(If a firm has branch offices, complete for each specific branch office seeking work.)

1. REVISED ADSPO13-00003465*: Annual Request for Qualifications*

a.	FIRM (OR BRANCH OFFICE) NAME:	WEST Consultants, Inc.
b.	FIRM (OR BRANCH OFFICE) STREET:	8950 S. 52nd Street, Ste 210
c.	FIRM (OR BRANCH OFFICE) CITY:	Tempe
d.	FIRM (OR BRANCH OFFICE) STATE:	AZ
e.	FIRM (OR BRANCH OFFICE) ZIP CODE:	85284

f.	YEAR ESTABLISHED:	1988

(g1).	OWNERSHIP - TYPE:	Corporation
(g2)	OWNERSHIP - SMALL BUSINESS STATUS:	Small

h.	POINT OF CONTACT NAME AND TITLE:	Brian Wahlin, Office Manager
i.	POINT OF CONTACT TELEPHONE NUMBER:	480-345-2155
j.	POINT OF CONTACT E-MAIL ADDRESS:	bwahlin@westconsultants.com

k.	NAME OF FIRM *(If block 1a is a branch office)*:	WEST Consultants, Inc.

2. EMPLOYEES BY DISCIPLINE

a. Discipline Title	b. Function: Primary (P) or Secondary (S)	c. No. of Employees - Firm	d. No. of Employees - Branch
Hydraulic Engineer	P	28	4
Civil Engineer	S	24	4
Technician/Analyst	P	6	2
Geographic Information System	P	5	0
Hydrologist	P	8	0
Hydrographic Surveyor	P	3	0
Other	P	8	1
CADD Technician	S	5	0
Geologist	S	1	0
Total		55	7

3. PROFILE OF FIRM'S EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST YEAR

a. Approximate No. of Projects	b. Experience	c. Revenue Index Number *(see below)*
3	Codes; Standards; Ordinances	3
4	Dams (Concrete; Arch)	3
6	Dams (Earth; Rock); Dikes; Levees	3
60	Digital Elevation and Terrain Model Development	5
3	Environmental Impact Studies, Assessment, or Statements	2
8	Hydrographic Surveying	3
2	Irrigation; Drainage	1
8	Measurement / Verification / Conservation Water Consumption Savings	4
35	Rivers, Canals, Waterways, Flood Control	5
14	Storm Water Handling and Facilities	3
15	Surveying; Platting; Mapping; Flood Plain Studies	4
1	Topographic Surveying and Mapping	1
13	Water Resources; Hydrology; Ground Water	4

PROFESSIONAL SERVICES REVENUE INDEX NUMBER

1. Less than $100,000
2. $100,000 to less than $250,000
3. $250,000 to less than $500,000
4. $500,000 to less than $1 million
5. $1 million to less than $2 million
6. $2 million to less than $5 million
7. $5 million to less than $10 million
8. $10 million to less than $25 million
9. $25 million to less than $50 million
10. $50 million or greater

4. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT (*Complete one Section 4 for each key person.)*

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
		1. TOTAL	2. WITH CURRENT FIRM
Brian Wahlin, Ph.D., P.E., D.WRE	Project Manager	20	10

c. FIRM NAME AND LOCATION *(City and State)*

WEST Consultants, Inc. (Tempe, AZ)

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
Ph.D., Civil Engineering, Arizona State University	AZ, Civil Engineer
M.S., Civil Engineering, Arizona State University	NM, Civil Engineer
B.S.E., Mechanical Engineering, Arizona State Univerisity	IA, Civil Engineer
	Diplomate, Water Resources Engineer

g. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*

Dr. Wahlin has over 20 years of experience in floodplain and hydraulic studies, levee certifications, sediment transport studies, dam breach studies, and flow measurement studies. He is a lead instructor for most of WEST's HEC-RAS courses.

H. RELEVANT PROJECTS

	(1) TITLE AND LOCATION *(City and State)*	(2) Year Completed: Professional Services	(2) Year Completed: Construction *(if applicable)*
1)	Scour Evaluation for Protection of Critical Infrastructure on the Hassayampa River (Buckeye, AZ)	2011	
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☑ Check if project performed with current firm		
	Dr. Wahlin was the project manager on this project which involved developing a sediment transport model to estimate potential scour around three critical SRP electrical towers and a Transwestern Gas pipeline. The model results were then used to develop a scour mitigation option to protect the structures in the future. $121,500.		
2)	Tres Rios North Levee Physical Map Revision, Levee Certification, and Levee Emergency Action Plan (Phoenix, AZ)	2012	
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☑ Check if project performed with current firm		
	Dr. Wahlin was the project manager on this project which performed a detailed floodplain and floodway re-delineation of the Salt River near the Tres Rios North Levee. Scour analyses were also performed to assist the USACE with the levee certification. The first ever levee emergency action plan in AZ was developed as part of this project. $191,500		
3)	Guadalupe Floodplain Delineation Study (Guadalupe, AZ)	2012	
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☑ Check if project performed with current firm		
	Dr. Wahlin was the project manager on this project which updated the floodplains in the Town of Guadalupe. A unique unsteady HEC-RAS model consisting only of storage areas was created as part of this project. $76,600		
4)	Centennial Wash Physical Map Revision (Arlington, AZ)	2013	
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☑ Check if project performed with current firm		
	Dr. Wahlin provided QA/QC on this large floodplain study on the west side of Maricopa County. The project was unique in that the floodplain maps contained both 1-D and 2-D results. $462,500.		
5)	Levee Certification Studies for the Agua Fria River (Avondale, AZ)	2011	
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☑ Check if project performed with current firm		
	Dr. Wahlin was the project manager for this project which provided detailed hydraulic, scour, and freeboard analyses in support of the certification of three levees along the Agua Fria River. In a condensed time frame of only three months, Dr. Wahlin coordinated with multiple agencies and firms to assemble the levee certification packages. $97,600		

4. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT (*Complete one Section 4 for each key person.)*

a. NAME Bert Clemmens	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
		1. TOTAL 38 yrs	2. WITH CURRENT FIRM 2 yrs

d. FIRM NAME AND LOCATION *(City and State) WEST Consultants, Tempe, AZ*

e. EDUCATION *(DEGREE AND SPECIALIZATION)*
BS Civil Engineering, MS Civil Engineer (Water Resources, PhD Industrial Engineering (Operations Research)- Specializing in Irrigation, Hydraulics, and Flow Measurement

f. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
PE Civil Engineering, Arizona
Diplomate, Water Resources Engineering

g. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)* Dr. Clemmens is the former Center Director of the US Arid Land Agricultural Research Center and Laboratory Director for the US Water Conservation Laboratory. He oversaw research on irrigation management, remote sensing, wastewater reuse, crop response to global climate change, breeding of cotton. Dr. Clemmens has more than 300 professional publications. Career Achievement Awards: 2009 USCID Merriam Improved Irrigation Award, 2007 Scientist of the Year Award (USDA-ARS-PWA), 2006 ASABE Award for Advancement of Surface Irrigation, 2005 Sixth Gulhati Honorary Lecture (ICID), 2005 Royce J. Tipton Award (ASCE)

H. RELEVANT PROJECTS

1)
(1) TITLE AND LOCATION *(City and State)*
Determination of Annual Quantities of Water Conserved for San Carlos Irrigation and Drainage District – San Carlos, AZ

(2) Year Completed
Professional Services 2013 | Construction *(if applicable) NA*

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Led a three-person Engineering Board charged with determining the amount of water that could be conserved through rehabilitation of district infrastructure. This required evaluation of historical water losses through seepage, spillage, evaporation, poor water accounting, etc. Project provided software for determining annual water conserved based on facilities constructed (i.e., canal lining, pipelines, reservoirs, etc.) Cost $400,000.

X Check if project performed with current firm

2)
(1) TITLE AND LOCATION *(City and State)*
Seventh Technical Committee for Review of Diversion Flow Measurements and Accounting Procedures – Chicago District, U.S. Army Corp of Engineers – Chicago, IL

(2) Year Completed
Professional Services 2-13 | Construction *(if applicable) NA*

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Water is pumped from Lake Michigan to communities in the Chicago Area. Drainage water is discharge into the Chicago Sanitary and Ship Canal, which discharges in to the Des Plaines River which eventually feeds the Mississippi River. A U.S. Supreme Court decree limits the amount of water that can be transferred from Lake Michigan to the State of Illinois. A three person Technical Committee is contracted approximately every 5 years to review the accounting of water transferred. Dr. Clemmens is the flow measurement expert on this Committee. This review is ongoing. Cost $43,000

X Check if project performed with current firm

3)
(1) TITLE AND LOCATION *(City and State)*
Hydrologic Investigation for Saddleback Flood Retarding Structure – Phoenix, AZ

(2) Year Completed
Professional Services 2013 | Construction *(if applicable) NA*

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
Saddleback Flood Retarding Structure (FRS) is a small earth dam protecting valuable farmland and homes in an area west of Phoenix, AZ. Saddleback FRS is old and in need of repairs or rehabilitation. Two other earth embankment upstream also contribute flow into Saddleback FRS. In an effort to improve the structure and reduce the risk to those downstream of the FRS, Dr. Clemmens develop HEC-1 models of the runoff from watershed upstream from these structures and developed 1-D unsteady models of flow along these FRSs. Analysis showed that Saddleback FRS is overtopped under the Maximum Probable Flood. Cost $91,122.

X Check if project performed with current firm

4)
(1) TITLE AND LOCATION *(City and State)*
East Maricopa Floodway Hydrology and Hydraulics Study – Phoenix, AZ

(2) Year Completed
Professional Services 2014 | Construction *(if applicable) NA*

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
The East Maricopa Floodway (EMF) collects drainage water from East Mesa, and Queen Creek and discharges it to the Gila River. Two levees along the EMF have provisional certification and have to either be certified of decertified. A new hydrologic model of the area is being developed in HEC-1, based on prior studies. A new unsteady HEC-RAS model is being developed to determine water surface elevations to evaluate whether or not the levees can be certified as is, or whether modifications are required.

X Check if project performed with current firm

5)
(1) TITLE AND LOCATION *(City and State)*
Improved Water Management, Measurement and Accounting – Carlsbad, NM

(2) Year Completed
Professional Services 2014 | Construction *(if applicable) NA*

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE
The Carlsbad Irrigation District had been experiencing significant water losses (e.g., 30%) within the irrigation canal system. This project will provide the District with new flow measurement devices, remote monitoring equipment, and a SCADA system so that they can track water losses in real time.

X Check if project performed with current firm

4. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT (*Complete one Section 4 for each key person.)*

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
		1. TOTAL	2. WITH CURRENT FIRM
Quentin Brent Travis, Ph.D., P.E., D.WRE	Senior Hydraulic Engineer	19	3

c. FIRM NAME AND LOCATION *(City and State)*

WEST Consultants, Inc.; 8950 S. 52nd Street, Suite 210; Tempe, AZ; 85284

e. EDUCATION *(DEGREE AND SPECIALIZATION)*

Ph.D. Water Resources Engineering, Arizona State University
B.S. Engineering and Applied Science, California Institute of Technology (Caltech)
B.A. Psychology, Wesleyan University

f. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*

Arizona, Civil Engineering, Registration Number 33462

g. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*

Eight peer reviewed journal articles; fourteen other technical articles; former chair of the ASCE Arizona Water Resources Technical Committee and Environmental Water Resources Institute.

H. RELEVANT PROJECTS

	(1) TITLE AND LOCATION *(City and State)*	(2) Year Completed: Professional Services	(2) Year Completed: Construction *(if applicable)*
1)	Guadalupe Floodplain Delineation, Flood Control District of Maricopa County	2012	N/A
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☑ Check if project performed with current firm		
	Led the the model development to support LOMR efforts specific to an in the area near a major canal. The developed model and associated floodplain linked HEC-1 / HEC-RAS through a unique method that directly accounted for the highly complex network of ponding areas, retention basins, storm drains, and weirs.		
2)	(1) TITLE AND LOCATION *(City and State)*	(2) Year Completed: Professional Services	(2) Year Completed: Construction *(if applicable)*
	Queen Kaahumanu Highway Expansion, Hawaii (big island)	2013	NA
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☑ Check if project performed with current firm		
	The complexity of this high profile project led the project's general civil firm to hire WEST to conduct all of the hydraulic and hydrologic analyses. Dr. Travis kept the project on schedule despite numerous unexpected fast track requests including a flooding runout analysis, compound culvert design, and forensic hydrologic analysis. WEST is currently designing a unique BMP system to protect the adjacent national park.		
3)	(1) TITLE AND LOCATION *(City and State)*	(2) Year Completed: Professional Services	(2) Year Completed: Construction *(if applicable)*
	Tres Rios North Levee Emergency Action Plan, Maricopa County, AZ	2012	NA
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☑ Check if project performed with current firm		
	FCDMC requested that Dr. Travis and the WEST team develop the first Emergency Action Plan (EAP) for an Arizona levee. Incorporating extensive research and input from both national and international experts, the final EAP combines key elements of established southwest dam EAP's with levee specific considerations such as adjacent river inundation flow patterns, regional evacuation procedures, and road closure plans.		
4)	(1) TITLE AND LOCATION *(City and State)*	(2) Year Completed: Professional Services	(2) Year Completed: Construction *(if applicable)*
	Niobrara River Regional Sediment Management Plan, Niobrara, NE	2011	NA
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☑ Check if project performed with current firm		
	For this 11,000 sq mi watershed, Dr. Travis developed specific sediment mediation actions guided by solicited input from 70+ identified stakeholders. The resulting detailed action plan optimized solutions while directly accounting for potential environmental benefit and perceived public good - a first of its kind in the field.		
5)	(1) TITLE AND LOCATION *(City and State)*	(2) Year Completed: Professional Services	(2) Year Completed: Construction *(if applicable)*
	Master Drainage Plan, Queen Valley, Arizona	2011	NA
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — ☑ Check if project performed with current firm		
	Dr. Travis managed this multiphase effort that began with developing a detailed HEC-HMS hydrologic model and a comprehensive HEC-RAS hydraulic model of the area. Utilizing these models and input from Pinal County and other identified stakeholders, WEST established a comprehensive, lowest cost, actionable flooding mitigation plan		

4. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT (*Complete one Section 4 for each key person.)*

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
		1. TOTAL	2. WITH CURRENT FIRM
Chuck Davis, P.E., CFM	Hydraulic Engineer	8.5	5.5

d. FIRM NAME AND LOCATION *(City and State)*

WEST Consultants, Inc., Tempe, AZ

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
M.S., Civil Engineering – Sediment Transport, Univ. of Kentucky B.S., Civil Engineering, Univ. of Kentucky	AZ, Civil Engineer (No. 52895) Certified Floodplain Manager, ASFPM (No. US-09-04662)

g. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*

Since joining WEST Consultants, Mr. Davis played key roles in numerous hydraulic, hydrologic, and sedimentation engineering projects as staff engineer and project manager. He has published 4 peer-reviewed papers, presented research in over 15 technical conference papers, and has worked with 7 professional organizations.

H. RELEVANT PROJECTS

	(1) TITLE AND LOCATION *(City and State)*	(2) Year Completed: Professional Services	(2) Year Completed: Construction *(if applicable)*
1)	Centennial Wash Floodplain Re-Delineation Study from the La Paz County/Maricopa County Border to the Gila River – Arlington, AZ	2013	
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — [X] Check if project performed with current firm Mr. Davis managed a detailed FEMA floodplain delineation study for over 45 riverine miles to remap the entire Centennial Wash reach within Maricopa County. Management responsibilities included client interaction, overseeing modeling tasks, overseeing floodplain mapping tasks, overseeing project documentation and reporting, and invoicing. 1-D and 2-D hydraulic models were used for the mapping. The project was completed on time and under budget and submitted to FEMA as a PMR. Cost: $452,000.		
2)	Rio Grande Hydraulic and Sediment Transport Model – Albuquerque, NM	2012	
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — [X] Check if project performed with current firm Mr. Davis developed a hydraulic and sediment transport model of approximately 40 miles of the Rio Grande near Albuquerque, NM. This project has required an improvement to the sediment transport module of HEC-RAS, and Mr. Davis has been acting as a beta tester for the USACE Hydrologic Engineering Center (HEC) for this improved algorithm. Cost: $206,000.		
3)	Fry Townsite Letter of Map Revision (LOMR) for FEMA – Sierra Vista, AZ	2013	
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — [X] Check if project performed with current firm Mr. Davis managed a detailed FEMA floodplain delineation study for a small county island within the corporate boundaries of Sierra Vista, AZ, for the Cochise County Floodplain Department. Management responsibilities included client interaction, overseeing modeling tasks, overseeing floodplain mapping tasks, overseeing project documentation and reporting, and invoicing. 1-D and 2-D hydraulic models were used for the mapping. A full FEMA LOMR submittal was made. Cost: $60,800.		
4)	Salt River Project, Scour Analyses – Phoenix, AZ	2011	
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — [X] Check if project performed with current firm Mr. Davis assisted in the development of various scour analysis studies completed for the Salt River Project in Arizona. Scour analyses were completed on small washes across the Maricopa County area in support of transmission line tower foundation design. Cost: $36,800.		
5)	FEMA Levee Certification Study for Levee Freeboard and Erosion Susceptibility – Dayton, KY	2013	
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE — [X] Check if project performed with current firm Mr. Davis managed a modeling study for the certification of a levee along the Ohio River in Dayton, Kentucky. A FEMA effective model was obtained, a duplicate effective model was created, and detailed survey analysis was obtained to conduct a thorough freeboard analysis. The susceptibility of the surficial soils to erosion was assessed as well. Cost: $8,000.		

4. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT (*Complete one Section 4 for each key person.)*

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
		1. TOTAL	2. WITH CURRENT FIRM
Suzanne Monk	Hydraulic Engineering Staff	1	1

c. FIRM NAME AND LOCATION *(City and State)*

WEST Consultants, Inc. Tempe, AZ

e. EDUCATION *(DEGREE AND SPECIALIZATION)*	f. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
Bachelor's and Master's degrees in Civil Engineering	n/a

g. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*

CFM (#US-13-07026, issued 5/1/2013)

H. RELEVANT PROJECTS

	(1) TITLE AND LOCATION *(City and State)*	(2) Year Completed	
		Professional Services	Construction *(if applicable)*
1)	Centennial Wash Floodplain Delineation Study in Western Maricopa County near Gila Bend, AZ	2013	
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	☑ Check if project performed with current firm	
	A re-study of the effective Special Flood Hazard Area for Centennial Wash from the La Paz county boundary to the confluence with the Gila River was performed for the Flood Control District of Maricopa County. I helped with the model input development, specifically the HEC-RAS model.		
	(1) TITLE AND LOCATION *(City and State)*	(2) Year Completed	
		Professional Services	Construction *(if applicable)*
2)	Cactus Forest Flood Mitigation and Mapping Study near Florence, AZ	ongoing	
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	☑ Check if project performed with current firm	
	Models were developed to aid in flood mitigation and regulation in the Cactus Forest area as well as mapping floodplains for the area to revise the currently effective floodplains. I was involved in model development as well as the floodplain mapping process.		
	(1) TITLE AND LOCATION *(City and State)*	(2) Year Completed	
		Professional Services	Construction *(if applicable)*
3)	Hydrologic Investigation for Saddleback Flood Retarding Structure in Western Maricopa County near Tonopah, AZ	2013	
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	☑ Check if project performed with current firm	
	The existing hydrologic analysis for the Saddleback FRS needs to be updated anticipating repairs or rehabilitation in the future. I was involved in developing hydrologic and routing models using FCDMC's DDMSW, HEC-1, and HEC-RAS		
	(1) TITLE AND LOCATION *(City and State)*	(2) Year Completed	
		Professional Services	Construction *(if applicable)*
4)	APS HANG #2 Scour Analysis along a proposed transmission line crossing Centennial Wash, Site 160, and Castle Dome Wash	2012	
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	☑ Check if project performed with current firm	
	Scour analyses were performed at proposed transmission line structure locations near several washes. I was involved in model development for these washes as well as scour analysis at each location.		
	(1) TITLE AND LOCATION *(City and State)*	(2) Year Completed	
		Professional Services	Construction *(if applicable)*
5)	Fry-Ark RiverWare along the Frying Pan and Arkansas Rivers in Colorado	2013	
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	☑ Check if project performed with current firm	
	A RiverWare model was developed representing the system's facilities to be used for an accounting system to be developed later on. I was involved in the RiverWare model development for the entire reach.		

4. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT (*Complete one Section 4 for each key person.)*

a. NAME	b. ROLE IN THIS CONTRACT	c. YEARS EXPERIENCE	
		1. TOTAL	2. WITH CURRENT FIRM
Jesse Piotrowski	Hydraulic Engineering Staff	4.0	0.5

c. FIRM NAME AND LOCATION *(City and State)*

WEST Consultants, Inc. Tempe, AZ

e. EDUCATION *(DEGREE AND SPECIALIZATION)*

M.S. (Civil and Environmental Engineering) - University of Iowa
B.S. (Civil Engineering) - University of Wisconsin-Platteville

f. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*

Certified Floodplain Manager (US-11-06129)

g. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*

American Society of Civil Engineers, International Association for Hydro-Environment Engineering and Research, Association of State Floodplain Managers.

H. RELEVANT PROJECTS

	(1) TITLE AND LOCATION *(City and State)*	(2) Year Completed	
		Professional Services	Construction *(if applicable)*
1)	Centennial Wash Floodplain Delineation Study: Gila River to La Paz County (western Maricopa County, AZ). Completed 2013.	Floodplain delineation	
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	☑ Check if project performed with current firm	
	Re-delineation of Special Flood Hazard Area for Centennial Wash. Project included complex HEC-RAS modeling and FLO-2D modeling. Specific role: QC and data review. Cost: $640,000. Length: 1 year.		
	(1) TITLE AND LOCATION *(City and State)*	(2) Year Completed	
		Professional Services	Construction *(if applicable)*
2)	Fry Townsite LOMR (Sierra Vista, AZ). Completed 2013.	Floodplain delineation	
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	☑ Check if project performed with current firm	
	Letter of Map Revision for Village Vista Drainageway in Sierra Vista, AZ. Project included hydrologic analysis using HEC-HMS and hydraulic analysis using HEC-RAS and FLO-2D. Specific role: hydrologic and hydraulic analysis. Cost: $30,000. Length: 6 months.		
	(1) TITLE AND LOCATION *(City and State)*	(2) Year Completed	
		Professional Services	Construction *(if applicable)*
3)	Iowa Statewide Floodplain Mapping Project. Ongoing project.	Floodplain delineation	
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	☐ Check if project performed with current firm	
	Perform approximate zone floodplain analysis for all 85 counties declared Presidential Disaster Areas following the 2008 floods. H&H analysis of all streams with drainage areas greater than 1 square mile. Cost: $10M. Ongoing project.		
	(1) TITLE AND LOCATION *(City and State)*	(2) Year Completed	
		Professional Services	Construction *(if applicable)*
4)	City of Ames Flood Mitigation Modeling and Mapping. Completed 2013.	Floodplain delineation	
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	☐ Check if project performed with current firm	
	Update hydrology, perform sensitivity analyses and investigate flood mitigation alternatives for Squaw Creek and Skunk River in the vicinity of Ames, IA. Cost: $9,000. Length: 6 months.		
	(1) TITLE AND LOCATION *(City and State)*	(2) Year Completed	
		Professional Services	Construction *(if applicable)*
5)	Bathymetric Mapping of the Des Moines River and Gray's Lake. Completed 2012.	Bathymetric Mapping	
	(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE	☐ Check if project performed with current firm	
	Perform multi- and single-beam bathymetric mapping of the Des Moines River and Gray's Lake in support of safety inspections for the Hy-Vee Triathlon. Cost: $23,000. Length: 3 months.		

5. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present no more than five (5) projects. Complete one Section 5 for each project.)

a. TITLE AND LOCATION *(City and State)*	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
Scour Evaluation for Protection of Critical Infrastructure on the Hassayampa River (Buckeye, AZ)	2011	

23. PROJECT OWNER'S INFORMATION

c .PROJECT OWNER	d .DOLLAR AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
Salt River Project	$121,250	$121,250

f. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and length of project)

High flows exposed the foundations of several transmission lines

The Salt River Project (SRP) maintains three 500kV electric transmission lines that cross the ephemeral Hassayampa River east of Buckeye, Arizona. In addition, a 36-inch natural gas pipeline owned by Transwestern Pipeline Company crosses under the Hassayampa River within the electric transmission line right-of-way and runs parallel to the electric transmission lines. On January 21, 2010, high flows eroded an approximate 3.5-acre portion of the river's south/west bank in the proximity of three electric transmission lattice tower structures within the utility corridor. In this one event, the bank retreated about 265 feet and approximately 8 feet of foundation depth was exposed on footings where the river flowed under and around two towers. A portion of the parallel Transwestern pipeline was also exposed on the south river bank during the event. Because of the critical nature of these facilities, a hydrologic engineering study was performed to assess total scour and lateral stream bank migration near electric transmission tower foundations and the gas pipeline crossing the Hassayampa River.

The primary scour components considered were local scour, general or contraction scour, bedform scour, long-term degradation, and low-flow channel incisement. The total depth of scour at the electric transmission towers and natural gas pipeline were estimated as the sum of each of the individual scour components. An HEC-RAS sediment transport model was developed to estimate the long-term degradation. The sediment transport modeling also considered a proposed gravel pit downstream of the electrical transmission lines. The extents of lateral migration were estimated. The scour estimates and lateral migration extents were used to design appropriate structure protection measures. The final design was for soil cement ring dike that was 1,500 feet in circumference that formed an island around the transmission line towers. The dike is 26 feet tall and extends almost 20 feet into the channel bottom. Construction was completed in mid-2012.

Temporary repairs on the foundations of the transmission line

5. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present no more than five (5) projects. Complete one Section 5 for each project.)

a. TITLE AND LOCATION *(City and State)*	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
Centennial Wash Physical Map Revision (Arlington, AZ)	2013	

23. PROJECT OWNER'S INFORMATION

c .PROJECT OWNER	d .DOLLAR AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
Flood Control District of Maricopa County	$462,500	$462,500

f. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and length of project)

WEST prepared a floodplain delineation study (FDS) to submit as a Physical Map Revision (PMR) request to the Federal Emergency Management Agency (FEMA) for Centennial Wash in western Maricopa County. Centennial Wash flows from the headwaters of the river (which actually originates in far northwestern Maricopa County) to the southwest into La Paz County towards Wenden and Salome, Arizona. Near Salome, the wash turns and flows to the southeast, crossing back into Maricopa County until it confluences with the Gila River. This FDS studied the portion of Centennial Wash from the reentry back into Maricopa County to the confluence with the Gila River, which covers just over 40 river miles along the main stem.

Water flowing in this study reach enters Maricopa County through a well-defined channel. Roughly five or six miles downstream, upon entering the Harquahala Valley Irrigation District's irrigated lands, the channel becomes less well defined. At high flows, water is not contained in the low-flow channel, with a significant volume of water flowing into the northern overbank. Water in the northern overbank eventually returns to the main channel at approximately Baseline Road near the downstream limits of the Harquahala Valley. The flow is contained in a single channel for the remaining approximately 26 river miles to the confluence with the Gila River.

HEC-RAS was used in this study to determine the extents of the floodplain and floodway boundaries throughout the entire length of the main stem of Centennial Wash. Due to the complexity of the flow split in the Harquahala Valley, FLO-2D was used to determine the amount of water which flows into the northern overbank in the Harquahala Valley. The FLO-2D modeling domain covered 48.5 square miles with a 40-foot grid cell size. The HEC-RAS modeling was completed—in typical fashion for FEMA studies—using steady-state modeling of the peak 1%-annual-chance flow. FLO-2D, an unsteady flow model, was used to map floodplain boundaries in the northern overbank in the Harquahala Valley. Peak flows calculated in the unsteady FLO-2D model at specified locations in the modeling domain were used directly as steady-state flows in the HEC-RAS model to provide a "feedback" mechanism between the two modeling approaches over a 7-mile stretch of the main branch, and the results of the FLO-2D and HEC-RAS models were compared to each other for verification purposes.

Even with the complex modeling approach, the project was completed on time and under budget. Final production included 49 detailed work maps at a scale of 1" = 400' and annotated FIRM panels.

5. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present no more than five (5) projects. Complete one Section 5 for each project.)

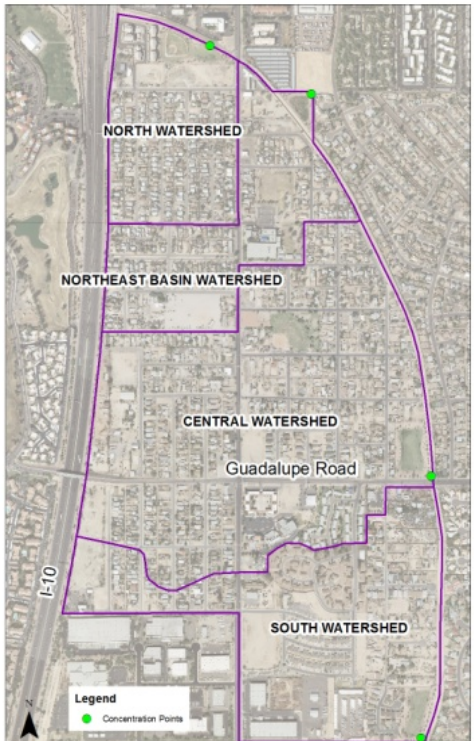
a. TITLE AND LOCATION *(City and State)*	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
Guadalupe Floodplain Delineation Study (Guadalupe, AZ)	2012	

23. PROJECT OWNER'S INFORMATION

c .PROJECT OWNER	d .DOLLAR AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
Flood Control District of Maricopa County	$76,600	$76,600

f. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and length of project)

WEST Consultants, Inc. prepared a Letter of Map Revision (LOMR) for the ponding areas in the Town of Guadalupe, Arizona for the Flood Control District of Maricopa County (District). The effective floodplain along the Highline Lateral (canal), which was categorized as Zone A, appears to simply be an approximate 150-foot buffer from the banks of the canal. The goal of this study was to update the Zone A floodplains with Zone AH floodplains that more accurately depict the ponding along the embankment of the canal.



Watershed Map of the Town of Guadalupe

A hydrologic model was developed using HEC-1 in conjunction with the District's Drainage Design Management System (DDMSW), which was used to develop sub-basin and routing parameters for the hydrologic model. The output hydrographs from the HEC-1 model were used, along with a Digital Elevation Model (DEM) of the topography, to generate ponding areas along the Highline Lateral. The actual ponding depths were determined by utilizing a unique unsteady HEC-RAS model consisting of only storage areas. This unsteady HEC-RAS model was used to model the hydraulic relationships between the various ponding areas along the Highline Lateral and to determine the actual ponding elevations. The results of this study indicate smaller floodplain ponding areas behind the Highline Lateral than shown with the effective Zone A floodplain maps.

Water Flowing Against the Highline Lateral

5. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present no more than five (5) projects. Complete one Section 5 for each project.)

a. TITLE AND LOCATION *(City and State)*	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
Tres Rios North Levee Physical Map Revision, Levee Certification, and Levee Emergency Action Plan (Phoenix, AZ)	2012	

23. PROJECT OWNER'S INFORMATION

c .PROJECT OWNER	d .DOLLAR AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
Flood Control District of Maricopa County	$191,500	$191,500

f. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and length of project)

Low Flow Channel in the Salt River

WEST prepared a floodplain and floodway re-delineation study as a Physical Map Revision (PMR) request package in support of the newly constructed Tres Rios North Levee (TRNL) from approximately 83rd Avenue to just west of El Mirage Road in Phoenix, AZ. The TRNL is one part of the Tres Rios Environmental Restoration Project. WEST worked closely with the Flood Control District of Maricopa County and the US Army Corps of Engineers (LA District) to develop new technical data and to coordinate technical data sharing between the two agencies in order to prepare a Technical Data Notebook (TDN) for the PMR submittal to FEMA. WEST also assisted the US Army Corps of Engineers in preparing the levee certification package for the TRNL. The TRNL was certified by FEMA and the new floodplains are in the process of becoming effective.

As part of the levee certification process, the US Army Corps of Engineers and the Flood Control District of Maricopa County requested that WEST developed an Emergency Action Plan (EAP) for the TRNL, a first of its kind in the Arizona. After extensive research and coordination with experts both nationally and internationally, WEST developed an EAP for the TRNL that combines the key elements of the well established dam failure EAP's specific to the southwest while extending and modifying it to address levee specific issues, such as adjacent river inundation flow patterns, regional evacuation procedures, road closure plans, and emergency services coordination. The EAP has been accepted by the US Army Corps of Engineers and is to serve as a new template for future Flood Control District of Maricopa County sponsored EAP projects.

Spur Dike on the Tres Rios North Levee

5. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

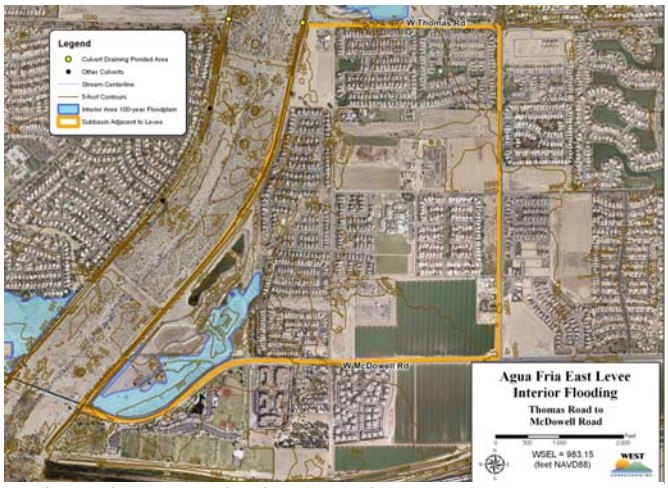
(Present no more than five (5) projects. Complete one Section 5 for each project.)

a. TITLE AND LOCATION *(City and State)*	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
Levee Certification Studies for the Agua Fria River (Avondale, AZ)	2011	

23. PROJECT OWNER'S INFORMATION

c .PROJECT OWNER	d .DOLLAR AMOUNT OF PROJECT	e. TOTAL COST OF PROJECT
Flood Control District of Maricopa County	$97,600	$97,600

f. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and length of project)



Interior Drainage Mapping for Agua Fria

In a compressed time frame of only three months, WEST prepared Levee Certification Packages for three levees along the Agua Fria River near the City of Avondale, AZ. These three levees (called Levee 8, 16, and 18) were Provisionally Accredited Levees (PALs). The PAL status of these three levees was expiring, leading to the compressed time frame for the study. If the PAL status of these levees expired, several hundred people in the City of Avondale living behind the levees would have been put into the floodplain. This project required close coordination with the Flood Control District of Maricopa County, the City of Avondale, FEMA Region IX, and other consulting firms. Levee Certification Packages were prepared that conformed to the Code of Federal Regulations (CFR) Chapter 44, Section 65.10, which establishes the requirements that must be met in order for a levee to be certified and then accredited by FEMA.

Agua Fria Levee 08

WEST conducted a field reconnaissance and review of analyses, calculations, and studies for the three levees. Due to the compressed time frame, interior drainage studies were determined using modified versions of previously existing HEC-1 models. WEST also computed levee freeboard, performed scour analyses for the stability of levee toes, and mapped the floodplains of the interior drainage areas. Geotechnical engineers provided parameters essential to the stability analysis of the levees, such as depth and duration of flooding. WEST then assembled all of these analyses into three separate Levee Certification Packages. The levees were accredited by FEMA.

6. ADDITIONAL INFORMATION

a. PROVIDE ANY ADDITIONAL INFORMATION YOU FEEL MAY BE NECESSARY TO DESCRIBE YOUR FIRMS QUALIFICATIONS. *(ATTACH ADDITIONAL SHEETS AS NEEDED.)*

As a specialized firm with offices in Arizona, California, Oregon, Washington, and Maryland, WEST offers a staff of over 60 highly trained engineering and scientific professionals, including 25 licensed engineers specifically dedicated to the field of water resources. In addition, we have 13 Diplomates of Water Resources Engineering (D.WRE) certified by the American Academy of Water Resources Engineers. WEST offers a unique depth and breadth of resources, expertise, and experience in water resources engineering that is typically absent from much larger, less specialized firms. As specialists, our experience in hydrologic and hydraulic analyses, hydraulic modeling, sediment transport analyses, flood hazard assessment, flood insurance studies, DFIRM production, FIS reports, and working with FEMA is unparalleled. WEST has a long record of preparing successful map revision requests to FEMA for clients in Arizona, as well as California, Oregon, Washington, Hawaii, and other states.

WEST routinely completes high level, complex engineering projects in hydraulics, hydrology, and sediment transport. We focus this experience and skill to meet our clients' water resource challenges that are unique to the arid southwest. Our highly professional staff has earned a reputation for effectively mitigating the risk associated with flooding while our planning studies provide clear, implementable direction for future project work. Our high level understanding allows us to consistently complete projects efficiently and effectively. Our expertise in all aspects of hydraulic and hydrologic modeling allows us to select the best modeling approach for each project.
One of the unique aspects of WEST is the national and international training we conduct for hydraulic, sediment, hydrologic, and GIS analyses. WEST personnel routinely teach highly rated courses in basic HEC-RAS, unsteady HEC-RAS, sediment transport analyses with HEC-RAS, dam break analyses with HEC-RAS, GIS for hydrologic and hydraulic analyses, and streambank stabilization. We have taught hundreds of courses nationwide for ASCE, the National Highway Institute, AFMA, FMA, and the Flood Control District of Maricopa County (FCDMC). In addition, we have taught several GIS courses for ASCE and AFMA. We are also experts in 2-D modeling, completing over 50 2-D studies using a wide variety of programs such as FLO-2D, ADH, EFDC, and RMA-2. Of these, approximately 15 have been large-scale FLO-2D models. Several of our 2-D models have been of Arizona features such as Centennial Wash, the Cactus Forest area near Florence, and the San Tan area near Queen Creek.

WEST is known for being innovative in its approach to projects and, as a result, we have developed some unique solutions to complex modeling problems. For example, in the Guadalupe floodplain delineation study, we created a unique unsteady HEC-RAS model that accounted for the complex network of ponding areas, retention basins, storm drains, and weirs. This allowed for the balancing of the water surface among the different ponding areas against an irrigation canal. Modeling the same situation in HEC-1, which is the typical approach, would have required an iterative solution that would have taken significant time and money. Our "out-of-the-box" solution to this problem saved significant resources.

WEST also used innovative techniques to complete the first Emergency Action Plan (EAP) ever made for a major levee in Arizona. Developed after extensive research and coordination with experts both nationally and internationally, the EAP combines the key elements of the well established dam failure EAPs specific to the southwest while extending and modifying it to address levee specific issues. The EAP has been accepted by the USACE and will help to serve as a new template for future projects. In addition, we created a "flight simulator" for canal operators at the Central Arizona Project (CAP). In this project, we linked an unsteady HEC-RAS model to CAP's control system so that newly hired canal operators could learn how to operate the canal using a virtual canal similar to the way pilots learn to fly with flight simulators. Yet as much as we value nonlinear thinking, we also recognize that solutions must be implementable. Hence, we also adopt a "return to the box" philosophy, wherein we spend equal effort on taking our creative solutions and turning them into practical, implementable, and imminently cost effective actions.

See addition sheet for more information.

7. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS

a.	Percentage of Total Work Attributable to State, Federal and Municipal Government Work:	85%
b.	Percentage of Total Work Attributable to Non-Government Work:	15%

8. AUTHORIZED REPRESENTATIVE. The foregoing is a statement of facts.

Signature:_____ Date:__12/11/2013_____

Name: __Brian Wahlin_____ Title: __Office Manager _____

6. Additional Information

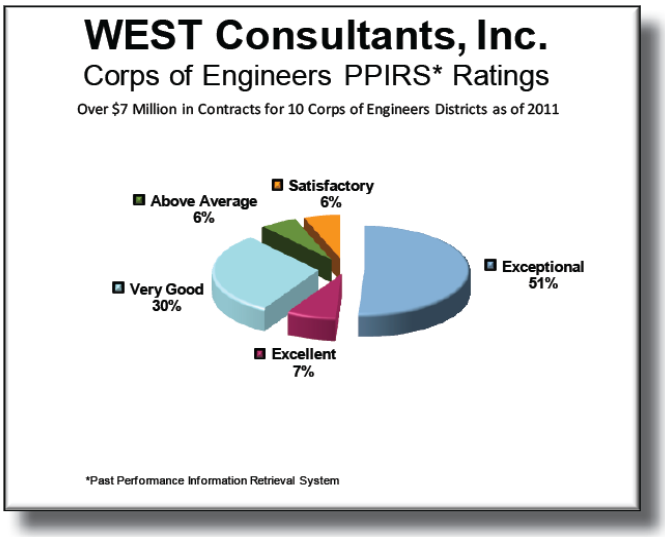
CAPACITY OF WEST CONSULTANTS

WEST team has the experienced staff and the financial resources to complete any water resources related project for the State of Arizona. Resumes for our key personnel in our Tempe, AZ office are included in the submittal. If capacity of the Tempe officesis exceeded, WEST has several other offices (i.e., San Diego Folsom, Portland, Salem, and Bellevue) that can be utilized to complete any project in a timely fashion. WEST has managed a range of projects with small budgets to large multi-million dollar/multi-year projects. WEST is experienced at managing various small projects (i.e., less than $250,000) that originate from on-call contracts. Currently, the Arizona office of WEST holds on-call contracts with the Flood Control District of Maricopa County, Mohave County, Pinal County, Cochise County, New Mexico Interstate Stream Commission, and the New Mexico Office of the State Engineer. We have been able to manage the various projects from these contracts efficiently and consistently deliver quality work products to our clients in a timely fashion.

Providing quality work products on time and within budget has been a key to WEST's success. WEST has an established set of quality control guidelines with a quality control plan developed and implemented at the beginning of each project. WEST always assigns a Project Principal and a Project Manager to each project contract. The Project Manager will be responsible for identifying specific objectives and requirements for the project, establishing project task milestones, schedule, and budget, defining the technical approach and deliverables, and coordinating with the State of Arizona. The Project Manager will ensure that deliverables (i.e., computer models, reports, work maps, plans, etc.) will be provided on time and within budget; and will coordinate with the State of Arizona to ensure that all project requirements are met and any project issues are quickly resolved. Our Project Manager is always supported by a team of professionals with expertise necessary for successful completion of the project. The Project Principal will be responsible for ensuring adequate resources are available, quality assurance is met, and all work products are delivered on time. Finally, an assigned Quality Assurance / Quality Control leader will review all deliverables.

PRIOR PROJECT EXPERIENCE

WEST has completed dozens of hydraulics and hydrology studies throughout Arizona in just the last 3 years. WEST developed DFIRMs in sixteen counties across Oregon and Idaho for FEMA Region X, which involved producing more than 1,300 DFIRM panels along more than 550 miles of river. Other recent floodplain studies include Physical Map Revisions (PMRs) for the Tres Rios North Levee and Centennial Wash. WEST has also developed numerous FLO-2D models.



WEST has a proven track record of superior water resources engineering services. Our past and current clients include FEMA Region IX and X, U.S. Army Corps of Engineers (USACE), Flood Control District of Maricopa County, Pima County Regional Flood Control District, Pinal County Department of Public Works, Cochise County, Salt River Project, Central Arizona Project, Arizona Department of Transportation, Caltrans, Oregon Department of Transportation, Washington Department of Transportation, Federal Highways Administration,

Transwestern Pipeline Company, Freeport McMoRan, New Mexico Interstate Stream Commission, many other local governments, numerous engineering consultants, and private industry. Our clients confirm that WEST delivers quality project results. ***WEST Consultants has achieved a documented 100% Satisfaction Rating (51% were rated Exceptional) in the Past Performance Information Retrieval System for our federal projects.***

Coordination of any hydraulics or hydrology project usually includes interactions with the public. WEST has a history of creating positive partnerships with individuals and public organizations in order to maximize benefit from a project. For example, a large project in Nebraska required WEST to reach out to more than 70 stakeholder organizations. By soliciting their input through a variety of methods and establishing a means of communication early in the project, WEST helped to gather public support and was able to develop a sediment control strategy for the area (12,000 square miles) that won the USACE's highest score of approval.

PROJECT RISK MANAGEMENT

Every project has unknowns or complicating factors in it that can pose risk to the budget, scope, and schedule. To minimize these risks, we have developed the following procedures:

Disciplined Financial Management – We prioritize accurate and realistic contracting because we recognize financial management is a key priority of our clients. We believe in developing a comprehensive and fair initial contract, and are dedicated to delivering the best possible product while strictly adhering to every aspect of that contract, from time frame to financial expectations.

Respect for our Client's Client – Projects of significance inevitably involve numerous stakeholders, each of whom measure success according to their own perspective. We strive to understand our client's responsibilities, and recognize that our top priority must be to help them become highly successful in the opinion of their constituents.

Scheduling – WEST recognizes the importance of scheduling, and so we translate project scheduling into a leadership tool to guide the consultant team toward successful delivery of a project. We schedule sequentially and in parallel, insuring schedule robustness and efficient product delivery. We believe that every project task is a milestone and a reflection of our performance.

Scope Definition – Projects that are poorly scoped can pose a significant risk to the overall project. As experts in the field of hydrology, hydraulics, and sediment transport studies and our experience with floodplain projects, we are able to identify areas in the scope that may be problematic and offer suggestions on how to improve the scope as was done in Guadalupe FDS as described in the following paragraph. In addition, WEST personnel are experts in a wide range of software packages and are able to select the most appropriate modeling tool for a given project.

One example of where we mitigated the risks to a project budget and schedule is the Guadalupe FDS that we recently completed for the FCDMC. This study involved mapping floodplains in ponded areas along a canal. The traditional approach taken by the FCDMC was an iterative approach that would have taken significant effort and resources. We identified this as a potential issue for the project and immediately called a meeting with the FCDMC. We suggested creating a unique HEC-RAS model consisting of only storage areas and storage area connections to model the ponding against the canal. This unique approached saved significant resources and kept the project on time and under budget.

A second example of mitigation of risks to a project budget and schedule occurred on the Tres Rios North Levee PMR project that we completed for the FCDMC. This project consisted not only of a PMR but also a certification of the newly constructed Tres Rios North Levee. It was a high priority project because a lawsuit settlement required that the levee be certified so that the residents beyond the levee could be removed from the floodplain. Initially, the USACE was going to complete the project and WEST was

hired by the FCDMC to simply review the USACE's work. The technical staff at the USACE had difficulties meeting the time schedule set forth by the FCDMC. WEST realized that this situation would result in the project falling significantly behind, alerted the FCDMC, and suggested that WEST take over the bulk of the workload to keep the project on track. Both the USACE and the FCDMC agreed and the project was completed on time.

A second risk factor presented itself about halfway through the Tres Rios North Levee PMR project. The USACE informed the FCDMC and WEST that an Emergency Action Plan (EAP) would be required for Tres Rios North Levee. Under a short time frame and with limited budget, WEST was able to develop an EAP for the levee, the first of its kind in Arizona. The FCDMC then used WEST's EAP as the basis of its recently developed levee EAP template. Thus, even though an unexpected development occurred in this project, WEST was able to adjust and complete the project on time and within budget.

ADAPTING PROJECT SCHEDULE

WEST has a history of meeting project schedules and budgets, even under emergency conditions, during its 25 year history. We have the ability to re-arrange workloads and shift projects between offices so that our clients' needs and budgets are met in the most efficient manner possible. A few specific examples are given to demonstrate situations in which WEST has risen above the normal call of duty to meet clients' emergency needs:

Recently, the Salt River Project (SRP), a long-standing client of WEST, approached us with a project to perform a scour analysis on some of their electrical transmission towers. Ordinarily, this would have been a routine project for us. However, due to extenuating circumstances the project had to be completed within the two weeks surrounding the holiday season. WEST met this challenge by assigning sufficient qualified staff to complete the project within the allotted time frame.

In January 2010, flood flows endangered several SRP electrical transmission towers along the Hassayampa River west of Phoenix. SRP once again turned to WEST to perform hydraulic, hydrologic, and scour analyses on this critical infrastructure site in a timely fashion. WEST was once again able to shift its workload to meet the needs of this emergency project.

We also recently completed an emergency project for SSFM International for the Queen Kaahumanu Highway expansion in Hawaii. The hydraulics and hydrologic lead on this project had to step down due to personal reasons and WEST was tasked with evaluating an entirely new drainage study that would meet original project deadlines despite starting several months late. We developed a forensic hydrology study that convinced the Hawaii DOT to reduce the design flow requirements for the highway that will allow smaller culverts and therefore achieve significant cost savings. Thus, even though we worked with a compressed deadline, we were able to provide cost savings for SSFM and meet their deadlines.

> ***"Brian Wahlin of WEST Consultants was a pleasure to work with. Dr. Wahlin demonstrated creativity and professional expertise in developing a custom product to meet our unique needs. He was responsive to our desires and changing requirements as the project unfolded. I am certain he worked far beyond our budgeted hours in order to ensure the ultimate deliverable was a success, and this extra labor was never billed. This is a testimony to WEST's commitment to customer service, and I would not hesitate to hire them again."***
>
> *Tim Kacerek, Central Arizona Project (retired)*

We pride ourselves on being a highly technical engineering firm, but we recognize that success does not come solely from technical expertise but also from a companywide dedication to our clients. This dedication is expressed by providing consistent quality engineering for projects and by responding quickly to emergency projects that must be completed in just a few days – such as our recent investigation of emergency protection options following a massive bank failure on the Hassayampa River.

Moreover, we respond quickly to events that are important to a project but may not be known to our client. For example, we were asked by Pinal County to investigate mitigation solutions to the ongoing flooding problems in Queen Valley, Arizona. Just a few weeks later a major storm began in the region. In response, we immediately drove to the site to photograph, measure, and otherwise document the actual flow effects on the existing drainage structures. This allowed us to calibrate and verify our hydraulic models for the region, thereby maximizing confidence in our predictions and recommendations.

COST CONTROL PROCESS

Cost control is a major element of project management. The budget is presented at all internal project coordination meetings so that individual team members are up-to-date on the task efforts and remaining budget to complete tasks. Our cost control approach includes monitoring the project budget and determining whether we are meeting projected project schedule and budget. WEST has also developed project management values and tools that it uses to ensure that projects are effectively delivered. These values are derived from many years of listening to what is important to our clients.

Client / Consultant Partnerships – By listening to the needs of our clients, we develop client / consultant partnerships that translate into highly successful outcomes. To maintain close client / consultant relations, WEST project managers maintain a high degree of technical involvement and management control over each project. WEST values each client and takes pride providing responsive client service. WEST continually strives to exceed expectations. As a result, WEST has established long-term partnerships with multiple clients, with many still active after more than two decades.

Trust Based Relationships – Trust is the cornerstone of the client / consultant relationship. WEST believes trust is continuously earned through clear communications, dedication to the project schedule, and the ongoing effort to understand and implement our clients' needs and priorities.

Clear Communication – WEST recognizes that communication is the critical factor for project success. We pride ourselves in the availability of project staff and immediacy in client responses.

We apply the above procedures to all of our projects with great success. One particular example was the PMR for Centennial Wash that WEST recently completed for the FCDMC. This large project (greater than $250,000) involved developing floodplain maps for over 40 linear miles of Centennial Wash in the western portion of Maricopa County. In addition, a large FLO-2D model was created to map the floodplains where Centennial Wash breaks out from its main channel, creating the need to develop a procedure to map both HEC-RAS and FLO-2D results on the same work maps. WEST utilized the project management and cost control processes described above and finished this project on time and significantly under budget.

QUALITY ASSURANCE AND QUALITY CONTROL

Quality Assurance and Quality Control (QA/QC) are important components of developing hydraulic modeling and flood insurance study products to the specifications required by FEMA. WEST has well-developed and proven internal QA/QC procedures that have been refined during our many past FEMA projects. The internal review process consists of a self-review check list, reviews by the project manager, and reviews by an assigned independent senior reviewer. Our thorough review process reduces the likelihood of costly and time consuming revisions and helps facilitate a more efficient LOMR review by FEMA's Risk Mapping, Assessment, and Planning (RISK MAP) Production and Technical Services Contractor for Region IX.

Quality performance includes technical content, clarity of information, and the ability to convey technically complex information to a general audience. Our quality assurance protocols are closely related to our project management philosophy: clear communication of client and project manager

expectations, reinforced and supported by regular guidance and progress review. We hold project kickoff meetings to provide the project team with a clear understanding of client needs and expectations. Our Project Manager monitors progress toward completion, providing feedback on technical content, schedule and budget. Reviews of project deliverables will be made by the Principal-In-Charge and other technically qualified and experienced personnel as appropriate for the specific deliverable. As required, third party reviews will also be utilized. The QA/QC review process will be appropriately documented to ensure clear communication of comments, responses and back checking/acceptance of required revisions to deliverables.