

Yavapai County Flood Control District

**Prescott Valley Mapping Activity Statement Activities
(Zone A Floodplain Delineation and Base Map Updates)**

Scope of Work

Prepared by:

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Objective and Introduction:

The objective of the project documented in this scope of work is to complete a Federal Emergency Management Agency (FEMA) RiskMAP-compliant approximate floodplain delineation study for several streams in Yavapai County. This scope of work will assist Yavapai County in delivering agreed-upon products as part of a Mapping Activity Statement (MAS) between Yavapai County (also known as the Cooperating Technical Partner (CTP)) and FEMA. The deliverables will be supplied to FEMA through a Letter of Map Revision (LOMR) for FEMA to produce updated Flood Insurance Rate Maps (FIRMs) and/or Flood Insurance Study (FIS) reports. Atkins will not produce updated FIRMs or FIS reports; FEMA will revise their products. It is our understanding that FEMA will produce updated Digital FIRMs with ortho-rectified imagery based on the information supplied by Atkins and Yavapai County as the CTP.

The tributaries to be studied in this Scope of Work are listed in Table 1 below, and shown graphically on the Study Map, attached as Attachment 1 to this scope of work. Atkins North America, Inc. (Consultant) will develop new flood hazard data, as summarized in Table 1, Total Stream Mile Counts by Type of Study. This study will include approximate analysis of the tributaries using updated topographic data.

Table 1: Total Stream Mile Counts by Type of Study

Stream Name	Miles
Navajo Drive Wash	2.8
North Navajo Drive Wash	2.2
Unnamed Wash	1.5
Total Stream Miles:	6.5

Unless otherwise specified, all work performed under this Scope of Work will be based on FEMA's standards for the RiskMAP program published as a FEMA policy. Additionally, although superceded, the Guidelines and Specifications (G&S) for Flood Hazard Mapping Partners and effective Procedure Memoranda (PMs) will be referenced.

Scope:

The Subtasks included in this Scope of Work are listed and described below.

Subtask 1: Field Reconnaissance

The Consultant shall conduct a field reconnaissance of the study area to determine conditions along the floodplain(s), types and numbers of hydraulic and/or flood-control structures, apparent condition of existing hydraulic structures, and other parameters

(such as selecting Manning’s roughness coefficients) needed for the analyses.

Field surveys will not be performed for approximate-level mapping. Identifying or establishing temporary or permanent bench marks is not included in this scope of work.

Deliverables:

The Consultant shall make the following products available electronically to Yavapai County. Uploading the digital data to the Mapping Information Platform (MIP) is not included for this task in this scope of work. Additionally, support documentation and Certification of Work shall be submitted according to Appendix M.

- Photographs, notes, and drawings that provide the reconnaissance results.

Digital survey data formatted to the Data Capture Standards (DCS) as described in the G&S will not be delivered.

Subtask 2: Prepare Basemap and Correct Identified FIRM Database Issues

Base map preparation activities consist of obtaining the formatting digital photography from Yavapai County and/or Prescott Valley and updating other base map information. The Consultant shall update street names, wash names, and political boundaries on the appropriate FEMA spatial layers. Additionally, the Consultant shall compare floodplain boundaries with previous boundaries, available topographic information, and other physical and spatial information to investigate potential data shifts and misalignment of data that occurred during previous DFIRM production. The consultant shall correct identified shifts on the associated spatial layers using methods deemed acceptable by the Town of Prescott Valley, Yavapai County, and FEMA. These methods are assumed to be best-fit algorithms or comparison between water surface elevations and terrain. No new hydraulic modeling will be performed under this task. Uploading the digital data to the Mapping Information Platform (MIP) is not included for this task in this scope of work.

Deliverables:

In accordance with the G&S, the Consultant shall make the following products available to Yavapai County.

- Digital basemap spatial layers for revised items;
- Digital versions of draft text for inclusion in the FIS report;
- Format Database or Data Delivery consistent with the Data Capture Standards– in the G&S;
- For GIS-based modeling, deliverables include all input and output data, and GIS data layers;
- LOMR preparation;
- Digital versions of draft text for inclusion in the FIS report;

- Documentation that FEMA can use the digital base map;
- Documentation of the Horizontal and Vertical Datums;
- Incorporate the results of all effective Letters of Map Change (LOMCs) for all affected communities on the FIRM; and
- Additional Base Map acquisition correspondence.

Subtask 3: Develop Topographic Data

It is assumed that the Town of Prescott Valley will provide the Consultant with the 2008, two-foot contour interval topography with ortho-rectified 6” resolution imagery data to use for this floodplain delineation study. It is assumed that this topographic data will be tied to Prescott Valley’s established benchmark system and no further work will be necessary to rectify the topography. The topography data will be FEMA-approved and the accuracy shall be in accordance with the current FEMA requirements for flood hazard study level of detail. Uploading the digital data to the Mapping Information Platform (MIP) is not included for this task in this scope of work.

Deliverables:

Atkins will make the available topographic products available to FEMA through LOMR submittal along with support documentation. It is assumed that Prescott Valley will supply associated Certification of Work of the topographic information. Atkins will perform the following:

- Preparation of supporting files consistent with the Data Capture Standards (DCS).

Subtask 4: Hydrologic Analysis

The Consultant shall either use effective hydrology or perform regression-type hydrologic analyses for the tributaries in Yavapai County identified in Study Map (Attachment 1) and Table 1. Peak flood discharges will be calculated, if necessary, using USGS regression equations. These flood discharges will be the basis for subsequent Hydraulic Analyses performed under this scope of work. All Hydrologic Analyses work shall be performed in accordance with FEMA policy. Uploading the digital data to the Mapping Information Platform (MIP) is not included for this task in this scope of work.

Deliverables:

The Consultant shall make the following products available to Yavapai County and FEMA.

- Digital copies of all calculations or documentation of existing calculations for the 1-percent-annual-chance event;
- Digital Summary of Discharges Tables presenting discharge data for the flooding sources for which hydrologic analyses were performed;
- Digital versions of draft text for inclusion into a TDN/TSDN report;
- Digital versions of all backup data used in the analysis;
- Format Hydrology Database or Data Delivery consistent with FEMA standards; and
- Preparation of the LOMR forms and submittal.

Subtask 5: Hydraulic Analysis

The Consultant shall perform hydraulic analyses for approximately 6.5 miles of the flooding sources listed in Table 1. The modeling will include the 1-percent-annual-chance event based on peak discharges computed under Hydrologic Analyses. The Consultant shall use a HEC-RAS model under steady state regime to analyze the study reaches. The hydraulic analysis will be developed for the 1-percent-annual-chance event. A floodway will not be established.

The Consultant shall use the topographic data, provided by the Town of Prescott Valley and/or Yavapai County, to perform the hydraulic analyses. The hydraulic analyses will be used to establish Zone A floodplain limits for the flooding sources listed in Table 1 and shown in study map.

The Consultant shall address concerns or questions regarding the hydraulic analyses that are raised during the County QA/QC review. It is assumed that the comments (concerns or questions) received will be minor and will not result in re-analysis.

All Hydraulic Analyses work shall be performed in accordance with FEMA G&S and PMs. Uploading the digital data to the Mapping Information Platform (MIP) is not included for this task in this scope of work.

Deliverables:

In accordance with the G&S, the Consultant shall make the following products available to Yavapai County. A metadata file complying with the NFIP Metadata Profiles Specifications, shall accompany the digital data.

- Incorporate the results of all effective Letters of Map Change (LOMCs);
- A metadata file complying with the NFIP Metadata Profiles Specifications;
- Support documentation and Certification of Work;
- Digital hydraulic modeling (input and output) files;
- Digital tables with range of Manning’s “n” values;
- Digital versions of all backup data used in the analyses;
- Digital versions of draft text for inclusion in the TDN/TSDN report;
- Draft FIRM database prepared in accordance with FEMA standards;
- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during hydraulic analyses;
- For GIS-based modeling, deliverables include all input and output data, and GIS data layers;
- Digital versions of draft FIS report text; and
- Preparation of LOMR forms.

Subtask 6: Floodplain Mapping

The Consultant shall delineate the 1-percent-annual-chance floodplain boundaries for the flooding sources for which hydrologic and hydraulic analyses were performed. The Consultant shall use the topographic data provided by Yavapai County to delineate the floodplain boundaries on a digital work map.

The Consultant shall tie-in the proposed Zone A to the FEMA effective Zone A and Zone AE at the study limits. The Consultant shall inform Yavapai County/FEMA if the tie-in cannot be accomplished by meeting FEMA criteria or for other technical reasons.

The Consultant shall address concerns or questions regarding Floodplain Mapping that are raised by the Town of Prescott Valley and Yavapai County during QA/QC review. It is assumed that the comments (concerns or questions) received will be minor and will not result in significant rework.

All Floodplain Mapping work shall be performed in accordance with FEMA G&S and PMs. Mapping quality standards must be consistent with PM 38, dated October 17, 2007. The Consultant will perform self-certification audits for the Floodplain Boundary Standards, as described in PM 38 and all subsequent revisions, for all flood hazard areas.

It is assumed that Atkins will pay the fees necessary to submit the information to FEMA through the LOMR process. Uploading the digital data to the Mapping Information Platform (MIP) is not included for this task in this scope of work.

Deliverables:

In accordance with the G&S, and upon completion of floodplain mapping for all flooding sources in this project, the Consultant shall make the following products available to Yavapai County. A metadata file complying with the NFIP Metadata Profiles Specifications will accompany the compliant digital data. Additionally, support documentation and Certification of Work shall be submitted according to FEMA policy. Text relevant to Floodplain Mapping shall be delivered.

- Digital work map showing the 1-percent-annual-chance floodplain boundary delineations, cross sections, flood insurance risk zone designation labels, and applicable base map features;
- Digital versions of input and output for any computer programs that were used consistent with the DCS in the G&S;
- A Summary Report that describes and provides the results of all automated or manual QA/QC review steps taken during the delineation of floodplain;
- Any backup or supplemental information including supporting calculations and assumptions used in the mapping.
- Written summary of the analysis methodologies;
- Digital versions of draft FIS report section;
- If automated GIS-based models are applied, all input data, output data, intermediate data processing products;
- FIRM database files, prepared in accordance with FEMA standards;
- A metadata files complying with the FEMA NFIP Metadata Profile Specifications; and
- Preparation and submittal of the LOMR forms and completed LOMR application.

Subtask 7: Non Regulatory Products

This task will develop flood risk datasets as listed below (also termed “non-regulatory products”) for the newly delineated floodplains in accordance with the Flood Risk Database Technical Reference and the draft version of the Yavapai County Flood Studies Guidance Manual. Atkins will prepare the following and make available to FEMA via either CD/DVD, external hard drive, or FTP. It is our assumption that FEMA Region IX does not upload these deliverables in the MIP.

- Depth and Analysis Grids dataset and exhibits, including:
 - 1% Annual Chance Flood Depth Grid
 - 1 % Annual Chance Water Surface Elevation Grid

Subtask 8: Project Management and LOMA preparation

The Consultant shall coordinate and attend up to two meetings with Yavapai County and/or the Town of Prescott Valley to discuss project schedule, work performed, and any special problems or discussion items. The Consultant shall prepare agendas and

meeting notes for each meeting. The Consultant shall submit brief monthly progress updates in the form of a memorandum. The Consultant shall include a physical percent complete for each subtask outlined in this Scope of Work in the monthly memorandum.

SCHEDULE:

The schedule for this Scope of Work will begin immediately upon receipt of the Notice to Proceed from Yavapai County. The scope will be completed by June 30, 2015.

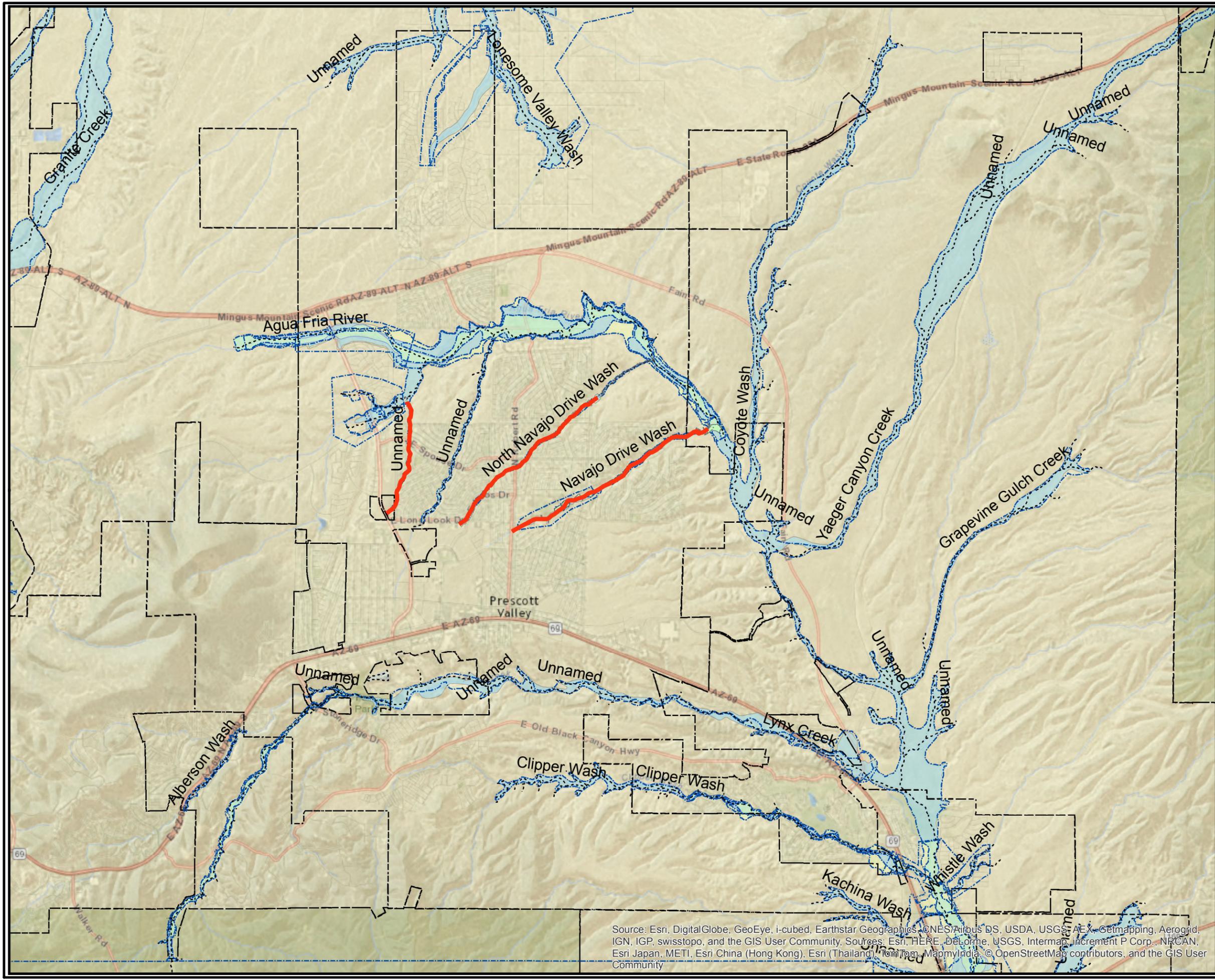
COSTS:

The total amount of this Scope of Work shall not exceed \$56,351 for all labor, materials, and support costs required to perform the Subtasks and provide the deliverables. See Attachment 2 for cost detail.

ATTACHMENT 1

STUDY MAP

October 2014



- Legend**
- Proposed Zone A Delineation
 - - - - Stream Centerline
 - - - - Existing Floodplain
 - - - - Political Boundaries
- Old Floodplain Limits**
- Zone A or AE
 - Zone AE Floodway
 - Zone D
 - Zone Shaded X
 - Zone Unshaded X



1 inch = 6,000 feet

0 1,500 3,000 6,000 9,000 12,000 Feet

Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

