

**RFQ# ADSPO14-0003465, Annual Request for Qualifications and Experience  
REVISED – Attachment I – General Qualifications**

(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:	Tetra Tech Inc. (DIV)
b.	FIRM (OR BRANCH OFFICE) STREET:	4801 E. Broadway Blvd., Suite 521
c.	FIRM (OR BRANCH OFFICE) CITY:	Tucson
d.	FIRM (OR BRANCH OFFICE) STATE:	Arizona
e.	FIRM (OR BRANCH OFFICE) ZIP CODE:	85711
f.	YEAR ESTABLISHED:	1966

(g1).	OWNERSHIP - TYPE:	Corporation
(g2)	OWNERSHIP - SMALL BUSINESS STATUS:	N/A

h.	POINT OF CONTACT NAME AND TITLE:	Doug Lantz, PhD, PE, PH
i.	POINT OF CONTACT TELEPHONE NUMBER:	(520) 623-7980
j.	POINT OF CONTACT E-MAIL ADDRESS:	doug.lantz@tetrattech.com

k.	NAME OF FIRM (If block 1a is a branch office):	Tetra Tech, Inc.
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42	Hydrographic Surveying	3
13	Surveying; Plating; Mapping; Floodplain Studies	3
6	Value Analysis; Life-Cycle Costing	1
151	Water Resources; Hydrology; Ground Water	6

PROFESSIONAL SERVICES REVENUE INDEX NUMBER

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

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

a. NAME Jonathan Elslager, PE, CFM	b. ROLE IN THIS CONTRACT Project Engineer	c. YEARS EXPERIENCE	
		1. TOTAL 9	2. WITH CURRENT FIRM 9
d. FIRM NAME AND LOCATION (City and State) Tetra Tech (DIV) – Tucson, Arizona			
e. EDUCATION (Degree and Specialization) BS, Civil Engineering, University of Arizona, 2004		f. CURRENT PROFESSIONAL REGISTRATION (State and Discipline) Professional Engineer Arizona # 49108 Certified Floodplain Manager US-11-06091	
g. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.) Proficient in numerous software programs including FLO-2D, HEC-RAS, HEC-HMS, HEC-1, HEC-2, HEC-GEORAS, Fluvial-12, and Maricopa County FCD's DDMSW program. Also proficient in the use of Computer Aided Design and Drafting software, including AutoCAD and MicroStation.			

H. RELEVANT PROJECTS			
(1) TITLE AND LOCATION (City and State)	(2) YEAR COMPLETED		
	PROFESSIONAL SERVICES	CONSTRUCTION (If applicable)	
1) Buckeye Flood Retarding Structure No. 1, Final Design Buckeye, Arizona	Ongoing		
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm			
Project engineer responsible for unsteady HEC-RAS analysis and preparation of construction drawings, special provisions, quantities, and cost estimates for the Phase I and Phase II final design services for the rehabilitation of the Buckeye FRS No. 1. Major design features include central filter, dam raise and abutment at the eastern end, soil-cement revetment on the auxiliary spillway, replacement of the principal spillway inlet, landscaping, and aesthetics. The total construction cost is currently estimated at approximately \$25 million. Major components of the contract include geotechnical/geophysical field investigations, hydrologic/hydraulic analyses, FMEA analyses, plans and specifications, CMAR coordination and engineering support during construction.			
2) Gravel Pit River Mechanics Study and Headcut Reclamation & Mitigation Design Plans, CEMEX USA, Pinal County, Arizona	Ongoing		
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm			
River Mechanics Study included Hydrologic Analysis, Hydraulic Analysis, detailed Sediment Transport Analysis, Pit Scour Analysis for Sand and Gravel operations on the Queen Creek Wash in Pinal County. Analyses included the use of one-dimensional and two-dimensional hydraulic analyses and Sediment Transport Modeling effort utilizing Fluvial-12. From this analysis Disturbance Mitigation/Restoration Design plans, Quantities and Cost Estimates.			
3) Northern Relief Interceptor Sewer Sediment Transport Modeling and Scour Analysis, Pima County Regional Wastewater Reclamation Department, Tucson, Arizona	2012		
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm			
Project Engineer responsible for developing a calibrated hydraulic model, conduction field investigation, sediment sampling, sediment transport modeling using Fluvial-12 and HEC-RAS, and determining maximum single event scour calculations in support of a Regional Sewer Interceptor Project across the Rillito River in Tucson, AZ.			

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

a. NAME Doug Lantz, PhD, PE, PH	b. ROLE IN THIS CONTRACT Project Manager/Hydraulic Engineer	c. YEARS EXPERIENCE	
		1. TOTAL 25	2. WITH CURRENT FIRM 16
d. FIRM NAME AND LOCATION (City and State) Tetra Tech (DIV) – Tucson, Arizona			
e. EDUCATION (Degree and Specialization) PhD Watershed Management, University of Arizona, 1998; MS Watershed Management University of Arizona; 1989, BS Watershed Management, University of Arizona, 1986		f. CURRENT PROFESSIONAL REGISTRATION (State and Discipline) Professional Engineer: Arizona # 28850 (Also registered in WA, OR, ID, CA, MD, NM and OK) Registered Professional Hydrologist, No. 1479, American Institute of Hydrology, 1998	
g. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.) National Dam Safety Program, ASDSO - Spillway Hydraulics (2006); National Dam Safety Program, ASDSO – Dam Failure Analysis (2006); ASDSO - SITES and WinDam Specialty Workshop (2008).			

**H. RELEVANT PROJECTS**

	(1) TITLE AND LOCATION (City and State)	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES	CONSTRUCTION (If applicable)
1)	Buckeye Flood Retarding Structure No. 1 Buckeye, Arizona	Ongoing	
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Tetra Tech is currently under contract with the Flood Control District of Maricopa County to provide design and construction services for Buckeye FRS No. 1, a 7-mile long NRCS assisted dam that provides flood protection for the Town of Buckeye and surrounding agricultural area. Dr. Lantz is Project Manager for a multi-disciplinary team and is responsible for all aspects of the \$2.5 million on-call contract with the District.		
2)	Florence Flood Retarding Structure Florence, Arizona	2011	
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Tetra Tech provided planning, design, and preconstruction services to the FAWFCD and the NRCS Arizona State Office for rehabilitation of the Florence FRS, a five-mile long earthen dam that provides flood protection to the Town of Florence, Arizona. Doug was the Project Manager responsible for all aspects of the project including field survey and mapping, hydrology and hydraulics, economics, construction plans, specifications and design report.		
3)	Tres Rios del Norte Ecosystem Restoration Feasibility Study Pima County, Arizona	2013	
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm The Los Angeles District is conducting feasibility level analyses for ecosystem restoration along an 18-mile, effluent-dominated reach of the Santa Cruz River near Tucson, Arizona. Local sponsors include Pima County, the City of Tucson, and the Town of Marana. The project is evaluating 10 project alternatives with up to 4,000 acres of restoration including cottonwood-willow forest, mesquite-bosque, emergent wetland, and Sonoran scrub-shrub. The project also includes flood damage reduction efforts to protect portions of Interstate 10 from erosion or slope failure in connection with a large gravel pit that could be captured by the river. Dr. Lantz was the Project Manager and Hydraulic Engineer and was responsible for (1) plan formulation to develop, describe, and evaluate alternatives, (2) GIS development and analysis of alternatives to provide inputs for hydrogeomorphic habitat modeling, (3) hydraulic analysis of restoration alternatives using HEC-RAS and GeoRAS, (4) preliminary water budgeting analyses, (5) conceptual design and cost estimating for restoration plantings, water delivery infrastructure, bank protection, grade controls, and impoundment structures for benefit-cost analysis and incremental analyses, (6) coordination with the Corps study team and the local sponsors, and (7) preparation of the feasibility report and appendices for hydraulics, economics, design, and cost estimating.		

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

a. NAME Adam Raczynski, PE, CFM	b. ROLE IN THIS CONTRACT Hydrology/Hydraulics	c. YEARS EXPERIENCE	
		1. TOTAL 6	2. WITH CURRENT FIRM 6
d. FIRM NAME AND LOCATION (City and State) Tetra Tech (DIV) – Tucson, Arizona			
e. EDUCATION (Degree and Specialization) M.S. Civil Engineering, University of Arizona, 2008; B.S. Civil Engineering, University of Arizona, 2007		f. CURRENT PROFESSIONAL REGISTRATION (State and Discipline) Professional Engineer: Arizona # 52933 Certified Floodplain Manager, US-06-06088	
g. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.) Proficient in numerous software programs including FLO-2D, HEC-RAS, HEC-HMS, HEC-1, HEC-2, HEC-GeoRAS, Fluvial-12, SITES, and MCASES. He is also proficient in the use of computer assisted technologies, including AutoCAD (including Civil3D), MicroStation, and ArcMap.			

**H. RELEVANT PROJECTS**

	(1) TITLE AND LOCATION (City and State)	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES	CONSTRUCTION (If applicable)
1)	Buckeye Flood Retarding Structure No. 1 Buckeye, Arizona	Ongoing	
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Project engineer responsible for updating previously developed HEC-1 modeling to evaluate the site specific PMP at FRS No. 1. Work included a separate spreadsheet analysis of the Green & Ampt loss method for shallow soils in mountainous sections of the watershed. Additional work included HEC-RAS modeling and floodplain mapping, alternative analysis for closure structures, quantity take-offs, civil design, and cost-estimating, and civil design of mitigation features for the FRS No. 1 project.		
2)	San Xavier Flood Hazard Study, Indian Health Service Tucson, Arizona	Ongoing	
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Project Manager. The intent of the study is to identify and quantify the potential for flooding and erosion hazards along the Santa Cruz River and major washes caused by a 100-year flood and by a 500-year floods. Additional work includes quantifying the likelihood of potential damage to existing critical facilities by future floods and conceptually quantifying the design measures that are needed to mitigate such damage.		
3)	Floodplain Analysis Rio Nuevo CLOMR/LOMR-F/LOMR Tucson, Arizona	Ongoing	
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Design Engineer. Prepared a CLOMR for Rio Nuevo and letter of map revision for fill (LOMR-F) for the Gadsden Property within the Rio Nuevo site. The work included preparation of hydraulic analyses of existing conditions and the effects of the proposed fill of the University of Arizona Science Center, construction of the Cushing Street Bridge, floodwall for the River Park Inn (with adjacent properties), and fill at the Gadsden Property along the Santa Cruz River. Currently preparing a LOMR for the as-built conditions constructed Cushing Street Bridge, floodwall, and fill. The work includes the compilation of all required technical documentation for submittal to FEMA.		
4)	Freeport McMoRan Copper & Gold, Sierrita, Leach Field No. 1 Green Valley, Arizona	2012	
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Design Engineer responsible for technical documentation (hydrology and hydraulics) for the development of the Emergency Action Plan for the Leach Field No. 1 (Bailey Lake) at the Sierrita open pit mine. Work included field investigation of existing site conditions, updating and compiling documentation for submittal to ADWR, and flood inundation map preparation using ArcGIS Geo-RAS.		

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a. NAME <b>Scott Estergard</b>		b. ROLE IN THIS CONTRACT <b>Senior Water Resources Planner</b>		c. YEARS EXPERIENCE	
				1. TOTAL <b>17</b>	2. WITH CURRENT FIRM <b>2</b>
d. FIRM NAME AND LOCATION (City and State) <b>Tetra Tech (DIV) – Phoenix, Arizona</b>					
e. EDUCATION (Degree and Specialization) <b>MEng – Water Resources</b>			f. CURRENT PROFESSIONAL REGISTRATION (State and Discipline)		
g. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.) Mr. Estergard has over 17 years of experience in water resource planning and environmental impact assessment. His expertise includes detailed knowledge of aspects of plan formulation and Federal water resource policy with focus in ecosystem restoration and flood risk management. He has led interdisciplinary study teams working with local communities and stakeholder groups to develop, evaluate, and recommend solutions to water resource problems. He has extensive knowledge of developing planning reports of varying types and complexities – Initial Appraisals, Reconnaissance Reports (905(b)), Feasibility Reports, Preliminary Restoration Plans, and Technical Decision Documents and is certified as having completed the USACE Planning Community of Practice requirements as an Expert Planner. For 14 years prior to joining Tetra Tech, Mr. Estergard was with the U.S. Army Corps of Engineers (Los Angeles and Rock Island Districts). Project experience includes watershed studies and feasibility studies addressing flood risk management, ecosystem restoration, groundwater recharge, stream bank stabilization, and navigation.					

**H. RELEVANT PROJECTS**

1)	(1) TITLE AND LOCATION (City and State) <b>El Rio Medio Ecosystem Restoration Feasibility Study, Pima County, Arizona</b>	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES <b>Ongoing</b>	CONSTRUCTION (If applicable)
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm <b>Tetra Tech is currently working with the U.S. Army Corps of Engineers-Los Angeles District and Pima County Regional Flood Control District on a feasibility study along the Santa Cruz River. As a senior planner Mr. Estergard has overseen a sensitivity analysis of HEC-RAS modeling, evaluated refinements to restoration alternatives to reduce flood risks, updated cost estimate and design documents, and feasibility report materials.</b>		
2)	(1) TITLE AND LOCATION (City and State) <b>Tres Rios del Norte Ecosystem Restoration Feasibility Study, Pima County, Arizona</b>	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES <b>2007-2010</b>	CONSTRUCTION (If applicable)
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm <b>Mr. Estergard was the lead planner and study manager from 2008-2010 for this \$7 million feasibility study along an 18-mile, effluent-dominated reach of the Santa Cruz River near Tucson, Arizona. Local sponsors include Pima County, the City of Tucson, and the Town of Marana. The feasibility study is investigating opportunities for ecosystem restoration, water supply, flood risk management and recreation. As lead planner during this time Mr. Estergard was responsible for plan formulation and evaluation, trade off analysis, preparation of the Draft Feasibility Report/DEIS, and overall study coordination and management. The Draft report identifies a combined ecosystem restoration and groundwater recharge plan with recreation features.</b>		
3)	(1) TITLE AND LOCATION (City and State) <b>Little Colorado River (LCR) Flood Risk Management Study, Planning Charette, Winslow, Arizona</b>	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES <b>2012</b>	CONSTRUCTION (If applicable)
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm <b>Tetra Tech assisted the Corps of Engineers in the facilitation and documentation of a planning charette, and development of post charette reports for LCR at Winslow Study. A 3-day planning charette including nearly 50 stakeholders was held in May 2012. Tetra Tech provided facilitation in brainstorming sessions including planning, design and hydraulic engineering disciplines and developed a Post Charette Report which documents the study objectives and develops a preliminary set of flood risk management alternatives for additional analysis. Measures and alternatives developed in the charette were screened based on available information and conceptual designs and preliminary estimates of cost for each of the remaining alternatives were developed. Alternatives considered included levee rehabilitation, new levees, upstream detention, channelization, and elevation of residential structures. Mr. Estergard was Project Manager and Senior Planner for the project.</b>		

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a. NAME John Lynch, PE, RLS		b. ROLE IN THIS CONTRACT QA/QC		c. YEARS EXPERIENCE	
		1. TOTAL 42	2. WITH CURRENT FIRM 10		
d. FIRM NAME AND LOCATION (City and State) Tetra Tech (DIV) – Tucson, Arizona					
e. EDUCATION (Degree and Specialization) B.S. 1969, Civil Engineering			f. CURRENT PROFESSIONAL REGISTRATION (State and Discipline) Professional Engineer (AZ) (inactive status: NY; OH; NM; IL; & AR); Registered Land Surveyor (AZ)		
g. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.) Mr. Lynch is currently responsible for project management and/or quality control/assurance for technical reports and studies, field surveys, design and preparation of construction documents, easement documents, and construction surveillance projects. Mr. Lynch has been a principal contributor to the design and/or construction of more than one billion dollars in public and private funded transportation, flood control, water, sewerage and utility infrastructure projects.					

**H. RELEVANT PROJECTS**

	(1) TITLE AND LOCATION (City and State)	(2) YEAR COMPLETED	
		PROFESSIONAL SERVICES	CONSTRUCTION (If applicable)
1)	Buckeye Flood Retarding Structure No. 1, Final Design, Flood Control District of Maricopa County	Ongoing	
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Mr. Lynch provided technical guidance on the design and specifications for <i>soil cement</i> used for spillway construction and QC for all design reports, plans, specifications and opinions of probable construction cost and assisted the District and served on their selection panel for the first CMAR contract issued by the District's Dam Safety Division.		
2)	Standard Specifications and Standard Details for Public Improvements, 2003, 1994 and 1988 Editions, Pima County and City of Tucson Departments of Transportation, Pima County Regional Wastewater Reclamation Department & Tucson Water Department, Tucson	2009-2012	
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Mr. Lynch, working with a committee comprised of City, County, contractor and supplier representatives, on three occasions was retained to create or update specifications and details used by the City and County for CIP and development projects. The first-ever edition was recognized as the "Outstanding Public Sector Engineering Project for 1989" by AzASPE. This edition" was accepted by Federal Highway Administration (FHWA) for use on federally funded, local Certification Acceptance administered projects.		
3)	Florence Flood Retarding Structure - Florence Arizona	2011	
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Mr. Lynch provided technical guidance on the design and specifications for <i>soil cement</i> used for spillway construction and Q/C and constructability review of the final project documents (plans, specifications and OPCC) for the rehabilitation of an NRCS governed, 5-mile long, 25-foot high earthen dam for which Tetra Tech is under contract to the Florence Area Watershed Flood Control District.		
4)	Tucson Drainage Area/Arroyo Chico Drainage Improvements, US Army Corps of Engineers, Los Angeles District	Ongoing	
	(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE <input checked="" type="checkbox"/> Check if project performed with current firm Local Team Coordinator and Utility Relocation and Storm Drain Lead for the development of plans, specifications & OPCC as well as construction period services. The \$24 million project includes four excavated detention basins totaling 747,000 cy of material; flood retarding embankments; concrete arch culverts; extensive utility relocations; mitigation of environmental hazards; street closures, detours and traffic control plans; demolition of buildings and athletic fields; 1,252 linear feet of 8'wide x 10' high, concrete storm drain beneath a high school site and streets; stabilized channels; aesthetic treatment of concrete surfaces; athletic facilities (buildings and fields); landscape and irrigation; new field lights; and environmental preservation and restoration elements.		

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**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) Tres Rios del Norte Restoration Study Pima County, Arizona	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES 2013	CONSTRUCTION (If applicable) N/A

**23. PROJECT OWNER'S INFORMATION**

c. PROJECT OWNER U.S. Army Corps of Engineers LA District – Phoenix Office	d. DOLLAR AMOUNT OF PROJECT \$1,508,450	e. TOTAL COST OF PROJECT
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f. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and length of project)  
The Tres Rios del Norte Ecosystem Restoration study is a joint partnership between the U.S. Army Corps of Engineers, the City of Tucson, the Town of Marana, and the Pima County Regional Flood Control District. Because of severe ecosystem degradation, the sponsors of the study wished to restore habitat values along an 18-mile, effluent-dominated reach of the Santa Cruz River that runs through Tucson, Marana, and unincorporated Pima County. The study also addresses many water and related land resource issues, such as flood damage reduction, water supply, and recreation within the floodplain and riparian zone of this important river corridor.

The study considered 10 project alternatives with as many as 4,000 acres of ecosystem restoration that includes cottonwood-willow forest, mesquite-bosque, emergent wetland, and Sonoran riparian scrub-shrub habitat types. The alternatives were evaluated on the basis of environmental outputs and estimated costs, and a Recommended Plan with 1,360 acres of restored habitat was selected. The study includes a water supply plan that will provide features such as basins, multiple channels, and t-berms for recharge of treated effluent into the riverbed. The study also includes grade controls, levee modifications, and structural bank protection to accommodate the increased vegetation and to prevent flood and erosion damages to the proposed project. As well as a comprehensive recreation plan that includes parks, river trails, bridge crossings over rivers, tributaries and roads, and interpretive signage.

Tetra Tech, Inc. provided planning and engineering services in support of the feasibility study under contract to the Los Angeles District.

**Plan Formulation Services** Plan formulation kicked-off with a series of inter-agency workshops that included the Corps, the local sponsors, the U.S. Fish and Wildlife Service, the Arizona Department of Game and Fish, and Saguaro National Park. The workshops were held to gain local input on proposed alternatives and measures for ecosystem restoration, water supply, recreation, and flood damage reduction. Tetra Tech facilitated the workshops and the collected information was used to develop and describe restoration alternatives that were evaluated by the Engineer Research and Development Center (ERDC) on the basis habitat output (using HGM) and conceptual cost estimates. Formulation of the Recommended Plan required development of a restoration plan (NER), a recreation plan (NED), and a water supply plan (NED). The individual plans were then combined into a comprehensive Combined Plan (NER/NED) that was evaluated in terms of incremental restoration benefits, NED benefits, and by means of a trade off trade off analysis between the two.

**Hydrologic and Hydraulic Services** Tetra Tech provided expert hydrologic, hydraulic, and sediment transport consulting services to ensure that a balance is achieved between water availability, long-term domestic and municipal needs, flood issues, long term sediment transport impacts, groundwater interactions and recharge opportunities, and ecosystem water needs. The effort included hydraulic analysis of restoration alternatives using HEC-RAS and GeoRAS, water budgeting analyses, and inputs to groundwater modeling being done by the Los Angeles District.

**Conceptual Design and Cost Estimating** Tetra Tech prepared conceptual designs and cost estimates for restoration plantings, water delivery infrastructure, bank protection, levee modifications, grade controls, and impoundment structures for incremental evaluation of the 10 alternatives. Tetra Tech also prepared conceptual designs for recreation features such as underpass ramps, bridge crossings, trailheads, and interpretive signs; and water supply features such as recharge basins, in channel t-berms, multiple low flow systems, and inflatable rubber dams. The cost estimate for the Recommended Plan was prepared using MCACES and include comprehensive estimates for restoration plan (NER), recreation plan (NED), water supply plan (NED), and the Combined NER/NED plan.

**Geographical Information System (GIS)** The GIS component is a critical tool in the plan formulation and selection process. Tetra Tech developed and maintained GIS databases for each alternative using a broad series of land-use, ecosystem

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restoration features, and habitat area maps. The GIS database for the Recommended Plan includes existing and proposed habitat features; existing and proposed structural features including as bank protection, levee modifications, and grade controls; proposed recreation features; and proposed water supply features. The GIS component has also been an important tool in evaluating and mitigating floodplain impacts from proposed alternatives.

**Report Preparation** Tetra Tech completed the Alternative Formulation Briefing (AFB) Feasibility Report and technical appendices for hydraulics, design, and cost estimating and participated in the AFB Conference with the Los Angeles District, South Pacific Division (SPD), and Headquarters Tetra Tech assisted the Los Angeles District in responding to review comments from the South Pacific Division and Headquarters and is currently working towards completion of the Draft Feasibility Report and associated appendices for public and agency review. The documents will be used by the sponsors and watershed stakeholders to make decisions regarding plan selection and trade-offs.

**Coordination** Tetra Tech coordinated with an inter-disciplinary study team that included Los Angeles District personnel, local sponsors, agencies, and consultants. Tetra Tech assisted the Los Angeles District in more than 40 local sponsor coordination meetings for plan formulation, coordination, and review of products. In each of these meetings, Tetra Tech worked with the District on the agenda, provided technical information for discussion and review, and provided written notes for meeting documentation.

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<b>5. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT</b> <i>(Present no more than five (5) projects. Complete one Section 5 for each project.)</i>	
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a. TITLE AND LOCATION <i>(City and State)</i> Buckeye Flood Retarding Structure No. 1 Rehabilitation Project Maricopa County, Arizona	b. YEAR COMPLETED PROFESSIONAL SERVICES Ongoing
CONSTRUCTION <i>(If applicable)</i>	

<b>23. PROJECT OWNER'S INFORMATION</b>		
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c. PROJECT OWNER Flood Control District of Maricopa County	d. DOLLAR AMOUNT OF PROJECT \$2.5 million On-Call Contract	e. TOTAL COST OF PROJECT
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f. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT *(include scope, size, and length of project)*  
 Buckeye Flood Retarding Structure (FRS) No.1 is a 7.1-mile-long earthen-embankment dam located near the Town of Buckeye, Arizona. The dam was built in the early 1970s by the SCS and is owned and operated by the Flood Control District of Maricopa County. The dam is classified as an unsafe, high-hazard dam by the Arizona Department of Water Resources (ADWR) due to the presence of the transverse cracks and an inability to safely pass the full Probable Maximum Flood (PMF). Tetra Tech is under contract with the District to complete final design services for the rehabilitation of the Buckeye FRS No. 1. Major design features include central filter, dam raise and abutment at the eastern end, soil-cement revetment on the auxiliary spillway, replacement of the principal spillway inlet. Major components of the contract include geotechnical/geophysical field investigations, hydrologic/hydraulic analyses, FMEA analyses, plans and specifications, and engineering support during construction. The work is being executed through a series of work assignments under a \$2.5 million on-call contract.

WA1, completed in November 2010, included a Design Criteria Report, Geotechnical Appraisal Report, Hydrologic/Hydraulics Appraisal Report, Site-Specific PMP analysis, and geotechnical trenching and borings.

WA2, completed in December 2011, included geotechnical investigations and lab analyses to characterize the subsurface conditions. WA2 also included freeboard analyses and preliminary integrity of the auxiliary spillway using the NRCS Earthen Spillway Erosion Technology in the SITES program.

WA 3 and WA4 cover final design for central filter installation with trenching to depths of 48 feet below top of dam, leveling the top of dam, construction of access ramps, removal of abandoned irrigation outlets that penetrate the embankment, and placement of hydroseed and rock mulch on the embankment slopes. Structural features include replacement of the principal spillway inlet structure, reinforcement of the auxiliary spillway with a soil-cement grade control, and constructing a new abutment on the east end. Designs for WA3 and WA4 are 95% and 60% complete respectively. The District is using the Construction Manager at Risk (CMAR) delivery method and Tetra Tech assisted in selection of the CMAR contractors for each phase.

WA5, completed in April 2013, prepared an analysis of potential subsidence and earth fissuring that could occur given future groundwater withdrawals. The study included geologic reconnaissance, photo-geological lineament analysis, and geophysical investigations using deep refraction micro-tremor and deep resistivity.

WA 6, completed in September 2012, included seismic refraction surveys to better locate the alluvium/bedrock interface beneath the dam. Results were used to support the potential subsidence analyses under WA5.

WA 7 includes supplemental geotechnical investigations and analyses to better characterize foundation and seepage conditions on the embankment, and erodibility on the auxiliary spillway.

**RFQ# ADSP014-0003465, Annual Request for Qualifications and Experience  
REVISED – Attachment I – General Qualifications**

**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) Florence Flood Retarding Structure, Planning and Design Florence, Arizona	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES 2010	CONSTRUCTION (If applicable) 2010

**23. PROJECT OWNER'S INFORMATION**

c. PROJECT OWNER Florence Area Watershed Flood Control District, NRCS State Office	d. DOLLAR AMOUNT OF PROJECT \$527,700	e. TOTAL COST OF PROJECT \$527,700
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f. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and length of project)

Tetra Tech prepared planning studies, preliminary design studies, and final design for the Florence Flood Retarding Structure for the NRCS Arizona State Office and the Florence Area Watershed Flood Control District (FAWFCD). The planning level work included development and analysis of alternatives to decommission or rehabilitate an existing 5-mile-long, 25-foot-high earthen dam that provides flood control to the Town of Florence, Arizona and surrounding agricultural areas. Tasks included work plan development, public involvement, geotechnical analysis, hydrology, hydraulics, design, cost estimating, economics, Landrights Workmap, and preparation of the Supplemental Watershed Plan/Environmental Assessment (Plan/EA). Hydrologic analyses included the principal spillway hydrograph, stability design hydrograph, and freeboard hydrograph in accordance with TR-60. Environmental analyses included a biologic assessment, impacts of alternatives, and preparation of the Environmental Assessment (EA) in accordance with NEPA requirements. Tetra Tech prepared a public participation plan and organized/facilitated public meetings during the feasibility phase.



Tasks under preliminary design included field survey and photogrammetry, revised hydrologic analyses and flood routing, and coordination with the NRCS for geotechnical investigations, and geotechnical analysis. This phase also included transposition of the results from a nearby site-specific probable maximum precipitation study for use at Florence. Hydrologic modeling included SITES and WinTR-20. Hydraulic analysis included 1-dimensional unsteady routing using HEC-RAS and 2-dimensional routing using FLO-2D. Tetra Tech conducted auxiliary spillway stability and integrity analyses in accordance with NRCS criteria using the earthen spillway erosion technology in the SITES program. The recommended rehabilitation plan includes a soil-cement sill to prevent headcutting and erosion in the auxiliary spillway, and placement of riprap along the face of the dam to prevent erosion from auxiliary spillway flows.

Tetra Tech completed the final design phase that included construction drawings (AutoCAD), specifications, Design Engineer's Report, bid schedule, cost estimates, construction performance time estimate, O&M Manual, jurisdictional delineation, and permit applications. The estimated construction cost was \$2.2 million. The design was reviewed and approved by the NRCS at the state and national level, and was also approved by the Arizona Department of Water Resources (ADWR) – Dam Safety Bureau. Tetra Tech provided preconstruction services, including review of contract documents, responses to contractor requests for information, and bidding support.

The original Planning Phase contract value was increased from \$157,000 to \$207,700 based on negotiated changes in the scope of work for geotechnical analyses, hydrology/hydraulics, economics, and design of alternatives. The Preliminary Design contract value was increased from \$174,000 to \$175,000 based on negotiated changes in the scope of work. The Final Design was completed within the original contract value of \$145,000. All work was completed within project schedules that were adjusted in accordance with scope modifications.

**RFQ# ADSP014-0003465, Annual Request for Qualifications and Experience  
REVISED – Attachment I – General Qualifications**

**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) Design of Queen Creek Channel Mitigation Measures Pinal County, Arizona	b. YEAR COMPLETED	
	PROFESSIONAL SERVICES 2012-2013	CONSTRUCTION (If applicable) 2013

**23. PROJECT OWNER'S INFORMATION**

c. PROJECT OWNER CEMEX	d. DOLLAR AMOUNT OF PROJECT \$221,600	e. TOTAL COST OF PROJECT \$221,600
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f. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and length of project)



Tetra Tech was contracted by CEMEX Construction Materials South, LLC, to develop a channel mitigation plan for an approximately 0.5-mile segment of Queen Creek, located between Schnepf Road and Kenworthy Road, in Pinal County, Arizona. The mitigation plan was necessary to stop channel degradation, headcutting, and bank migration created by (1) sand-and-gravel mining operations immediately upstream and downstream of Schnepf Road, (2) flood-retarding structures associated with the CAP Canal, and (3) Whitlow Ranch Dam, a regional dam built by USACE. The flood-retarding structures and the dam are located farther upstream, within the Queen Creek watershed. Furthermore, the recent Pinal County construction of a new roadway crossing of Queen Creek at Schnepf Road made the elimination of potential future channel degradation, headcutting, and bank migration

especially critical.

Because of the involvement of stakeholders, which included the owners of several sand-and-gravel mining operations, Pinal County, and FEMA, as an element of the plan preparation, Tetra Tech needed to conduct a value-engineering analysis to develop several alternatives from which a preferred alternative would be selected on the basis of its cost and long-term functionality. A key element of the work was the accommodation of a deep, in-channel gravel pit located at the downstream limit of the project area and a deep gravel pit located adjacent to the channel on the north overbank. Consequently, several of the alternatives included a major grade-control (i.e., "drown-out") structure to eliminate the possibility of continued headcut migration in an upstream direction, toward Schnepf Road, as well as bank protection to mitigate the lateral bank migration. Key elements of the project included the following:



- Site investigations
- Forensic post flood investigation and analyses
- Legal support/expert witness
- Hydrologic modeling
- One- and two-dimensional hydraulic modeling
- Single-event local scour analysis
- Channel response to in-stream mining (CRISM) headcut analysis
- Fluvial-12 sediment transport modeling
- Floodplain use permitting
- Post-mining mitigation preliminary design and alternatives formulation
- Cost estimating
- Final design, construction plans, special provisions, and an engineer's estimate of probable costs
- Post-design construction services

**RFQ# ADSP014-0003465, Annual Request for Qualifications and Experience  
REVISED – Attachment I – General Qualifications**

<b>5. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT</b> <i>(Present no more than five (5) projects. Complete one Section 5 for each project.)</i>	
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a. TITLE AND LOCATION <i>(City and State)</i> Update to the Standard Specifications for Public Improvements, 2003, Tucson, Arizona	b. YEAR COMPLETED <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;">PROFESSIONAL SERVICES 2009-2013</td> <td style="width:50%;">CONSTRUCTION <i>(If applicable)</i></td> </tr> </table>	PROFESSIONAL SERVICES 2009-2013	CONSTRUCTION <i>(If applicable)</i>
PROFESSIONAL SERVICES 2009-2013	CONSTRUCTION <i>(If applicable)</i>		

<b>23. PROJECT OWNER'S INFORMATION</b>		
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c. PROJECT OWNER Pima Association of Governments (PAG)	d. DOLLAR AMOUNT OF PROJECT \$309,000	e. TOTAL COST OF PROJECT \$309,000
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f. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (include scope, size, and length of project)

As project manager, Mr. John Lynch was responsible for the 1988, 1994 and 2003 editions of the Standard Specifications for Public Improvements. These standards are used across the Tucson/Pima County metro region.

The completed edition of the updated/expanded specifications and details have been accepted by all PAG Agencies and are currently being reviewed by Arizona Department of Transportation (ADOT), acting on behalf of US Federal Highway Administration (FHWA), for use on Federal-Aid transportation projects. It is anticipated that these documents will be printed and in use by January, 2014.

**Key Features:**

- Specifications used by Pima County and City of Tucson.
- Outstanding Public Sector Engineering Project for 1988 by ASPE.
- First Edition focused on roadway and storm-drain construction only.
- Updated/Expanded edition expanded to sanitary sewer conveyance construction and design details.
- 1994 update included potable and reclaimed water construction specifications and details.
- All updates included committee coordination including Agencies/Departments, representatives from the contracting community and key material and supplier representatives.

