

Agenda Item: 9.

MEMORANDUM

TO: Programs, Projects and Operations Subcommittee

FROM: Lori Ann Laster, Stormwater Management Engineer

SUBJECT: Review and Recommendation on Contract with Stantec Consulting Services, Inc. for Papio Hydraulic Modeling

DATE: April 3, 2017

A flood study of the Papillion Creek Watershed has been ongoing since 2003. This study is a collaboration between the Federal Emergency Management Agency (FEMA), US Army Corps of Engineers (USACE) and the District. In 2010, the flood maps for the West Papillion basin were completed and published. The study for the Big and Little Papillion branches began in June 2008 and it was intended for flood maps to be published in 2013 however, due to delays in USACE funding, the timeline has changed and it is currently anticipated that the maps will be published in 2019.

As part of the Big and Little Papio project, new hydrology for the watershed was completed in 2010 by the USACE. The peak flows increased substantially in many parts of the watershed. The next step of the study, the hydraulics, began in 2011 but the USACE funding stalled and in 2014 it was determined that the USACE could not complete the project. FEMA provided the funding to finish the hydraulics using their contractor and the initial results were presented at a March 2016 Flood Risk Review meeting. Significant increases in flows and floodplains are seen on the proposed flood maps especially along the Little Papillion Creek.

In June 2016, the District contracted with FYRA Engineering to reexamine the hydrology. National Oceanic and Atmospheric Administration (NOAA) published *Atlas 14 Precipitation-Frequency Atlas of the United States Volume 8 for the Midwestern States* which updated rainfall depths and distribution patterns. Additionally, the District and the Papillion Creek Watershed Partnership has or will complete four flood control reservoirs by 2019. FYRA Engineering presented this information to the District and indicated that an update of the hydrology provides the most current data and could make a significant impact on the proposed flood maps.

FYRA Engineering completed the study and it was submitted to FEMA for review in December 2016. FEMA has reviewed the study and will accept the new hydrology for the updated flood maps.

In order to incorporate the new data in the upcoming flood maps, the District will need to contract with FEMA's contractor, Stantec Consulting Services, Inc., to update the hydraulic model and the reports and data sets FEMA publishes with each flood map. The attached scope and fee from Stantec includes all of the tasks necessary to incorporate the new data from FYRA. The total cost to complete the work is \$429,681.81.

The Papillion Creek Watershed Partnership has agreed to contribute \$150,000 toward these hydrology and hydraulics updates.

Management recommends that the Subcommittee recommend to the Board that the General Manager be authorized to waive District Policy 15.2 and execute the proposed contract with Stantec Consulting Services, Inc. for an update of the Papillion Creek Watershed hydraulic modeling in an amount not-to-exceed \$429,681.81, subject to changes deemed necessary by the General Manager and approval as to form by District Legal Counsel.



March 17, 2017

John Winkler
General Manager
Papio-Missouri River Natural Resources District
8901 S. 154th Street
Omaha, NE 68138-3621

Dear John,

Reference: Hydraulic Modeling for Papillion Creek Watershed

Stantec Consulting Services Inc. is pleased to submit the attached proposal to complete 214 miles of hydraulic modeling in the Papillion Creek Watershed. The attached proposal addresses requirement set forth by FEMA to compete a new hydraulic analysis.

The cost of the proposed work shall not exceed the amount of \$429,681.81. Included in the proposal is a detailed cost estimate.

We look forward to the opportunity to work with you on the very important project. If you have any questions, please feel free to contact me at 913-202-6866.

Regards,

A handwritten signature in black ink that reads "Jason Schneider".

Jason Schneider, PE, PMP, CFM
Project Manager
Phone: (913) 202-6866
jason.schneider@stantec.com

Attachments: Proposal
Schedule
Cost Proposal

jts document2

Design with community in mind

Hydraulic Modeling for Papillion Creek Watershed

Proposal



Prepared for:
Papio-Missouri River Natural Resource
District

Prepared by:
Jason Schneider, P.E., PMP, CFM
Project Manager

March 17, 2017

Table of Contents

Summary.....	1
1 CTP Program Management.....	1
1.1 Quality Assurance/ Quality Control Plan.....	1
1.2 Project Management Team.....	1
2 Project Management.....	1
2.1 Earned Value Data Management.....	1
2.2 30-Day Review of Modeling Methods.....	1
2.3 Meeting.....	1
2.4 Status Report.....	2
2.5 Project Outreach and Communication Plan.....	2
3 Develop Flood Risk Products.....	2
3.1 Flood Risk Products.....	2
3.2 Flood Risk Datasets.....	2
3.3 Independent QA/QC of Flood Risk Products.....	2
4 Develop Topographic Data.....	3
5 Develop Hydrologic Data.....	3
6 Develop Hydraulic Data.....	3
7 Perform Independent QA/QC: Hydraulic Data.....	5
8 Perform Floodplain Mapping.....	5
9 Perform Independent QA/QC: Floodplain Mapping.....	5
Appendices.....	1
Appendix A – Flooding Sources to be Studied.....	1

Summary

Stantec Consulting Services Inc prepared this proposal to provide 214 miles of hydraulic modeling in the Papillion Creek Watershed for the Papio-Missouri River NRD (Papio NDR). This proposal was prepared to meet the requirement set forth by Federal Emergency Management Agency (FEMA's) in the Mapping Activities Statement (MAS) agreed upon by FEMA and the Papio NRD. Task included in this proposal are listed below along with the deliverables included with each task.

1 CTP Program Management

1.1 Quality Assurance/ Quality Control Plan

Stantec will prepare and provide the Papio NDR with a Quality Assurance/Quality Control (QA/QC) plan that will meet the requirement from FEMA as outline in the MAS. The plan will outline summary reports and describes how results of all automated or manual QA/QC review steps will be provided.

1.2 Project Management Team

Stantec, in cooperation with the Papio NRD, will establish a Project Management Team (PMT) and provide the required documentation as required by FEMA Region VII. STARR II will host and participate in the Project Management Team meetings monthly.

2 Project Management

2.1 Earned value Data Management

Stantec will update FEMA's Mapping Information Platform (MIP) Workflow including the schedule, physical percent completes and cost to date on a monthly basis. Tasks shall include:

- Monthly Earned Value data reporting through the MIP with variance explanations to support management of technical mapping activities within specified time frame. This will include updates for both Regulatory and Flood Risk Products.
- Management of SPI/CPI performance.
- Overall project QA/QC maintenance information, including maintenance of a QA/QC log and developing a QA/QC approach to FEMA for review and approval.
- Management for adherence to scope and overall quality of work.

2.2 30-Day Review of Modeling Methods

Stantec shall produce and distribute to all communities in the project area letters explaining the engineering methods proposed in accordance with FEMA standards.

2.3 Meeting

Stantec shall provide meeting invites, agenda, presentations and sign in sheets from all meetings conducted as part of the projects once completed. Meetings will include:

- A 75% modeling review meeting with the Papio NRD.

- A Flood Risk Review Meeting: Stantec will prepare workmaps, Flood Risk Database, Flood Risk Report and Flood Risk Map for this meeting. Stantec will prepare a presentation and send invites to all applicable communities.

2.4 Status Report

Stantec will prepare monthly status reports and deliver these to the Papio NRD.

2.5 Project Outreach and Communication Plan

Stantec will prepare a Project Outreach and Communication Plan to support the project. This plan will be delivered within the first month after the official notice to proceed.

3 Develop Flood Risk Products

3.1 Flood Risk Products

Stantec will complete Flood Risk Products for the streams identified as part of the project area. We will utilize local data in place of census data where available throughout the watershed. All products and datasets will be developed in accordance with FEMA Standards. Details about the development of these products include:

- The Flood Risk Database will contain the applicable Flood Risk Datasets. The Flood Risk Database will be produced in accordance with the latest Flood Risk Database Technical Reference.
- The Flood Risk Map will include an exhibit that depicts the Flood Risk assessment data.
- The Flood Risk Report will present risk information for local communities, as well as a summary of the watershed risk.

3.2 Flood Risk Datasets

Stantec will produce the following Flood Risk Datasets:

- Changes Since Last FIRM
- Water Surface Elevation Grids for all newly modeled frequencies
- Flood Depth Grids for all newly modeled frequencies.
- Percent Annual Chance Grid
- Percent 30-year Chance Grid
- Flood Risk Assessment
- Areas of Mitigation Interest

Deliverables shall include:

- Flood Risk Report, Flood Risk Map, and the Flood Risk Database which shall include all applicable Flood Risk datasets developed in accordance with this scope.

3.3 Independent QA/QC of Flood Risk Products

Stantec will complete Independent QA/QC of the developed Flood Risk Products in accordance with all FEMA Standards.

Deliverables shall include:

- A Summary Report that describes the findings of the independent QA/QC review.
- Recommendations to resolve any problems that are identified during the independent QA/QC review.

4 Develop Topographic Data

Stantec will utilize the 2010 Lidar for all hydraulic modeling, mapping and flood risk products. The available topographic data has a 1.7 meter post spacing. Stantec will deliver through the MIP a topographic deliverable.

Deliverables shall include:

- Bare Earth DEM.
- 2 ft Contours.
- A Technical Support Data Notebook (TSDN) narrative describing the scope of work, direction from FEMA, issues, information for next mapping partner, etc.
- Metadata file complying with the latest Metadata Technical Reference.

5 Develop Hydrologic Data

Stantec will utilize the existing hydrology submittal prepared by the Papio NRD once it has passed the FEMA QA/QC and complete a DCS Compliant submittal in accordance with the FEMA standards.

- Stantec assumes that all review comments from the hydrology submittal will be resolved by the contractor who develops this submittal. Stantec shall not be responsible for errors or omissions in the hydrology. If issues are found Stantec shall present the findings to the Papio NRD.
- Stantec will format the hydrologic data consistent with the latest FIRM Database Data Capture Technical Reference

Deliverables shall include:

- FIRM Database files as stated in the latest FIRM Database Technical Reference.
- Metadata file complying with the latest Metadata Technical Reference
- Digital versions of draft text for inclusion in the FIS report.
- Digital versions of backup data used in the analysis including GIS data layers work maps.
- Certification that the digital data meet the minimum standards and specifications.

6 Develop Hydraulic Data

Stantec shall perform hydraulic analysis for approximately 214 miles of detailed study for the area marked in Appendix A. The hydraulic analysis will include establishing a regulatory

floodway and flood elevations for the 10%, 4%, 2%, 1%, "1% plus" and 0.2% annual chance flood events. The floodway will be modeled using the Papio NRD adopted 4 -step process that includes:

1. Determining floodway using future 1-pct-annual chance discharge
2. Adjusting floodway wider, if needed, for existing, 1-pct-annual chance discharge
3. Comparing adjusted floodway to required stream setbacks of 3 times the depth of the stream plus 20 ft or 50 ft as defined in 2009 Watershed Management Plan
4. Selecting the encroachment stations that produce the widest floodway from the previous steps.

No new field survey will be performed as part of this project. Survey information will come from existing hydraulic modeling that shall be leveraged. All hydraulic data analysis and deliverables will be performed in accordance with FEMA standards.

Deliverables shall include:

- Digital copies of hydraulic modeling (input and output) files for the 10%, 4%, 2%, 1%, "1% plus" and 0.2% annual chance events.
- Digital hydraulic data consistent with the latest Data Capture Technical Reference.
- FIRM Database files as described in the latest FIRM Database Technical Reference
- Metadata file complying with the latest Metadata Technical Reference
- Digital versions of draft text for inclusion in Section 5.2 Hydraulic Analyses of the FIS report.
- Digital Floodway Data Tables for each flooding source studied by detailed methods that is compatible with the FIRM database.
- Digital profiles of the 10%, 4%, 2%, 1%, "1% plus" and 0.2% annual chance events, representing existing conditions using the FEMA RASPLLOT program or similar software (for flooding sources studied by detailed methods).
- Digital versions of backup data used in the analysis, including high water mark data for model calibration, GIS data layers, and any additional hydraulics data collected for use in the preparation of this Flood Risk Project.
- Set of digital work maps to be used at the Flood Engineering Review meeting. Work maps will include all appropriate GIS layers and be PDF files depicting effective and revised flooding, cross sections, streams and roads on an aerial base map.
- A Hydraulic Report summarizing the approach and results of the hydraulic analysis for each study area.
- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the preparation of the FIRM as outlined in the QA/QC Plan.
- Certification that the digital data meet the minimum standards and specifications.
- Explanations for unresolved messages from the CHECK-2 or CHECK-RAS program, as appropriate.

- Written response to any comments resulting from the independent QA/QC review.

7 Perform Independent QA/QC: Hydraulic Data

Stantec will perform an independent QA/QC of the hydraulic analysis in accordance with FEMA standards and the submitted QA/QC plan.

Deliverables shall include:

- A Summary Report that describes the findings of the independent QA/QC review.
- Recommendations to resolve any problems that are identified during the independent QA/QC review.

8 Perform Floodplain Mapping

Stantec will delineate the 1 percent and 0.2 percent annual chance flood hazard boundaries, the regulatory floodway boundaries, limit of study locations, stream centerlines, cross section locations, and BFE locations for the areas listed in Appendix A.

Deliverables shall include:

- A metadata file complying with the latest Metadata Technical Reference.
- Draft FIRM database prepared in accordance with FEMA standards.
- DCS compliant digital versions of input and output for computer programs that were used (see draft language and coordinate with the Region regarding its appropriate usage).
- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the preparation of the FIRM as outlined in the QA/QC Plan.
- Written summary of the analysis methodologies.
- Results of the Floodplain Boundary Standards (FBS) audit.
- Digital versions of draft FIS report, Floodway Data Tables and updated profiles including all profiles and tables converted to the appropriate vertical datum, as well as any other necessary items for the finalization of the preliminary FIS.

9 Perform Independent QA/QC: Floodplain Mapping

Stantec will perform an independent QA/QC of the floodplain mapping in accordance with FEMA standards and the Papio NRD QA/QC plan.

Deliverables shall include:

- A Summary Report that describes the findings of the independent QA/QC review.
- Recommendations to resolve any problems that are identified during the independent QA/QC review.

APPENDIX/DIVIDER TITLE

Appendix A

Appendices

APPENDIX A – FLOODING SOURCES TO BE STUDIES

Flooding Sources	Reach Limits.	Miles	Hydraulics	Redelineation
Boys Town Dam No 1	Reservoir area			X
Standing Bear Lake	Lake area			X
Candlewood Lake	Lake area			X
New Port Landing (Bennington Lake)	Lake area			X
Shadow Lake	Lake area			X
Midlands Lake	Lake area			X
Walnut Creek Lake	Lake area			X
Wehrspann Lake	Lake area			X
Whitehawk Lake	Lake area			X
Zorinsky Lake	Lake area			X
Cunningham Lake	Lake area			X
Lonergan Lake	Lake area			X
Lawrence Youngsman Lake	Lake area			X
Big Papillion Creek/Papillion Creek	Mouth to Douglas/ Washington County line UnSteady State modeling	30.8	X	
Little Papillion Creek	265 feet north of State Street to confluence with Big Papillion Creek	10.5	X	
Little Papillion Creek	Dutch Hall Rd to Confluence with Cunningham Reservoir	2.3	X	
90 th Street Drain	1,300 feet upstream of N 90 th St to confluence with Little Papillion Creek	0.7	X	
Applewood Creek	1,400 feet upstream of Giles Rd to confluence with West Papillion Creek	1.0	X	
Beadle Creek	Just downstream of S 192 nd St to the confluence with Little Papillion Creek	1.4	X	
Bennington Creek	2,500 feet upstream of Bennington Lake Trail to confluence with Big Papillion Creek	2.0	X	
Betz Road Ditch	500 feet upstream of Lincoln Rd to confluence with Big Papillion Creek	2.3	X	
Big Elk Creek	5,600 feet upstream of Cornhusker Rd to confluence with Big Papillion Creek	2.3	X	
Boettger Creek	400 feet upstream of N108th St to Confluence with Cunningham Reservoir	2.0	X	
Boxelder Creek	3,800 feet upstream of S 204 th St to confluence with Zorinsky Lake	3.7	X	
Butterflat Creek	Washington/Douglas County line to Confluence with Big Papillion Creek	0.8	X	
Blood Creek	600 feet upstream of railroad to confluence with Big Papillion Creek	1.0	X	
Cemetary Creek	450 feet SE of Center St to 230 ft NW of Fredrick Cir	0.5	X	
Champions Creek	550 feet upstream of Eagle Run Dr to Confluence with Eagle Run	0.2	X	
Cole Creek	Sorensen Pkwy to confluence with Little Papillion Creek	4.7	X	
Crystal Creek	1,500 feet upstream of Cornhusker Rd to Confluence with South Papillion Creek	1.3	X	

Eagle Run Creek	2,300 feet upstream of N 132 nd St to confluence with Big Papillion Creek	1.9	X	
East Knight Creek	650 feet upstream of Rainwood Rd to confluence with Cunningham Reservoir	1.2	X	
Elmwood Creek	1,700 feet upstream of University Dr S to confluence with Little Papillion Creek	1.1	X	
F Street Drain	1,100 feet upstream of S 60 th St to confluence with Little Papillion Creek	0.7	X	
Fairview Creek	250 feet upstream of S 17 th St to confluence with Big Papillion Creek	2.0	X	
Fort Crook Creek	1,900 feet upstream of Fort Crook Rd to confluence with Big Papillion Creek	1.5	X	
Frederic Street Creek	1,000 feet upstream of pedestrian bridge to confluence with Big Papillion Creek	0.5	X	
Fricke Creek	290 feet north of Fall Creek Rd to confluence with Big Papillion Creek	0.6	X	
Giles Creek	650 feet upstream of S 48 th St to confluence with Big Papillion Creek	0.8	X	
Glenbrook Creek	1,800 feet upstream of Sorensen Pkwy to confluence with Little Papillion Creek	0.5	X	
Hanover Creek	250 feet downstream of N 168 th St to Confluence with Big Papillion Creek	2.0	X	
Huntington Creek	70 feet downstream of N 156 th St to Confluence with North Branch West Papillion Creek	0.5	X	
Indian Creek	Fort St to confluence with West Papillion Creek	2.4	X	
Lockwood Creek	N 132 nd St to confluence with Big Papillion Creek	1.9	X	
Lonergan Creek	Lonergan Lake to confluence with Cunningham Reservoir	1.2	X	
Maple Village Creek	2,800 feet upstream of Maplewood Blvd to confluence with Little Papillion Creek	1.4	X	
Meadow Lane Creek	550 feet upstream of S 117 th St to confluence with Big Papillion Creek	0.8	X	
Mission Creek	850 feet upstream of Monroe St to confluence with South Papillion Creek	1.0	X	
Mockingbird Creek	130 feet upstream of Mockingbird Dr to confluence with Big Papillion Creek	1.4	X	
Morton Creek	200 feet upstream of West Papio South to confluence with West Papillion Creek	0.1	X	
Mud Creek	Sarpy/Douglas boundarty to confluence with Little Papillion Creek	4.4	X	
North Boxelder Creek	2,500 feet upstream of Marinda St to confluence with Boxelder Creek	1.5	X	
North Standing Bear Creek	4,500 feet upstream of Ida St to confluence with Standing Bear Creek	0.8	X	
North Washington Creek	Dutch Hall Rd to confluence with Washington Creek	0.5	X	
North Wehrspann Creek	4,300 feet upstream of S 160 th St to confluence with Wehrspann Creek	0.9	X	
Oak View Creek	90 feet downstream of 144 th Street South to confluence with West Papillion Creek	0.5	X	
Old Bones Creek	Dutch Hall Rd to confluence with Little Papillion Creek	0.5	X	
Old Home Creek	630 feet upstream of railroad to confluence with Mud Creek	0.1	X	
Old Lincoln Highway Creek	1,400 feet upstream of Harney St to confluence with West Papillion Creek	1.6	X	
Pacific Hollow Creek	270 feet upstream of S 153 rd St to confluence with West Papillion Creek	0.5	X	
Quail Creek	Capehart Rd to confluence with Papillion Creek	2.6	X	
Ralston Creek	1,600 feet upstream of S 78 th St to confluence with Big Papillion Creek	1.4	X	
Ridgewood Creek	3,500 feet upstream of Pawnee Rd to confluence with Big Papillion Creek	2.6	X	
Rockbrook Creek	280 feet downstream of US 680 to confluence with Big Papillion Creek	1.2	X	

Saddle Creek	N Saddle Creek Rd and Seward St to confluence with Little Papillion Creek	4.0	X	
South Standing Bear Creek	N 155 th Ave to confluence with Standing Bear Lake	1.7	X	
South Washington Creek	1,900 feet upstream of Pawnee Rd to confluence with Washington Creek	0.4	X	
South Wehrspann Creek	3,800 feet upstream of I-80 to confluence with Wehrspann Creek	1.2	X	
Standing Bear Creek	125 feet upstream of N 132 nd St to confluence with Big Papillion Creek	0.8	X	
Thomas Creek	Washington/Douglas County boundary to the confluence with Little Papillion Creek	7.3	X	
Thompson Creek	1,000 feet upstream of Edgewood Blvd to confluence with Big Papillion Creek	1.9	X	
Tiburon Creek	2,100 feet upstream of Giles Rd to confluence with South Papillion Creek	0.7	X	
Walnut Creek	1,700 feet upstream of Schram Rd to 100 feet downstream of Schram Rd	0.4	X	
Washington Creek	400 feet upstream of N 216 th St to confluence with Big Papillion Creek	4.5	X	
Wehrspann Creek	750 feet downstream of S 204 th St to confluence with Wehrspann Lake	4.8	X	
West Midland Creek	S Washington St to confluence with Midland Creek	0.6	X	
West Quail Creek	Lakewood Villages Lake to confluence with Quail Creek	0.4	X	
Whispering Ridge Creek	5,100 feet upstream of W Maple Rd to confluence with West Papillion Creek	2.8	X	
Whitehawk Creek	600 feet upstream of S 207 th St to confluence with Boxelder Creek	3.7	X	
Whitted Creek	650 feet upstream of S 25 th St to confluence with Big Papillion Creek	1.2	X	
Wolf Creek	100 feet downstream of Cornhusker Rd to confluence with Mud Creek	0.6	X	
Hell Creek	Doyle Dr to confluence with West Papillion Creek	6.2	X	
Midland Creek	S Washington St to confluence with West Papillion Creek	2.8	X	
North Branch West Papillion Creek	175 feet upstream of N 216 th St to confluence with West Papillion Creek	10.7	X	
South Midland Creek	1,300 feet upstream of Capehart Rd to confluence with Midland Creek	1.6	X	
South Papillion Creek	Douglas/Sarpy County boundary to confluence with West Papillion Creek	11.9	X	
South Papillion Tributary (Westmont Creek)	2,300 feet upstream of S 144 th St to confluence with South Papillion Creek	4.1	X	
Walnut Creek	Walnut Creek Lake to confluence with West Papillion Creek	2.1	X	
West Papillion Creek	Edgewater Rd to confluence with Big Papillion Creek	23.9	X	
West Papillion Tributary (Schram Creek)	Schram Rd to confluence with West Papillion Creek	4.0	X	

Schedule

Papillion Creek Watershed	Baseline Start Date	Baseline End Date	Baseline Cost
1 CTP Program Management	5/1/2017	10/31/2017	\$4,153.92
2 Project Management	5/1/2017	10/31/2017	\$19,478.64
3 Develop Flood Risk Products	8/21/2017	10/31/2017	\$43,524.30
4 Develop Topographic Data	5/1/2017	5/19/2017	\$1,927.44
5 Develop Hydrologic Data	5/1/2017*	6/2/2017	\$15,853.38
6 Develop Hydraulic Data	5/1/2017*	9/18/2017	\$274,020.30
7 Independent QA/QC Hydraulic Data	7/1/2017*	9/30/2017	\$57,873.48
8 Perform Floodplain Mapping	9/1/2017*	10/15/2017	\$10,171.77
9 Perform Independent QA/QC Floodplain Mapping	9/18/2017*	10/31/2017	\$2,678.58
Total			\$429,681.81

* Start dates depend on the hydrology submittal pass the FEMA Review.

All changes or delays in scheduled will be coordinated with the Papio NRD and a corrective action plan will be prepared if deemed necessary.

Cost Proposal

Tasks	1 CTP Program Management	2 Project Management	3 Develop Flood Risk Products	4 Develop Topographic Data	5 Develop Hydrologic Data	6 Develop Hydraulic Data	7 Independent QA/QC Hydraulic Data	8 Perform Floodplain Mapping	9 Perform Independent QA/QC Floodplain Mapping	TOTAL HOURS	Labor Rate	Total
Principal										0		
Program Manager										0		
Sr. Project Manager										0		
Project Manager	20	68	10	1	6	84	20	3	2	214	\$ 49.47	\$ 31,759.74
Sr. Engineer	4	1	0	0	6	192	124	0	0	327	\$ 48.86	\$ 47,931.66
Engineer	0	35	16	0	74	1176	282	8	0	1591	\$ 38.20	\$ 182,328.60
Jr. Engineer	0	0	0	0	0	972	0	0	0	972	\$ 30.09	\$ 87,742.44
Sr. GIS Specialist	2	9	146	3	24	86	16	14	16	316	\$ 28.47	\$ 26,989.56
GIS Specialist	0	16	262	18	42	42	36	90	12	518	\$ 28.20	\$ 43,822.80
Jr. GIS Specialist										0		\$ -
Sr. Surveyor										0		\$ -
Survey										0		\$ -
Jr. Survey										0		\$ -
Admin/Billing	6	23	78	0	0	0	0	0	0	107	\$ 23.81	\$ 7,643.01

Total Hours	32	152	512	22	152	2,552	478	115	30	4,045		
Total Labor Cost	\$4,154	\$18,015	\$43,524	\$1,927	\$15,853	\$274,020	\$57,873	\$10,172	\$2,679	\$428,217.81		\$428,217.81

Engineering Labor Rate is Average Project Engineers

Project Multiplier 3.0

OTHER DIRECT COST SUMMARY

M&IE Per Diem		\$256.00										
Lodging												
Parking												
Car Rental		\$120.00										
Mileage												
Fuel		\$120.00										
Postage & Express Delivery		\$968.00										
Large Format Plot												

Other Direct Cost \$0.00 \$1,464.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00

TOTAL TASK COST \$4,154 \$19,479 \$43,524 \$1,927 \$15,853 \$274,020 \$57,873 \$10,172 \$2,679 \$429,681.81

Unit Cost:

1. Large format color plots are charged at \$8 per 24" x 36"
2. Rental Car assumed a rate of \$60 per day.
3. Fuel was charged at \$30 per tank.

Task Name	PM	Sr Eng	Eng	Jr Eng	Sr GIS	GIS	Admin	Total Hrs
Total Project	214	327	1591	972	316	518	107	4045
1 CTP Program Management	20	4	0	0	2	0	6	32
1.1 Quality Assurance / Quality Control Plan	8	4			2			14
1.2 Project Management Team								0
Establish Project Management Team	4							4
Monthly Project Management Team Meeting	8						6	14
2 Project Management	68	1	35	0	9	16	23	152
2.1 Earned Value Data Management	6							6
2.2 30-Day Review of Modeling Methods								0
Prepare 30-Day Review of Modeling Methods Letter	1						4	5
Confirm/Update Contact Information							2	2
Prepare and mail Letters							2	2
2.3 Meetings								0
75% modeling meeting with Papio NRD	22		8			6		36
Flood Risk Review Meeting	24		10			10		44
Schedule FRR Meeting	1							1
Confirm/Update Contact Information							3	3
Prepare FRR Meeting Letters							4	4
Mail FRR Meeting Letters							2	2
Prepare FRR meeting materials (agenda, maps, presentation, etc)	8		16		8		2	34
2.4 Status Reports	2		1					3
2.5 Project Outreach and Communication Plan	4	1			1		4	10
3 Develop Flood Risk Products	10	0	16	0	146	262	78	512
3.1 Flood Risk Products								0
Flood Risk Database	2				22	64		88
Flood Risk Map	2		2		4	42		50
Flood Risk Report	2		2		12	36	78	130
3.2 Flood Risk Datasets	2		10		92	112		216
3.3 Independent QA/QC of Flood Risk Products	2		2		16	8		28
4 Develop Topographic Data	1	0	0	0	3	18	0	22
Collect LiDAR Data					2			2
Develop TSDN/Metadata						8		8
QC Deliverable	1				1	4		6
Submit Topo Data to the MIP						6		6
5 Develop Hydrologic Data	6	6	74	0	24	42	0	152
FIRM Database Files	2		42		16	16		76
Digital Version of all Data Used including GIS Layers	2	4	26		8	18		58
Develop Metadata						8		8
Digital Version of Draft Text for the FIS Report	2	2	6					10
6 Develop Hydraulic Data	84	192	1176	972	86	42	0	2552
Setup HEC-Geo RAS	3	12	145					160
Prepare HEC-RAS Models	24		176	232				432
Model Hydraulic Structures	16	28	75	128				247
Model Floodway	28	76	306	332				742
Model Calibration	4	56	196					256
Run Check RAS	2	16	36	96				150
Prepare Digital Flood Profiles	3		88	142				233
Prepare Floodway Data Tables	2		64	42				108
Prepare TSDN including draft FIS test	2	4	42					48
Detailed Flood Hazard and Floodway Delineations			48		86	42		176
7 Independent QA/QC Hydraulic Data	20	124	282	0	16	36	0	478
Internal QA	8	56	176					240
Independent QR of deliverable	4	22						26
Address QR comments	8	46	106		16	36		212
8 Perform Floodplain Mapping	3	0	8	0	14	90	0	115
Clean up floodplain boundaries	2		6		14	54		76
Create work maps						16		16
Prepare Floodplain Mapping Project Narrative / Metadata/ Spatial Files	1		2			8		11
Conduct Floodplain Boundary Standards Audit						12		12
9 Perform Independent QA/QC Floodplain Mapping	2	0	0	0	16	12	0	30
Internal QA	1				10			11
Independent QR of deliverable					4			4
Address QR Comments	1				2	12		15