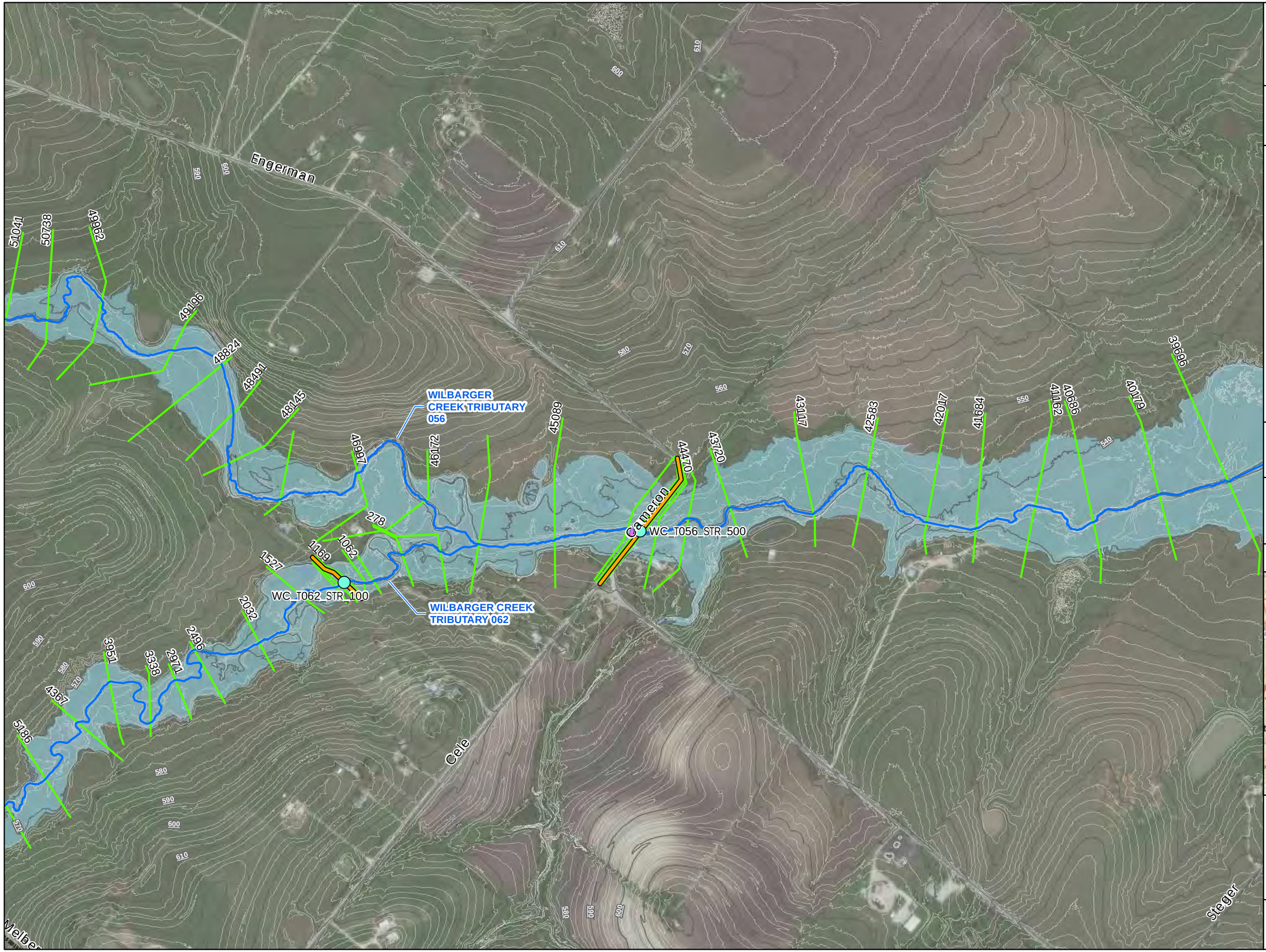
0 600 1,200 Feet

HALFF

WC_T056_STR_800
WILBARGER CREEK TRIBUTARY 056
WC_T062_STR_200
WILBARGER CREEK TRIBUTARY 062
Engerman
Melber
City of Pflugerville
Cele



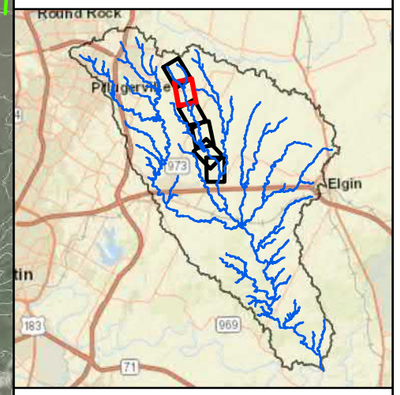
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Lateral Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 56, 62, & 70

Panel 2 of 6



N

0 600 1,200
Feet

HALFF

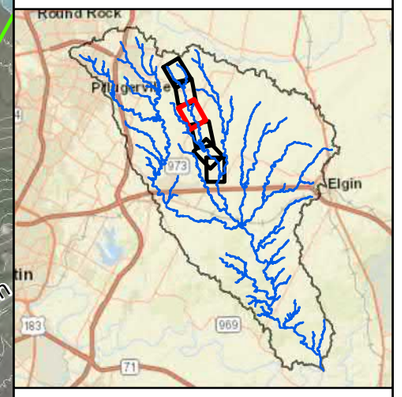
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Lateral Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 56, 62, & 70

Panel 3 of 6



N

0 600 1,200 Feet

HALFF

WILBARGER CREEK TRIBUTARY 070
WILBARGER CREEK TRIBUTARY 056
WILBARGER CREEK TRIBUTARY 047
WC_T056_STR_400
FM 973
Saint Therese
Saint Raguel
New Sweden Church
Steger

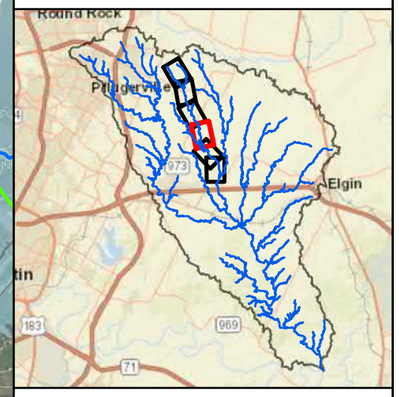
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Lateral Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 56, 62, & 70

Panel 4 of 6



N

0 600 1,200 Feet

HALFF

Axell
New Sweden Church
Jacobson
City of Pflugerville
WC_T056_STR_300
WILBARGER CREEK TRIBUTARY 056
WILBARGER CREEK TRIBUTARY 047
WC_T047_STR_300
WC_T047_STR_400
Steger
FM 973
Sparks
29688
29415
28846
28040
27235
26308
26039
25501
25031
24700
24190
23748
23377
22783
22206
21560
20268
19797
19307
18832
17696
17074

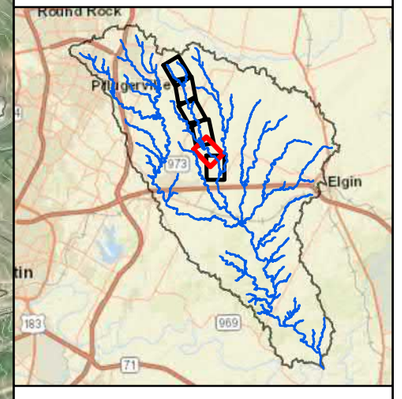
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Lateral Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 56, 62, & 70

Panel 5 of 6



N

0 600 1,200 Feet

HALFF

WILBARGER CREEK TRIBUTARY 056
WILBARGER CREEK TRIBUTARY 047
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WC_T047_STR_200
WC_T047_STR_100
WC_T056_STR_100
Kimbro
Sparks
City of Manor
Johnson
Bois D Arc
19797
19307
18652
17696
17074
15885
15384
14517
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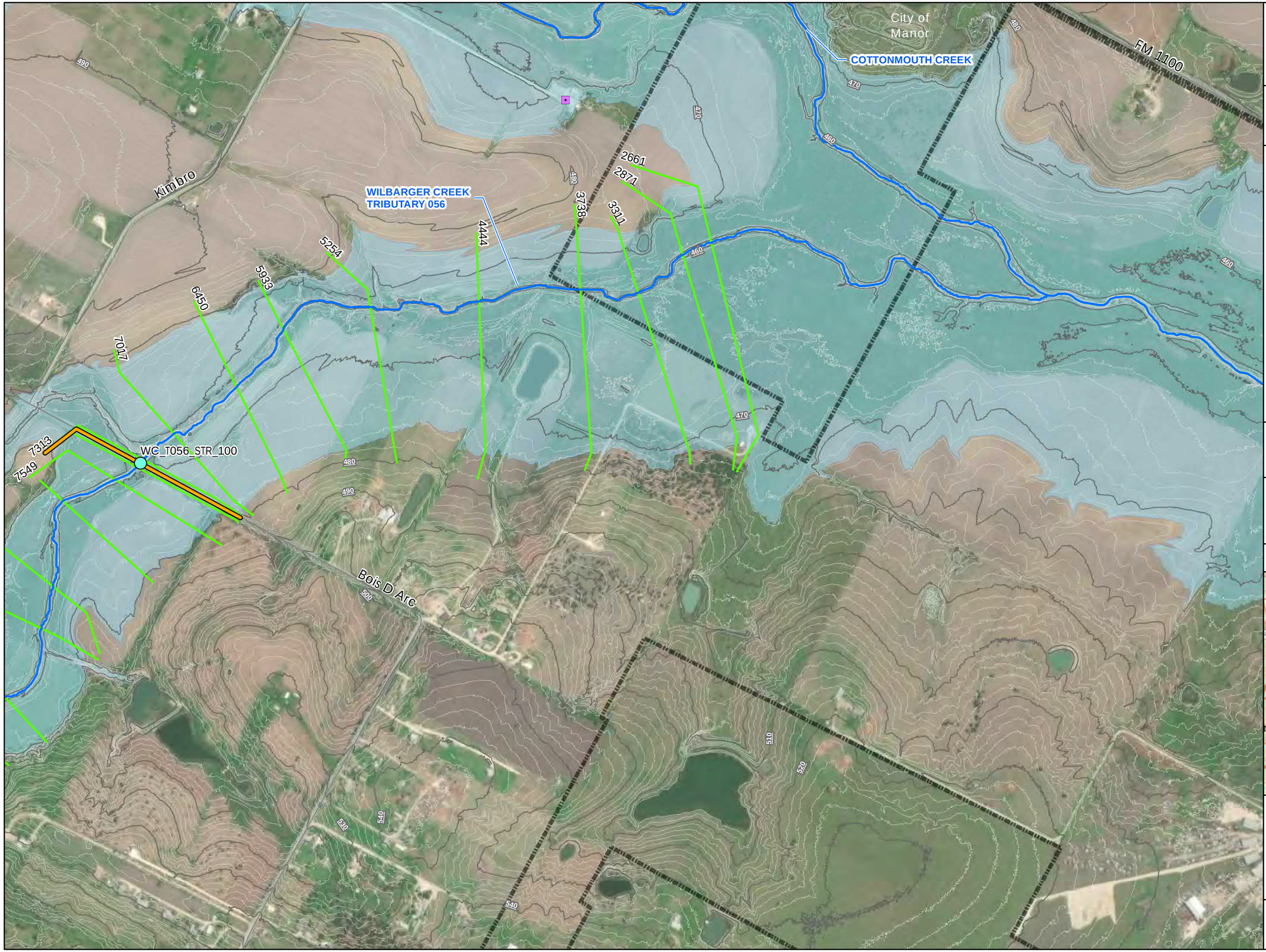


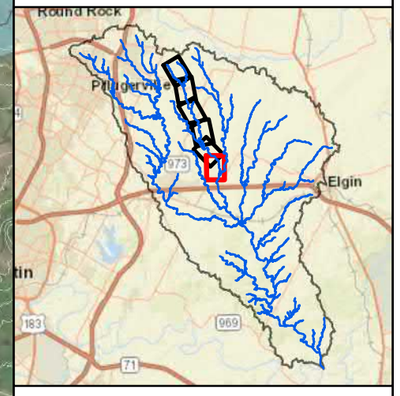
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Lateral Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 56, 62, & 70

Panel 6 of 6



N

0 600 1,200 Feet

HALFF

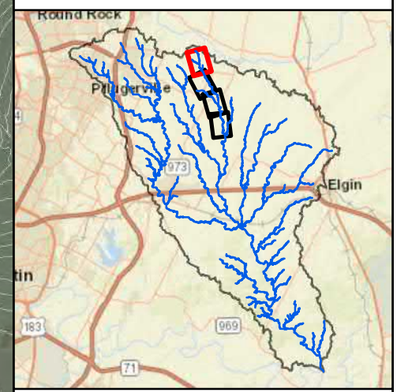
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 80, 82, 85, & 86

Panel 1 of 4



N

0 600 1,200 Feet

HALFF

WILLIAMSON
TRAVIS
County Road 129
Engerman
Melber
City of Pflugerville
WILBARGER CREEK TRIBUTARY 085
WILBARGER CREEK TRIBUTARY 080
WILBARGER CREEK TRIBUTARY 086
WC_T080_STR_900
WC_T080_STR_800
WC_T086_STR_100
40440
40009
39561
39003
39499
38002
37477
36904
36456
36322
36245
35952
35594
35041
34735
33221
39072
32467
31839
31201
30768
2099
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1547
1459
1239
954
838
413
218
959
1441
1934
2183
2441
2750
2997
3274
3415
920
930
920
910
600
590
600
580
570
620
650
640
630
620
650
620
600
620
620
620

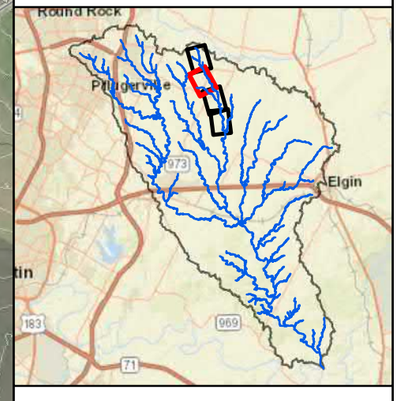
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 80, 82, 85, & 86

Panel 2 of 4



N

0 600 1,200 Feet

HALFF

WC_T080_STR_600
WC_T080_STR_500
WC_T080_STR_400
WC_T082_STR_300
WILBARGER CREEK TRIBUTARY 080
WILBARGER CREEK TRIBUTARY 082
TRAVIS
Cameron
Hamann
Engerman

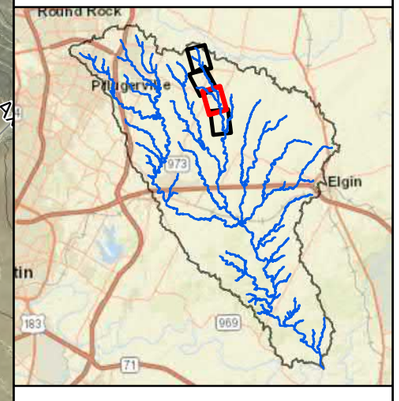
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 80, 82, 85, & 86

Panel 3 of 4

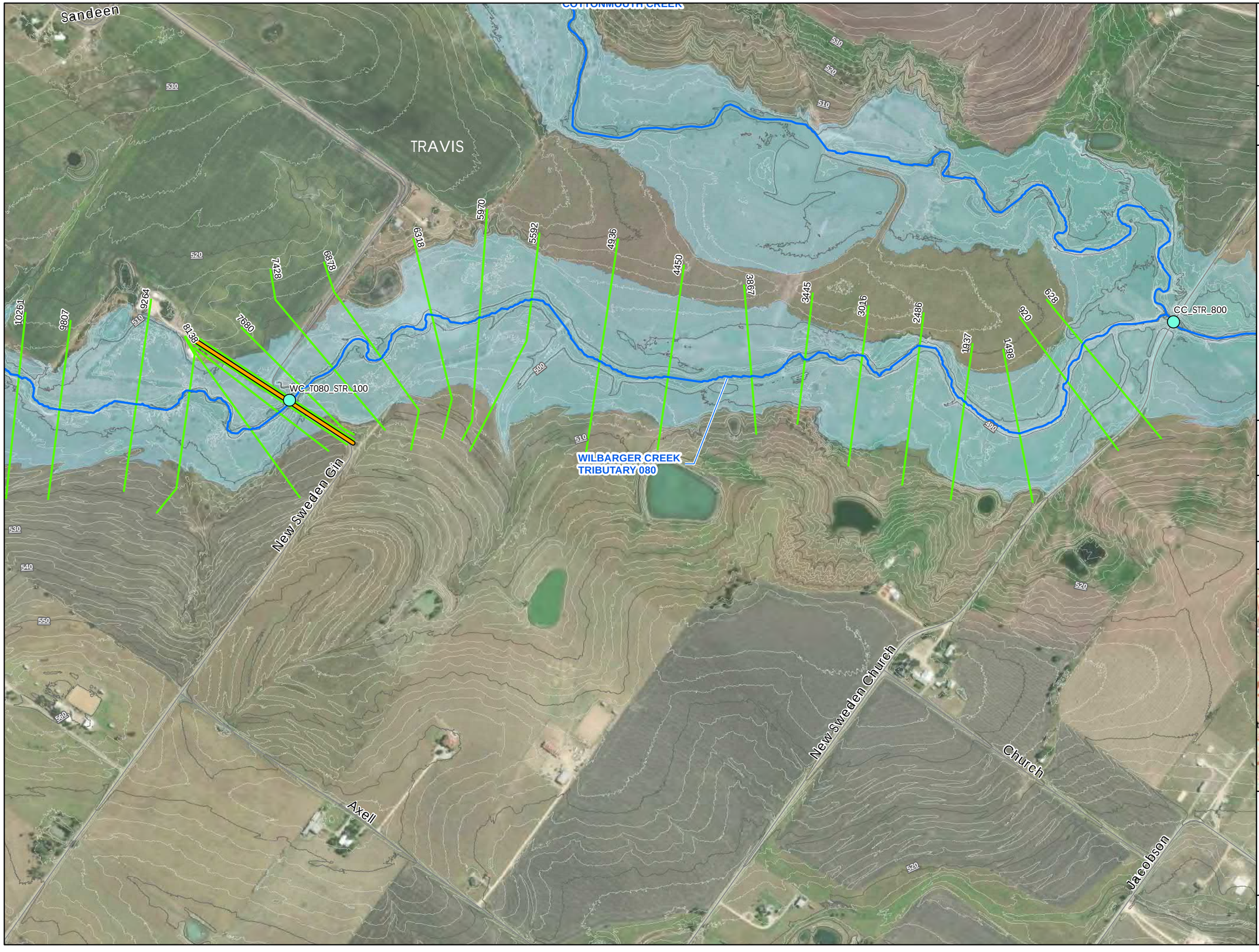


N

0 600 1,200 Feet

HALFF

WC_T080_STR_300
WC_T080_STR_200
WC_T082_STR_100
WC_T082_STR_200
WILBARGER CREEK TRIBUTARY 080
WILBARGER CREEK TRIBUTARY 082
FM 973
Mccurry
Sandeen
Hamann
New Sweden Gin
TRAVIS



Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
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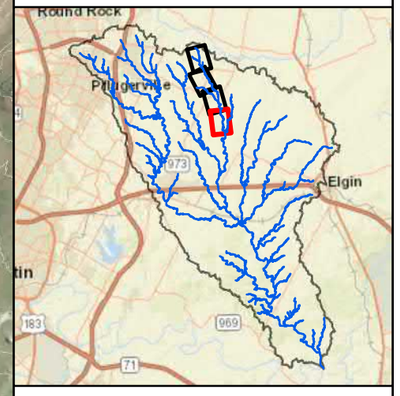
- 100-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 80, 82, 85, & 86

Panel 4 of 4



N

0 600 1,200 Feet

HALFF

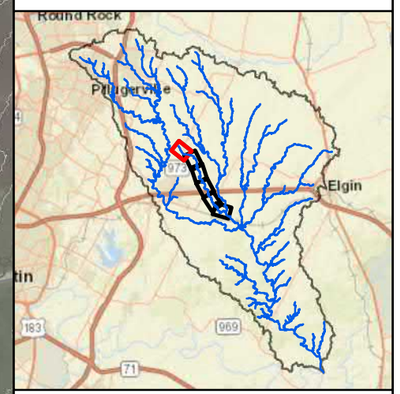
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek Tributary 113

Panel 1 of 6



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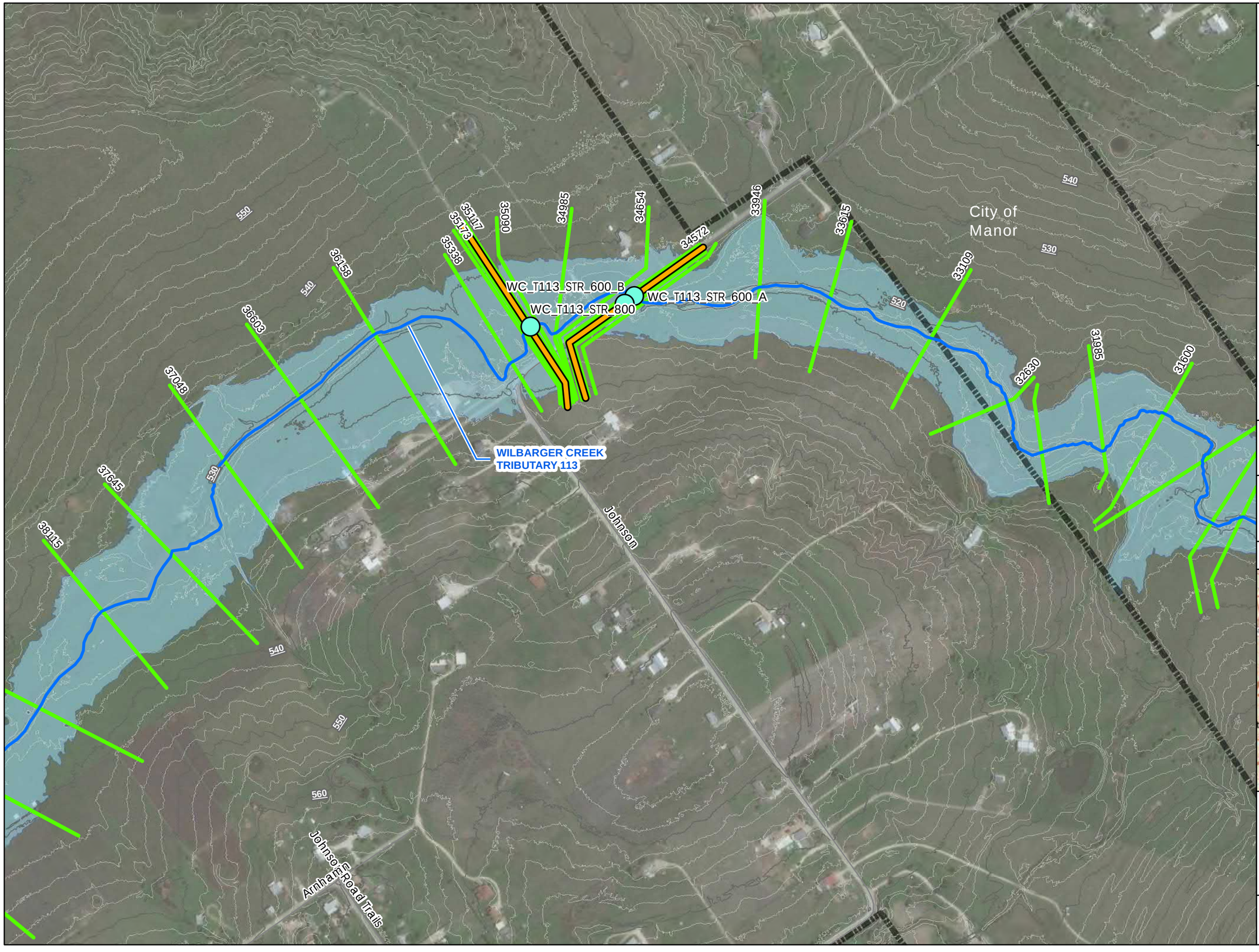
HALFF



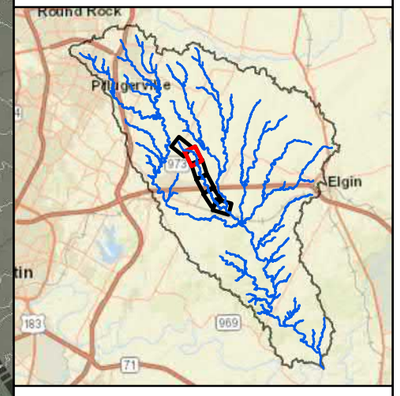
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributary 113

Panel 2 of 6



N

0 400 800 Feet

HALFF

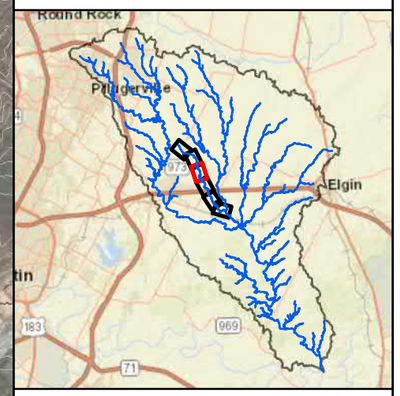
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributary 113

Panel 3 of 6



N

0 400 800 Feet

HALFF

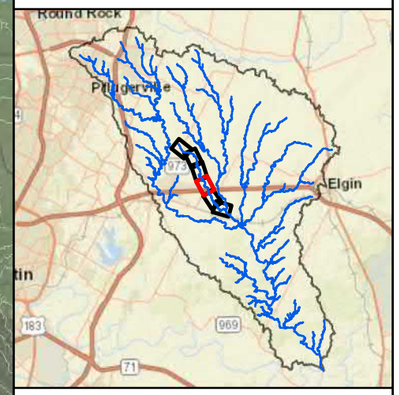
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributary 113

Panel 4 of 6



N

0 400 800 Feet

HALFF

City of Manor

US 290

WILBARGER CREEK TRIBUTARY 113

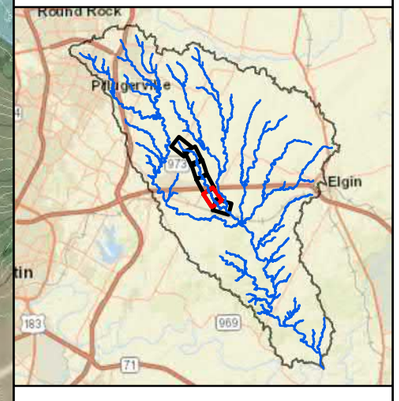
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek Tributary 113

Panel 5 of 6



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HALFF

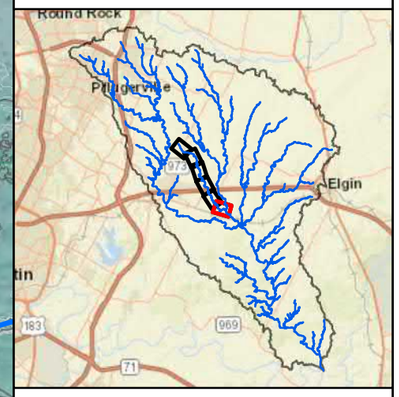
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributary 113

Panel 6 of 6



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HALFF

COTTONMOUTH CREEK

WILBARGER CREEK
TRIBUTARY 113

480 490 450 440 460 470

7943 7725 7346 7143 6132 5783 5251 5041 4440 4214 3103 2791 2542 2175 1638 1152 948 487

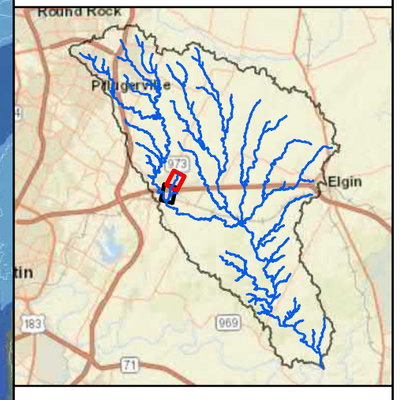
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Roadway Structures
- Cross Sections
- 500-Year Limit of Study
- City Boundary
- Contours 10-ft
- Contours 2-ft
- 100-Year Floodplain
- 500-Year Floodplain

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek Tributary 167

Panel 1 of 2



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HALFF

Richard Nixon
John F Kennedy
Lyndon B Johnson
Rutherford B Hayes
City of Manor
US 290
Ralph Richie
WC_T167_STR_800
WC_T167_STR_900
WC_T167_STR_1100
WC_T167_STR_1200
WILBARGER CREEK TRIBUTARY 167
FM 973
Shadowglen
Pecangate
Crownstone
Oaklynn
Pine Arbor
10335
10119
10012
9958
9676
9387
8966
8826
8223
7845
7088
6728
6411
12199
12099
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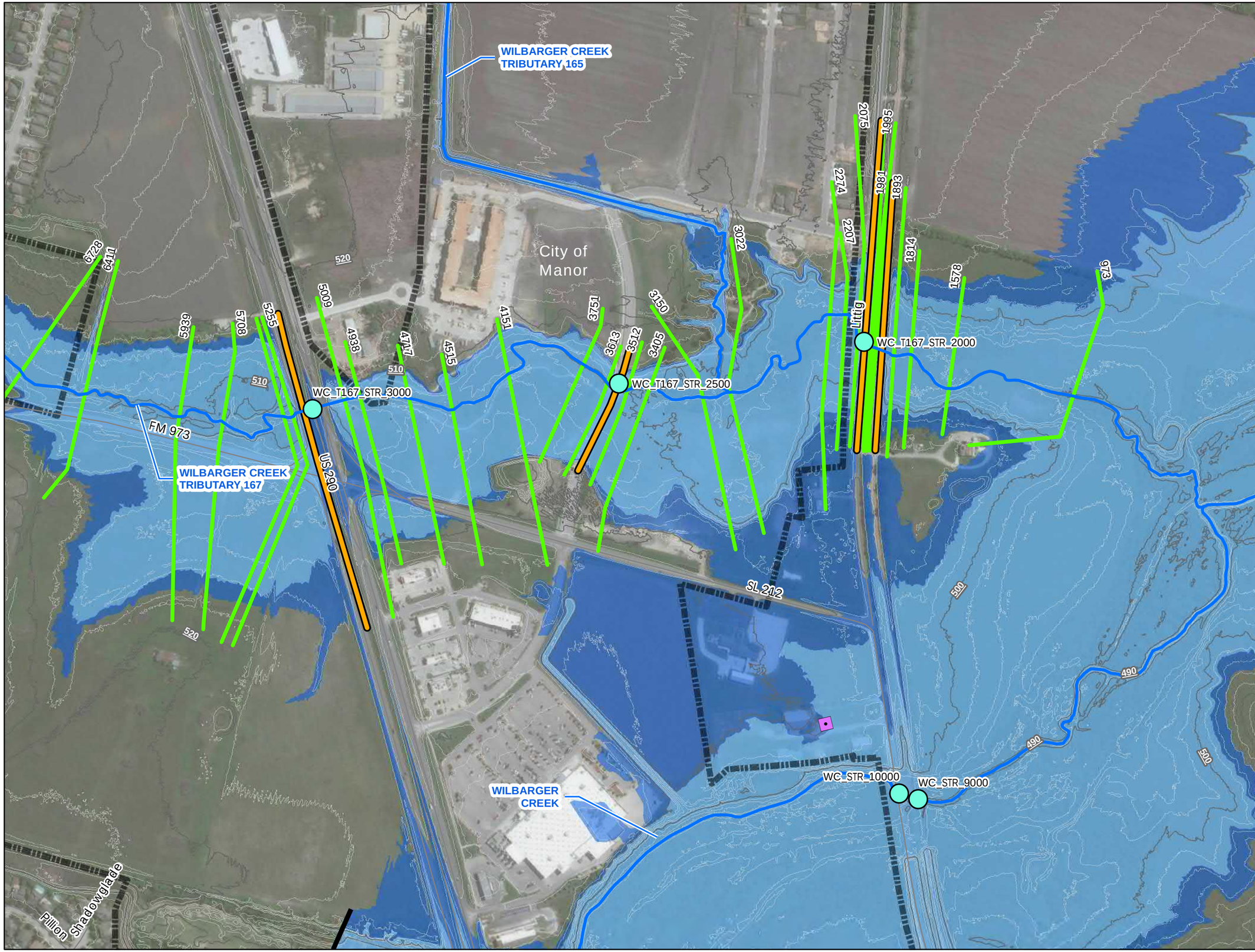
540
530
520
560



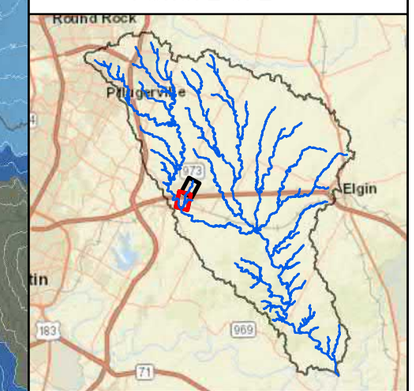
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Roadway Structures
- Cross Sections
- 500-Year Limit of Study
- City Boundary
- Contours 10-ft
- Contours 2-ft
- 100-Year Floodplain
- 500-Year Floodplain

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek Tributary 167

Panel 2 of 2



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HALFF

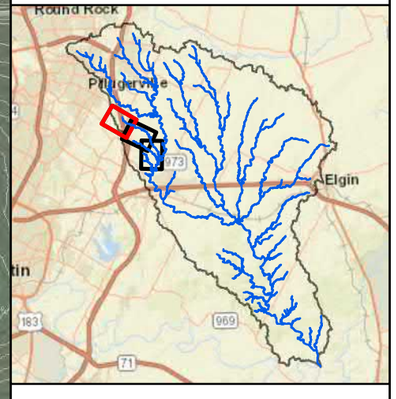
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Tributaries
169, & 171, 220, & 227

Panel 1 of 3



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HALFF

City of Pflugerville

WILBARGER CREEK TRIBUTARY 220

WC_T220_STR_300

27472
27196
26435
25892
25487
25157
25032
24511
24105
23432
22680
22257
21721

Pflugerville

Cameron

SH 130

Killingsworth

Unknown

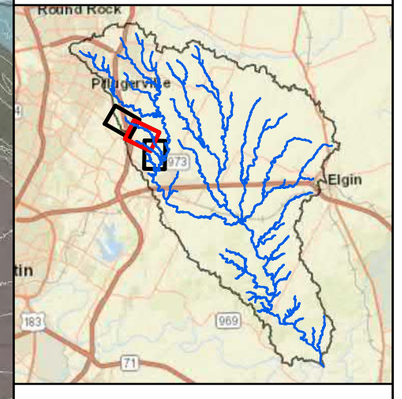
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Tributaries
169, & 171, 220, & 227

Panel 2 of 3



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HALFF

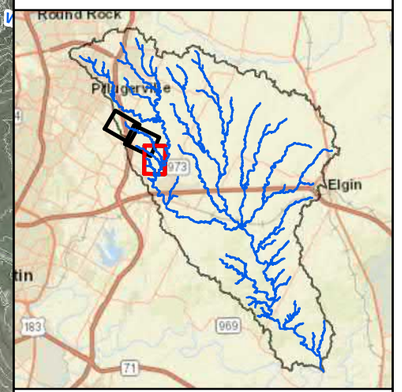
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Tributaries
169, & 171, 220, & 227

Panel 3 of 3



N

0 700 1,400 Feet

HALFF

City of Pflugerville

City of Manor

WILBARGER CREEK

WC_T220_STR_100

WC_T220_STR_200

WILBARGER CREEK TRIBUTARY 220

WILBARGER CREEK TRIBUTARY 227

WC_T227_STR_100

WC_T171_STR_100

WILBARGER CREEK TRIBUTARY 171

WC_T169_STR_100

WILBARGER CREEK TRIBUTARY 169

Fuchs Grove

Reeder

Gregg - 6038

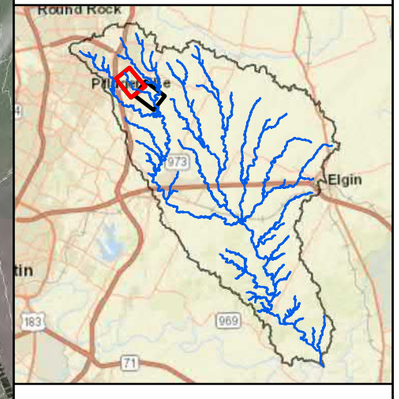
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodway
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Tributary 196

Panel 1 of 2



N

0 600 1,200 Feet

HALFF

City of Pflugerville

WILBARGER CREEK TRIBUTARY 196

10682 9997 9351 9080 17601 17322 16980 16498 16191 15626 15011 14496 14160 14059 13631 13666 13412 12834 12714 12571 11995 11492

WILBARGER CREEK TRIBUTARY 207

WILBARGER CREEK TRIBUTARY 200

WILBARGER CREEK TRIBUTARY 210

WILBARGER CREEK TRIBUTARY 196

WC_T196_STR_2000

9997 9351 9080 8911 8781 8495 8119 7543 6860 6415 6220 5562 5438 5003 4507 4003 3565 3168 2940 2001 1666 498

640 610 600 590 580 570 630 620

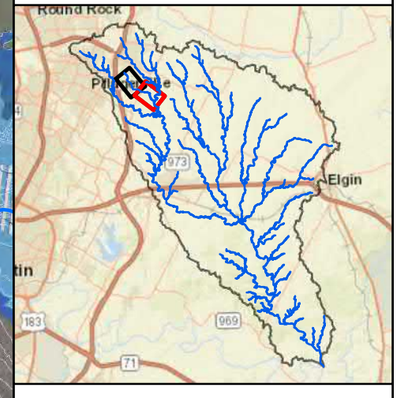
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodway
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Tributary 196

Panel 2 of 2



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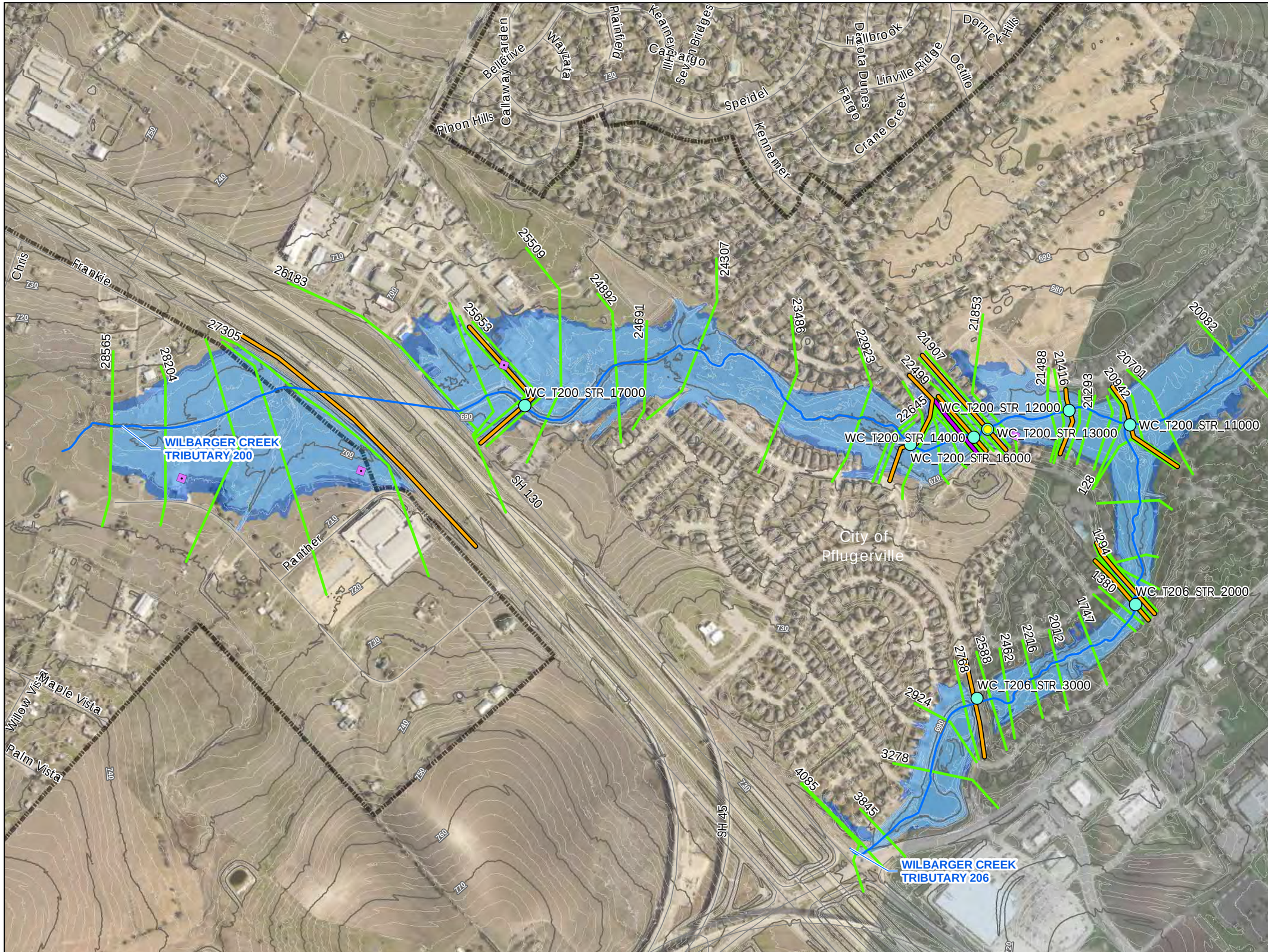


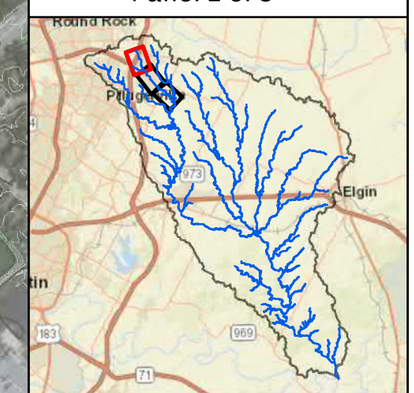
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- Lateral Structures
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodway
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Tributaries
200, 206, & 207

Panel 1 of 3



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HALFF

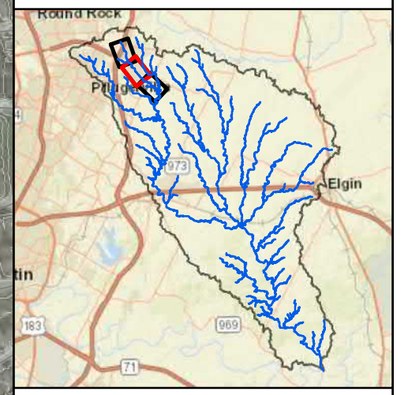
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- Lateral Structures
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodway
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Tributaries
200, 206, & 207

Panel 2 of 3



N

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HALFF

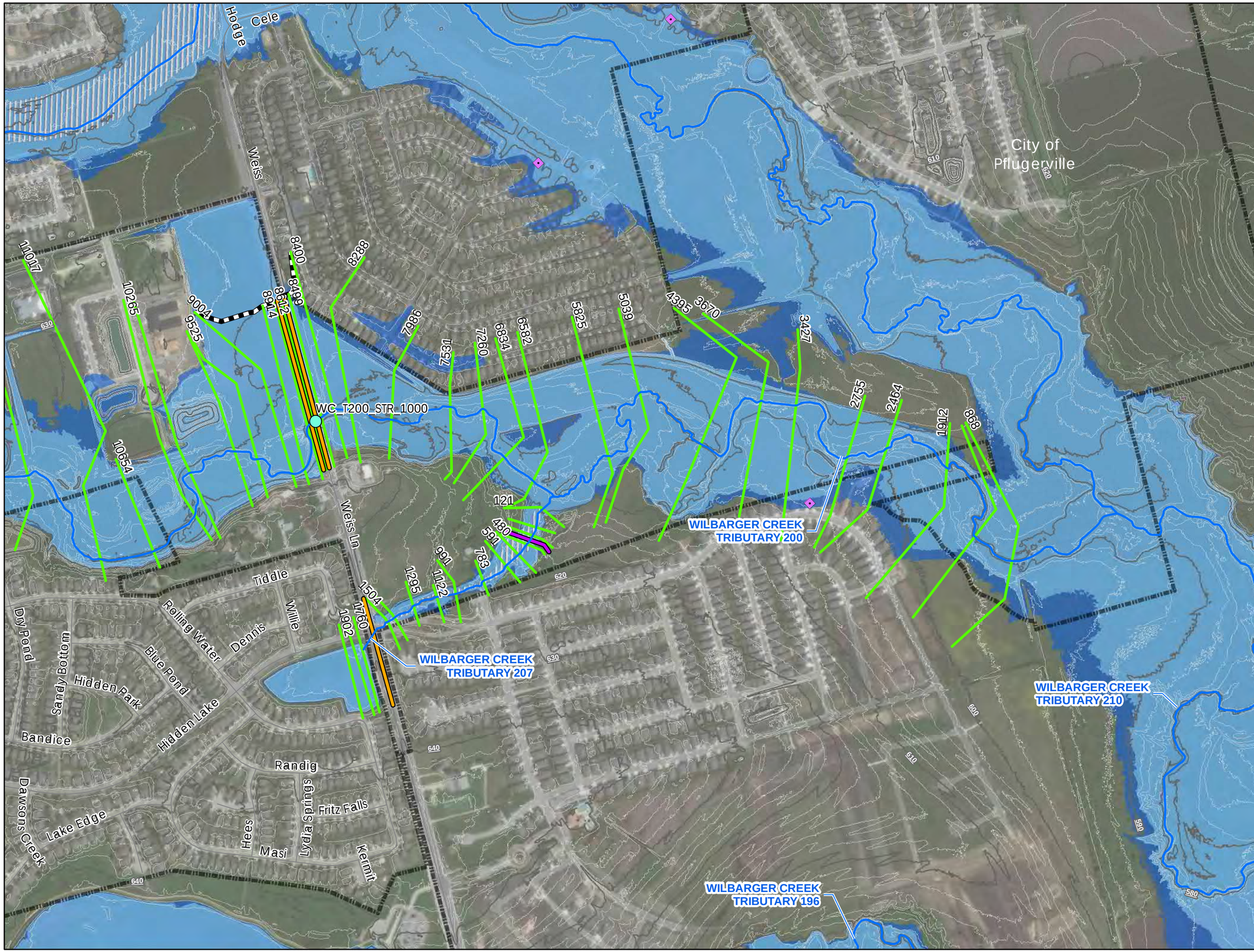
WILBARGER CREEK TRIBUTARY 210

WILBARGER CREEK TRIBUTARY 200

City of Pflugerville

WC_T200_STR_10000
WC_T200_STR_9000
WC_T200_STR_8000
WC_T200_STR_7000
WC_T200_STR_6000
WC_T200_STR_5000
WC_T200_STR_4000
WC_T200_STR_3000
WC_T200_STR_2000

Dornick Hills
Mistty Shore
Farm Pond
Crispin Hall
Wearyall Hill
Peat Moss
Melwas
Brue
Brent Knoll
Morgana
Jakes Hill
Birdie
Glastonbury
Mendips
Moorlynch
Sangremon
Westonbirt
Taylor Falls
Shoreless Shore
Endless Shore
Dry Lake
Sandy Shore
Deep Water
Silent Water
Windless
White Water
Veiled Falls
Rocky Shore
Bandice
Dry Pond
Blue Pond
Hidden Park
Sandy Bottom
Rolling Water
Hidden Lake
Trickling Springs
Shallow Pool
Dry Brook
Silent Harbor
Lake Edgecliff
Dawsons Creek



Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
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- Inline Structures
- Lateral Structures
- Contours 2-ft
- Contours 10-ft
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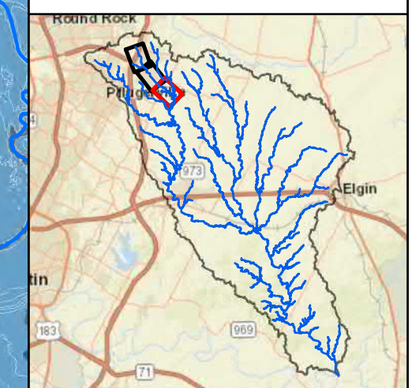
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Tributaries
200, 206, & 207

Panel 3 of 3



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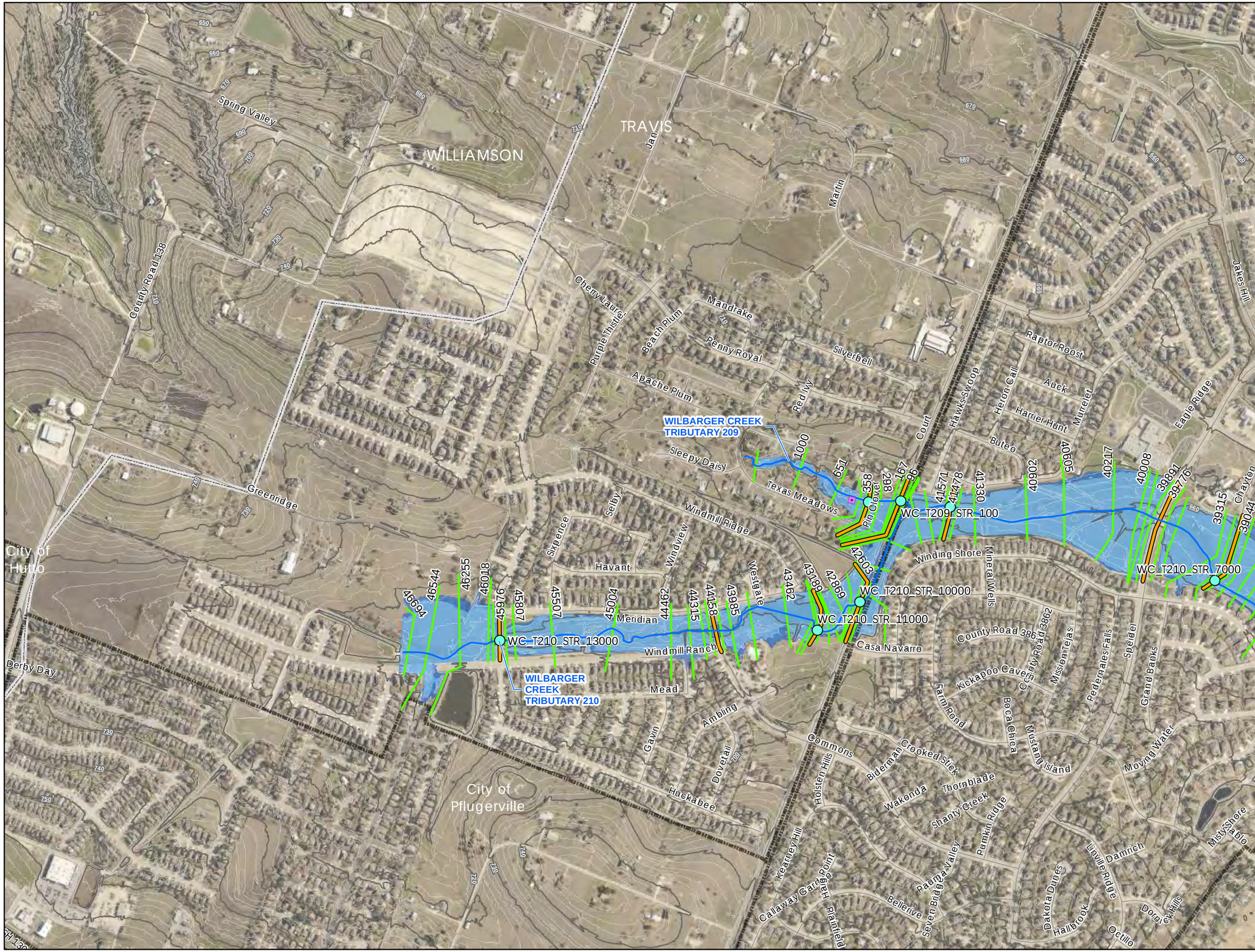


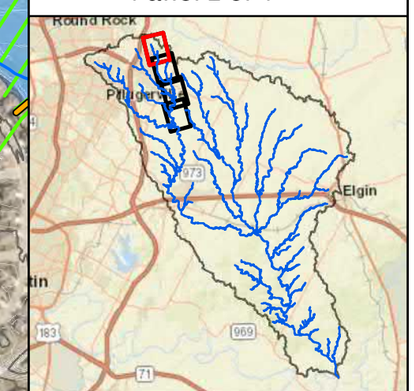
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodway
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Tributaries
208, 209, 210, & 216

Panel 1 of 4



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HALFF

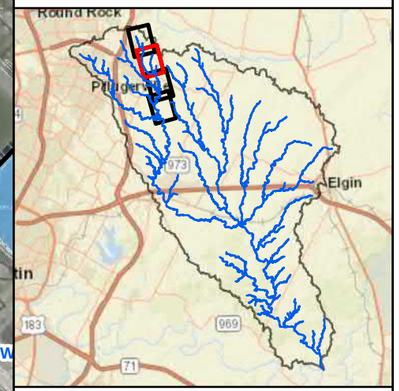
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodway
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Tributaries
208, 209, 210, & 216

Panel 2 of 4



N

0 700 1,400 Feet

HALFF

WILLIAMSON
TRAVIS
Speidel
Hodge
Court
Martin
Jakes Hill
Raptor Roost
Hawks Swoop
Heron Call
Auck
Harrier Hunt
Murrelet
Buteo
Eagle Ridge
Sandpiper Court
Sandpiper Spot
Schaefer Chayton
Nighthawk Dive
Falconers
Winding Shore
Mineral Wells
County Road 3862
County Road 3863
Kickapoo Cavern
Mission Tejas
Pedernales Falls
Grand Banks
Boca Chica
Farm Pond
Mustang Island
Thornblade
Pumkin Ridge
Moving Water
Crispin Hall
Brent Knoll
Morgana
Glastonbury
Birdie
Melwas
Brue
Wearyall Hill
Peat Moss
Cele
Weiss
City of Pflugerville
WILBARGER CREEK TRIBUTARY 208
WILBARGER CREEK TRIBUTARY 216
WILBARGER CREEK TRIBUTARY 210
WILBARGER CREEK TRIBUTARY 200
WC_T208_STR_100
WC_T216_STR_1000
WC_T210_STR_3000
WC_T210_STR_7000
WC_T210_STR_6000
WC_T210_STR_5000
7004
6941
6788
6513
6284
6144
6022
5896
5618
5151
5013
4638
4183
4036
3921
3720
3045
2645
2544
2333
2236
1896
1436
1191
528
2504
2195
2151
2064
1534
1010
525
29008
28536
29903
30140
30694
30870
31172
31765
32260
32415
32988
33498
33991
34418
34728
34529
34851
35276
35713
35979
36251
36460
36598
36742
37011
37274
37487
37725
38030
38592
38649
39120
39315
39776
39891
40008
40217
40605
40902
41330

City of Pflugerville

WILBARGER CREEK TRIBUTARY 208

WILBARGER CREEK TRIBUTARY 216

WILBARGER CREEK TRIBUTARY 210

WILBARGER CREEK TRIBUTARY 200

WILBARGER CREEK TRIBUTARY 207

WC_T210_STR_2000

WC_T210_STR_3000

WC_T200_STR_1000

Cele

Hodge

Weiss

Weiss Ln

Jesse Bohls

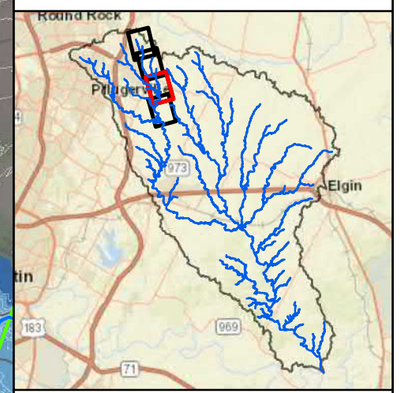
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodway
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Tributaries
208, 209, 210, & 216

Panel 3 of 4



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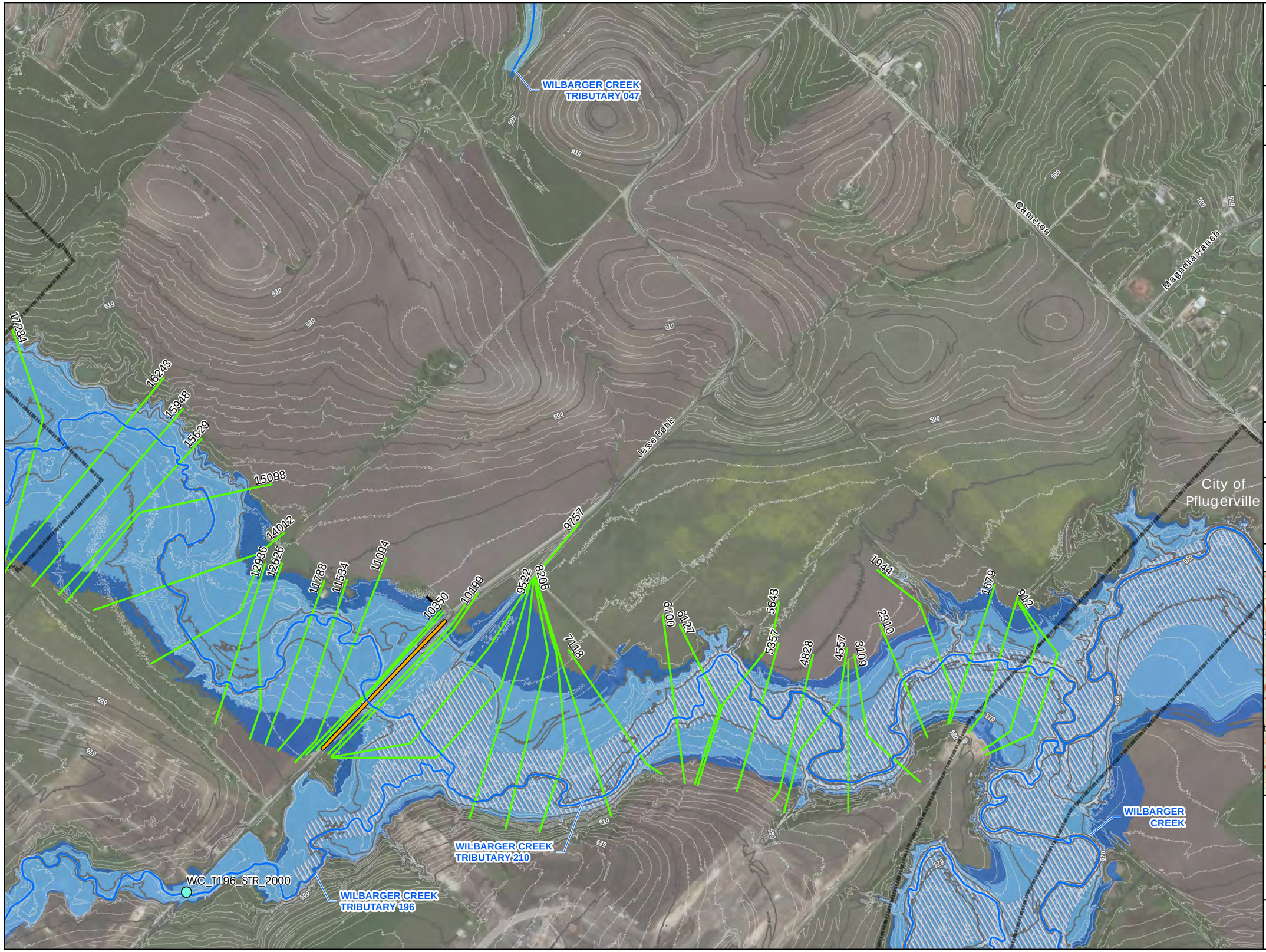
HALFF



Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
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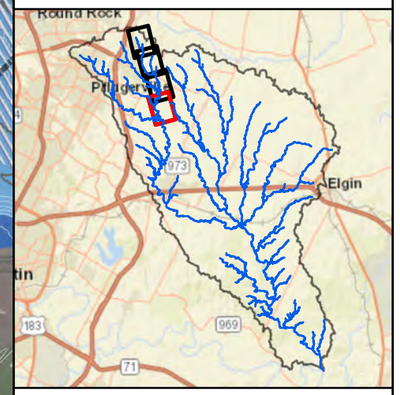
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Tributaries
208, 209, 210, & 216

Panel 4 of 4



N

0 700 1,400 Feet

HALFF

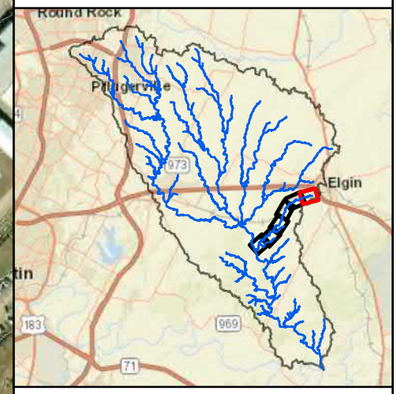
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 9, 286, and 298

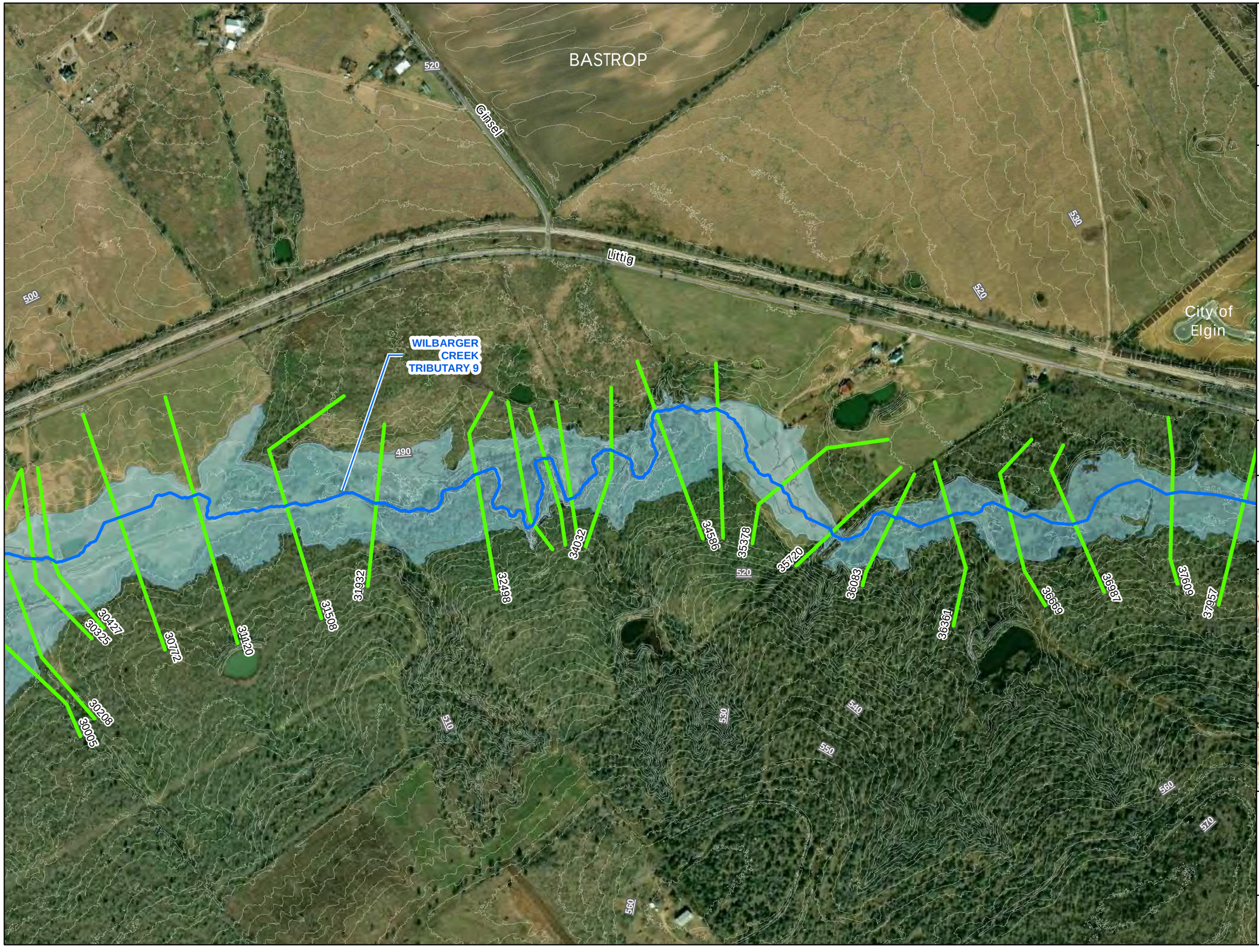
Panel 1 of 6



N

0 400 800 Feet

HALFF



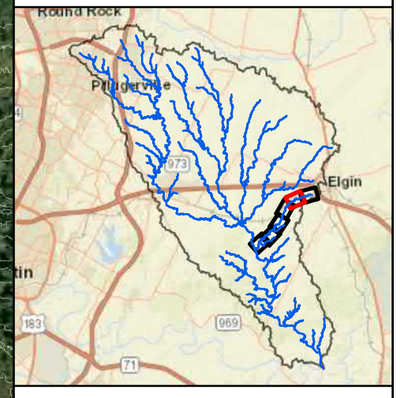
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 9, 286, and 298

Panel 2 of 6



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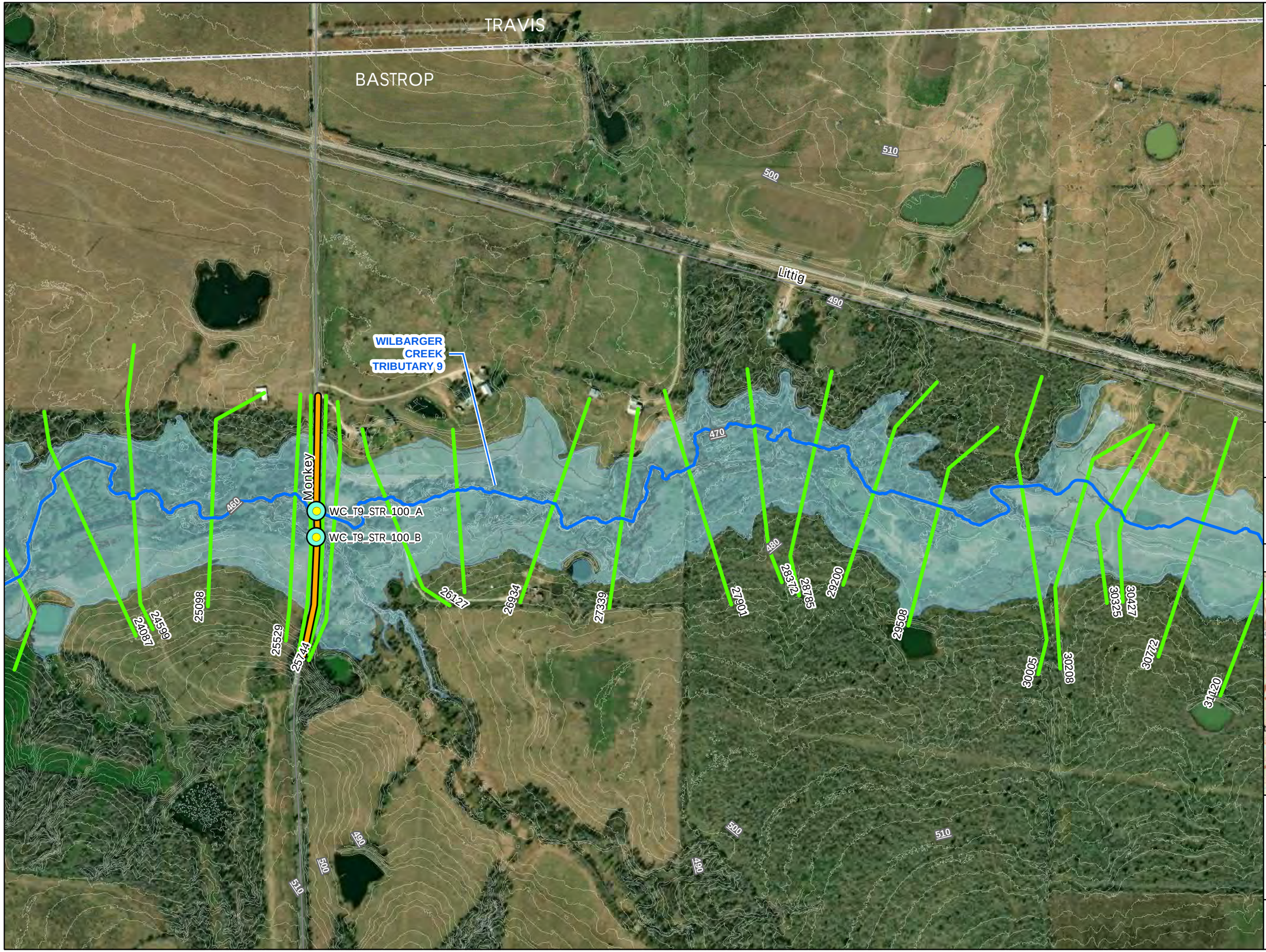
0 400 800 Feet

HALFF



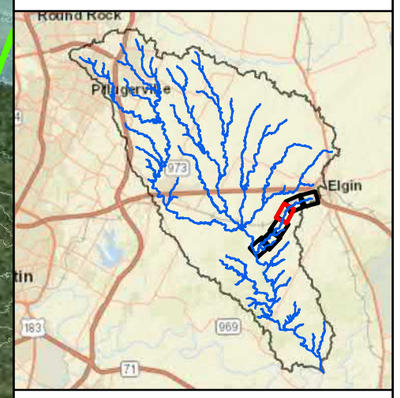
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 9, 286, and 298

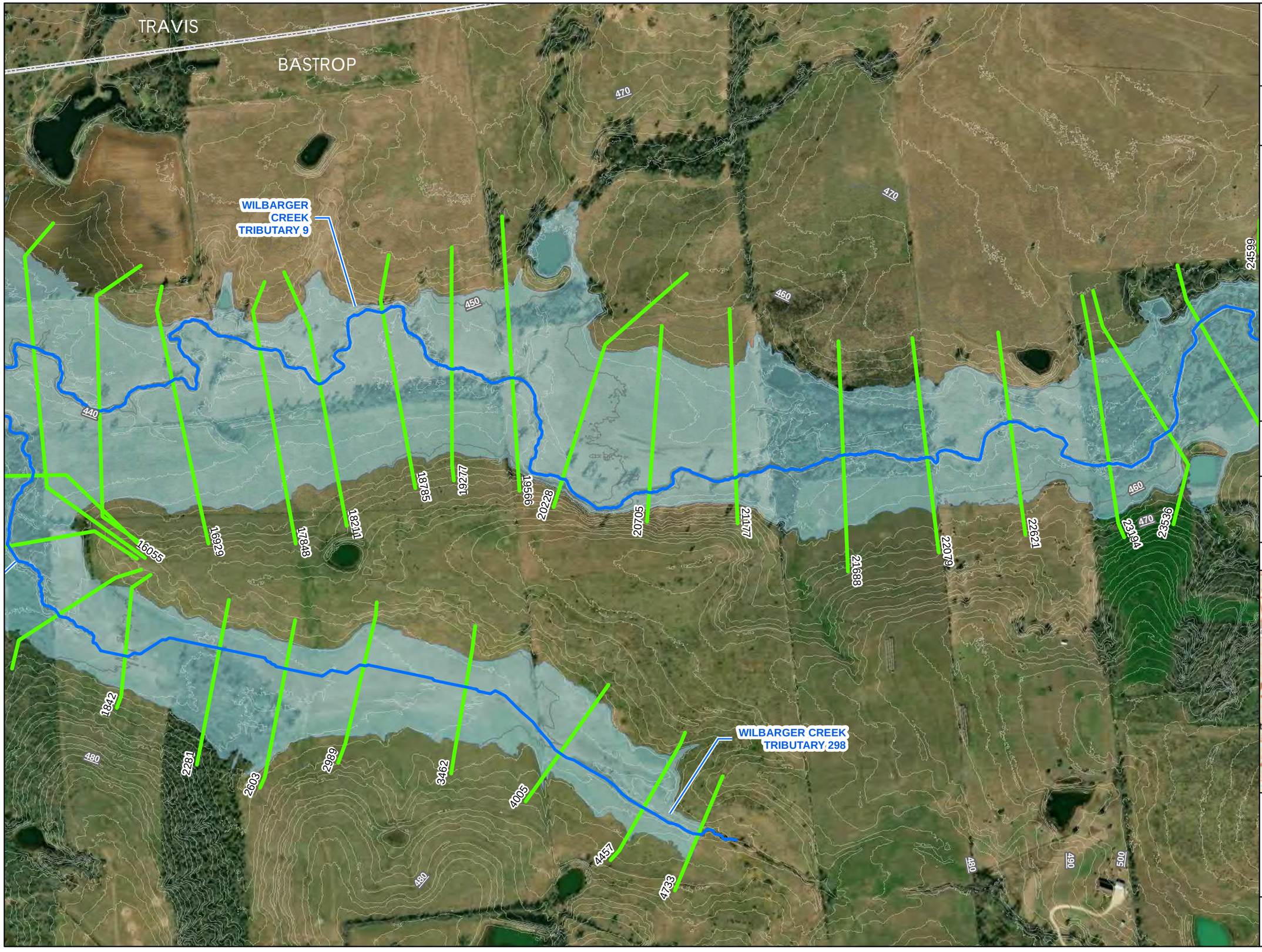
Panel 3 of 6



N

0 400 800 Feet

HALFF



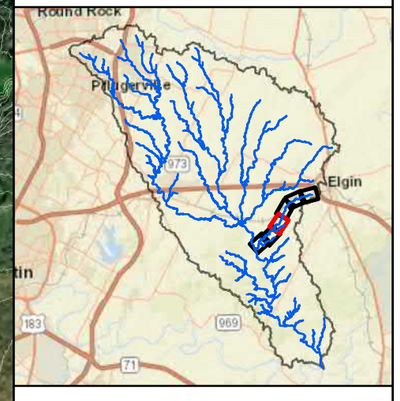
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 9, 286, and 298

Panel 4 of 6



0 400 800 Feet

HALFF

TRAVIS

BASTROP

WILBARGER CREEK TRIBUTARY 9

WILBARGER CREEK TRIBUTARY 298

WILBARGER CREEK TRIBUTARY 286

WC_T286_STR_100

Upper Elgin

8145 8553 9229 9638 10099 10562 11116 11529 11964 12708 13531 14067 14354 697 15379 15547 16055 1489 1842 3994 4228 4537 5194 5786 6374 6481 6744 6984 7462 7632 7734 8129

430 440 450 460 470 480 490

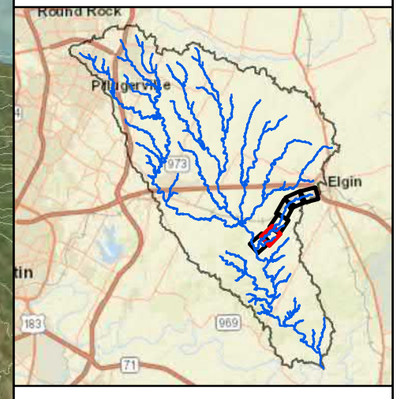
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 9, 286, and 298

Panel 5 of 6



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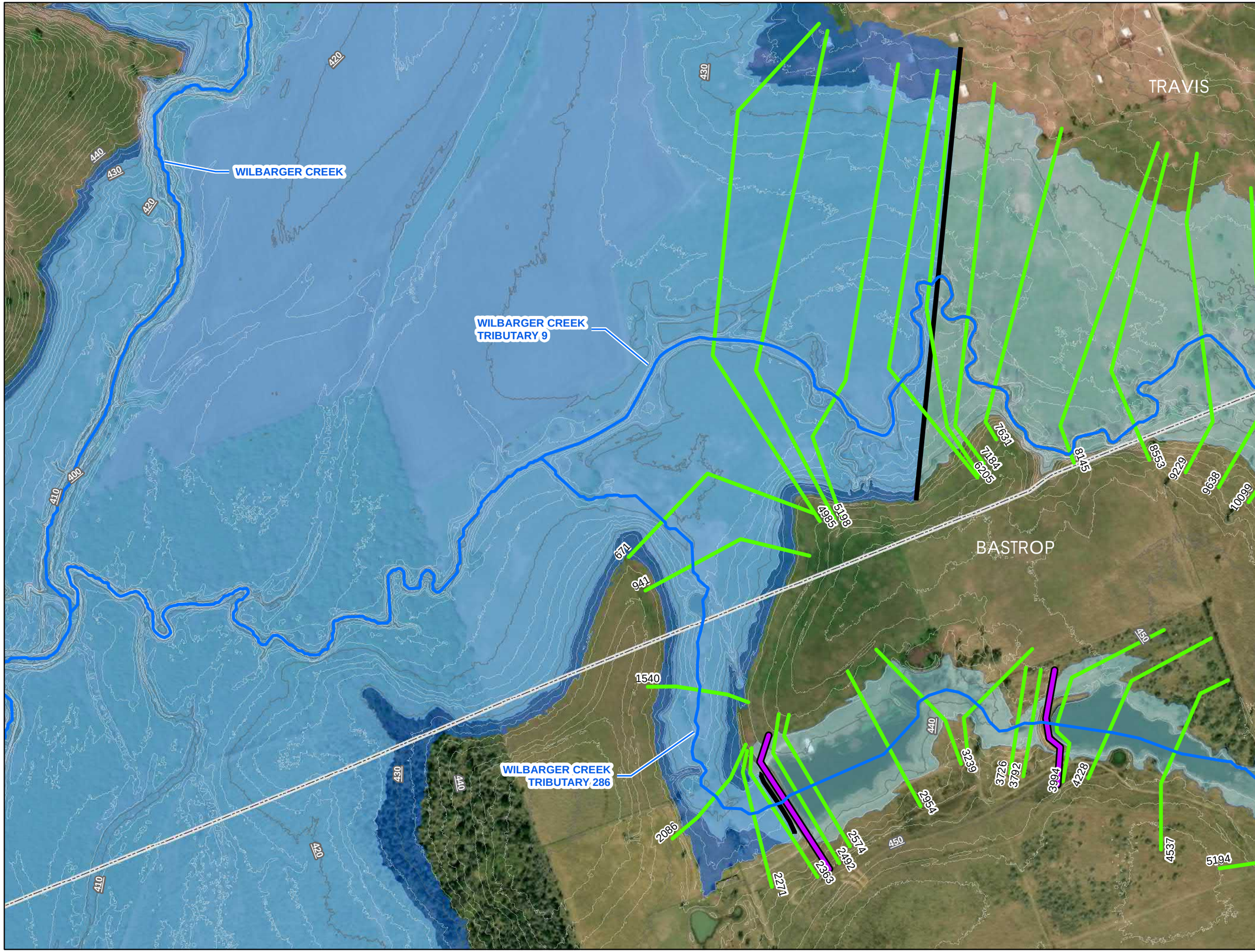
HALFF



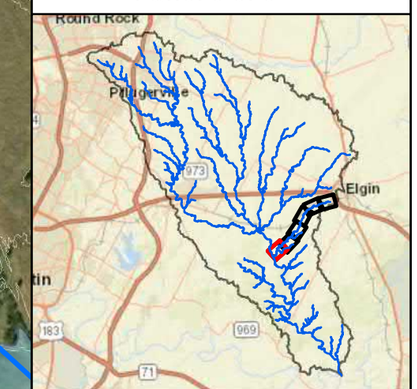
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain
- City Boundary
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 9, 286, and 298

Panel 6 of 6



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0 400 800 Feet

HALFF

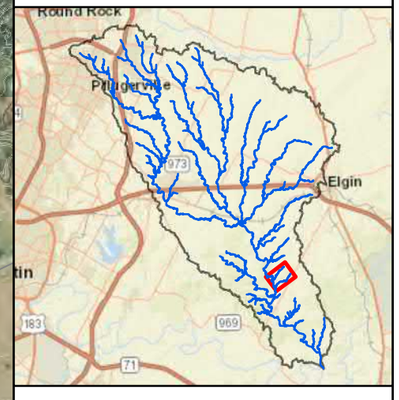
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Inline Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain

Wilbarger Creek Watershed Hydraulic Workmap

Wilbarger Creek
Tributaries 304 & 305

Panel 1 of 1



0 600 1,200 Feet

HALFF

WILBARGER CREEK
TRIBUTARY 304

WILBARGER CREEK

WILBARGER CREEK
TRIBUTARY 305

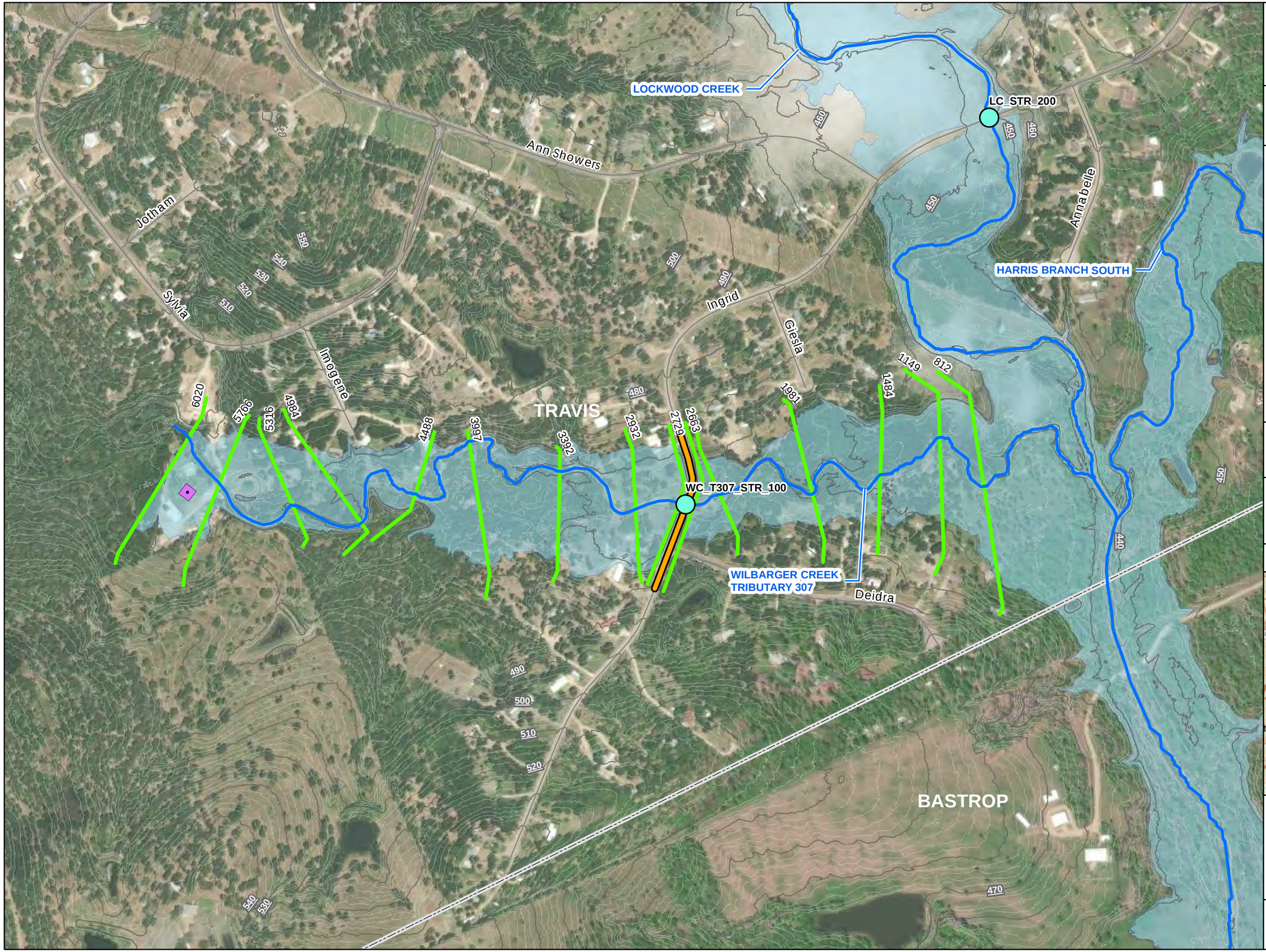
Balch

Speir

FM 1704

1439 1588 1974 2474 3007 3486 3999 4457 4643 4771 4959 5175 5393 5609 5819 6039 6259 6636 6815 7151 7534 7819

3469 3944 4428 4889 5074 5427 5923 6327 6836 7271 7584 7980 8443 8818 9188 9504 10000 10222



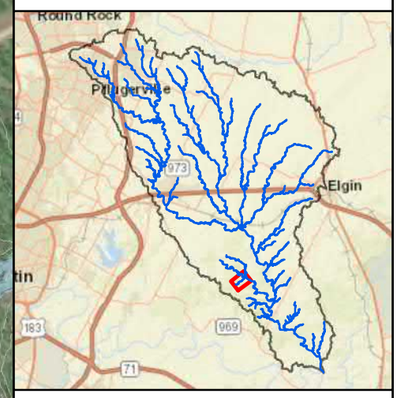
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- County Boundary

Wilbarger Creek Watershed Hydraulic Workmap

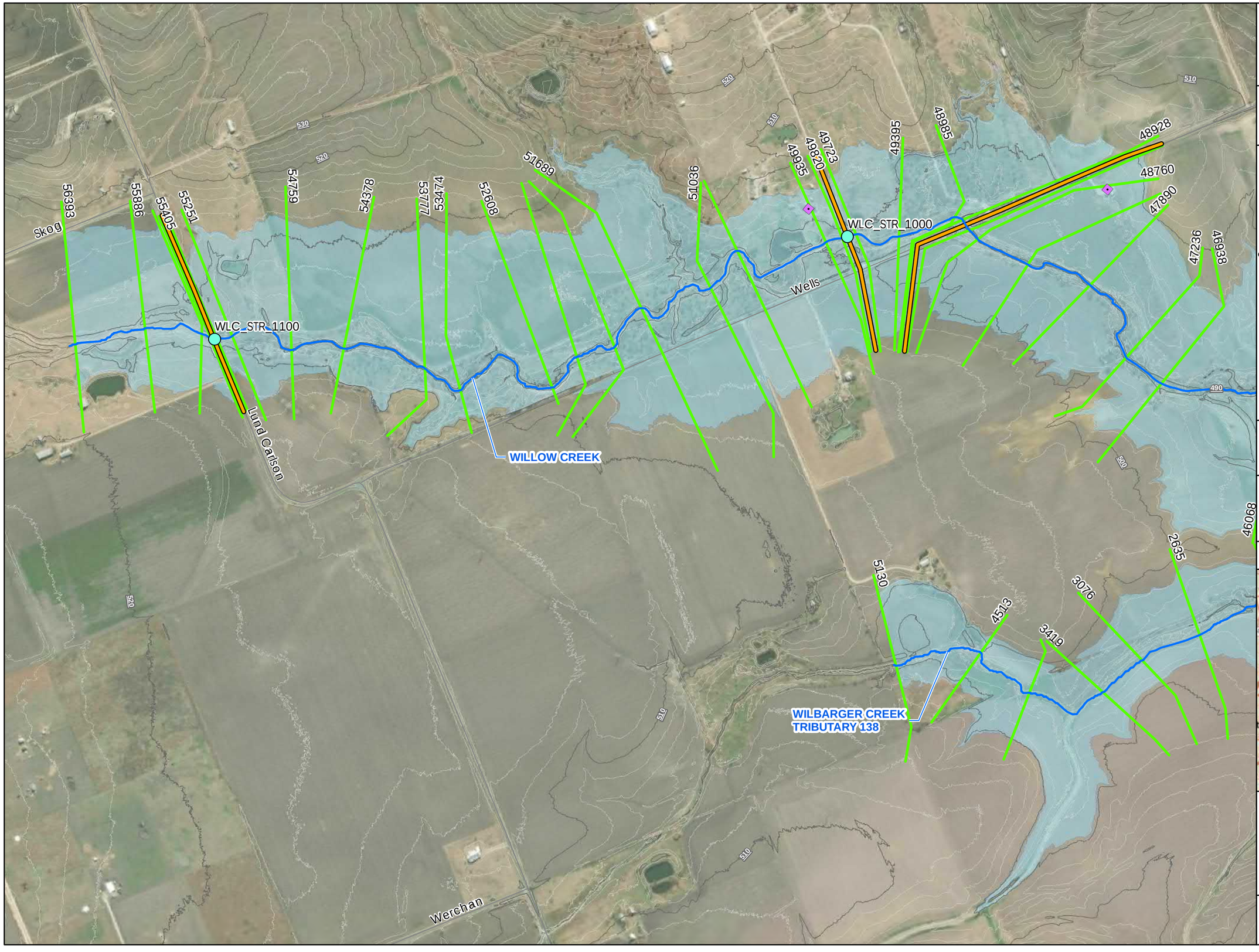
Wilbarger Creek Tributary 307

Panel 1 of 1



0 400 800 Feet

HALFF



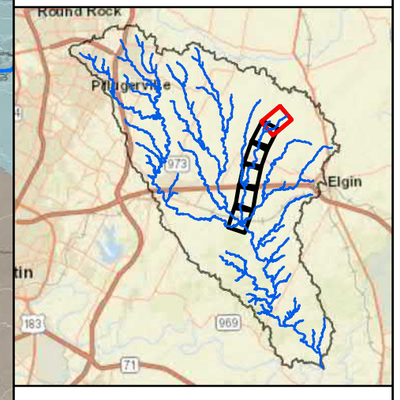
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain

Wilbarger Creek Watershed Hydraulic Workmap

Willow Creek and Wilbarger Creek Tributary 138

Panel 1 of 6



0 600 1,200 Feet

HALFF

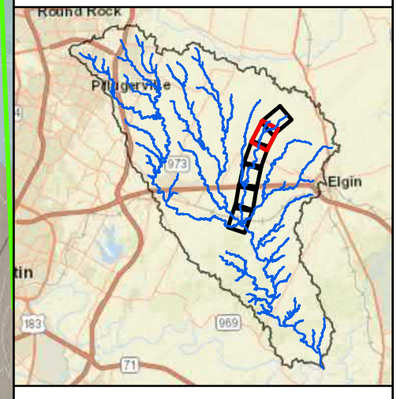
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain

Wilbarger Creek Watershed Hydraulic Workmap

Willow Creek and Wilbarger Creek Tributary 138

Panel 2 of 6



0 600 1,200 Feet

HALFF

Wells
Carlson
WILLOW CREEK
WILBARGER CREEK TRIBUTARY 138
49395
48985
48928
48760
47890
46938
46068
45510
45154
44187
43695
43136
42719
42245
41530
41180
40043
38406
38026
37313
34419
3076
2635
2005
1651
500
490
510
520

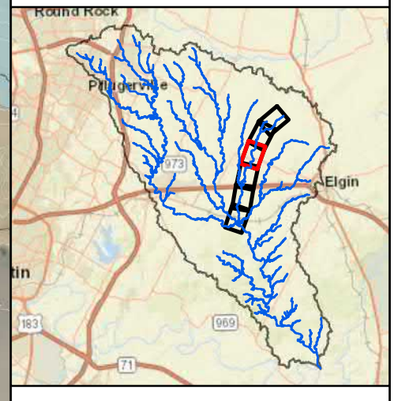
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain

Wilbarger Creek Watershed Hydraulic Workmap

Willow Creek and Wilbarger Creek Tributary 138

Panel 3 of 6



N

0 600 1,200 Feet

HALFF

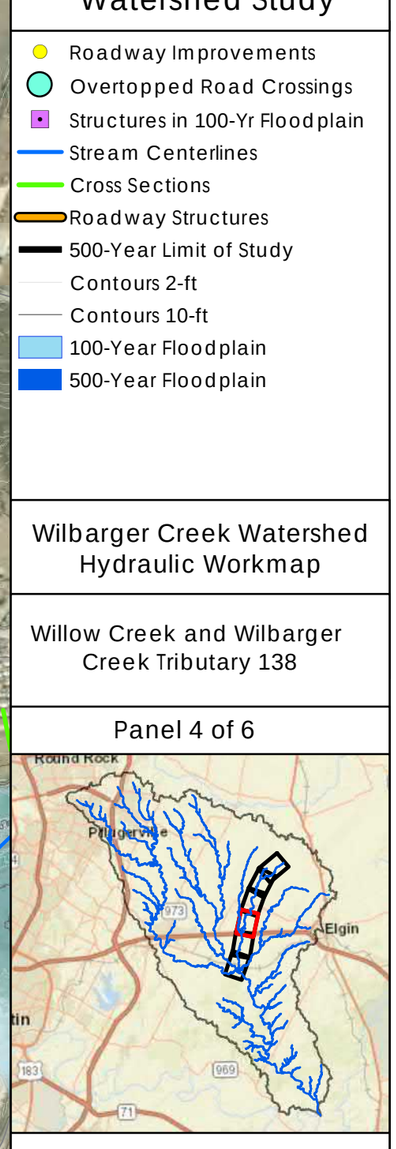
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain

Wilbarger Creek Watershed Hydraulic Workmap

Willow Creek and Wilbarger Creek Tributary 138

Panel 4 of 6



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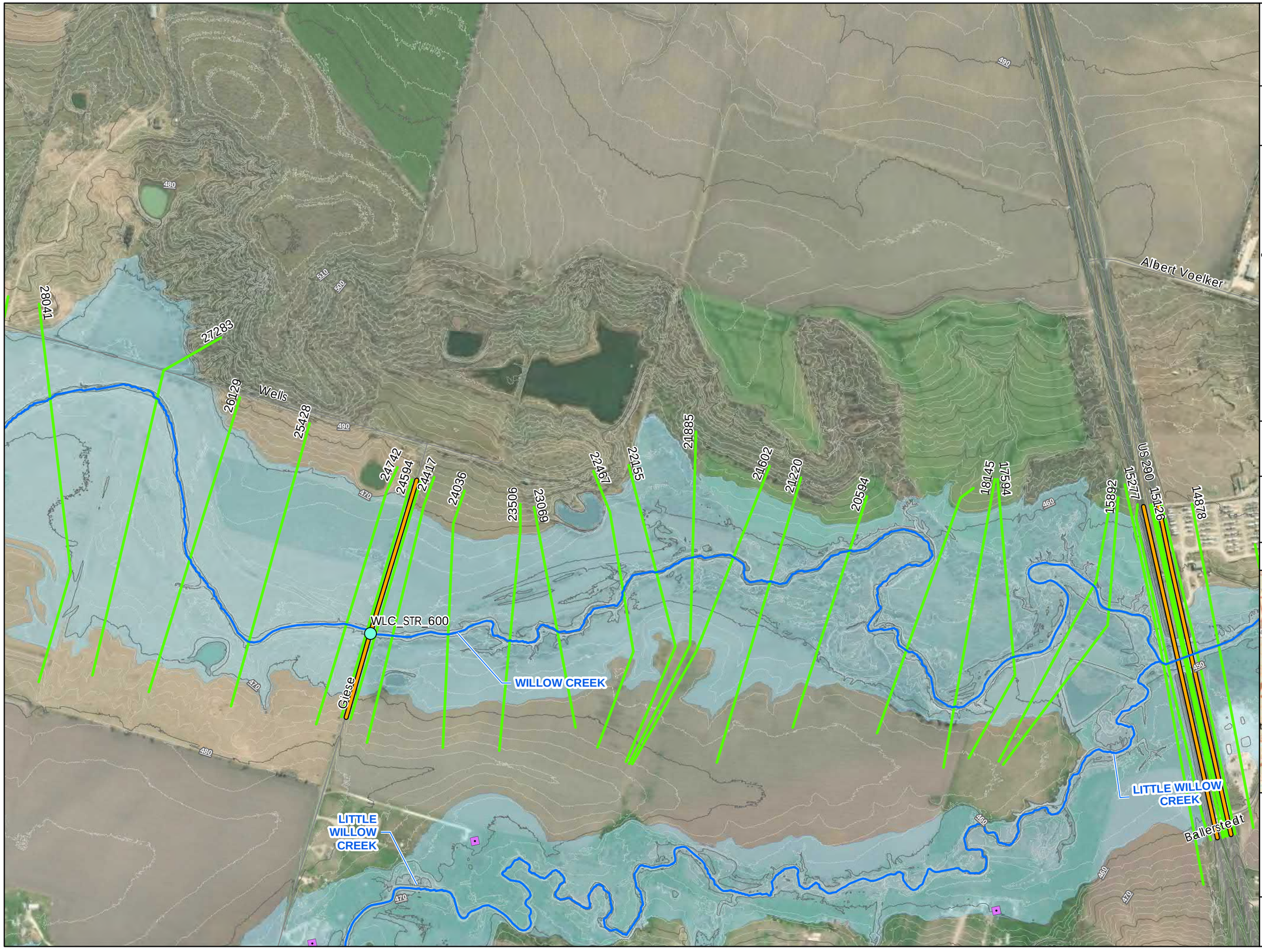
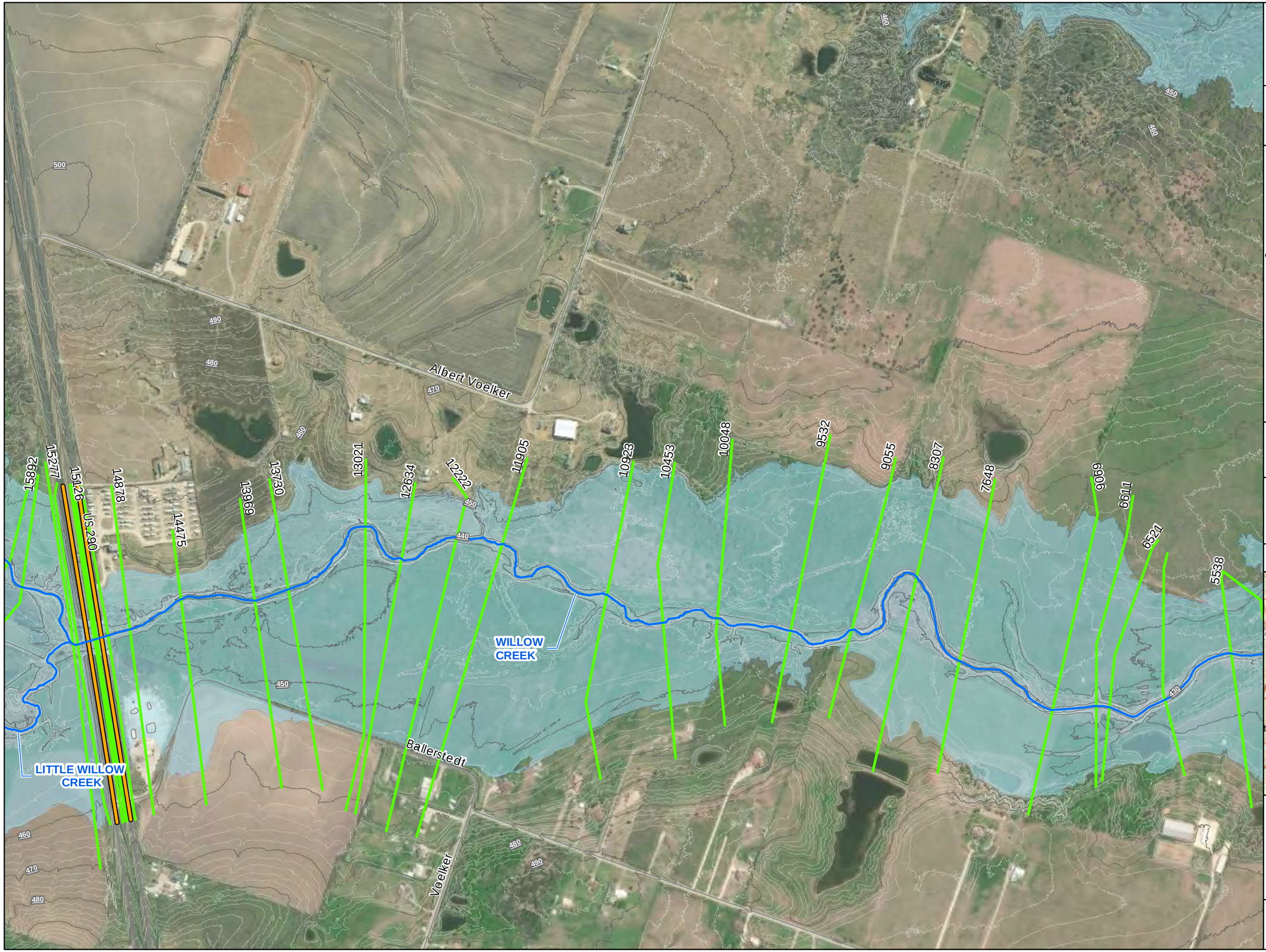
0 600 1,200 Feet

HALFF





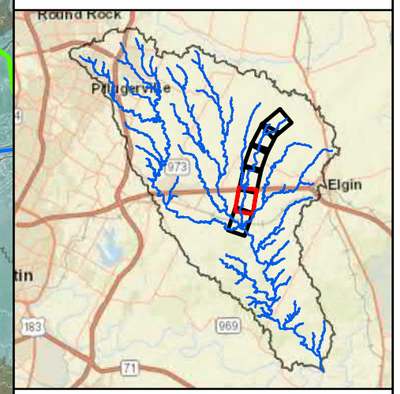
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain

Wilbarger Creek Watershed Hydraulic Workmap

Willow Creek and Wilbarger Creek Tributary 138

Panel 5 of 6



N

0 600 1,200 Feet

HALFF

DCW_STR_200_B
DCW_STR_200_A
DRY CREEK WEST
2413
1733
2887
3447
3964
6606
6611
6521
5288
4456
WLC_STR_200
WLC_STR_100
Little
WILLOW CREEK
WILBARGER CREEK
COTTONMOUTH CREEK
CC_STR_100
CC_STR_200
Ballerstedt

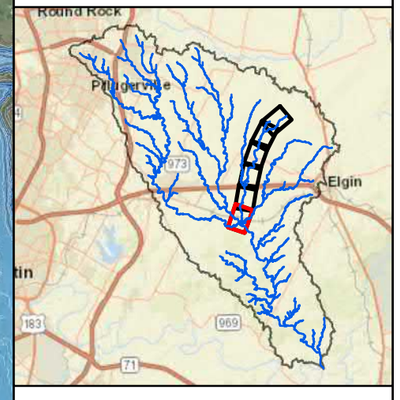
Wilbarger Creek Watershed Study

- Roadway Improvements
- Overtopped Road Crossings
- Structures in 100-Yr Floodplain
- Stream Centerlines
- Cross Sections
- Roadway Structures
- 500-Year Limit of Study
- Contours 2-ft
- Contours 10-ft
- 100-Year Floodplain
- 500-Year Floodplain

Wilbarger Creek Watershed Hydraulic Workmap

Willow Creek and Wilbarger Creek Tributary 138

Panel 6 of 6



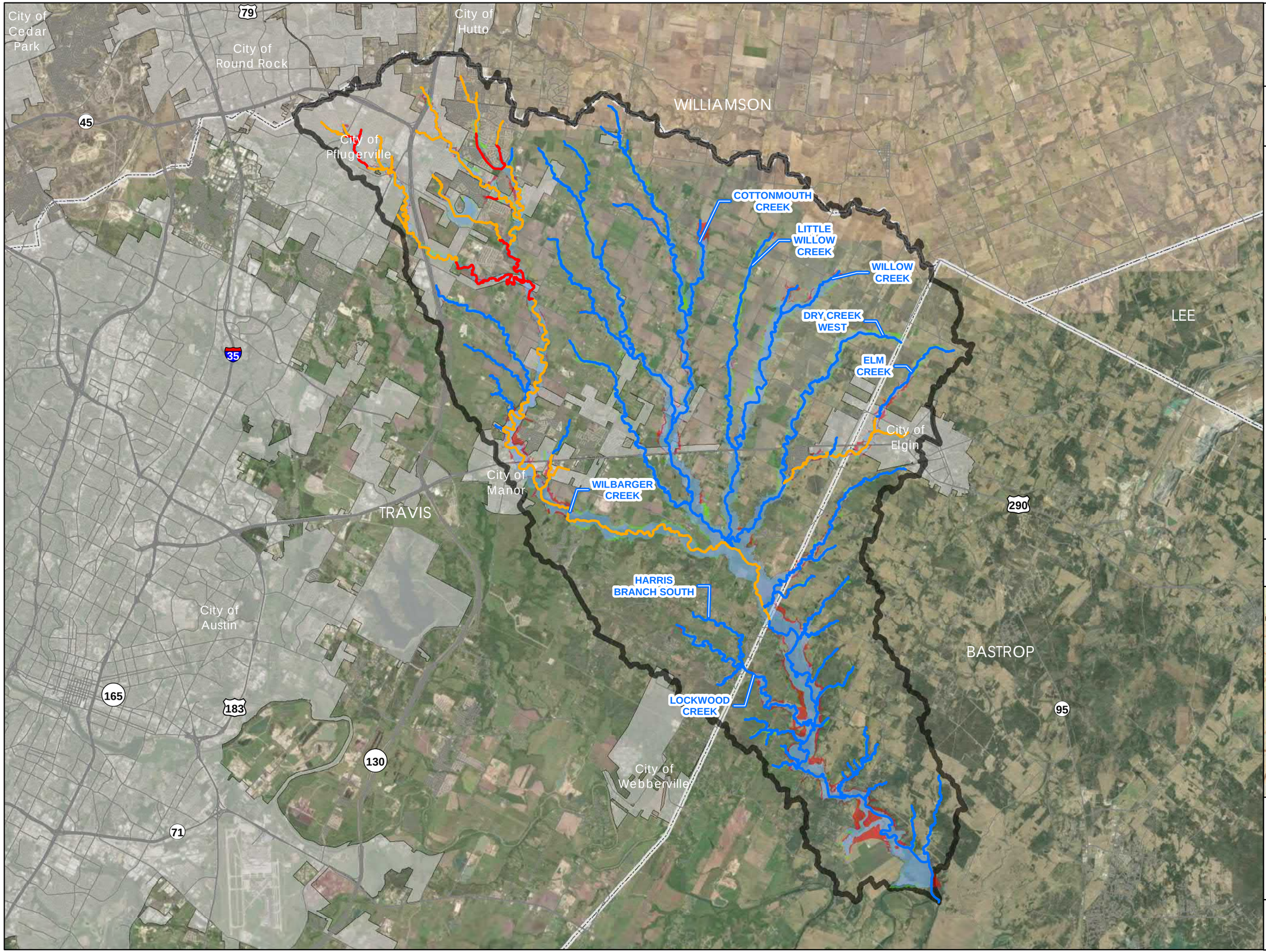
N

0 600 1,200 Feet

HALFF

Appendix G: Floodplain Mapping

G-2 Comparison to FEMA Effective Floodplain



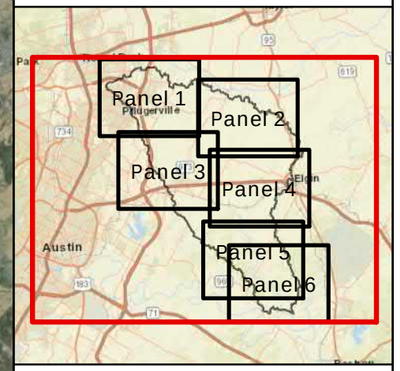
Wilbarger Creek Watershed Study

- Limited Detail Study
- Detailed Study with Floodway
- Detailed Study without Floodway
- Watershed Boundary
- City Boundary
- County Boundary

Floodplain Changes

- Decrease
- Increase
- No Change

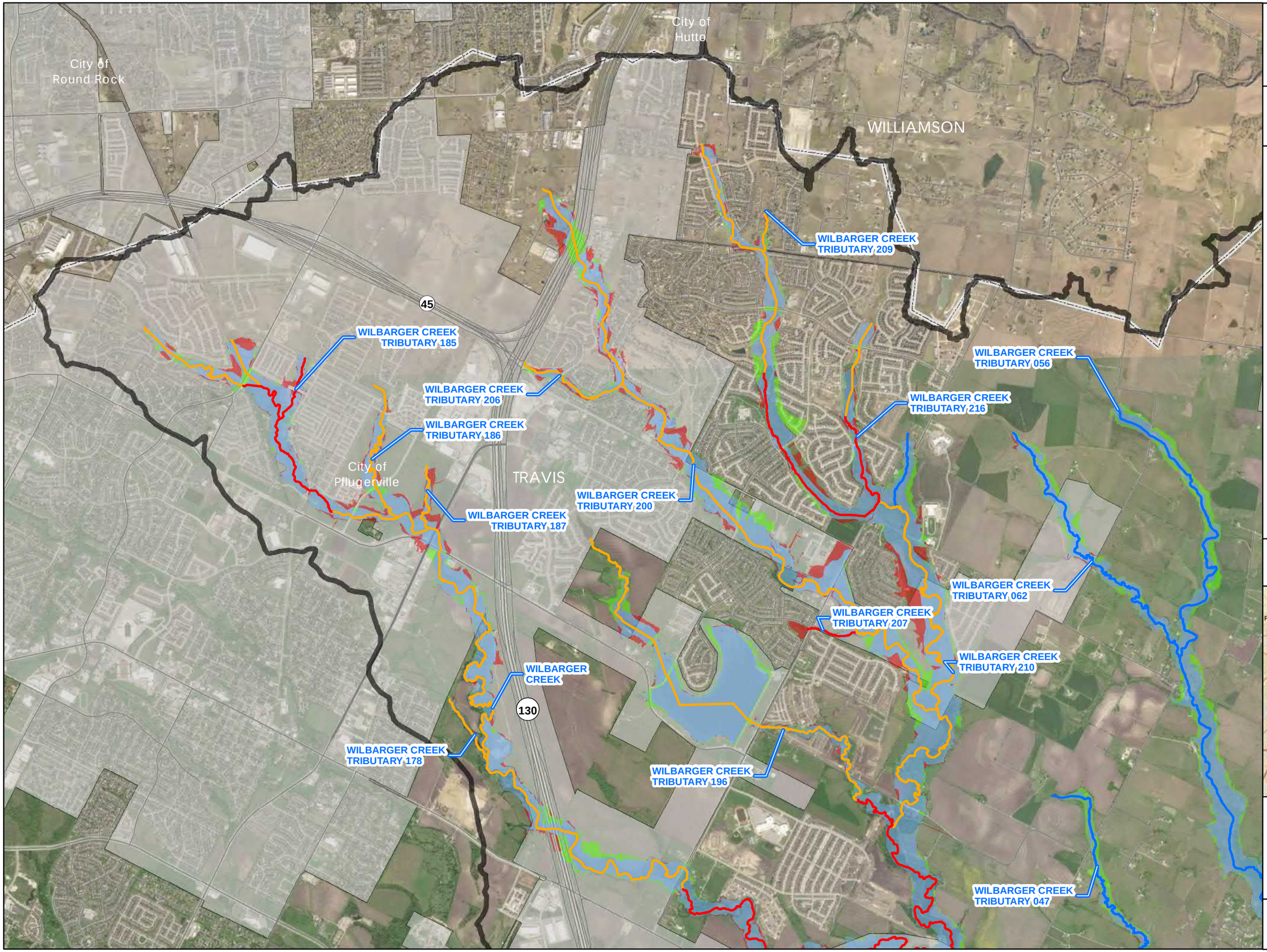
Exhibit G2
Floodplain Comparison



N

0 12,000 24,000 Feet

HALFF



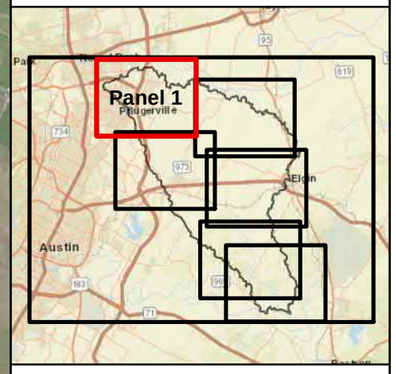
Wilbarger Creek Watershed Study

- Limited Detail Study
- Detailed Study with Floodway
- Detailed Study without Floodway
- Watershed Boundary
- City Boundary
- County Boundary

Floodplain Changes

- Decrease
- Increase
- No Change

Exhibit G2.1
Floodplain Comparison



N

0 3,000 6,000 Feet

HALFF

Wilbarger Creek Watershed Study

- Limited Detail Study
- Detailed Study with Floodway
- Detailed Study without Floodway
- Watershed Boundary
- City Boundary
- County Boundary

Floodplain Changes

- Decrease
- Increase
- No Change

WILLIAMSON

TRAVIS

BASTROP

City of Pflugerville

WILBARGER CREEK TRIBUTARY 080

WILBARGER CREEK TRIBUTARY 082

LITTLE WILLOW CREEK

COTTONMOUTH CREEK

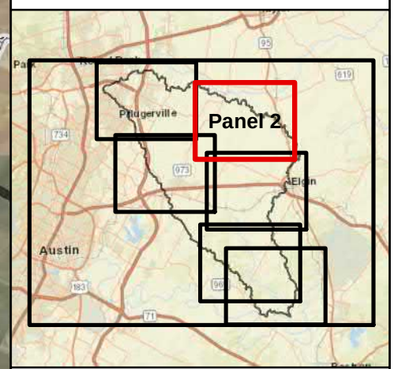
WILBARGER CREEK TRIBUTARY 138

WILLOW CREEK

DRY CREEK WEST

95

Exhibit G2.2
Floodplain Comparison



N

0 3,000 6,000 Feet

HALFF

Wilbarger Creek Watershed Study

City of Pflugerville

City of Austin

City of Manor

WILBARGER CREEK TRIBUTARY 220

WILBARGER CREEK TRIBUTARY 227

WILBARGER CREEK TRIBUTARY 171

WILBARGER CREEK TRIBUTARY 047

WILBARGER CREEK

WILBARGER CREEK TRIBUTARY 113

WILBARGER CREEK TRIBUTARY 167

130

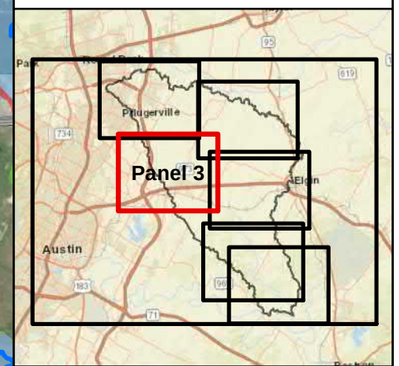
290

- Limited Detail Study
- Detailed Study with Floodway
- Detailed Study without Floodway
- Watershed Boundary
- City Boundary
- County Boundary

Floodplain Changes

- Decrease
- Increase
- No Change

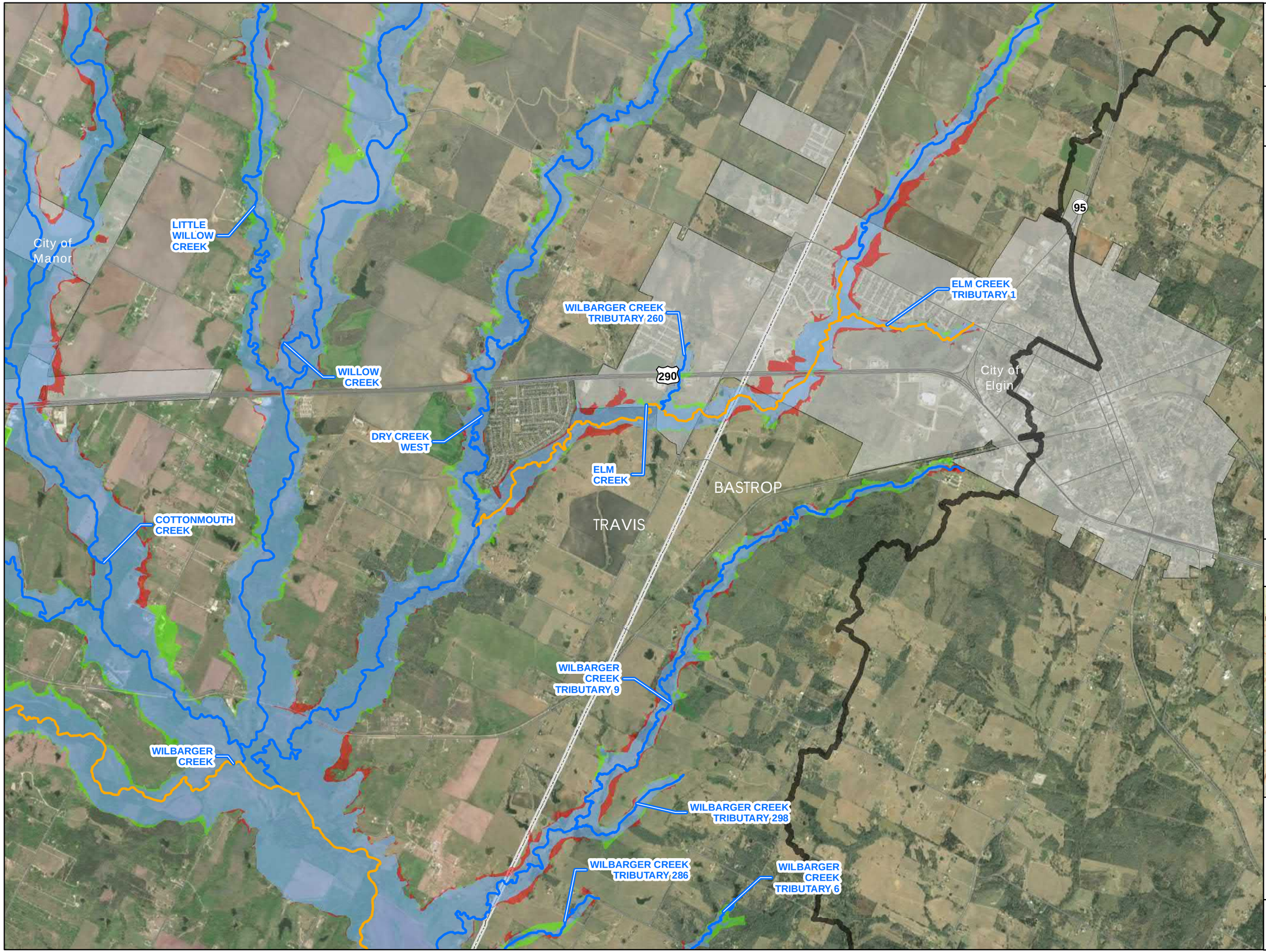
Exhibit G2.3
Floodplain Comparison



N

0 3,000 6,000 Feet

HALFF



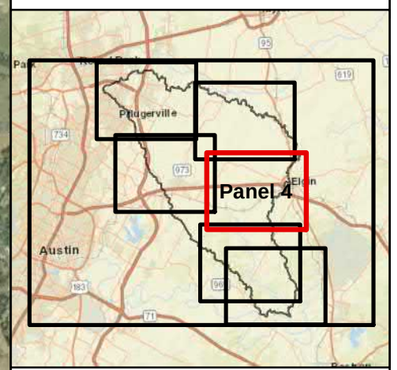
Wilbarger Creek Watershed Study

- Limited Detail Study
- Detailed Study with Floodway
- Detailed Study without Floodway
- Watershed Boundary
- City Boundary
- County Boundary

Floodplain Changes

- Decrease
- Increase
- No Change

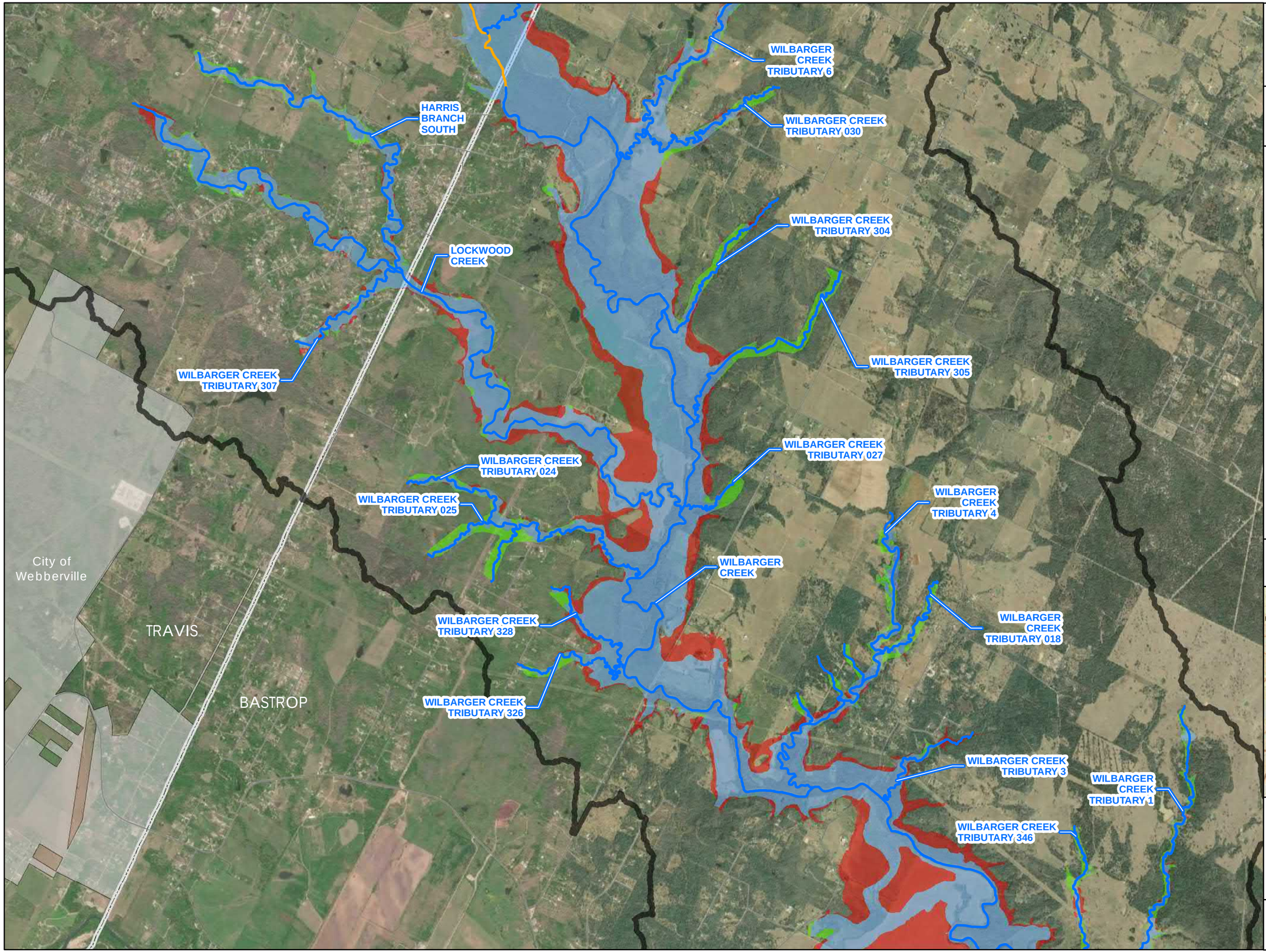
Exhibit G2.4
Floodplain Comparison



N

0 3,000 6,000 Feet

HALFF



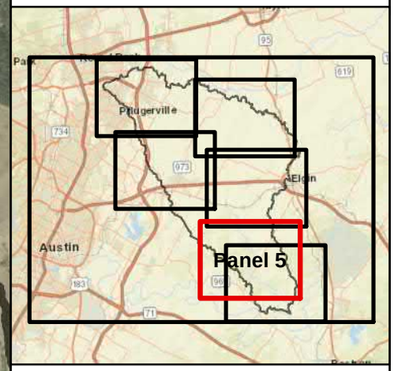
Wilbarger Creek Watershed Study

- Limited Detail Study
- Detailed Study with Floodway
- Detailed Study without Floodway
- Watershed Boundary
- City Boundary
- County Boundary

Floodplain Changes

- Decrease
- Increase
- No Change

Exhibit G2.5
Floodplain Comparison



N

0 3,000 6,000 Feet

HALFF

TRAVIS

BASTROP

WILBARGER CREEK TRIBUTARY 305

WILBARGER CREEK TRIBUTARY 027

WILBARGER CREEK TRIBUTARY 024

WILBARGER CREEK TRIBUTARY 025

WILBARGER CREEK TRIBUTARY 4

WILBARGER CREEK

WILBARGER CREEK TRIBUTARY 328

WILBARGER CREEK TRIBUTARY 018

WILBARGER CREEK TRIBUTARY 326

WILBARGER CREEK TRIBUTARY 3

WILBARGER CREEK TRIBUTARY 1

WILBARGER CREEK TRIBUTARY 346

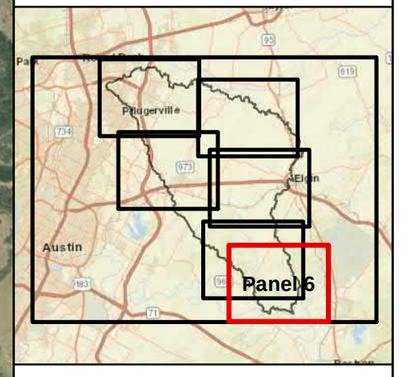
Wilbarger Creek Watershed Study

- Limited Detail Study
- Detailed Study with Floodway
- Detailed Study without Floodway
- Watershed Boundary
- City Boundary
- County Boundary

Floodplain Changes

- Decrease
- Increase
- No Change

Exhibit G2.6
Floodplain Comparison



N

0 3,000 6,000 Feet

HALFF

Appendix H: Alternative Evaluation

H-1 Roadway Crossing Urgency Rating

Wilbarger Creek Structure Urgency Ratings - Bastrop County																					
Stream[1]	Structure Station[2] (ft)	Structure ID	Road Name[3]	Structure Type[4]	Level of Study	Visit Type	AADT Traffic Count[5] (veh/day)	Minimum TOR	Frequency Water Surface Elevation[7] (ft)							Annual Chance of Flooding[8]		Flowrate at Structure (Q)[9] (cfs)		Urgency Rating[10] (veh/day/yr)	Risk Rank
									2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr	Year Event	Percent Chance	25-yr	100-yr		
EC	23115	EC_STR_4000	FM 1100	Culverts	Detailed Study	Survey	4731	507.8	505.4	508.7	509.2	509.8	510.2	510.6	511.3	5-yr	20%	5100	7700	946.2	1
EC	38608	EC_STR_600	TX-95	Culverts	Detailed Study	Field Recon	8409	564.3	560.3	560.7	564.6	565.0	565.2	565.3	565.7	10-yr	10%	720	1000	840.9	2
EC	18054	EC_STR_2000	US-290 EASTBOUND	Bridge	Detailed Study	Survey	30528	499.1	494.0	495.0	495.8	497.5	499.6	500.2	501.0	50-yr	2%	6000	9500	610.6	3
WC	35719	WC_STR_300	FM 1704	Bridge	Detailed Study	Field Recon	2453	390.4	387.2	393.0	394.8	397.9	400.0	402.8	409.6	5-yr	20%	79200	129100	490.6	4
EC	18161	EC_STR_3000	US-290 WESTBOUND	Bridge	Detailed Study	Survey	30528	501.3	494.6	495.9	496.8	498.9	499.7	502.4	503.4	100-yr	1%	6000	9500	305.3	5
WC_T009	25659	WC_T9_STR_100_A & WC_T9_STR_100_B	MONKEY RD	Multiple Opening	Limited Detail Study	Field Recon	530	466.35	466.9	467.6	468.0	468.5	468.8	469.1	470.0	2-yr	50%	4800	7000	265.0	6
WC	24571	WC_STR_200	LOWER ELGIN RD	Bridge	Detailed Study	Field Recon	377	372.99	376.6	379.4	381.4	383.7	385.5	387.6	392.6	2-yr	50%	79400	129600	188.5	7
WC	67996	WC_STR_400	UPPER ELGIN RD	Multiple Opening	Detailed Study	Field Recon	361	412.09	414.0	415.7	416.9	418.8	420.2	421.9	426.3	2-yr	50%	76800	123500	180.5	8
WC_T006	14007	WC_T6_STR_200	YOUNGS PRAIRIE RD	Culverts	Limited Detail Study	Field Recon	290	457.6	458.0	458.3	458.5	458.7	459.0	459.2	459.6	2-yr	50%	1500	2100	145.0	9
WC_T030	5799	WC_T030_STR_100	BALCH RD	Culverts	Limited Detail Study	Field Recon	250	429.9	431.1	431.5	431.7	431.9	432.2	432.4	432.9	2-yr	50%	1800	2600	125.0	10
WC_T004	5553	WC_T4_STR_100	WILBARGER CREEK DR	Culverts	Limited Detail Study	Field Recon	210	378.5	383.2	384.3	385.5	386.9	387.8	388.3	390.0	2-yr	50%	5500	8400	105.0	11
WC_T020	1139	WC_T020_STR_100	WILBARGER CREEK DR	Culverts	Limited Detail Study	Field Recon	110	404.3	405.3	405.5	405.7	406.0	406.2	406.4	406.7	2-yr	50%	270	370	55.0	12
LC	10406	LC_STR_100	UPPER ELGIN RD	Bridge	Limited Detail Study	Field Recon	70	405.8	407.3	408.1	408.6	409.2	409.6	410.1	411.4	2-yr	50%	9100	14300	35.0	13
WC_T024	8552	WC_T024_STR_100_A & WC_T024_STR_100_B	UPPER ELGIN RIVER RD	Multiple Opening	Limited Detail Study	Field Recon	70	429.0	429.9	430.3	430.6	430.9	431.1	431.4	431.9	2-yr	50%	1800	2600	35.0	13
WC_T009	40803	WC_T9_STR_400	UPPER ELGIN RD	Culverts	Limited Detail Study	Field Recon	50	541.0	541.6	541.8	541.8	541.9	542.0	542.1	542.3	2-yr	50%	500	700	25.0	15
WC_T326	3281	WC_T326_STR_100	OLD AUSTIN TRL	Culverts	Limited Detail Study	Field Recon	50	388.0	389.4	389.7	389.8	390.0	390.3	390.3	390.7	2-yr	50%	1100	1600	25.0	15
WC_T024	6538	WC_T024_STR_200	DRY WILLOW RD	Culverts	Limited Detail Study	Field Recon	40	413.6	415.4	415.8	416.0	416.3	416.7	417.0	417.5	2-yr	50%	2000	2900	20.0	17
WC_T006	5797	WC_T6_STR_100	BALCH RD	Bridge	Limited Detail Study	Field Recon	280	418.3	415.4	417.5	418.2	418.6	418.8	419.2	419.9	25-yr	4%	2200	3300	11.2	18
WC_T019	1462	WC_T019_STR_200	WILBARGER CREEK DR	Culverts	Limited Detail Study	Field Recon	20	418.9	419.7	420.0	420.3	420.5	420.7	420.9	421.2	2-yr	50%	220	310	10.0	19
WC_T003	4239	WC_T3_STR_100	FOREST RIDGE DR	Culverts	Limited Detail Study	Field Recon	190	398.3	390.5	391.6	392.7	398.4	399.7	400.2	401.3	25-yr	4%	1200	2000	7.6	20

Proposed Roadway Improvement Location

Notes
1. As designated within HEC-RAS models
2. Stationing begins at the most downstream location of conveyance for the stream
3. As designated within HEC-RAS models
4. AS designated within HEC-RAS models
5. Data interpreted from TxDOT 2019 Austin District Traffic Map
6. Minimum TOR elevation includes surrounding roadways
7. As determined by HEC-RAS models
8. Flood event at which the minimum TOR is overtopped
9. Flowrates taken from adjacent upstream XS
10. Calculated as (AADT Traffic Count)/(Frequency of flooding storm event)

Wilbarger Creek Structure Urgency Ratings - Travis County																				
Stream[1]	Structure Station[2]	Structure ID	Road Name[3]	Structure Type[4]	Level of Study	Visit Type	AADT Traffic Count[5]	Minimum TOR	Frequency Water Surface Elevation[7] (ft)							Annual Chance of Flooding[8]		Flowrate at Structure (Q)[9] (cfs)		Urgency Rating[10]	Risk Rank
	(ft)						(veh/day)		2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr	Year Event	Percent Chance	25-yr	100-yr	(veh/day/yr)	
CC	19188	CC_STR_400	US-290	Bridge	Limited Detail Study	Field Recon	30630	464.5	461.2	466.4	468.8	470.2	471.2	472.1	474.1	5-yr	20%	30600	48000	6126.0	1
WC_T056	31074	WC_T056_STR_400	FM 973	Culverts	Limited Detail Study	Field Recon	8040	517.1	517.6	518.9	519.6	520.4	520.9	521.3	522.2	2-yr	50%	9100	13200	4020.0	2
CC	19084	CC_STR_300	US-290	Bridge	Limited Detail Study	Field Recon	30630	462.9	461.5	461.5	465.6	467.3	468.4	469.5	471.6	10-yr	10%	30600	48000	3063.0	3
WC_T167	2035	WC_T167_STR_2000	OLD HIGHWAY 20	Bridge	Detailed Study	Survey	4991	499.7	501.1	501.7	502.0	502.4	502.7	502.9	504.0	2-yr	50%	3200	4400	2495.5	4
WC_T210	27970	WC_T210_STR_2000	CELE RD	Bridge	Detailed Study	Survey	2792	612.2	612.9	613.7	614.1	614.5	614.8	615.1	615.7	2-yr	50%	6800	9500	1396.0	5
DCW	27321	DCW_STR_500	US-290	Bridge	Limited Detail Study	Field Recon	30860	475.0	468.7	468.7	468.7	475.5	476.4	477.2	478.6	25-yr	4%	5600	8800	1234.4	6
WC_T220	6109	WC_T220_STR_100	GREGG LN	Culverts	Limited Detail Study	Field Recon	2280	539.9	541.4	542.0	542.2	542.6	542.9	543.2	544.0	2-yr	50%	4600	6800	1140.0	7
WC	159485	WC_STR_16000	GREGG LN	Culverts	Detailed Study	Survey	2278	526.1	531.3	532.4	533.5	534.9	536.0	537.1	540.0	2-yr	50%	23300	35600	1139.0	8
EC	12988	EC_STR_1500 & EC_STR_1000	COUNTY LINE RD	Multiple Opening	Detailed Study	Survey	2278	483.1	483.8	484.6	485.1	485.6	486.0	486.6	487.7	2-yr	50%	6100	9800	1138.8	9
WC_T167	5197	WC_T167_STR_3000	US-290	Culverts	Detailed Study	Survey	44701	515.1	509.5	510.2	511.0	511.2	515.7	516.2	517.2	50-yr	2%	2600	3600	894.0	10
WC_T080	17477	WC_T080_STR_300	FM 973	Culverts	Limited Detail Study	Field Recon	7850	530.2	524.1	524.1	530.8	531.7	532.2	532.7	533.7	10-yr	10%	6000	8800	785.0	11
WC_T082	2777	WC_T082_STR_200	FM 973	Culverts	Limited Detail Study	Field Recon	7850	535.3	530.4	530.4	537.7	538.5	538.8	539.0	539.7	10-yr	10%	3100	4000	785.0	11
WC	173364	WC_STR_17000	CAMERON RD	Bridge	Detailed Study	Survey	1561	552.3	555.1	556.3	557.2	558.3	559.1	560.0	562.4	2-yr	50%	22600	34200	780.5	13
WC_T260	1900	WC_T260_STR_100	US-290	Culverts	Limited Detail Study	Field Recon	31100	494.3	484.8	485.8	486.4	487.5	494.6	495.0	495.5	50-yr	2%	1700	2300	622.0	14
DCW	27214	DCW_STR_400	US-290	Bridge	Limited Detail Study	Field Recon	30860	473.0	468.6	469.5	470.4	472.6	473.4	474.3	476.2	50-yr	2%	5600	8800	617.2	15
WC_T220	25073	WC_T220_STR_300	CAMERON RD	Culverts	Limited Detail Study	Field Recon	3010	595.2	592.9	596.3	597.3	598.0	598.3	598.4	599.0	5-yr	20%	2500	3300	602.0	16
WC_T056	44490	WC_T056_STR_500	CAMERON RD	Culverts	Limited Detail Study	Field Recon	1090	545.9	548.3	549.1	549.8	550.7	551.3	551.9	553.3	2-yr	50%	5900	8300	545.0	17
WC_T208	2127	WC_T208_STR_100	HODDE LN	Culverts	Limited Detail Study	Field Recon	2630	619.2	616.0	619.6	619.8	620.0	620.1	620.2	620.4	5-yr	20%	830	1100	526.0	18
WC_T210	29951	WC_T210_STR_3000	HODGE LN	Bridge	Detailed Study	Survey	2630	616.6	614.5	617.0	617.5	618.0	618.3	618.6	619.2	5-yr	20%	4100	5800	526.0	18
WC	134476	WC_STR_12000	US-290 WESTBOUND	Bridge	Detailed Study	Survey	51848	512.4	505.8	507.2	508.4	510.1	511.0	514.3	516.9	100-yr	1%	26100	40700	518.5	20
WC	134389	WC_STR_11000	US-290 EASTBOUND	Bridge	Detailed Study	Survey	51848	512.3	505.0	506.3	507.5	509.1	510.0	513.0	515.3	100-yr	1%	26100	40700	518.5	20
CC	4579	CC_STR_200	LITTIG RD	Bridge	Limited Detail Study	Field Recon	880	440.3	440.7	442.0	443.2	445.5	445.8	446.9	450.1	2-yr	50%	34200	54500	440.0	22
WLC	2466	WLC_STR_200	LITTIG RD	Bridge	Limited Detail Study	Field Recon	880	434.5	437.1	438.4	439.5	441.0	442.8	443.1	445.0	2-yr	50%	17900	26600	440.0	22
WC_T113	16071	WC_T113_STR_200	US-290	Culverts	Limited Detail Study	Field Recon	37670	487.5	479.8	481.6	483.1	485.3	487.4	488.1	489.4	100-yr	1%	4800	6800	376.7	24
DCW	7313	DCW_STR_200_A & DCW_STR_200_B	LITTIG RD	Multiple Opening	Limited Detail Study	Field Recon	690	433.4	436.1	436.9	437.8	438.6	439.2	441.6	444.1	2-yr	50%	11400	18400	345.0	25
WC	81655	WC_STR_6500 & WC_STR_6000	BITTING SCHOOL RD	Multiple Opening	Detailed Study	Survey	681	420.4	427.7	429.5	431.0	433.1	434.7	436.5	441.0	2-yr	50%	75700	120600	340.5	26
WC_T056	26447	WC_T056_STR_300	NEW SWEDEN CHURCH RD	Culverts	Limited Detail Study	Field Recon	640	506.8	508.4	509.4	510.0	510.7	511.2	511.7	512.7	2-yr	50%	9100	13200	320.0	27
WC_T056	16004	WC_T047_STR_200	SPARKS RD	Culverts	Limited Detail Study	Field Recon	590	483.7	487.7	488.6	489.5	490.7	491.6	492.5	494.6	2-yr	50%	10200	15300	295.0	28
WC_T200	13995	**WC_T200_STR_2000**	**HIDDEN LAKE DR**	Culverts	Detailed Study	Survey	6480	641.2	637.7	637.7	637.7	642.0	643.0	643.7	644.6	25-yr	4%	6400	9100	259.2	29
WC_T220	8408	WC_T220_STR_200	FUCHS GROVE RD	Culverts	Limited Detail Study	Field Recon	2570	550.7	545.5	545.5	551.0	552.0	552.2	552.7	553.5	10-yr	10%	4600	6800	257.0	30
WC_T056	7345	WC_T056_STR_100	BOIS D ARC LN	Bridge	Limited Detail Study	Field Recon	470	474.0	475.7	476.7	477.4	478.3	478.8	479.5	481.4	2-yr	50%	14000	21400	235.0	31
LWC	16876	LWC_STR_200	FM 1100	Bridge	Limited Detail Study	Field Recon	1750	491.6	487.2	488.6	492.2	493.4	493.9	494.1	495.0	10-yr	10%	3600	5300	175.0	32
WC_T210	42694	WC_T210_STR_10000	ROWE LN	Culverts	Detailed Study	Survey	4063	678.1	675.7	677.9	677.9	678.4	678.7	679.2	680.0	25-yr	4%	2300	3000	162.5	33
WC_T047	10272	WC_T047_STR_600	FM 973	Culverts	Limited Detail Study	Field Recon	8040	524.5	513.1	513.1	513.1	513.1	524.7	525.3	526.2	50-yr	2%	3500	5000	160.8	34
CC	39356	CC_STR_700	JACOBSON RD	Bridge	Limited Detail Study	Field Recon	300	485.6	486.0	487.1	488.3	489.2	489.8	490.4	491.7	2-yr	50%	16800	24800	150.0	35
WC	95955	WC_STR_7000	JONES RD	Bridge	Detailed Study	Survey	277	448.0	448.5	449.4	450.3	451.6	452.5	453.7	456.7	2-yr	50%	27200	42500	138.5	36
WC	129502	WC_STR_10000	FM 973	Bridge	Detailed Study	Survey	13368	506.9	500.6	502.2	503.5	505.4	505.4	509.3	511.8	100-yr	1%	26100	40700	133.7	37
WC_T196	3594	WC_T196_STR_2000	JESSE BOHLS RD	Culverts	Detailed Study	Survey	267	586.3	587.7	588.0	588.3	588.7	588.9	589.2	589.7	2-yr	50%	980	1400	133.5	38
WC_T113	34549	WC_T113_STR_600_A & WC_T113_STR_600_B	JOHNSON RD	Multiple Opening	Limited Detail Study	Field Recon	260	525.4	526.6	526.9	527.0	527.3	527.5	527.7	528.1	2-yr	50%	2300	3200	130.0	39
WC_T080	33201	WC_T080_STR_800	ENGELMANN LN	Culverts	Limited Detail Study	Field Recon	250	575.3	575.9	576.3	576.7	577.2	577.2	577.5	578.0	2-yr	50%	2300	3300	125.0	40
WC_T080	27403	WC_T080_STR_400	CAMERON RD	Culverts	Limited Detail Study	Field Recon	250	550.2	552.7	553.2	553.7	554.1	554.4	554.8	555.5	2-yr	50%	4300	6200	125.0	40
WC_T082	8330	WC_T082_STR_300	CAMERON RD	Culverts	Limited Detail Study	Field Recon	250	556.9	558.6	558.8	558.8	559.1	559.2	559.4	559.7	2-yr	50%	1800	2400	125.0	40
WC_T056	15358	WC_T056_STR_200 & WC_T047_STR_100	SPARKS RD	Multiple Opening	Limited Detail Study	Field Recon	240	484.9	487.4	488.3	489.2	490.5	491.4	492.2	494.4	2-yr	50%	10200	15300	120.0	43
WC_T169	1241	WC_T169_STR_100	FUCHS GROVE RD	Culverts	Limited Detail Study	Field Recon	240	536.8	537.7	537.9	538.0	538.2	538.3	538.4	538.7	2-yr	50%	1200	1700	120.0	43
WC_T227	7100	WC_T227_STR_100	FUCHS GROVE RD	Culverts	Limited Detail Study	Field Recon	2570	551.2	545.3	545.9	550.7	552.2	552.6	552.9	553.4	25-yr	4%	2600	3500	102.8	45
DCW	39526	DCW_STR_600	FM 1100	Bridge	Limited Detail Study	Field Recon	2370	495.8	492.3	493.6	494.5	498.4	498.7	498.9	499.6	25-yr	4%	5500	8300	94.8	46
WC_T080	36346	WC_T080_STR_900	MELBER LN	Culverts	Limited Detail Study	Field Recon	180	590.9	591.5	591.8	592.0	592.4	592.6	592.8	593.3	2-yr	50%	990	1500	90.0	47
WC_T086	3304	WC_T086_STR_100	MELBER LN	Culverts	Limited Detail Study	Field Recon	180	606.9	607.5	607.8	608.0	608.2	608.4	608.6	609.0	2-yr	50%	740	1000	90.0	47
CC	21928	CC_STR_500	OLD KIMBRO RD	Bridge	Limited Detail Study	Field Recon	170	458.6	464.5	466.9	469.2	470.7	471.8	472.8	475.2	2-yr	50%	30600	47700	85.0	49
WC_T113	17460	WC_T113_STR_300	OLD KIMBRO RD	Bridge	Limited Detail Study	Field Recon	170	484.1	484.7	485.8	486.3	487.1	487.8	488.4	489.8	2-yr	50%	4800	6800	85.0	49
WC_T167	11382	WC_T167_STR_900	RALPH RITCHIE RD	Culverts	Detailed Study	Field Recon	170	543.2	543.5	543.8	543.9	544.2	544.4	544.6	544.9	2-yr	50%	790	1100	85.0	49
WC_T216	2447	**WC_T216_STR_1000**	**ISLE OF GLASS ST**	Culverts	Detailed Study	Survey	2090	624.2	620.8	620.8	620.8	624.6	625.0	625.4	626.0	25-yr	4%	1800	2300	83.6	52
WC_T209	142	WC_T209_STR_100	COURT LN	Culverts	Detailed Study	Field Recon	4063	674.7	671.4	671.4	671.4	671.4	674.7	675.0	675.2	50-yr	2%	630	840	81.3	53
WLC	31458	WLC_STR_700	FM 1100	Bridge	Limited Detail Study	Field Recon	1750	476.5	473.9	474.5	475.0	476.8	477.1	477.5	478.7	25-yr	4%	13500	19900	70.0	54
DCW	17645	DCW_STR_300	ALBERT VOELKER RD	Bridge	Limited Detail Study	Field Recon	130	452.7	453.6	454.3	454.9	455.6	456.2	457.2	459.5	2-yr	50%	11200	18000	65.0	55
WC_T047	5910	WC_T047_STR_300	BOBBY RD	Culverts	Limited Detail Study	Field Recon	100	499.0	501.2	501.7	502.0	502.5	502.8	503.2	504.0	2-yr	50%	3500	5000	50.0	56
WC_T113	43461	WC_T113_STR_1000	ANDERSON RD	Culverts	Limited Detail Study	Field Recon	100	559.0	559.7	559.9	560.1	560.2	560.3	560.4	560.7	2-yr	50%	690	940	50.0	56
WC_T113	28415	WC_T113_STR_400	BOIS-D-ARC RD	Bridge	Limited Detail Study	Field Recon	370	511.1	508.0	508.8	511.2	511.6	511.9	512.4	513.1	10-yr	10%	4000	5800	37.0	58
WLC	55384	WLC_STR_1100	LUND CARLSON RD	Bridge	Limited Detail Study	Field Recon	180	511.8	511.8	512.7	513.2	513.8	514.1	514.4	515.1	5-yr	20%	7000	9600	36.0	59
LWC	11106	LWC_STR_100	GIESE RD	Bridge	Limited Detail Study	Field Recon	70	475.4	475.9	476.6	477.2	478.0	478.5	478.9	479.8	2-yr	50%	4200	6900	35.0	60
WC_T056	56609	WC_T056_STR_800	MELBER LN	Culverts	Limited Detail Study	Field Recon	70	600.4	601.0	601.3	601.9	602.0	602.2	602.4	602.9	2-yr	50%	1400	1900	35.0	60
WC_T062	6702	WC_T062_STR_200	MELBER LN	Culverts	Limited Detail Study	Field Recon	70	576.6	577.6	578.0	578.3	578.8	579.1	579.4	580.1	2-yr	50%	2300	3200	35.0	60
WLC	24567	WLC_STR_600	GIESE RD	Bridge	Limited Detail Study	Field Recon	70	466.5	466.8	467.8	468.4	469.2	469.7	470.2	471.7	2-yr	50%	13500	19900	35.0	60
WC	111792	WC_STR_8000	PARSONS RD	Bridge	Detailed Study	Survey	781	478.5	474.1	475.3	475.7	479.7	481.3	483.0	485.9	25-yr	4%	27000	42200	31.2	64
LWC	23272	LWC_STR_300	WELLS SCHOOL RD	Bridge	Limited Detail Study	Field Recon	60	502.6	503.6	504.5	505.0	505.5	505.9	506.2	507.0	2-yr	50%	3600	5300	30.0	65
WC_T209	385	WC_T209_STR_200	PIN CLOVER CT	Culverts	Detailed Study	Field Recon	60	674.9	675.3	675.5	675.6	675.8	675.9	676.0	676.2	2-yr	50%	630	840	30.0	65

Wilbarger Creek Structure Urgency Ratings - Travis County																				
Stream[1]	Structure Station[2] (ft)	Structure ID	Road Name[3]	Structure Type[4]	Level of Study	Visit Type	AADT Traffic Count[5] (veh/day)	Minimum TOR	Frequency Water Surface Elevation[7] (ft)							Annual Chance of Flooding[8]		Flowrate at Structure (Q)[9] (cfs)		Urgency Rating[10] (veh/day/yr)	Risk Rank
									2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr	Year Event	Percent Chance	25-yr	100-yr		
WC_T080	16050	WC_T080_STR_200	WALTON HILL PASS	Culverts	Limited Detail Study	Field Recon	50	523.9	525.1	525.7	526.1	526.6	526.9	527.2	528.0	2-yr	50%	6000	8800	25.0	67
WC_T082	1415	WC_T082_STR_100	WALTON HILL PASS	Culverts	Limited Detail Study	Field Recon	50	526.4	527.7	528.3	528.5	528.9	529.0	529.2	529.7	2-yr	50%	3100	4000	25.0	67
WC_T171	6689	WC_T171_STR_100	FUCHS GROVE RD	Culverts	Limited Detail Study	Field Recon	240	540.3	534.5	535.0	540.4	541.0	541.4	541.7	542.9	10-yr	10%	2000	2800	24.0	69
CC	30606	CC_STR_600	KIMBRO W RD	Bridge	Limited Detail Study	Field Recon	110	475.0	473.6	475.5	476.5	477.8	478.7	479.6	481.4	5-yr	20%	17000	25500	22.0	70
WC_T080	7805	WC_T080_STR_100	BRITA OLSON	Bridge	Limited Detail Study	Field Recon	40	506.5	508.0	508.7	509.2	509.7	510.5	511.2	512.3	2-yr	50%	7300	11100	20.0	71
WC_T210	45927	**WC_T210_STR_13000**	**WINDY VANE DR**	Culverts	Detailed Study	Survey	900	695.6	691.4	691.8	694.6	694.7	695.9	696.3	697.0	50-yr	2%	1900	2600	18.0	72
CC	56433	CC_STR_900	SANDEEN RD	Culverts	Limited Detail Study	Field Recon	30	512.0	514.2	514.7	515.2	515.7	516.1	516.6	517.5	2-yr	50%	7900	11100	15.0	73
WC_T047	27117	WC_T047_STR_700	CAMERON RD	Culverts	Limited Detail Study	Field Recon	600	577.8	574.6	575.0	575.0	575.5	579.1	579.8	580.5	50-yr	2%	1000	1400	12.0	74
DCW	49123	DCW_STR_700	CARLSON LN	Culverts	Limited Detail Study	Field Recon	20	513.6	513.9	514.5	514.9	515.4	515.7	516.0	516.7	2-yr	50%	5000	7400	10.0	75
LC	26619	LC_STR_200	INGRID DR	Culverts	Limited Detail Study	Field Recon	940	455.7	450.5	451.4	452.2	453.0	453.7	455.9	458.5	100-yr	1%	5300	8000	9.4	76
WC_T307	2695	WC_T307_STR_100	INGRID DR	Culverts	Limited Detail Study	Field Recon	570	462.9	456.5	457.2	457.8	458.4	458.9	463.2	464.5	100-yr	1%	2000	2900	5.7	77
WLC	37047	WLC_STR_800	WELLS SCHOOL RD	Bridge	Limited Detail Study	Field Recon	10	480.3	483.3	484.1	484.7	485.5	486.1	486.7	488.2	2-yr	50%	13400	19700	5.0	78
DCW	53580	DCW_STR_800	CARLSON RD	Culverts	Limited Detail Study	Field Recon	10	518.5	521.9	522.1	522.4	522.8	523.2	523.6	524.6	2-yr	50%	4600	6700	5.0	78
CC	45206	CC_STR_800	NEW SWEDEN CHURCH RD	Bridge	Limited Detail Study	Field Recon	290	497.1	491.7	492.8	493.8	495.6	496.6	497.4	499.2	100-yr	1%	8700	12500	2.9	80
DCW	61727	DCW_STR_900	COUNTY LINE RD	Culverts	Limited Detail Study	Field Recon	30	545.6	543.2	543.6	545.3	546.0	546.3	546.5	547.2	25-yr	4%	2300	3200	1.2	81
LWC	37321	LWC_STR_400	LUND CARLSON RD	Bridge	Limited Detail Study	Field Recon	0	540.4	541.5	541.8	541.9	542.2	542.4	542.6	543.0	2-yr	50%	1300	1900	0.0	82
WC_T167	3562	WC_T167_STR_2500*	RING RD	Culverts	Detailed Study	Survey	0	504.0	501.8	501.8	504.3	504.9	505.2	505.6	506.3	10-yr	10%	2600	3600	0.0	82

bold requested AADTs, current estimates based on number of residences and ITE trip estimate

* roads lead to a waste service facility and self storage facility

Proposed Roadway Improvement Location

Notes
1. As designated within HEC-RAS models
2. Stationing begins at the most downstream location of conveyance for the stream
3. As designated within HEC-RAS models
4. AS designated within HEC-RAS models
5. Data interpreted from TxDOT 2019 Austin District Traffic Map
6. Minimum TOR elevation includes surrounding roadways
7. As determined by HEC-RAS models
8. Flood event at which the minimum TOR is overtopped
9. Flowrates taken from adjacent upstream XS
10. Calculated as (AADT Traffic Count)/(Frequency of flooding storm event)

Wilbarger Creek Structure Urgency Ratings - City of Pflugerville																				
Stream[1]	Structure Station[2]	Structure ID	Road Name[3]	Structure Type[4]	Level of Study	Visit Type	AADT Traffic Count[5]	Minimum TOR Elevation[6]	Frequency Water Surface Elevation[7] (ft)							Annual Chance of Flooding[8]		Flowrate at Structure (Q)[9] (cfs)		Urgency Rating[10]	Risk Rank
	(ft)						(veh/day)		2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr	Year Event	Percent Chance	25-yr	100-yr	(veh/day/yr)	
WC	226659	WC_STR_24000	FM 685	Bridge	Detailed Study	Survey	24318	686.0	683.4	687.5	688.5	689.2	689.5	689.9	690.6	5-yr	20%	6000	8700	4863.6	1
WC_T200	16518	WC_T200_STR_5000	KELLY LN	Culverts	Detailed Study	Survey	7579	649.0	650.7	651.0	651.2	651.5	651.8	652.1	652.9	2-yr	50%	6200	8600	3789.5	2
WC_T200	17073	**WC_T200_STR_6000**	**VILAMOURA ST**	Multiple Opening	Detailed Study	Survey	2700	652.7	653.5	654.2	654.6	655.6	656.3	656.9	657.9	2-yr	50%	6200	8600	1350.0	3
WC	225909	WC_STR_23000	E PFLUGERVILLE PKWY	Bridge	Detailed Study	Survey	10357	683.4	680.0	681.0	680.9	684.2	684.9	685.5	686.6	25-yr	4%	6000	8700	414.3	4
WC_T200	21941	**WC_T200_STR_13000**	**KENNEMER DR**	Culverts	Detailed Study	Survey	1890	672.1	669.0	672.2	672.8	673.6	674.3	674.6	675.5	5-yr	20%	5000	6800	378.0	5
WC_T200	8580	WC_T200_STR_1000	WEISS LN	Bridge	Detailed Study	Survey	3669	622.5	617.4	618.6	619.7	623.2	623.7	624.1	625.0	25-yr	4%	6400	9100	146.7	6
WC	241299	**WC_STR_29000**	**SPRINGBROOK DR**	Culverts	Detailed Study	Survey	4040	760.8	756.9	757.3	757.6	760.4	761.1	761.5	762.2	50-yr	2%	1400	1900	80.8	7
WC_T206	2695	**WC_T206_STR_3000**	**MURCHISON RIDGE TR**	Culverts	Detailed Study	Survey	1910	693.8	687.1	688.6	689.7	694.9	695.3	695.6	696.1	25-yr	4%	1500	2200	76.4	8
WC_T186	5669	WC_T186_STR_2000	TOWN CENTER DR	Culverts	Detailed Study	Survey	1860	726.6	722.4	722.7	723.0	723.3	725.4	727.2	728.4	100-yr	1%	530	1200	18.6	9
WC_T200	25687	WC_T200_STR_17000	DALSHANK ST	Culverts	Detailed Study	Survey	80	690.4	686.5	687.5	690.4	691.6	692.0	692.4	693.1	10-yr	10%	3800	5100	8.0	10

bold requested AADTs, current estimates based on number of residences and ITE trip estimate

Proposed Roadway Improvement Location

Notes
1. As designated within HEC-RAS models
2. Stationing begins at the most downstream location of conveyance for the stream
3. As designated within HEC-RAS models
4. AS designated within HEC-RAS models
5. Data interpreted from TxDOT 2019 Austin District Traffic Map
6. Minimum TOR elevation includes surrounding roadways
7. As determined by HEC-RAS models
8. Flood event at which the minimum TOR is overtopped
9. Flowrates taken from adjacent upstream XS
10. Calculated as (AADT Traffic Count)/(Frequency of flooding storm event)

Appendix H: Alternative Evaluation

H-2 Alternative Structures

		Bastrop County						
		Existing				Proposed		
	Structure Name, Road Name Stream ID	Existing Structure	ACE	WSEL (ft)	Overtopping Depth (ft)	Proposed Improvements	WSEL (ft)	Overtopping Depth (ft)
1	WC_T9_STR_100_A (west) & WC_T9_STR_100_B (east) on Monkey Rd. WC_T009	two 8' x 4' RCBs (100_B) & one 20'-span bridge (100_A)	50%	466.88	1.31	• one 50'-span bridge (B) & two 50'-span bridge (A), both 24" slab beam • Five 4' x 1.5' RCB flood flow culverts installed east of (B) • Channel grading (3:1 slope, 30' channel bottom) at the main structure (A) • Channel grading (3:1 slope, same channel bottom) at the second structure (B) • Raised road 1.1'	465.97	-0.73
			20%	467.60	2.03		467.19	0.49
			10%	467.96	2.39		467.91	1.21
			4%	468.47	2.90		468.70	2.00
			2%	468.82	3.25		469.19	2.49
			1%	469.11	3.54		469.59	2.89
			0.2%	469.99	4.42		470.59	3.89
	WC_STR_200 on Lower Elgin Rd.	290'-wide bridge, four spans	include discussion in the report					
2	WC_STR_400 (south) & WC_STR_450 (north) on Upper Elgin Rd. WC	150'-wide bridge, three spans (400) & Five 3' CMPs (450)	50%	414.43	5.84	• Use 24" slab beam for the old bridge (400) • Flatten the S curve of the existing road • Four 50'-span bridge & one 50'-span bridge, both 24" slab beam • Four 8'x4' RCBs • Raised road by 5.4' • 75'-wide channel benching approx. 270' downstream of the road	412.92	-1.08
			20%	415.94	7.35		416.03	2.03
			10%	417.24	8.65		417.46	3.46
			4%	419.12	10.53		419.43	5.43
			2%	420.55	11.96		420.75	6.75
			1%	422.27	13.68		421.97	7.97
			0.2%	426.80	18.21		426.32	12.32
3	WC_T6_STR_200 on Youngs Prairie Rd. WC_T006	Two 4' CMPs	50%	458.00	1.23	• Four 5'x5' RCBs and channel grading •Raised road 1'	455.54	-2.26
			20%	458.29	1.52		457.99	0.19
			10%	458.49	1.72		458.28	0.48
			4%	458.73	1.96		458.66	0.86
			2%	458.97	2.20		458.72	0.92
			1%	459.15	2.38		459.00	1.20
			0.2%	459.58	2.81		459.54	1.74

		Travis County						
		Existing				Proposed		
	Structure Name, Road Name Stream ID	Existing Structure	ACE	WSEL (ft)	Overtopping Depth (ft)	Proposed Improvements	WSEL (ft)	Overtopping Depth (ft)
1	WC_T210_STR_2000 on Cele Rd. WC_T210	85'-wide bridge, two spans	50%	613.02	0.93	• Four 50'-span, 24" slab beam bridge • Concrete bridge opening with 2:1 side slope • Raised road 1.5' • Contingent on the channel improvements for the Reserve at West Creek subdivisions	609.74	-3.86
			20%	613.70	1.61		610.29	-3.31
			10%	614.14	2.05		610.62	-2.98
			4%	614.57	2.48		611.60	-2.00
			2%	614.87	2.78		611.60	-2.00
			1%	615.14	3.05		611.60	-2.00
			0.2%	615.71	3.62		614.33	0.73
2	WC_T220_STR_100 on Gregg Ln. WC_T220	Two 10' x 5' RCBs	50%	541.35	1.48	• Four 50'-span, 24" slab beam bridge • Raised road 3.6' - will impact the adjacent property	539.24	-4.26
			20%	541.84	1.97		539.86	-3.64
			10%	542.12	2.25		540.40	-3.10
			4%	542.54	2.67		541.50	-2.00
			2%	542.88	3.01		541.50	-2.00
			1%	543.14	3.27		542.26	-1.24
			0.2%	543.88	4.01		544.65	1.15
3	WC_STR_17000 on Cameron Rd. WC	130'-wide bridge, two spans	50%	555.06	2.79	• Six 50'-span bridge • Raised road 9' - will impact the adjacent property • Channel grading (3:1 slope, 280' channel bottom) at the structure	554.14	-7.16
			20%	556.35	4.08		555.47	-5.83
			10%	557.29	5.02		556.59	-4.71
			4%	558.34	6.07		557.80	-3.50
			2%	559.17	6.90		557.80	-3.50
			1%	560.08	7.81		557.80	-3.50
			0.2%	562.51	10.24		563.25	1.95

		City of Pflugerville						
		Existing				Proposed		
	Structure Name, Road Name Stream ID	Existing Structure	ACE	WSEL (ft)	Overtopping Depth (ft)	Proposed Improvements	WSEL (ft)	Overtopping Depth (ft)
1	WC_STR_24000 on FM 685 WC	Two 50'-span bridge	50%	683.36	-2.53	Integrated solution • 100'-wide channel benching on the left side of the channel (side slope = 3:1) for approx. 1,700' along the stream • FM 685 - four 50'-span bridge, raised road 2', keep the long rail • E Pville Pkwy - four 50'-span bridge, no road raise, removed the concrete drop structure upstream of E Pflugerville Pkwy	680.86	-5.25
			20%	687.46	1.57		681.56	-4.55
			10%	688.49	2.60		682.08	-4.03
			4%	689.21	3.32		682.80	-3.31
			2%	689.52	3.63		683.35	-2.76
			1%	689.88	3.99		684.11	-2.00
			0.2%	690.59	4.70		687.52	1.41
2	WC_STR_23000 on E Pflugerville Pkwy WC	Three 50'-span bridge	50%	679.97	-3.33		677.66	-5.64
			20%	681.02	-2.28		678.58	-4.72
			10%	680.94	-2.36		679.20	-4.10
			4%	684.15	0.85		680.02	-3.28
			2%	684.86	1.56		680.65	-2.65
			1%	685.50	2.20		681.23	-2.07
			0.2%	686.61	3.31		684.24	0.94
3	WC_T200_STR_13000 on Kennemer Dr. WC_T200	Twelve 8' x 6' RCBs	50%	669.03	-3.02	• Three 50'-span, 24" slab beam bridge • Concrete bridge opening with 2:1 side slope • Raised road 0.8' • Constraints (pedestrian path and inline structure) upstream of Kennemer Dr.	670.87	-2.00
			20%	672.23	0.18		670.87	-2.00
			10%	672.89	0.84		670.87	-2.00
			4%	673.68	1.63		672.96	0.09
			2%	674.29	2.24		673.58	0.71
			1%	674.70	2.65		674.09	1.22
			0.2%	675.49	3.44		675.11	2.24

Appendix H: Alternative Evaluation

H-3 Alternative Cost Analysis

Project: Bastrop Co. Flood Protection Planning
Stream: Wilbarger Creek Tributary 9
Road: Monkey Rd. (WC_T9_STR100)
Engineer's Estimate of Probable Construction Cost
Date: April 16, 2021

HALFF

PAY ITEM NO	DESCRIPTION	UNITS	UNIT PRICE	QTY	TOTALS
0100 6001	PREPARING ROW	STA	$5,000	4	$20,000
0132 6006	EMBANKMENT (DENSITY, TYPE C)	CY	$15	460	$6,928
0400 6006	CUT & RESTORING PAVEMENT (base and HMAC)	SY	$130	1,700	$221,000
442	SLAB BEAM BRIDGE (24" BEAM DEPTH)	SF	$175	5,100	$892,500
0462 6131	CONC BOX CULV (4 FT X 2 FT)	LF	$350	200	$70,000
0466 6166	WINGWALL	EA	$10,000	2	$20,000
0496 6006	REMOV STR (HEADWALL)	EA	$1,200	4	$4,800
0496 6007	REMOV STR (PIPE)	LF	$15	50	$769
0500 6001	MOBILIZATION (10%)	LS	$139,195	1	$139,195
0502 6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	$9,000	6	$54,000
0506 6002	EROSION CONTROL (5%)	LS	66,283	1	$66,283
0540 6002	MTL W-BEAM GD FEN (STEEL POST)	LF	$60	470	$28,200
0540 6005	TERMINAL ANCHOR SECTION	EA	$1,730	4	$6,919
0542 6001	REMOVING METAL BEAM GUARD FENCE	LF	$5	110	$550

PROJECT SUBTOTAL	**$1,531,200**
30% CONTINGENCY	$459,400
BASE TOTAL	$1,990,600
Environmental Permitting (3%)	$59,800
Engineering Design (12%)	$238,900
PROJECT TOTAL	**$2,289,300**

This statement was prepared utilizing standard cost estimate practices. It is understood and agreed that this is an estimate only, and that Engineer shall not be held liable to Owner or third party for any failure to accurately estimate the cost of the project, or any part thereof. Unit prices are in current dollars and should be adjusted as required when letting schedule for project is determined.

Project: Bastrop Co. Flood Protection Planning
Stream: Wilbarger Creek
Road: Upper Elgin Rd. (WC_STR400 and STR450)
Engineer's Estimate of Probable Construction Cost
Date: April 16, 2021

PAY ITEM NO	DESCRIPTION	UNITS	UNIT PRICE	QTY	TOTALS
0100 6001	PREPARING ROW	STA	$5,000	19	$96,602
0110 6002	EXCAVATION (CHANNEL)	CY	$9	24,980	$223,571
0132 6006	EMBANKMENT (DENSITY, TYPE C)	CY	$15	13,660	$205,722
0400 6006	CUT & RESTORING PAVEMENT (base and HMAC)	SY	$130	8,090	$1,051,700
442	SLAB BEAM BRIDGE (24" BEAM DEPTH)	SF	$175	9,000	$1,575,000
0462 6019	CONC BOX CULV (8 FT X 4 FT)	LF	$575	100	$57,500
0466 6166	WINGWALL	EA	$5,000	2	$10,000
04966009	REMOV STR (BRIDGE 0 - 99 FT LENGTH)	EA	$18,000	1	$18,000
0496 6006	REMOV STR (HEADWALL)	EA	$1,068	2	$2,137
0496 6007	REMOV STR (PIPE)	LF	$15	80	$1,230
0500 6001	MOBILIZATION (10%)	LS	$353,317	1	$353,317
0502 6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	$9,000	8	$72,000
0506 6002	EROSION CONTROL (5%)	LS	$168,246	1	$168,246
0540 6002	MTL W-BEAM GD FEN (STEEL POST)	LF	$57	730	$41,647
0540 6005	TERMINAL ANCHOR SECTION	EA	$1,730	4	$6,919
0542 6001	REMOVING METAL BEAM GUARD FENCE	LF	$5	580	$2,900

PROJECT SUBTOTAL	**$3,886,500**
30% CONTINGENCY	$1,166,000
BASE TOTAL	$5,052,500
Environmental Permitting (3%)	$151,600
Engineering Design (12%)	$606,300
PROJECT TOTAL	**$5,810,400**

This statement was prepared utilizing standard cost estimate practices. It is understood and agreed that this is an estimate only, and that Engineer shall not be held liable to Owner or third party for any failure to accurately estimate the cost of the project, or any part thereof. Unit prices are in current dollars and should be adjusted as required when letting schedule for project is determined.

Project: Bastrop Co. Flood Protection Planning
Stream: Wilbarger Creek Tributary 6
Road: Youngs Prairie Rd. (WC_T6_STR200)
Engineer's Estimate of Probable Construction Cost
Date: April 16, 2021

PAY ITEM NO	DESCRIPTION	UNITS	UNIT PRICE	QTY	TOTALS
0100 6001	PREPARING ROW	AC	$5,000	2	$8,998
0132 6006	EMBANKMENT (DENSITY, TYPE C)	CY	$15	300	$4,518
0400 6006	CUT & RESTORING PAVEMENT (base and HMAC)	SY	$130	990	$128,669
0462 6009	CONC BOX CULV (5 FT X 5 FT)	LF	$366	70	$25,630
0466 6166	WINGWALL	EA	$10,000	2	$20,000
0496 6007	REMOV STR (PIPE)	LF	$15	80	$1,230
0500 6001	MOBILIZATION (10%)	LS	24,895	1	$24,895
0502 6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	$9,000	4	$36,000
0506 6002	EROSION CONTROL (5%)	LS	$5,000	11,855	$11,855
0540 6002	MTL W-BEAM GD FEN (STEEL POST)	LF	$57	90	$5,135
0540 6005	TERMINAL ANCHOR SECTION	EA	$1,730	4	$6,919

PROJECT SUBTOTAL	**$273,900**
30% CONTINGENCY	$82,200
BASE TOTAL	$356,100
Environmental Permitting (3%)	$10,700
Engineering Design (12%)	$42,800
PROJECT TOTAL	**$409,600**

This statement was prepared utilizing standard cost estimate practices. It is understood and agreed that this is an estimate only, and that Engineer shall not be held liable to Owner or third party for any failure to accurately estimate the cost of the project, or any part thereof. Unit prices are in current dollars and should be adjusted as required when letting schedule for project is determined.

Project: Bastrop Co. Flood Protection Planning
Stream: Wilbarger Creek Tributary 210
Road: Cele Rd (WC_T210_STR_2000)
Engineer's Estimate of Probable Construction Cost
Date: April 16, 2021

PAY ITEM NO	DESCRIPTION	UNITS	UNIT PRICE	QTY	TOTALS
0100 6001	PREPARING ROW	AC	$5,000	60	$301,208
0132 6006	EMBANKMENT (DENSITY, TYPE C)	CY	$15	2,730	$41,114
0400 6006	CUT & RESTORING PAVEMENT (base and HMAC)	SY	$130	5,460	$709,800
442	SLAB BEAM BRIDGE (24" BEAM DEPTH)	SF	$175	8,400	$1,470,000
04966009	REMOV STR (BRIDGE 0 - 99 FT LENGTH)	EA	$18,000	1	$18,000
0500 6001	MOBILIZATION (10%)	LS	$282,731	1	$282,731
0502 6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	$9,000	6	$54,000
0506 6002	EROSION CONTROL (5%)	LS	$134,634	1	$134,634
0540 6002	MTL W-BEAM GD FEN (STEEL POST)	LF	$57	1,480	$84,434
0540 6005	TERMINAL ANCHOR SECTION	EA	$1,730	4	$6,919
0542 6001	REMOVING METAL BEAM GUARD FENCE	LF	$5	1,440	$7,200

PROJECT SUBTOTAL	**$3,110,100**
30% CONTINGENCY	$933,100
BASE TOTAL	$4,043,200
Environmental Permitting (3%)	$121,300
Engineering Design (12%)	$485,200
PROJECT TOTAL	**$4,649,700**

This statement was prepared utilizing standard cost estimate practices. It is understood and agreed that this is an estimate only, and that Engineer shall not be held liable to Owner or third party for any failure to accurately estimate the cost of the project, or any part thereof. Unit prices are in current dollars and should be adjusted as required when letting schedule for project is determined.

Project: Bastrop Co. Flood Protection Planning
Stream: Wilbarger Creek Tributary 220
Road: Gregg Ln (WC_T220_STR_100)
Engineer's Estimate of Probable Construction Cost
Date: April 16, 2021

PAY ITEM NO	DESCRIPTION	UNITS	UNIT PRICE	QTY	TOTALS
0100 6001	PREPARING ROW	AC	$5,000	13	$63,170
0132 6006	EMBANKMENT (DENSITY, TYPE C)	CY	$15	20,210	$304,363
0400 6006	CUT & RESTORING PAVEMENT (base and HMAC)	SY	$130	6,740	$876,200
442	TX28 BEAM BRIDGE (42" BEAM DEPTH)	SF	$150	12,000	$1,800,000
0496 6006	REMOV STR (HEADWALL)	EA	$1,068	2	$2,137
0496 6007	REMOV STR (PIPE)	LF	$30	80	$2,400
0500 6001	MOBILIZATION (10%)	LS	$334,643	1	$334,643
0502 6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	$9,000	6	$54,000
0506 6002	EROSION CONTROL (5%)	LS	$159,354	1	$159,354
0540 6002	MTL W-BEAM GD FEN (STEEL POST)	LF	$57	1,370	$78,159
0542 6001	REMOVING METAL BEAM GUARD FENCE	LF	$5	1,330	$6,650

PROJECT SUBTOTAL	**$3,681,100**
30% CONTINGENCY	$1,104,400
BASE TOTAL	$4,785,500
Environmental Permitting (3%)	$143,600
Engineering Design (12%)	$574,300
PROJECT TOTAL	**$5,503,400**

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Project: Bastrop Co. Flood Protection Planning
Stream: Wilbarger Creek
Road: Cameron Rd (WC_STR_13000)
Engineer's Estimate of Probable Construction Cost
Date: April 16, 2021

PAY ITEM NO	DESCRIPTION	UNITS	UNIT PRICE	QTY	TOTALS
0100 6001	PREPARING ROW	STA	$5,000	6	$30,901
0132 6006	EMBANKMENT (DENSITY, TYPE C)	CY	$15	3,960	$59,638
0400 6006	CUT & RESTORING PAVEMENT (base and HMAC)	SY	$130	3,300	$429,000
	SLAB BEAM BRIDGE (24" BEAM DEPTH)	SF	$175	6,800	$1,190,000
04966009	REMOV STR (BRIDGE 0 - 99 FT LENGTH)	EA	$18,000	1	$18,000
0496 6006	REMOV STR (HEADWALL)	EA	$1,068	2	$2,137
0496 6007	REMOV STR (PIPE)	LF	$15	48	$738
0500 6001	MOBILIZATION (10%)	LS	$191,081	1	$191,081
0502 6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	$9,000	6	$54,000
0506 6002	EROSION CONTROL (5%)	LS	$90,991	1	$90,991
0540 6002	MTL W-BEAM GD FEN (STEEL POST)	LF	$57	560	$31,948
0540 6005	TERMINAL ANCHOR SECTION	EA	$1,730	2	$3,460

PROJECT SUBTOTAL	**$2,101,900**
30% CONTINGENCY	$630,600
BASE TOTAL	$2,732,500
Environmental Permitting (3%)	$82,000
Engineering Design (12%)	$327,900
PROJECT TOTAL	**$3,142,400**

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Project: Bastrop Co. Flood Protection Planning
Stream: Wilbarger Creek
Road: FM 685 (WC_STR_24000)
Engineer's Estimate of Probable Construction Cost
Date: April 16, 2021

HALFF

PAY ITEM NO	DESCRIPTION	UNITS	UNIT PRICE	QTY	TOTALS
0100 6001	PREPARING ROW	AC	$4,528	30	$136,198
0104 6022	REMOVING CONC (CURB AND GUTTER)	LF	$7	1,620	$11,486
0110 6002	EXCAVATION (CHANNEL)	CY	$9	27,110	$242,635
0132 6006	EMBANKMENT (DENSITY, TYPE C)	CY	$15	5,880	$88,553
0400 6006	CUT & RESTORING PAVEMENT (base and HMAC)	SY	$130	8,820	$1,146,600
442	TX28 BEAM BRIDGE (42" BEAM DEPTH)	SF	$150	19,570	$2,935,500
04966009	REMOV STR (BRIDGE 0 - 99 FT LENGTH)	EA	$18,000	1	$18,000
0500 6001	MOBILIZATION (10%)	LS	$504,872	1	$504,872
0502 6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	$8,277	8	$66,213
0506 6002	EROSION CONTROL	LS	$240,415	1	$240,415
0529 6008	CONC CURB & GUTTER (TY II)	LF	$20	1,620	$32,303
0531 6001	CONC SIDEWALKS (4")	SY	$50	1,620	$81,713
0540 6002	MTL W-BEAM GD FEN (STEEL POST)	LF	$57	710	$40,506
0540 6005	TERMINAL ANCHOR SECTION	EA	$1,730	4	$6,919
0542 6001	REMOVING METAL BEAM GUARD FENCE	LF	$2	685	$1,678

PROJECT SUBTOTAL	**$5,553,600**
30% CONTINGENCY	$1,666,100
BASE TOTAL	$7,219,700
Environmental Permitting (3%)	$216,600
Engineering Design (12%)	$866,400
PROJECT TOTAL	**$8,302,700**

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Project: Bastrop Co. Flood Protection Planning
Stream: Wilbarger Creek
Road: Pflugerville Parkway (WC_STR_23000)
Engineer's Estimate of Probable Construction Cost
Date: April 16, 2021

HALFF

PAY ITEM NO	DESCRIPTION	UNITS	UNIT PRICE	QTY	TOTALS
0100 6001	PREPARING ROW	STA	$4,528	26	$118,397
0104 6022	REMOVING CONC (CURB AND GUTTER)	LF	$7	416	$2,952
0110 6002	EXCAVATION (CHANNEL)	CY	$9	43,790	$391,921
0400 6006	CUT & RESTORING PAVEMENT (base and HMAC)	SY	$130	2,500	$325,000
442	TX28 BEAM BRIDGE (42" BEAM DEPTH)	SF	$150	4,927	$739,050
04966009	REMOV STR (BRIDGE 0 - 99 FT LENGTH)	EA	$18,000	1	$18,000
0500 6001	MOBILIZATION (10%)	LS	$187,928	1	$187,928
0502 6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	$8,277	6	$49,659
0506 6002	EROSION CONTROL	LS	$170,844	1	$170,844
0529 6008	CONC CURB & GUTTER (TY II)	LF	$20	420	$8,375
0531 6001	CONC SIDEWALKS (4")	SY	$50	420	$21,185
0540 6002	MTL W-BEAM GD FEN (STEEL POST)	LF	$57	460	$26,243
0540 6005	TERMINAL ANCHOR SECTION	EA	$1,730	4	$6,919
0542 6001	REMOVING METAL BEAM GUARD FENCE	LF	$2	300	$735

PROJECT SUBTOTAL	**$2,067,300**
30% CONTINGENCY	$620,200
BASE TOTAL	$2,687,500
Environmental Permitting (3%)	$80,700
Engineering Design (12%)	$322,500
PROJECT TOTAL	**$3,090,700**

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Project: Bastrop Co. Flood Protection Planning
Stream: Wilbarger Creek Tributary 200
Road: Kennemer Dr (WC_T200_STR13000)
Engineer's Estimate of Probable Construction Cost
Date: April 16, 2021

PAY ITEM NO	DESCRIPTION	UNITS	UNIT PRICE	QTY	TOTALS
0100 6001	PREPARING ROW	STA	$4,528	3	$12,939
0104 6022	REMOVING CONC (CURB AND GUTTER)	LF	$7	465	$3,297
0132 6006	EMBANKMENT (DENSITY, TYPE C)	CY	$15	406	$6,121
0400 6006	CUT & RESTORING PAVEMENT (base and HMAC)	SY	$130	1,524	$198,142
442	SLAB BEAM BRIDGE (24" BEAM DEPTH)	SF	$175	8,850	$1,548,750
0496 6006	REMOV STR (HEADWALL)	EA	$1,068	2	$2,137
0496 6007	REMOV STR (PIPE)	LF	$15	588	$9,038
0500 6001	MOBILIZATION (10%)	LS	$206,869	1	$206,869
0502 6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	$8,277	6	$49,659
0506 6002	EROSION CONTROL	LS	$188,063	1	$188,063
0529 6008	CONC CURB & GUTTER (TY II)	LF	$20	465	$9,272
0531 6001	CONC SIDEWALKS (4")	SY	$50	233	$11,727
0540 6002	MTL W-BEAM GD FEN (STEEL POST)	LF	$57	382	$21,793
0540 6005	TERMINAL ANCHOR SECTION	EA	$1,730	4	$6,919
0542 6001	REMOVING METAL BEAM GUARD FENCE	LF	$2	340	$833

PROJECT SUBTOTAL	**$2,275,600**
30% CONTINGENCY	$682,700
BASE TOTAL	$2,958,300
Environmental Permitting (3%)	$88,800
Engineering Design (12%)	$355,000
PROJECT TOTAL	**$3,402,100**

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Project: Bastrop Co. Flood Protection Planning
Stream: Wilbarger Creek
Subdivison: Shadowglen Phase 1 Sections 9, 11, 12, and 13
Engineer's Estimate of Probable Construction Cost
Date: April 16, 2021

PAY ITEM NO	DESCRIPTION	UNITS	UNIT PRICE	QTY	TOTALS
0100 6001	PREPARING ROW	AC	$4,000	200	$800,000
0110 6002	EXCAVATION (CHANNEL)	CY	$10	189,020	$1,890,200
0110 6003	EXCAVATION (SPECIAL)	CY	$5	527,110	$2,635,550
0400 6006	CUT & RESTORING PAVEMENT (base and HMAC)	SY	$130	15,830	$2,057,900
442	TX28 BEAM BRIDGE (42" BEAM DEPTH)	SF	$150	140,400	$21,060,000
04966009	REMOV STR (BRIDGE 0 - 99 FT LENGTH)	EA	$18,000	8	$144,000
0500 6001	MOBILIZATION (10%)	LS	$3,039,928	1	$3,039,928
0502 6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	$8,277	18	$148,978
0506 6002	EROSION CONTROL (5%)	LS	$1,447,585	1	$1,447,585
0540 6002	MTL W-BEAM GD FEN (STEEL POST)	LF	$57	3,500	$199,675
0540 6005	TERMINAL ANCHOR SECTION	EA	$1,730	4	$6,919
0542 6001	REMOVING METAL BEAM GUARD FENCE	LF	$2	3,460	$8,477

PROJECT SUBTOTAL	**$33,439,300**
30% CONTINGENCY	$10,031,800
BASE TOTAL	$43,471,100
Environmental Permitting (3%)	$1,304,200
Engineering Design (12%)	$5,216,600
PROJECT TOTAL	**$49,991,900**

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Project: Bastrop Co. Flood Protection Planning
Stream: Wilbarger Creek Tributary 210
Subdivison: Reserve at Westcreek
Engineer's Estimate of Probable Construction Cost
Date: April 16, 2021

PAY ITEM NO	DESCRIPTION	UNITS	UNIT PRICE	QTY	TOTALS
0100 6001	PREPARING ROW	AC	$5,000	114	$568,182
0104 6009	REMOVING CONC (RIPRAP)	SY	$30	60	$1,778
0110 6002	EXCAVATION (CHANNEL)	CY	$9	80,107	$716,955
0500 6001	MOBILIZATION (10%)	LS	$150,077	1	$150,077
0502 6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	$8,277	8	$66,213
0506 6002	EROSION CONTROL (10%)	LS	$136,434	1	$136,434
0531 6001	CONC SIDEWALKS (4")	SY	$50	222	$11,209

PROJECT SUBTOTAL	**$1,650,900**
30% CONTINGENCY	$495,300
BASE TOTAL	$2,146,200
Environmental Permitting (3%)	$64,400
Engineering Design (12%)	$257,600
PROJECT TOTAL	**$2,468,200**

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Project: Bastrop Co. Flood Protection Planning
Stream: Wilbarger Creek Tributary 185
Subdivison: Highland Park
Engineer's Estimate of Probable Construction Cost
Date: April 16, 2021

HALFF

PAY ITEM NO	DESCRIPTION	UNITS	UNIT PRICE	QTY	TOTALS
0100 6001	PREPARING ROW	STA	$5,000	3	$15,000
0104 6009	REMOVING CONC (RIPRAP)	SY	$30	70	$2,074
0104 6022	REMOVING CONC (CURB AND GUTTER)	LF	$7	45	$319
0132 6006	EMBANKMENT (DENSITY, TYPE C)	CY	$15	90	$1,355
0400 6006	CUT & RESTORING PAVEMENT (base and HMAC)	SY	$130	725	$94,279
450	PEDESTRIAN RAIL	LF	$95	80	$7,600
0462 6019	CONC BOX CULV (8 FT X 4 FT)	LF	$575	220	$126,500
0466 6166	HEADWALL AND WINGWALL	EA	$20,000	2	$40,000
0496 6006	REMOV STR (HEADWALL and WINGWALL)	EA	$5,000	2	$10,000
0500 6001	MOBILIZATION (10%)	LS	$35,139	1	$35,139
0502 6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	$8,277	4	$33,106
0506 6002	EROSION CONTROL (5%)	LS	$16,733	1	$16,733
0529 6008	CONC CURB & GUTTER (TY II)	LF	$20	45	$897
0531 6001	CONC SIDEWALKS (4")	SY	$50	70	$3,531

PROJECT SUBTOTAL	**$386,600**
30% CONTINGENCY	$116,000
BASE TOTAL	$502,600
Environmental Permitting (3%)	$15,100
Engineering Design (12%)	$60,400
PROJECT TOTAL	**$578,100**

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Appendix H: Alternative Evaluation

H-4 Benefit Cost Analysis

Shadowglen Subdivision - Benefit Cost Analysis Results

Storm Event	Existing Conditions		Proposed Conditions		Project Benefit (Present Value)	Project Cost	Benefit to Cost Ratio
	At Risk Structures	Est. Annual Damages	At Risk Structures	Est. Annual Damages			
5-Yr	0	$0	0	$0	$0		
10-Yr	1	$32,714	0	$0	$451,469		
25-Yr	48	$541,805	0	$0	$7,477,287		
50-Yr	81	$453,011	2	$12,041	$6,085,694		
100-Yr	133	$366,843	52	$148,783	$3,009,372		
500-Yr	213	$114,434	161	$87,966	$365,288		
Total	**-**	**$1,508,807**	**-**	**$248,790**	**$17,389,110**	**$49,991,900**	**0.35**

Note: Present Value calculated at 50-Yr annualized cost assuming 7% interest.

Reserve at Westcreek Subdivision - Benefit Cost Analysis Results

Storm Event	Existing Conditions		Proposed Conditions		Project Benefit (Present Value)	Project Cost	Benefit to Cost Ratio
	At Risk Structures	Est. Annual Damages	At Risk Structures	Est. Annual Damages			
5-Yr	0	$0	0	$0	$0		
10-Yr	0	$0	0	$0	$0		
25-Yr	0	$0	0	$0	$0		
50-Yr	0	$0	0	$0	$0		
100-Yr	0	$0	0	$0	$0		
500-Yr	6	$3,039	0	$0	$41,938		
Total	**-**	**$3,039**	**-**	**$0**	**$41,938**	**$2,468,200**	**0.02**

Note: Present Value calculated at 50-Yr annualized cost assuming 7% interest.

Appendix I: Electronic Data

I-1 HEC-HMS Model

Appendix I: Electronic Data

I-2 HEC-RAS Model

Appendix I: Electronic Data

I-3 GIS Data

Appendix I: Electronic Data

I-4 Additional Survey Photos