SUPPLEMENTAL WORK AUTHORIZATION NO. _4_
TO
WORK AUTHORIZATION NO. _2_

WILLIAMSON COUNTY ROAD BOND PROJECT:
Atlas 14 Floodplain Mapping Update – Study Area Analysis

This Supplemental Work Authorization No. _4_ to Work Authorization No. _2_ is made pursuant to the terms and conditions of the Williamson County Contract for Engineering Services, being dated March 23, 2021 ("Contract") and entered into by and between Williamson County, Texas, a political subdivision of the State of Texas, (the "County") and Doucet & Associates, Inc. (the "Engineer").

WHEREAS, the County and the Engineer executed Work Authorization No. _2_ on July 14, 2021 and dated effective July 24, 2021 (the "Work Authorization");

WHEREAS, pursuant to Article 14 of the Contract, amendments, changes and modifications to a fully executed Work Authorization shall be made in the form of a Supplemental Work Authorization; and

WHEREAS, it has become necessary to amend, change and modify the Work Authorization.

AGREEMENT

NOW, THEREFORE, premises considered, the County and the Engineer agree that the Work Authorization shall be amended, changed and modified as follows:

I. The Services to be Provided by the Engineer that were set out in the original Attachment "B" of the Work Authorization are hereby amended, changed and modified as shown in the attached revised Attachment "B" (must be attached)

II. The Work Authorization shall terminate on December 31, 2025. The Services to be Provided by the Engineer shall be fully completed on or before said date unless extended by an additional Supplemental Work Authorization. The revised Work Schedule is attached hereto as Attachment "C" (must be attached).

III. The maximum amount payable for services under the Work Authorization is hereby increased by $481,054.00 from $3,047,645.00 to $3,528,699.00. The revised Work Schedule is attached hereto as attachment "D" (must be attached).

Except as otherwise amended by prior or future Supplemental Work Authorizations, all other terms of the Work Authorization are unchanged and will remain in full force and effect.

This Supplemental Work Authorization does not waive the parties' responsibilities and obligations provided under the Contract.

IN WITNESS WHEREOF, the County and the Engineer have executed this Supplemental Work Authorization, to be effective as of the date of the last party's execution below.

ENGINEER:	**COUNTY:**
By: _____	By: _____
Signature	Signature
John Doucet	_____
Printed Name	Printed Name
Vice President	_____
Title	Title
5/15/2025	_____
Date	Date

LIST OF ATTACHMENTS

Attachment B – Services to be Provided by the Engineer

Attachment C – Work Schedule

Attachment D – Fee Schedule

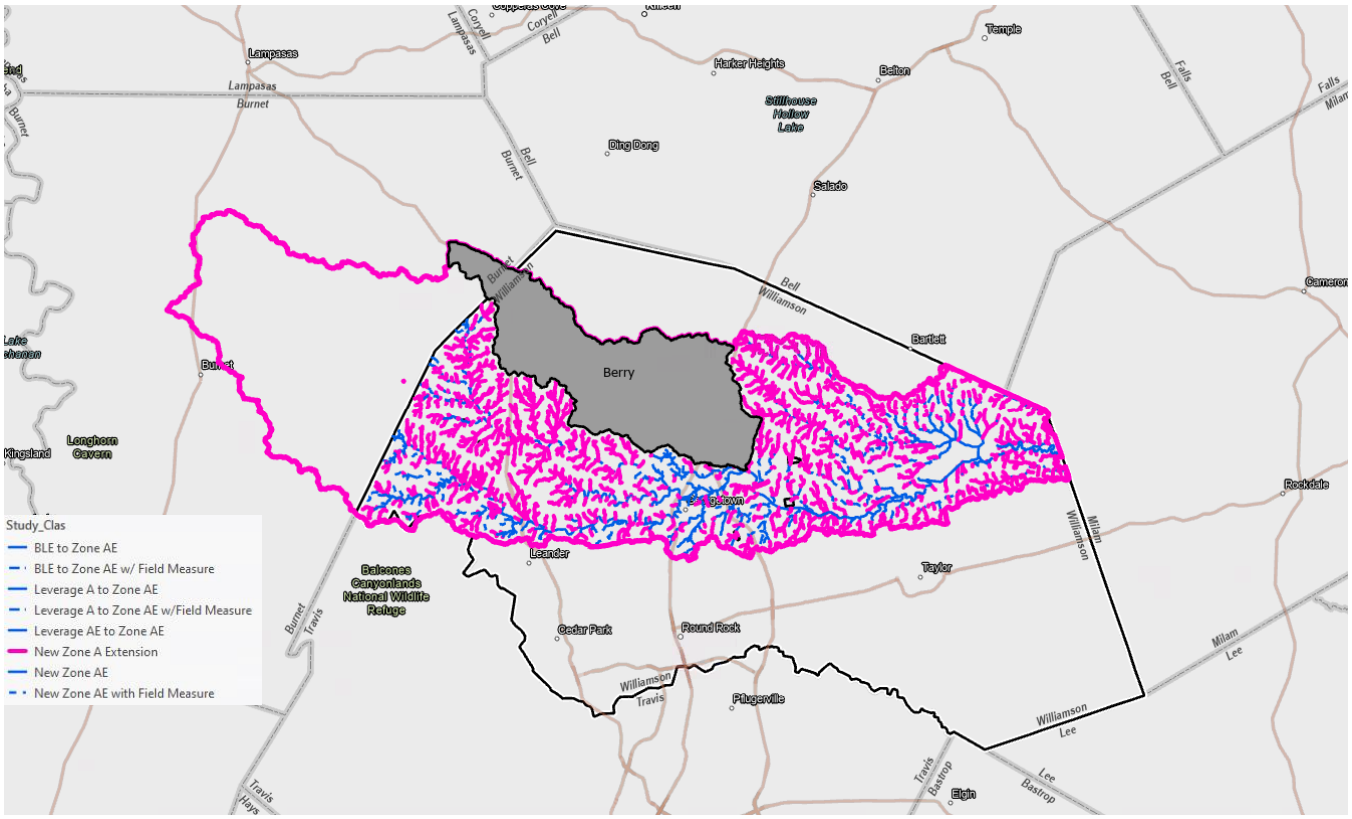
APPROVED
By Christen Eschberger at 9:49 am, May 27, 2025

ATTACHMENT B
SERVICES TO BE PROVIDED BY THE ENGINEER
FOR Atlas 14 Floodplain Mapping
Work Authorization No. 2 – Supplemental Work Authorization No. 4
Study Area LiDAR Update of Unincorporated Areas in the San Gabriel Basin plus Berry Creek Hydrology

PROJECT DESCRIPTION

Project Area

Areas within the Williamson County Atlas 14 Floodplain Mapping Project for San Gabriel watershed extents. The primary area is Williamson County with hydrology including portions of Milam, Burnet, and Bell Counties. Proposed work is for areas Outside of Municipality within the above listed watershed extents.



Proposed Project

Conduct existing condition hydrology, hydraulics, and mapping updates utilizing newly available 2024 LiDAR in areas where significant changes have occurred. All analysis shall be in accordance with the Williamson County bulleted Technical Standards developed specifically for the Atlas 14 Floodplain Mapping Project. The analysis shall also be in accordance with FEMA guidance and mapping standards.

The analysis will include the streams shown in the Project Area graphic. Table 1 displays the study stream types and associated stream miles. The recurrence intervals listed in Table 2 shall be used to develop the hydrologic and hydraulic models and associated floodplain mapping products.

Table 1. Study Stream Types and Mileage

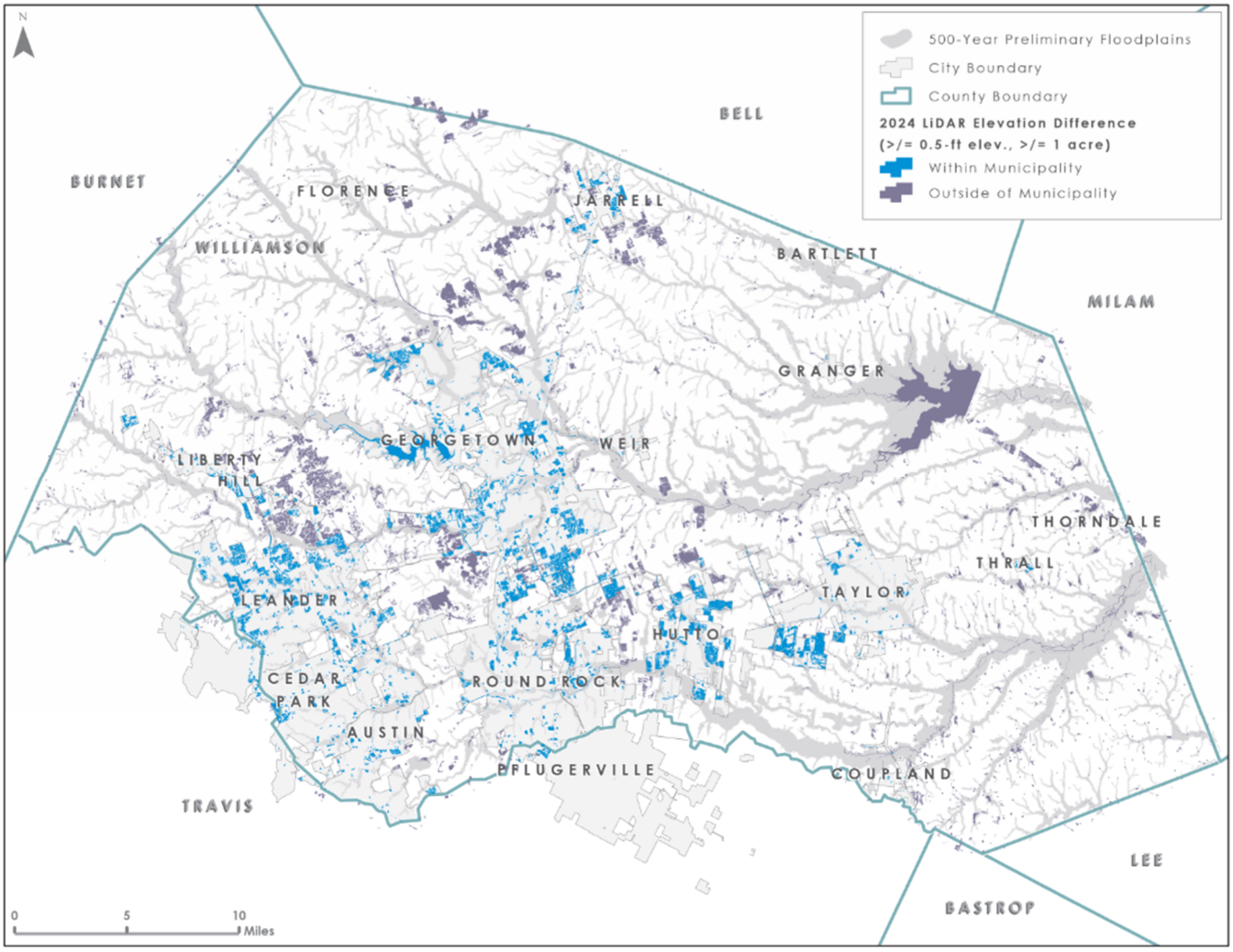
Study Classifications	Stream Miles
Zone AE	181
Zone A (Extensions)	115
Totals	**296**

Table 2. Study Requirements for Modeling and Mapping

(F = required by FEMA)		Land-Use Conditions					
(W = required by Wilco)		Existing Conditions					
Recurrence Interval Years (Annual % Chance Event)		2 (50%)	10 (10%)	25 (4%)	50 (2%)	100 (1%)	500 (0.2%)
Models	Hydrology	**W**	**F**	**F**	**F**	**F**	**F**
	Hydraulics	**W**	**F**	**F**	**F**	**F**	**F**
Detailed Analysis (Zone AE) Products	Floodplains					**F**	**F**
	Water Surface Elevation Grids					**F**	**F**
	Depth Grids					**F**	**F**
Limited Detailed Analysis (Zone A) Products	Floodplains					**F**	
	Water Surface Elevation Grids					**F**	
	Depth Grids					**F**	

The analysis for Williamson County's unincorporated areas includes hydrologic updates at 110 San Gabriel watershed locations, of which hydrologic updates of 35 locations are within the Berry Creek watershed and hydraulic updates at 120 locations. The budget covers updated modeling and mapping for these areas, including new developments and quarries, shown in the map on the following page. Updates for municipalities will be budgeted in future work authorizations.

Countywide 2024 LiDAR Changes – Unincorporated areas vs. Municipalities



PROJECT SCOPE

1. PROJECT MANAGEMENT & COORDINATION

   a. Monthly Progress Report, Invoices, and Billings (12 months assumed):

      1. Submit monthly progress status reports to the General Engineering Consultant (GEC). Progress reports will include: deliverable table, tasks completed, tasks/objectives that are planned for the upcoming periods, lists or descriptions of items or decisions needed from the County and its representatives. Subconsultant progress will be incorporated into the monthly progress report. A copy of the monthly progress report will be uploaded to ProjectWise.

      2. Prepare correspondence, invoices, and progress reports on a monthly basis in accordance with current County requirements.

   b. Project Coordination & Administration:

      1. Prepare and maintain routine project record keeping including records of meetings and minutes. Correspondence and coordination with outside entities will be handled through and with the concurrence of the GEC.

      2. Manage project activities (including documenting emails, phone and conference calls, maintain project files for the length of the project, meeting agendas, meeting minutes, and schedule meetings), direct Engineer's team/staff, coordinate and review subconsultant work, correspond with the County and its representatives, and assist the County and its representatives in preparing responses to project-related inquiries.

   c. Stakeholder Meetings (2 virtual stakeholder meetings):

      1. Attend two (2) coordination meetings with study area project stakeholders (Williamson County, GEC, Technical Program Manager, TWDB, local and state partners) throughout the duration of the project. Ideally these two meetings would include a kickoff with the validation of the LiDAR update modeling methodologies as well as a flood risk meeting near the end of the project to review draft mapping and reporting.

   d. Progress/Coordination Meetings:

      1. Plan and attend up to twenty-four (24) half-hour, virtual coordination meetings with the County Technical Program Management (TPM) and GEC to advance project implementation. Schedule is anticipated bi-weekly but may vary as appropriate throughout the duration of the project. Doucet is responsible for the development of meeting minutes and posting of the minutes in ProjectWise for these coordination meetings.

   DELIVERABLES:

   1. Up to 12 Monthly Invoices and Progress Reports
   2. Up to 24 County/TPM Coordination Meeting Minutes

2. DATA COLLECTION

a. Terrain Comparison (study area only):

1. Using the provided difference raster; identify locations where the terrain changes warrant updates to subbasin boundaries and hydraulic models (120 locations assumed). Generate a polygon shapefile indicating areas where existing condition models will be updated with 2024 LiDAR.
2. Halff will generate a final hydraulic terrain for the study area by taking the 2017/2015 DEM and incorporating areas of the 2024 LiDAR where modeling updates will be conducted. This scope assumes the terrain update to include 120 locations in the San Gabriel watershed which includes 35 locations in the Berry Creek watershed. No Doucet labor is assumed for this subtask.
3. Conduct internal QA/QC of the terrain prior to submission to Williamson County for review.

DELIVERABLES:

1. Polygon shapefile indicating areas where model updates will be conducted
2. Updated study area hydraulic DEM (mosaic of 2017/2015 LiDAR with 2024 LiDAR)

3. HYDROLOGIC ANALYSIS

This effort includes leveraging the existing condition hydrologic analysis conducted in a prior work authorization. Minor hydrologic updates will be conducted on the existing condition hydrology to reflect updated 2024 LiDAR. Consistent with Table 2 above, updated existing condition hydrologic analysis shall include evaluation of the 2-, 10-, 25-, 50-, 100-, and 500-year frequency events. Specific tasks include:

a. Update Prior Existing Condition Hydrologic Analysis:

1. Utilizing the polygon areas identified under Task 2a, evaluate subbasin delineations within 110 locations to reflect updated LiDAR. Only in these 110 locations, perform subbasin delineation adjustments where model results will have a measurable (5%) impact.
2. For only the subbasins that were altered, compute updated hydrologic parameters (updates to existing land use, curve number, percent impervious, flow path, time of concentration, and routing) following technical methodologies consistent with the prior existing condition analysis.
3. Update the prior existing condition hydrologic analysis to compute updated/new existing condition hydrologic results for the 2-, 10-, 25-, 50-, 100-, and 500-year frequency events.

b. Internal QA/QC:

1. Conduct internal QA/QC of the updated existing condition hydrologic results prior to submission to Williamson County for review. Two milestone reviews are anticipated for existing condition hydrologic updates.

- Subbasin and Parameter Adjustments – Review of 2024 LiDAR adjusted subbasin delineations and computed hydrologic parameters for adjusted subbasins relative to the prior hydrologic analysis.
- Updated Existing Conditions Hydrology – Review of updated hydrologic models, calculation/comparison spreadsheets, supporting data, and reporting.

2. Submit hydrologic data and internal review checklists for county review. It is anticipated that these two (2) hydrologic milestone reviews include one initial review and one backcheck to clear comments. It also assumes two (2) virtual coordination meetings to efficiently coordinate QC comments and resolution.
3. Reconcile county comments or reach a mutual agreement regarding comment resolution and re-submittal of final hydrologic deliverables.

DELIVERABLES:

1. Bulleted summary of existing condition hydrologic changes
2. Internal QA/QC forms
3. Reconciled external QA/QC forms
4. Updated existing condition hydrologic memorandum and dataset submittal (hydrologic modeling notebook, reporting support, hydrologic model, supporting calculation spreadsheets, and GIS files – final updated land use, soils, subbasins, and longest flow paths)

4. HYDRAULIC ANALYSIS AND MAPPING

This effort includes leveraging the existing condition hydraulic analysis conducted in a prior work authorization. Minor hydraulic updates will be conducted on the existing condition hydraulics to reflect updated 2024 LiDAR. Existing condition hydraulic analysis shall include evaluation of the 2-, 10-, 25-, 50-, 100-, and 500-year frequency events. Consistent with the existing condition analysis, all hydraulic analysis will include one-dimensional (1D), steady-state modeling using detailed analysis (Zone AE) for 181 stream miles and limited detailed analysis (model-backed Zone A) for 115 stream miles. Specific tasks include:

a. Update Prior Existing Condition Hydraulic Analysis:

1. Utilizing the polygon areas identified under Task 2a, evaluate cross-section alignments within 120 locations to reflect updated LiDAR. Only in these 120 locations, perform cross-section alignments adjustments.
2. For only the cross-sections that were altered, compute updated hydraulic parameters (elevations, roughness coefficients, expansion/contraction coefficients, ineffective areas and blocked obstructions) following technical methodologies consistent with the prior existing condition analysis.
3. This task assumes the inclusion of approximately 20 new crossings in the 120 locations that were updated. These new crossings will be based on as-built plans provided by the County. It is assumed no manual terrain modifications are necessary for this update.
4. Update the prior existing condition hydraulic analysis with updated hydrologic flows to compute updated/new existing condition hydrologic results for the 2-, 10-, 25-, 50-, 100-, and

500-year frequency events. This task also assumes model adjustments to uncross profiles and ensure model containment.

5. Update the existing condition floodplain mapping, including depth and water surface grids, to ensure alignment with LiDAR modeling updates. Additionally, ensure smooth tie-ins and cross-section alignments at confluences.

b. Internal QA/QC:

1. Conduct internal QA/QC of the updated existing condition hydraulic results prior to submission to Williamson County for review. Two milestone reviews are anticipated for existing condition hydraulic updates.
   - Cross-Section Adjustments – Review of 2024 LiDAR adjusted cross-section alignments relative to the prior cross-section alignments.
   - Updated Existing Conditions Hydraulics and Mapping – Review of updated hydraulic models, updated mapping, updated depth and water surface grids, and reporting.
2. Submit hydraulic data and internal review checklist for county review. It is anticipated that these two (2) hydraulic milestone reviews include one initial review and one backcheck to clear comments. It also assumes two (2) virtual coordination meetings to efficiently coordinate QC comments and resolution.
3. Reconcile County comments or reach a mutual agreement regarding comment resolution and re-submittal of final hydrologic deliverables.

DELIVERABLES:

1. Bulleted summary of existing condition hydrologic changes
2. Internal QA/QC forms
3. Reconciled external QA/QC forms
4. Updated existing condition hydraulic memorandum and dataset submittal (hydraulic modeling notebook, reporting support, hydraulic models, supporting GIS files – centerlines, cross-sections, n-values, floodplains, water surface elevation grids, and depth grids)

5. DOCUMENTATION

This effort includes preparation of an addendum memorandum for the prior Atlas 14 Floodplain Study report. The memorandum shall provide a thorough explanation of all updated procedures, assumptions, special considerations, comparisons, checkpoints, independent QA/QC, and planning results. Specific tasks include:

a. Documentation (Study Area):

1. Prepare an existing condition addendum memorandum documenting the updated existing condition study approach, data collection, hydrologic analysis, hydraulic analysis, and modeling results.
2. Prepare supporting digital information including computation spreadsheets, hydrologic models, hydraulic models, and supporting geospatial data. A digital copy of the memorandum will also be provided.

DELIVERABLES:

1. Draft existing condition addendum memorandum submittal describing the methods, assumptions, and results of the study area including supporting information, models, and GIS datasets.
2. Final existing condition addendum memorandum with reconciled independent QA/QC comments.

PROJECT ASSUMPTIONS

General Project Assumptions

1. The Outreach Consultant will be responsible for all administrative tasks related to stakeholder and public outreach, such as scheduling, advertisement, recording/documentation, meeting minutes, reproduction, and other duties as needed.
2. For the unincorporated areas of Williamson County, it was determined that 110 locations in the San Gabriel watershed including 35 locations within the Berry Creek watershed (developments and quarries) require updates to reflect terrain changes. If additional locations are identified, a change order will be required for existing condition modeling and mapping updates in those areas.
3. No wholistic existing condition modeling updates will be conducted such as broad updates of the existing condition land use layer, roughness coefficients, hydrologic routing, or adjustments to the Atlas 14 rainfall totals.
4. Natural LiDAR deviations due to vegetative cover, seasonal permanent pool fluctuations, channel erosion, base flow, etc. will not warrant modeling or mapping updates.
5. It is assumed that new developments planned or constructed after the 2024 LiDAR collection date (requiring manual development of DEMs based on construction plans) will not be included.
6. It is assumed that LiDAR updates are not necessary for areas outside of Williamson County.

Project Exclusions

1. Support and attendance of public meetings
2. Field survey and field reconnaissance
3. Manual development of DEMs
4. Update of gage analysis, historical simulations, or comparisons to any other newly available datasets beyond the comparisons in the prior existing condition analysis
5. Flood risk mitigation analysis
6. Grant application development

ATTACHMENT C
WORK SCHEDULE
FOR Atlas 14 Floodplain Mapping
Work Authorization No. 2, Supplemental Authorization 4
Study Area LiDAR Update
San Gabriel Basin plus Berry Creek Hydrology

TASK	DURATION (working days)	START	END
Notice to Proceed	***1***	***5/30/2025***	***6/2/2025***
1. Project Management and Coordination	185	5/30/2025	11/30/2025
2. Data Collection	15	5/30/2025	6/13/2025
3. Hydrologic Analysis	78	6/13/2025	9/15/2025
4. Hydraulic Analysis and Mapping	75	8/4/2025	10/31/2025
5. Documentation	42	11/3/2025	11/30/2025

Williamson County Atlas 14 2024 LiDAR Update - Doucet & Associates, Inc. Fee Summary					Principal Engineer (PE)	Senior Project Manager	Project Manager	Project Engineer III	Engineer Associate II	Sr. Operations Assistant	TOTAL HOURS	TOTAL LABOR	WILCO UN-INCORPORATED AREAS	*MUNICIPALITIES
LABOR TASK	Unit	Qty.	Cost	Total	*$265.98*	*$244.70*	*$212.78*	*$180.86*	*$138.31*	*$106.39*				
1. PROJECT MANAGEMENT/COORDINATION													70%	30%
a. Progress Reports, Invoicing	MO	12	$ 1,213	$ 14,554	12	36	-	-	-	24	72	$ 14,554	$ 10,188	$ 4,366
b. Project Coord & Admin	MO	12	$ 2,692	$ 32,300	12	72	48	-	-	12	144	$ 32,300	$ 22,610	$ 9,690
c. Stakeholder Meetings	EA	2	$ 4,617	$ 9,235	4	8	8	8	16	8	52	$ 9,235	$ 6,464	$ 2,771
d. Progress/Coordination Meetings	EA	24	$ 644	$ 15,448	12	24	12	12	12	-	72	$ 15,448	$ 10,814	$ 4,634
TASK TOTAL:				$ 71,537								**$ 71,537**	**$ 50,076**	$ 21,461
2. DATA COLLECTION													70%	30%
a. Terrain Comparison	EA	120	$ 160	$ 19,172	2	4	10	40	60	-	116	$ 19,172	$ 13,420	$ 5,752
b. Generate Hydraulic Terrain	EA	0	$ -	$ -	-					-	0	$ -	$ -	$ -
c. Data QA/QC	LS	1	$ 8,745	$ 8,745	2	4	4	20	20	-	50	$ 8,745	$ 6,122	$ 2,623
TASK TOTAL:				$ 27,917								**$ 27,917**	**$ 19,542**	$ 8,375
3. HYDROLOGIC ANALYSIS													70%	30%
a. Update Prior Hydrologic Analysis with LiDAR	EA	110	$ 1,814	$ 199,537	10	25	60	250	960	-	1305	$ 199,537	$ 139,676	$ 59,861
b. Hydrology QA/QC	LS	1	$ 37,066	$ 37,066	4	8	40	80	80	-	212	$ 37,066	$ 25,946	$ 11,120
TASK TOTAL:				$ 236,603								**$ 236,603**	**$ 165,622**	$ 70,981
4. HYDRAULIC ANALYSIS & MAPPING													70%	30%
a. Update Prior Hydraulic Analysis with LiDAR	EA	120	$ 2,088	$ 250,549	16	50	200	600	600	-	1466	$ 250,549	$ 175,384	$ 75,165
b. Hydraulics QA/QC	LS	1	$ 41,279	$ 41,279	6	10	40	90	90	-	236	$ 41,279	$ 28,896	$ 12,383
TASK TOTAL:				$ 291,828								**$ 291,828**	**$ 204,280**	$ 87,548
5. DOCUMENTATION													70%	30%
a. Existing Condition Memorandum	LS	1	$ 51,014	$ 51,014	10	15	30	120	120	-	295	$ 51,014	$ 35,710	$ 15,304
b. Digital Deliverables	LS	1	$ 8,320	$ 8,320	2	4	8	16	16	-	46	$ 8,320	$ 5,824	$ 2,496
TASK TOTAL:				$ 59,334								**$ 59,334**	**$ 41,534**	$ 17,800
TOTAL PROJECT COST:				**$ 687,219**								**$ 687,219**	**$ 481,054**	**$ 206,165**
												(TOTAL)	*(WILCO)*	*(CITIES)*

*** Proposed Project Work for this authorization is for areas Outside of Municipality ONLY. The proposed fee total for this Work Authorization is $481,054.00**