Funding Opportunity Announcement
No. R14AS00001
Funding Group I

Implementation of System Optimization Review and WaterSMART Basin Study Adaptation Strategies: Vadose Zone Recharge in Peoria, Arizona

January 23, 2014

City of Peoria, Arizona
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City of Peoria
WaterSMART: Water and Energy Efficiency Grants for FY 2014

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Implementation of System Optimization Review and WaterSMART Basin Study Adaptation Strategies: Vadose Zone Recharge in Peoria, Arizona

Executive Summary:

Date: January 23, 2014
Applicant Name: City of Peoria
City: Peoria
County: Maricopa
State: Arizona

This project, **Implementation of System Optimization Review and WaterSMART Basin Study Adaptation Strategies: Vadose Zone Recharge in Peoria, Arizona ("Peoria Implementation Project"),** requests Bureau of Reclamation funding of $300,000 (Task A Water Conservation, Funding Group I) to match $1,327,507 in City funding to design and construct three new vadose zone recharge wells to recharge A+ reclaimed water from the Butler Drive Water Reclamation Facility (Butler WRF), thereby providing sustained and improved water management for 25,206 acre feet (AF) that also serves as drought protection. As a result of the Reclamation grant-funded System Optimization Review (SOR) entitled *Recharge Optimization for Class A+ Treated Effluent from Butler Drive Water Reclamation Facility in Peoria, Arizona (RIIAP32067)*, completed in October 2012, feasible, efficient and cost-effective options to enhance the City's reclaimed water storage capabilities were identified, thus advancing the goal of sustainability and conservation of water resources. This study provided the alternatives analyses that identified installation of vadose zone wells at the Butler WRF as the first priority project to implement. The Peoria Implementation Project contributes to accomplishing the goals outlined in the grant announcement for Water Conservation, Energy-Water Nexus, Water Marketing and Other Contributions to Water Supply Sustainability, specifically towards the Colorado River Basin Study, December 2012. This project is not otherwise funded by the Title XVI Program, nor is it located on a Federal facility.

Estimated Project Duration: 24 months

Estimated Start/Completion Date: Start July 2013/Completion June 2015

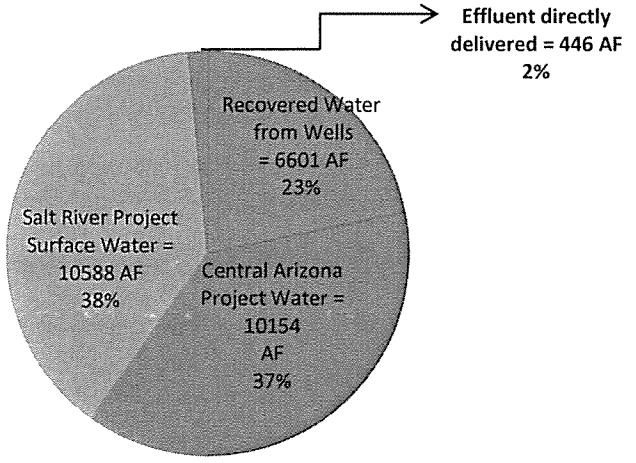
Background Data

Location maps: *Attachment A* is a map that indicates the location of Peoria within the state and county.

Source of water supply: The water supply portfolio of the City of Peoria, as seen in *Figure 1* consists of approximately 75% surface water from the Colorado and Salt-Verde River systems, 23% water pumped from wells, and 2% direct reuse reclaimed water. Reclaimed water is produced and owned by the City of Peoria from City-owned and operated water reclamation facilities: (1) the Beardsley Water Reclamation Facility; (2) the Butler Drive Water Reclamation Facility; and (3) the Jomax Water Reclamation Facility. Note that the original source water that subsequently results as reclaimed water is Central Arizona Project water from the Central Arizona Project canal and Salt-Verde River water from the Salt River Project Arizona Canal, where both sources are directly related to the Bureau of Reclamation. In 2012, 23% of the City's water supply was recovered Central Arizona Project water pumped from wells (recharged during the year at two Central Arizona Project facilities).

	AF/yr
Source of Water Supply	
Treated Surface Water - Salt River Project	10,588
Treated Surface Water- Central Arizona Project	10,154
Recovered through wells- Central Arizona Project	6,601
Reclaimed Water Direct Reuse	446
Total Water Supply	**27,789**

Figure 1 - 2012 Water Supply Portfolio



Total Water Supply = 27,211 acre-feet

Water Rights:
Legal availability of *groundwater* is based on the City's Service Area Right, 56-002029.0000. The Service Area Right is based on Arizona Revised Statute § 45-492. The

wells listed on the permit as Service Area Wells are wells legally authorized to pump groundwater. The City also has permitted its wells as recovery wells which allow legal recovery of surface and reclaimed water; such pumped recovery water does not count as mined groundwater.

Surface water rights total 58,437 AF/yr, as discussed below:

The legal availability of Central Arizona Project water is based on the City's subcontract with Central Arizona Water Conservation District for Central Arizona Project municipal and industrial water. The 1998 Agreement with the City sets forth the subcontract amount of 25,236 acre-feet per year of Central Arizona Project municipal and industrial priority water. The City also holds a lease on Indian Central Arizona Project municipal and industrial priority water in the amount of 7,000 acre-feet per year as the result of the Gila River Indian Community settlement. This totals 33,236 acre-feet per year of Central Arizona Project municipal and industrial water for Assured Water Supply purposes, but while this amount is legally available, the physical availability of this supply is limited by the capacity of the treatment plant.

The legal availability of Salt-Verde River system surface water delivered by Salt River Project is based on the Water Delivery and Use Agreement between Salt River Project and the City. The City's legally and continuously available supply of Salt River Project water was determined by Salt River Project in a November 2008 study entitled "2008 Assured Water Supply Study for Salt River Project Member Lands." Salt River Project annually allocates water stored in impoundments on the Salt-Verde River system, historically 3.0 acre-feet per acre of Member Lands. Although the City contains 10,877 acres which are Member Lands (including the town site), the Salt River Project study utilized projected demand in 2030 instead of acreage to determine the maximum amount of water available to the City. All municipal providers receiving Salt River Project surface water agree to the numbers fixed in the study. The total allocation for the City for Assured Water Supply Program purposes as determined in the study is 25,201 acre-feet per year. However, the amount that can be treated and thus would be physically available is much less.

Water Uses:
The City currently serves potable water for municipal, residential, commercial, and some light industrial customers. Potable water is produced at two surface water plants and from a series of production wells.

Reclaimed water is directly reused for turf and landscape irrigation in Vistancia, a master-planned development served by the Jomax WRF. All reclaimed water from the Beardsley WRF is recharged for annual and long term storage credits into permitted basins at the plant site, although it had its first reuse customer with the commencement

in May 2010 to construct a new recharge basin, funded with matching funds between the City and Reclamation in its September 2009 "Challenge Grant" (R09AP32R09). The reuse was temporary during construction only and has since terminated. The Butler Drive WRF currently recharges at the New River Agua Fria Underground Storage project (NAUSP) for annual and long term storage credits, and has municipal connections for direct reuse-the Municipal Operations Center (Fleet) car wash, City Hall campus, and a new community park, and one Homeowner's Association (HOA)-following completion in September 2010 of another component of the referenced Challenge Grant project.

Potential Shortfalls in Water Supply

In December 2012, the U.S. Bureau of Reclamation released the final version of the Colorado River Basin Water Supply and Demand Study. Three years in the making, the study was a cooperative effort with the Bureau, the seven Basin states, and a variety of stakeholders. The study covered 50 years, from 2010 to 2060, and examined a broad range of supply and demand scenarios. Technically sophisticated, this study provides a Basin-wide roadmap to the future.

The study projects significant imbalances between Colorado River supplies and demand within the seven Basin states and Mexico by 2060, with a likelihood of critical imbalances as early as 2025. The imbalances are largely due to the effects of climate change: a drier climate, shifts in seasonality, prolonged droughts, and increasing water needs. Flows at Lees Ferry may be reduced as much as 9%. Because of Arizona's junior priority status on the system, the state is more susceptible to risk created by shortages on the River. The CAP canal is most at risk, along with all subcontractors looking to the canal for sustainable supplies.

Augmentation, conservation, and re-use projects are the best ways to address the imbalances that will occur first. A key focus will be on municipal conservation, re-use and augmentation projects, which must be planned and funded in the near future as their impact will be felt only after their completion. The study identified some 150 options to increase supply, reduce demand, and provide better governance for Colorado River water. Municipal providers are best positioned to begin such projects now.

The City currently has 3 years of water supply stored in local aquifers, achieved through recharge of its surplus reclaimed water and portions of its unused CAP M&I allocation. Shortages on the Colorado River are expected as early as within the next decade, and as a municipal and industrial subcontractor, typically the lower priority user, the City could begin to feel the pinch and enact its Drought Plan (*Attachment B*) to call for more severe water conservation measures. The City's strategic sustainability goal is to achieve a six-year drought water supply in underground storage (Long Term Storage Account Credits). In any time of shortage, Peoria's surface water supplies would be most likely to be curtailed, which would necessitate increased reliance on water produced by wells. Yet

groundwater mining is restricted by Arizona Department of Water Resources (ADWR) and is irresponsible as sustainable policy and procedure. By directly using reclaimed water in lieu of groundwater, and by recharging as much water and reclaimed water as possible, Peoria preserves its groundwater supplies for the future and for shortage years.

Number of water users served:
Total service area population for 2012 = **153,572**
Total single family residences for 2012 = **45,255**
Total multi-family residences for 2012 = **13,429**

Current and projected water demand: Overall demand for the City of Peoria for municipal and industrial purposes through 2034 is presented in the table below:

Year	Applicant's Estimate of Future Service Area Demand (AF)		
2014	33,977	2025	63,156
2015	36,309	2026	66,520
2016	39,062	2027	69,960
2017	41,663	2028	73,403
2018	44,388	2029	76,848
2019	47,016	2030	80,297
2020	49,294	2031	83,748
2021	50,528	2032	87,202
2022	53,515	2033	90,690
2023	56,653	2034	94,318
2024	59,867		

The above demand numbers include current, committed, and projected demand based on growth of the entire City of Peoria service area, excluding areas served by private water companies. Demand numbers are in acre-feet per year. Because the City is subject to shortages on the Colorado and Salt-Verde systems, we must act responsibly to conserve, reuse and recharge as much as possible to provide efficiency, reliability and drought protection.

Description of municipal water delivery system:
Peoria Public Water System Numbers: 04-07-096, 04-07-520, 04-07-513
Water Treatment and System Features:

- Greenway Water Treatment Plant - 16 million gallons per day, serves Salt River Project water
- Pyramid Peak Water Treatment Plant (serves Central Arizona Project water, plant jointly owned with the City of Glendale, operated by Glendale) - 48 million gallons per day total capacity, of which 23% belongs to Peoria
    - Number of production wells – 40
    - Number of wells in service - 23
    - Number of piezometer wells – 9
    - Number of monitoring wells – 5
    - Salt River Project Service Area – 371.05 miles of pipe
    - Central Arizona Project Service Area – 521.80 miles of pipe
    - Peoria Fire Laterals – 77.21 miles of pipe
    - Peoria Service Laterals – 705.78 miles of pipe
    - Peoria Fire Hydrants – 8,225
    - Peoria Valves – 23,319
    - Peoria Water Service Meters – 48,306
    - Peoria Booster Stations – 33
    - Peoria Reservoirs – 27
    - Total System Capacity Storage in Use – 34.57 MG
    - Total System Capacity Storage available – 42.33 MG
    - Peoria Air Release Valves - 417
    - Peoria On/Off SRP Meters – 6

Working relationships with Reclamation: The City's ties to the U.S. Bureau of Reclamation (Reclamation) are varied and strong. As shown in Figure 1 illustrating Peoria's water supply for 2012, 98 % of the City's water supplies result from Reclamation projects. The City of Peoria holds a municipal and industrial subcontract for Colorado River water from Reclamation's Central Arizona Project canal operated by the Central Arizona Water Conservation District. This water is taken off the canal at several turnouts, of which the major turnout is the Pyramid Peak Water Treatment Plant. The water is treated and delivered as potable water to customers in the northern portion of Peoria. Peoria also recharges Central Arizona Project water at Agua Fria Linear Recharge Project and Hieroglyphics Recharge Project for annual storage and recovery as well as long term storage credits.

The City is also party to the Water Delivery and Use Agreement with Salt River Project, an entity created in 1903 under authority of the Reclamation Act of 1902 as the first multi-use water and power reclamation project in the nation.

Reclaimed water produced by the Butler WRF primarily stems from Salt-Verde River system water transported by Salt River Project in the Arizona Canal.

Reclaimed water produced by the Beardsley Water Reclamation Facility largely stems from Colorado River water transported in the Central Arizona Project canal, which is a Reclamation project.

The City participates in the West Valley Central Arizona Project Subcontractors organization, in which Bureau of Reclamation is a direct participant as well. This organization of water providers is dedicated to finding ways to put water from the Central Arizona Project canal to beneficial use within the West Salt River Valley. The West Valley Central Arizona Project Subcontractors organization has conducted meaningful water resource planning for over a decade, with major funding through Bureau of Reclamation. Peoria has contributed its share of matching funds and in-kind service.

Most recently, the City has enjoyed a more direct relationship with Reclamation. In September 2009, the City of Peoria was awarded a Challenge Grant (Grant number R09AP32R09) for $1,693,291. The grant funded three separate projects; each project has been successfully completed.

On September 19, 2011 the City was notified of another grant award ($30,000) for *Recharge Optimization for Class A+ Treated Effluent from Butler Drive Water Reclamation Facility in Peoria, Arizona (RIIAP32067).* This SOR was completed in October 2012, and it identified feasible, efficient and cost-effective options to enhance the City's reclaimed water storage capabilities, thus advancing the goal of sustainability and conservation of water resources. This study provided the alternatives analyses that identified installation of vadose zone wells at the Butler WRF as the first priority project to implement.

The City has received Water Conservation Field Services grants for the past three years, the most recent one for $25,000 received in September 2012, to be used to match the City's $33,037 funding to reduce water consumption at the City's largest HOAs.

Technical Project Description - Evaluation Criteria in *italics* from this point forward)

Subcriterion No. A.1—Water Conservation (28 points)

Subcriterion No. A.1(a)—Quantifiable Water Savings (20 points)

Describe the amount of water saved. *For projects that conserve water, please state the estimated amount of water expected to be conserved (in acre-feet per year) as a direct result of this project. Please provide sufficient detail supporting how the estimate was determined, including all supporting calculations.*

A.1(a)i. What is the applicant's average annual acre-feet of water supply?

Source of Water Supply	AF/yr
Treated Surface Water - Salt River Project	10,588
Treated Surface Water- Central Arizona Project	10,154
Recovered through wells- Central Arizona Project	6,601
Reclaimed Water Direct Reuse	446
Total Water Supply	**27,789**

A.1(a)ii. Where is that water currently going (i.e., back to the stream, spilled at the end of the ditch, seeping into the ground, etc.)?

Butler Drive WRF reclaimed water is currently recharged at New River Agua Fria Underground Storage project (NAUSP). The City's capacity in NAUSP is 20% which equates to approximately 6,400 AF/yr; the other partners are Chandler, Glendale, Avondale, and SRP Power. The City is currently losing Annual Storage and Recovery Credits and/or Long-Term Storage Credits at the rate of 2,800 acre-feet per year, due to the need to exchange these credits for leasing storage space in the NAUSP from our partners, because of diminished operational capacity at that recharge facility since November 2008. The Butler Drive WRF reclaimed water quantities increase as the plant flows rise to buildout capacity of 13 MGD, or 14,563 AF/yr. At buildout, the City will be losing approximately 7,900 AF/yr of Annual Storage and Recovery Credits and/or Long-Term Storage Credits. At present and moving into the future, the City must use recovered groundwater (i.e., Annual Storage and Recovery Credits and/or Long-Term Storage Credits) to meet potable water demands. The only way for the City to remain in its safe yield position, that is, recharging at least the same water annually that it withdraws, is to utilize Annual Storage and Recovery Credits and/or Long-Term Storage Credits, which means that the City must recharge the Butler Drive WRF reclaimed water where it can get full credit. There is no potential for increasing the operating capacity of the existing facilities at NAUSP, and as such, the City recognizes the imperative to identify, evaluate, permit, design and construct its own recharge facilities elsewhere. This *Peoria Implementation Project* constructs three new vadose zone recharge wells to recharge A+ reclaimed water from the Butler WRF, thereby providing sustained and improved water management, and enhancing the sustainability of the State's water resources and drought protection for an estimated 25,206 acre feet (AF).

A.1(a)iii. Where will the conserved water go?

The conserved water will be recharged to the aquifer within the City. This will allow the City to remain in safe yield, being self-sufficient for its groundwater replenishment and provide drought protection. The City relies on pumping recovered water in this area of the City in order to meet its demands, especially for all peak periods (daily, seasonally)

and during annual 6 week SRP canal dry-out. Further, the City's goal for drought protection is to have a six-year supply of wet water stored in our aquifers.

A.1(a)(5). Groundwater Recharge
(a). How has the estimated average annual water savings that will result from the project been determined? Please provide all relevant calculations, assumptions, and supporting data.

Vadose wells each have an estimated life of 15 years
3 vadose wells = 1.5 MGD recharge capacity
1.5 MGD x 365 days/year = 547.5 MG/year = 1,680 AF/year
547.5 MG/year x 15 years = 8,212 MG= **25,206 AF**

(b). Describe the source of the water to be used for recharge and what percentage of the recharged water is going to be available for use and how it will be used. Describe how this supply of water will offset other supplies.

The source of water to be recharged is A+ reclaimed water from the Butler WRF. One hundred percent (100%) will be available for use (i) to replenish the aquifer to allow the City to remain in safe yield, being self-sufficient for its groundwater replenishment and provide drought protection; and (ii) to pump as recovered water in this area of the City in order to meet its potable demands, especially for all peak periods (daily, seasonally) and during annual 6 week SRP canal dry-out.

(e). How will actual water savings be verified upon completion of the project?

Recharged volumes will be metered and recorded utilizing SCADA instrumentation.

Subcriterion No. A.1(b)—Improved Water Management (5 points)

Annual Estimated Amount of Water Better Managed	**1,680**	**= 6%**
City's 2012 Annual Water Supply	**27,789**	

Water is better managed because instead of recharging 25,206 AF of reclaimed water at the NAUSP which does not directly replenish the City's aquifer nor does Peoria retain the 25,206 AF of LTSCs, the recharged 25,206 AF will replenish the City's aquifer while earning 25,206 AF of LTSCs which inure to providing both recovered water to be distributed as potable water in the future and to drought protection.

Subcriterion No. A.2—Percentage of Total Supply (4 points)

- This project's water conservation will account for up to **6%** of the City's annual average water supply.

Annual Estimated Amount of Water Conserved	**1,680**	**= 6%**
City's 2012 Annual Water Supply	**27,789**	

Subcriterion No. A.3—Reasonableness of Costs (4 points)

Total Project Cost
(Acre-Feet Conserved, or Better Managed x Improvement Life)

$65/AF

Total Project Cost
Acre-Feet Conserved x 10 years

Where:

Total Project Cost = $1,627,507

Acre-Feet Conserved = **25,206**
Improvement Life = 15 years, industry accepted life-expectancy for vadose well

Evaluation Criterion B: Energy-Water Nexus
Subcriterion No. B.2.—Increasing Energy Efficiency in Water Management (4 points)

B.2(a) Describe any energy efficiencies that are expected to result from implementation of the water conservation or water management project (e.g., reduced pumping).

Because water is conserved in this project by keeping water resources local within the City's aquifer, there will be a significant energy savings of not having to pay for the importation for these water supplies in future years. Because additional non-project water supplies would otherwise have to be delivered via the CAP, we use the CAP estimate that it uses 1,000 kilowatt-hours of electricity to move 1 million gallons of water to the Phoenix region.

Calculated Energy Efficiencies

Energy savings from water not moved via CAP to City of Peoria =

Water Stored By Recharge Project (MG)/yr X Energy Required To Move 1 Million Gallons =

547.5 MG /yr x 1000 kwh/MG = **547,379 kwh saved/yr**

B.2(b) Describe any renewable energy components that will result in minimal energy savings/production (e.g., installing small-scale solar as part of a SCADA system).

The City's inclusion of SCADA in the project design will permit staff to accurately track the amount of water conserved. With SCADA, City staff will not have to travel to the site daily to operate the wells (turn on or off) or to record the amount of water flowing to each well and the depth to water in each monitoring well.

If the daily trips are reduced by SCADA to periodic weekly trips, there will be a savings of 6 trips per week or (6 x 52 trips) per year. Assuming that the wells are sited together at the Butler WRF or the adjacent Pioneer Community Park (see Attachment B), each round trip would be 0.50 miles from the Municipal Operations Center (MOC) located at 8850 N 79th Ave, Peoria 85345, where the Field Operations staff that operates the City's reclaimed system are located. The typical vehicle used for such monitoring trips in the service area gets 8.5 miles per gallon.

Miles saved per year for operations and monitoring = 312 trips x 0.5 mi RT MOC to Vadose Zone Wells
= 156 mi/yr

Projected gallons saved/yr = 156 miles saved/yr / 8.5 mpg =
18 gallons non-leaded fuel saved/yr

Evaluation Criterion C: Benefits to Endangered Species (12 points)
*Up to **12 points** may be awarded for projects that will benefit federally recognized candidate species or up to **12 points** may be awarded for projects expected to accelerate the recovery of threatened or endangered species, or addressing designated critical habitat.*

There are no endangered or threatened species present within the project boundaries, based on the City's current knowledge and observation, nor are any anticipated. Although, if an endangered specifies is identified, we would act to accelerate the recovery of the threatened or endangered species, and address designated critical habitat.

Evaluation Criterion D: Water Marketing (12 points)
*Up to **12 points** may be awarded for projects that propose water marketing elements, with maximum points for projects that establish a new water market. Note: Water*

*marketing does **not** include an entity selling conserved water to an existing customer. This criterion is intended for the situation where an entity that is conserving water uses water marketing to make the conserved water available to meet other existing water supply needs or uses.*

***Briefly describe any water marketing elements included in the proposed project.** Include the following elements:*

D.(1) Estimated amount of water to be marketed

25,206 AF via construction of a recharge facility

D.(2) A detailed description of the mechanism through which water will be marketed (e.g., individual sale, contribution to an existing market, the creation of a new water market, or construction of a recharge facility)

The City of Peoria must obtain an Underground Storage Facility (USF) permit from the Arizona Department of Water Resources (ADWR) for the recharge facility comprised of the three new vadose zone wells. The USF permits the City to recharge in a specific manner (i.e., vadose wells) into a specific hydro-geologic location. The City must also obtain a Water Storage Permit from ADWR which is the mechanism through which the City earns credit for recharge. Arizona Revised Statutes §§ 45-801 through 898 outline the Underground Storage Program. These storage credits can then be legally recovered in the same year-Annual Storage and Recovery Credits- or held for future recovery - Long-Term Storage Credits for drought protection. By this mechanism Arizona has encouraged the storage of replenishable supplies to promote long-term water sustainability and reduce groundwater overdrafts. The accumulation of Long-Term Storage Credits is critical for the sustainability of the City's water supply portfolio. Reclaimed water is thus transformed into a renewable water supply for the future.

D.(3) Number of users, types of water use, etc. in the water market

The City of Peoria will be the sole owner and user of the recharge facilities constructed to accept the 25,206 AF of reclaimed water that this Peoria Implementation Project will store. The stored reclaimed water can be recovered and used for a variety of municipal and industrial future customers, and/or maintained as the City's drought supply. Long-Term Storage Credits can then be exchanged with other water users in order to allow the movement of water pumping authority from one locale to another, or for other purposes of mutual benefit. Currently, the City must transfer Long-Term Storage Credits with other entities storing water at the New River-Agua Fria Underground Storage Project operated by Salt River Project in return for leasing their storage space at the facility. Constructing these new vadose wells will end this need for the City to lose Long-

Term Storage Credits, as the Project provides the recharge facility capacity needed for the City to earn and keep these credits.

D.(4) A description of any legal issues pertaining to water marketing (e.g., restrictions under Reclamation law or contracts, individual project authorities, or State water laws)

The City already holds a Recovery Well Permit which includes all wells owned or operated by the City from which this banked water can be served to future customers. If the City were to exchange credits with other water users, the City would certainly follow all regulations pertaining to such.

D.(5) Estimated duration of the water market

There are no limitations associated with the water market that is currently regulated by ADWR, as primarily the City is conserving water by recharge for service to future customers and in times of drought. The associated permits would be renewed and/or additional recharge facilities will be constructed as time passes creating the need for such.

Criterion E: Other Contributions to Water Supply Sustainability (14 points)
*Up to **14 points** may be awarded for projects expected to contribute to a more sustainable water supply. This criterion is intended to provide an opportunity for the applicant to explain how the project relates to a **WaterSMART Basin Study**, how the project could expedite future **on-farm improvements**, or how the project will provide **other benefits to water supply sustainability** within the basin. An applicant may receive the maximum 14 points under this criterion based on discussion of one or more of the numbered sections below.*

E.(1) Points may be awarded for projects that address an adaptation strategy identified in a WaterSMART Basin Study.
Proposals that thoroughly discuss how a project is addressing an adaptation strategy identified in a Basin Study (i.e., a strategy to mitigate the impacts of water shortages resulting from climate change, drought, increased demands, or other causes) may receive maximum points under this criterion. Applicants should provide as much detail as possible about the relationship of the proposed project to the adaptation strategy identified in the Basin Study, including, but not limited to, the following:

E.1(a) Identify the specific WaterSMART Basin Study where this adaptation strategy was developed. Describe in detail the adaptation strategy that will be implemented through this WaterSMART Grant project, and how the proposed WaterSMART Grant project would help implement the adaptation strategy.

The adaptation strategies were developed in the 2009 WaterSMART Basin Study: U.S. Bureau of Reclamation Colorado River Basin Water Supply and Demand Study (Basin Study), published December 2012. See Attachment C, cover and table of contents only due to space limitations. The recent Basin Study, covered 50 years, from 2010 to 2060, and examined a broad range of supply and demand scenarios. Technically sophisticated, this study provides a Basin-wide roadmap to the future.

The study projects significant imbalances between Colorado River supplies and demand within the seven Basin states and Mexico by 2060, with a likelihood of critical imbalances as early as 2025. The imbalances are largely due to the effects of climate change: a drier climate, shifts in seasonality, prolonged droughts, and increasing water needs. Because of Arizona's junior priority status on the system, the state is more susceptible to risk created by shortages on the River. The CAP canal is most at risk, along with all subcontractors looking to the canal for sustainable supplies.

M&I Water Conservation and Water Transfers, Exchanges and Banking are two of the highest feasible adaptation strategies. Recharging 25,206 AF of water is clearly in alignment with the Basin Study. Seen here in Table 2 from the Executive Summary of the Basin Study, M&I Water Conservation and Water Transfers, Exchanges and Banking are two of the highest feasible adaptation strategies.

TABLE 2
Summary of Representative Options Including Cost, Timing, Potential Yield, and Inclusion in Portfolios

Option Type	Option Category	Representative Option	Estimated Cost ($/afy)	Years before Available	Potential Yield by 2035 (afy)	Potential Yield by 2060 (afy)	Option Included in Portfolio
Increase Supply	Importation	Imports to the Colorado Front Range from the Missouri or Mississippi Rivers	1,700–2,300	30	0	600,000	Portfolios A, B
		Imports to the Green River from the Bear, Snake[1] or Yellowstone Rivers	700–1,900	15	158,000	158,000	None
		Imports to Southern California via Icebergs, Waterbags, Tankers, or from the Columbia River[1]	2,700–3,400	15	600,000	600,000	None
		Subtotal			**758,000**	**1,358,000**	
Reduce Demand	M&I Water Conservation	M&I Water Conservation	500–900	5–40	600,000	1,000,000	All Portfolios
		Subtotal			**600,000**	**1,000,000**	
	Agricultural Water Conservation	Agricultural Water Conservation	150–750	10–15	1,000,000	1,000,000	All Portfolios
		Agricultural Water Conservation with Transfers	250–750	5–15	1,000,000	1,000,000	All Portfolios
		Subtotal			**1,000,000**[2]	**1,000,000**[2]	
	Energy Water Use Efficiency	Power Plant Conversion to Air Cooling	2,000	10	160,000	160,000	All Portfolios
		Subtotal			**160,000**	**160,000**	
Modify Operations	System Operations	Evaporation Control via Canal Covers	15,000	10	18,000	18,000	None
		Evaporation Control via Reservoir Covers	15,000	20	200,000	200,000	None
		Evaporation Control via Chemical Covers on Canals or Reservoirs	100	15–25	200,000	850,000	None

TABLE 2
Summary of Representative Options Including Cost, Timing, Potential Yield, and Inclusion in Portfolios

Option Type	Option Category	Representative Option	Estimated Cost ($/afy)	Years before Available	Potential Yield by 2035 (afy)	Potential Yield by 2060 (afy)	Option Included in Portfolio
		Modified Reservoir Operations	N/A	15	0–300,000	0–300,000	None
		Construction of New Storage	2,250	15	20,000	20,000	None
		Subtotal			**588,000**[3]	**1,238,000**[3]	
	Water Transfers, Exchanges, and Banking	Water Transfers and Exchanges (same as Agricultural Water Conservation with Transfers)	250–750	5–15	1,000,000	1,000,000	All Portfolios
		Upper Basin Water Banking[4]	N/A	10	500,000	800,000	Portfolios A,C
		All Options			**5,735,000**[5]	**11,037,000**[5]	

[1] Among the more than 150 options submitted to Reclamation as responsive to the *Plan of Study*, additional importation of water supplies from various sources, including importation of water from the Snake and Columbia River systems, were submitted to the Study. Such options were appropriately reflected in the Study but did not undergo additional analysis as part of a regional or river basin plan or any plan for a specific Federal water resource project. This Study is not a regional or river basin plan or proposal or plan for any Federal water resource project

[2] The two agricultural water conservation representative options derive potential yield from similar measures and are thus not additive

[3] Subtotal assumes 150,000 afy for the Modified Reservoir Operations representative option.

[4] The values related to Upper Basin Banking reflected assumptions developed for modeling purposes. It was assumed that bank water is generated through conservation; therefore, the potential yield of the bank is consistent with the Upper Basin portion of agricultural and M&I conservation and energy water use efficiency

[5] Total does not account for several options that may be mutually exclusive due to regional integration limitations or are dependent on the same supply.

Responsible water providers like Peoria, in high growth areas of the Lower Colorado Basin, must plan and amend their plans for infrastructure sizes and locations in addition to water supply reliability. The proposed project will store a source of water which the City owns for the purpose of enhancing a sustainable water portfolio by replenishing its groundwater withdrawals and earning Long Term Storage Credits for drought protection. The stored reclaimed water can be recovered and used for a variety of municipal and industrial future customers, and/or maintained as the City's drought supply. Long-Term Storage Credits can then be exchanged with other water users in order to allow the movement of water pumping authority from one locale to another, or for other purposes of mutual benefit. This project is directly adapting the strategies of Water Conservation and Water Exchanges cited in the Basin Study.

E.1(b) Describe how the adaptation strategy and proposed WaterSMART Grant project will address the imbalance between water supply and demand identified by the Basin Study.

It is clear from the Basin Study that the future must involve water supplies that can be stored now for use later. Total reliance on CAP water leaves the City vulnerable, as it

forces the total reliance on groundwater. In order to provide for a more sustainable water future, the City must store water supplies now in order to build up underground inventories for later demand and drought protection.

Changes in climate across the western United States appear to be reducing the reliability of runoff from the mountain snowpack which feeds the Colorado River system. It was once thought that a shortage on the Colorado River system would never occur at the same time as a shortage on the Salt and Verde River system, but recent experience and new research have shown that the two systems can and have repeatedly in the past experienced shortages simultaneously. Currently, Salt River Project provides about one third of the City's water supply as surface water down the Arizona Canal to the Greenway Water Treatment Plant. This supply is dependent upon runoff from the northern Arizona watershed that is stored in the Salt River Project lake system. A recent study of tree-ring data funded by Salt River Project demonstrated that the two driest years out of the last 800 were 1999 and 2002. This tree-ring study also indicates that the City should plan to achieve and maintain a six-year drought supply in the form of long-term storage credits. While the Salt-Verde River storage system is currently full, the Colorado River system has yet to recover from low runoff. If shortages occur on the Colorado River, the Central Arizona Project canal will be adversely impacted first. This may mean that deliveries of Central Arizona Project water to the City may be curtailed. Central Arizona Project water represents another third of the total City water supply, and additionally is the source water for much of the City's recharge and recovery activities, representing a total of 60 % of the City's annual water supply portfolio.

Reclaimed water is steady, reliable and predictable, all key components in any discussion of sustainability. Reclaimed water grows with the growth in population. The City's population is expected to at least double over the next fifty years. Both storage of reclaimed water underground and direct reuse of reclaimed water for non-potable purposes are essential in the development of a sustainable water resources strategy for a growing population subject to surface water shortages in the semi-arid Southwest.

The proposed project will bank reclaimed water underground for future use in times of shortage, which will likely be more frequent in the future as climatic shifts make surface water supplies less reliable. Increased drought must be met with increased pumping, but increased pumping of Arizona's overdrafted aquifers cannot be sustained without increased storage of reclaimed water. The project is vital to the sustainability of the water supply portfolio of the City in that it increases the supply of stored water in the City's aquifers for drought and for expected increases in population.

Currently the City's Long-Term Storage Account holds 97,561 acre-feet. The City would like to store as much water underground as possible in order to be able to (1) annually pump recovered water instead of groundwater, fulfilling Arizona Department of Water

Resources' Third Management Plan goal of "safe yield" for the aquifer in the Phoenix Active Management Area; and (2) to have water for municipal and industrial deliveries in future shortage years. In order to have a six year supply of stored water, the City needs to store an additional 93,000 AF too retain a total of 190,000 AF. The additional ability to reliably and efficiently store water underground provided by the pressurization and reservoir of this project will increase the City's sustainable supply of water. Every acre-feet of surface or reclaimed water stored today eliminates the need to mine an acre-foot of groundwater. Further, the City recognizes that every acre-foot of reclaimed water directly reused eliminates the need to mine an acre-feet of groundwater or use precious surface water for non-potable irrigation purposes.

E.1(c) Identify the applicant's level of involvement in the Basin Study (e.g., cost-share partner, participating stakeholder, etc.).

The Arizona Department of Water Resources (ADWR) was a Non-Federal Cost Share Partner. Although Peoria did not directly provide information to the Study authors, Peoria did provide input needed for the Study and feedback regarding draft documents and analyses to ADWR staff. Of note, Peoria participated heavily in the Arizona Water Resources Development Commission stakeholder meetings and subcommittees on Demand, Supply, Conservation and Environment, from which substantive data used in the Basin Study were obtained, providing time and cost savings to the Basin Study.

E.1(d) Describe whether the project will result in further collaboration among Basin Study partners.

Because many cities are faced with the same problem, it is anticipated that collaboration amongst the cities in order to achieve more efficient storage techniques will occur. Such collaboration will enhance the sustainability of water supplies for all participants. Collaboration is already underway at the New River Agua Fria Storage Project, as exhibited in Peoria's transfers of Long-Term Storage Credits to its partners. The spirit of collaboration amongst the cities will likely grow as a result of the sharing of information concerning the proposed project.

Evaluation Criterion F: Implementation and Results (10 points)
Subcriterion No. F.1—Project Planning
Points may be awarded for proposals with planning efforts that provide support for the proposed project.

Does the project have a Water Conservation Plan, System Optimization Review (SOR), and/or district or geographic area drought contingency plans in place? Does the project relate/have a nexus to an adaptation strategy developed as part of a

WaterSMART Basin Study)? *Please self-certify, or provide copies of these plans where appropriate, to verify that such a plan is in place.*

Provide the following information regarding project planning:
F.1.(1) Identify any district-wide, or system-wide, planning that provides support for the proposed project. This could include a Water Conservation Plan, System Optimization Review (SOR), or other planning efforts done to determine the priority of this project in relation to other potential projects.

On September 19, 2011 the City was notified of another grant award ($30,000) for an SOR entitled R*echarge Optimization for Class A+ Treated Effluent from Butler Drive Water Reclamation Facility in Peoria, Arizona (Grant R11AP32067).* This Recharge SOR identified feasible, efficient and cost-effective options to enhance the City's reclaimed water storage capabilities, thus advancing the goal of sustainability and conservation of water resources. See Attachment D for the cover page, table of contents, and Summary of Conclusions.

The vadose zone wells to be built under this project were the highest ranked alternative of this Reclamation grant-funded SOR. See Table 8 from the SOR report below:

Table 8. Evaluation of Alternatives Matrix

	Peoria -Butler Recharge Optimization Study September 7, 2012	Benefits to the City	Low Potential Environmental Concerns	Low Level of Treatment Required	Aquifer unit impacted	Minimum Distance From Water Source	Mineral Regulatory Constraints	Mineral Area Property Requirements	Major Property Purchase (Ownership)	Low Capital Costs	Low Operational Costs	Recharge Credits	Minimal Constr. Impacts to Residents	Overall Feasibility	Score	Rank
	Weighting Factors	5	5	5	5	5	10	5	10	10	10	20	5	5	100	
	Column	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
Recharge Optimization Options																	
Area	Components																
1	New River & Rio Vista Park	5	2	5	4	1	3	1	1	1	3	2	5	3		250	7
	Managed Recharge in river bed (50 A) (25A Permitted)																
	Coupled with Wildlife Preserve along the length																
	New Transmission Line 18" (6,700')																
2	New River - Olive to Peoria	4	3	4	4	4	4	3	5	4	3	4	5	3		390	2
	Infiltration Basins or Berms in river bed (50 A)																
	New Transmission Line 36" (13,500')																
3	Butler Reclamation site	3	3	2	4	5	5	5	5	5	4	5	5	4		445	1
	Vadose Zone Wells (9) = (24 A)																
4	New River - Peoria to Cactus MCFCD	3	3	2	4	4	4	5	4	2	4	5	5	4		390	2
	Vadose Zone Wells (12) = (21 A)																
	New Transmission Line 24" (3,900')																
5	New River - North of Cactus MCFCD	3	3	2	4	3	4	5	4	2	4	5	5	4		385	3
	Vadose Zone Wells (5) = (15 A)																
	New Transmission Line 24" (2,600')																
	Grand Avenue Crossing																
6	New River - North of Cactus MCFCD	3	3	2	4	2	4	5	4	2	4	5	5	4		380	4
	Vadose Zone Wells (7) = (30 A)																
	New Transmission Line 24" (2,500')																
7	New River - North of Cactus MCFCD	3	3	2	4	2	4	5	4	2	4	5	5	4		380	4
	Vadose Zone Wells (5) = (33 A)																
	New Transmission Line 21" (2,600') from #6																
8	Glendale Recharge Facility	1	5	4	4	5	3	5	5	5	3	3	4	4		380	4
	Maintenance Cost in lieu of NAUSP 20% Ownership																
9	Recovery for Park Irrigation	4	5	5	1	3	4	5	5	3	4	0	5	4		320	6
	Use of existing wells near parks																
10	Aquifer Storage & Recovery Wells (Area 1 and Area 2)	5	5	1	3	3	4	4	2	1	2	5	5	5		355	5
Total	Scores																

Notes:
1. Options for Area 1 and Area 2 are completely independent. Pipe quantity is identified separately for each alternative
2. Options for Area 3 is completely independent of any other area
3. Options for Area 4 must have either Area 1 or Area 2 in place
4. Option for Area 5 must have Area 4 in place or modify pipe quantity
5. Option for Area 6 must have Area 4 and Area 5 in place or modify pipe quantity
6. Option for Area 7 is completely independent for all other areas

J:\Utilities\Grants\2013 WaterSmart\FINAL DOCS\Attachments\Copy for RBain Peoria RSO Report Table 8 Evaluation of Alternatives Matrix - Copy.xlsx

The adaptation strategies were developed in the 2009 WaterSMART Basin Study: U.S. Bureau of Reclamation Colorado River Basin Water Supply and Demand Study (Basin Study), published December 2012. See Attachment C, cover only due to space limitations.

The City of Peoria adopted a Drought Contingency Plan in 2003 which is still in effect. A copy is attached as Attachment B (cover and table of contents only due to space limitations).

The City's Water Conservation Plan was first adopted in 1986 and has been updated at regular intervals ever since. The most recent update was completed in January 2009. A copy is attached as Attachment E (cover and table of contents only due to space limitations).

The City's Water Reuse Master Plan (Attachment F, cover and table of contents only due to space limitations) was most recently updated in 2005. The Peoria Implementation Project implements options identified in that plan.

The City's Water Resources Master Plan (Attachment G, cover and table of contents only due to space limitations) was most recently updated in January 2006. The Plan calls for increased recharging/banking of reclaimed and surface water and direct reuse of reclaimed water. In the Plan's long-term strategy, reclaimed water is prioritized as the most feasible source of additional supply. In the Plan's short-term strategy, storage (banking) and direct reuse of reclaimed water is given the highest priority after maximization of surface water supplies, which are finite. The proposed project implements the higher priorities of both short and long-term strategies of the Water Resources Master Plan. The Peoria Implementation Project implements options identified in that plan.

F.1.(2) Identify and describe any engineering or design work performed specifically in support of the proposed project.

Attachment H is the cover sheet and site plan from bid documents for 2 new vadose zone wells permitted in 2011 and constructed in 2012 to recharge reclaimed water from the City's Jomax WRF in the Vistancia Master Planned community in northwest Peoria. Cost estimates for design and construction of the three new vadose wells to be built in this Peoria Implementation Project were developed based on actual costs for these newly completed and commissioned vadose zone wells in Vistancia. Although the City will not use the Vistancia well bid documents for the 3 new wells at Butler Drive WRF, please consider the familiarity and experience the City has with successfully completing such a project.

F.1.(3) Describe how the project conforms to and meets the goals of any applicable State or regional water plans, and identify any aspect of the project that implements a feature of an existing water plan(s).

Water conservation is a mandated requirement of the State's Groundwater Management Act Third Management Plan. See the documents at the following link:

http://www.azwater.gov/AzDWR/Watermanagement/AMAs/PhoenixAMA/default.htm

The City's Water Reuse Master Plan (Attachment F) was most recently updated in 2005. The Peoria Implementation Project carries out options identified in that plan.

The City's Water Resources Master Plan (Attachment G) was most recently updated in January 2006. The Plan calls for increased recharging/banking of reclaimed and surface water and direct reuse of reclaimed water. In the Plan's long-term strategy, reclaimed water is prioritized as the most feasible source of additional supply. In the Plan's short-term strategy, storage (banking) and direct reuse of reclaimed water is given the highest priority after maximization of surface water supplies, which are finite. The proposed project implements the higher priorities of both short and long-term strategies of the Water Resources Master Plan. The Peoria Implementation Project implements options identified in that plan.

On September 19, 2011 the City was notified of another grant award ($30,000) for an SOR entitled R*echarge Optimization for Class A+ Treated Effluent from Butler Drive Water Reclamation Facility in Peoria, Arizona (Grant R11AP32067).* This Recharge SOR identified feasible, efficient and cost-effective options to enhance the City's reclaimed water storage capabilities, thus advancing the goal of sustainability and conservation of water resources. See Attachment D.

The vadose zone wells to be built under this project were the highest ranked alternative of this Reclamation grant-funded SOR.

Subcriterion No. F.2—Readiness to Proceed
Points may be awarded based upon the extent to which the proposed project is capable of proceeding upon entering into a financial assistance agreement.

Describe the implementation plan of the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates. (Please note, under no circumstances may an applicant begin any ground-disturbing activities— including grading, clearing, and other preliminary activities—on a project before environmental compliance *is* ***complete and Reclamation explicitly authorizes work to proceed).***

This Peoria Implementation Project consists of a City of Peoria Capital Improvement Plan (CIP) project in the City's City Council approved FY 2014-2024 CIP budget. The project commenced after July 1, 2013 with selection of the design and permitting

consultant team. Note that survey, design, and permitting, and environmental compliance will be conducted prior to any ground-disturbing activities. The Peoria Implementation Project consists of design and construction of three new vadose zone recharge wells to recharge A+ reclaimed water from the Butler WRF, thereby providing sustained and improved water management, and enhancing the sustainability of the State's water resources and drought protection for an estimated 25,205 acre feet (AF).

Estimated Start/Completion Date: Start July 2013/Completion June 2015

UT00309 Estimated Project Duration (24 months)

Task	Date
Selection of Design Consultant	July-September 2013
Permitting (includes Hydrology Modeling, Environmental Clearance)	September 2013-August 2014
Design & Specifications Submitted	February 2014
Approval to Construct	August 2014
Bid Construction and Contract	June 2014-August 2014
Council Approval	September 2014
Construction Commencement	September 2014
Construction Completion	May 2015
Initiate Operation	June 2015

Please explain any permits that will be required, along with the process for obtaining such permits.

The City will obtain all required permits and permit modifications, approvals, and easements prior to construction of the proposed project. Having constructed similar projects annually and having the same experience Engineering Department staff assigned to this project, the City is well-suited and versed in obtaining these permits in a timely manner. Expected permits include:

- City of Peoria Building Permit
- City of Peoria Right of Way Permit
- Maricopa County
    - Approval To Construct (ATC);
    - Approval of Construction (AOC);
- Maricopa County Dust Control
- Arizona Department of Environmental Quality (ADEQ) Amendment to Butler WRF Aquifer Protection Permit
- ADWR USF and WSP

- Cultural Resources, Environmental Categorical Exclusion as appropriate and deemed necessary by Reclamation

Subcriterion No. F.3, VIII.A.5—Performance Measures
Points may be awarded based on the description and development of performance measures to quantify actual project benefits upon completion of the project.

Provide a brief summary describing the performance measure that will be used to quantify actual benefits upon completion of the project (i.e., water saved, marketed, or better managed, or energy saved).

The performance measure of constructing the three new vadose zone recharge wells will be the actual operating recharge capacity, as compared to design capacity. The design capacity is intended to be 1.5 MGD. Each well will thus have to recharge 0.5 MGD on average. Once wells are constructed, they are "developed", then performance tested. The City's SCADA system will serve to record the metered data from the new wells to provide an accurate total amount of reclaimed water recharged in the new project infrastructure. The City also must file an annual recharge report with ADWR documenting this same information, from which ADWR (after verification) then adds the requisite amount of LTSCs to the City's Long Term Storage Account.

Evaluation Criterion G: Additional Non-Federal Funding (4 points)
*Up to **4 points** may be awarded to proposals that provide non-Federal funding in excess of 50 percent of the project costs. State the percentage of non-Federal funding provided.*

$$\frac{\text{Non-Federal Funding}}{\text{Total Project Cost}} = \frac{\$1,327,507}{\$1,627,507} = \mathbf{82\%}$$

Evaluation Criterion H: Connection to Reclamation Project Activities (4 points)
*Up to **4 points** may be awarded if the proposed project is in a basin with connections to Reclamation project activities. No points will be awarded for proposals without connection to a Reclamation project or Reclamation activity.*

H.(1) How is the proposed project connected to Reclamation project activities?

The City's ties to Reclamation are varied and strong. Reclaimed water produced by the Butler Water Reclamation Facility primarily generates from Salt-Verde River system water transported by Salt River Project in the Arizona Canal. Salt River Project was created under authority of the National Reclamation Act of 1902. Reclaimed water produced by the Beardsley Water Reclamation Facility largely generates from Colorado River water transported in the Central Arizona Project canal, which is a major Bureau of

Reclamation project. The City also stores a large amount of water from the Central Arizona Project canal at Underground Storage Facilities operated by the Central Arizona Water Conservation District which also operates the Central Arizona Project canal for Reclamation.

H.(2) Does the applicant receive Reclamation project water?
Yes. The City of Peoria receives water from both the Salt River Project and the Central Arizona Project canals. This water supply represents over two-thirds of the municipal water supply.

H.(3) Is the project on Reclamation project lands or involving Reclamation facilities?
No.

H.(4) Is the project in the same basin as a Reclamation project or activity?
Yes, as described in H.(1).

H.(5) Will the proposed work contribute water to a basin where a Reclamation project is located?
Yes. The Butler Drive WRF recharge facilities are within the Salt River Project Association member lands. Raw surface water used in this service area is delivered in the Arizona Canal and treated for distribution at the City's Greenway Water Treatment Plant located at the terminus of the canal.

VIII.A.2 Performance Measure No. B: Projects with Quantifiable Energy Savings
B.1 - Implementation of Renewable Energy Improvements Related to Water Management and Delivery
Because water is conserved in this project by keeping water resources local within the City's aquifer, there will be a significant energy savings of not having to pay for the importation for these water supplies in future years. Because additional non-project water supplies would otherwise have to be delivered via the CAP, we use the CAP estimate that it uses 1,000 kilowatt-hours of electricity to move 1 million gallons of water to the Phoenix region.

Calculated Energy Efficiencies

Energy savings from water not moved via CAP to City of Peoria =
Water Stored By Recharge Project (MG)/yr X Energy Required To Move 1 Million Gallons =

547.5 MG /yr x 1000 kwh/MG = **547,379 kwh saved/yr**
8,212,500 kwh over 15 years

CAP energy costs are published as $74/AF delivered advisory for 2015; current firm price for 2014 is $67/AF delivered. Assuming the wells begin operation in 2015, and without using any incremental cost increases which will most certainly occur, the anticipated cost savings are

$74/AF X 1,680 AF/yr X 15 years = **$1,865,211**

Performance Measure No. B.2—Increasing Energy Efficiency in Water Management

The City's inclusion of SCADA in the project design will permit staff to accurately track the amount of water conserved. With SCADA, City staff will not have to travel to the site daily to operate the wells (turn on or off) or to record the amount of water flowing to each well and the depth to water in each monitoring well.

If the daily trips are reduced by SCADA to periodic weekly trips, there will be a savings of 6 trips per week or (6 x 52 trips) per year. Assuming that the wells are sited together at the Butler WRF or the adjacent Pioneer Community Park (see Attachment B), each round trip would be 0.50 miles from the Municipal Operations Center (MOC) located at 8850 N 79th Ave, Peoria 85345, where the Field Operations staff that operates the City's reclaimed system are located. The typical vehicle used for such monitoring trips in the service area gets 8.5 miles per gallon.

Miles saved per year for operations and monitoring = 312 trips x 0.5 mi RT MOC to Vadose Zone Wells
= 156 mi/yr

Projected gallons saved/yr = 156 miles saved/yr / 8.5 mpg =
18 gallons non-leaded fuel saved/yr
270 over 15 years

Assuming $3.85/gallon and no inflation, the anticipated cost savings are
$3.85/gallon X 18 gallons X 15 years = **$1,040**

VIII.B. and IV.D.1: Environmental and Cultural Resources Compliance

The City, having partnered with Reclamation in 2009-2011 for the Challenge Grant project, is well aware of the required NEPA process for environmental compliance. Since the new vadose zone wells are to be located on an existing City site that has been evaluated previously, the City believes the NEPA process will involve largely records research.

Ultimately we will need a categorical exclusion as documented by a Categorical Exclusion Checklist (CEC). The CEC normally addresses Endangered Species Act, NHPA,

and consultation with affected Tribes (there are none). We prefer that Reclamation staff complete these documents and invoice the grant funds for their work. We have provided adequate budget, 1%, in the project cost estimates and funding to remunerate Reclamation or a private consultant.

(1) Will the project impact the surrounding environment?

The construction of the new vadose zone wells involves excavation. Dust control measures will be implemented in accordance with City and County standards. No natural habitat will be disturbed. All land has been extensively modified in the past, and is not in a natural state.

***(2) Endangered species*:**

There are no endangered or threatened species present within the project boundaries, based on the City's current knowledge and observation, nor are any anticipated.

(3) Wetlands:

There are no wetlands present within the project boundaries.

(4) Date of water delivery system construction:

The City of Peoria was incorporated in 1954, and the water delivery system and the reclaimed water delivery system have been developed in stages continuously since that time.

(5) Modifications to irrigation system:

None

***(6) National Register of Historic Places*:**

Consultations with the Arizona State Historic Preservation Office have shown that there are no sites, structures, features or buildings within the project area that are now listed or are eligible for inclusion on the National Register of Historic Places.

(7) Archaeological sites:

No archaeological sites are known to exist within the project boundaries. Most lands within the project area appear to have been extensively modified in the past. A cultural resources inventory and archival research project will be performed in conjunction with the proposed project.

***(8)* Will the project have a disproportionately high and adverse effect on low income or minority populations?**

No.

***(9)* Will the project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?**

No.

(10) Will the project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?

No.

IV.D.2. Required Permits or Approvals

Expected permits include:

- City of Peoria Building Permit
- City of Peoria Right of Way Permit
- Maricopa County
    - Approval To Construct (ATC);
    - Approval of Construction (AOC);
- Maricopa County Dust Control
- Arizona Department of Environmental Quality (ADEQ) Amendment to Butler WRF Aquifer Protection Permit
- ADWR USF and WSP
- Cultural Resources, Environmental Categorical Exclusion as appropriate and deemed necessary by Reclamation

IV.D.3. Official Resolution

Attachment I is a draft Council Resolution that will be put forth to the Mayor and Council for approval at their February 18, 2014 Council Meeting. The Council Resolution acknowledges the City's financial commitment to funding its share of the proposed grant project at $1,327,507 from the Capital Improvement Program (CIP) to receive a grant of $300,000 from the Bureau of Reclamation. There are no charges to be incurred prior to July 1, 2013.

IV.D.4. Project Budget

IV.D.4. (1) Funding Plan and Letters of Commitment

Describe how the non-Reclamation share of project costs will be obtained. Reclamation will use this information in making a determination of financial capability. Project funding provided by a source other than the applicant shall be supported with letters of commitment from these additional sources. This is a mandatory requirement. Letters of commitment shall identify the following elements:

(1) The amount of funding commitment

(2) The date the funds will be available to the applicant

(3) Any time constraints on the availability of funds
(4) Any other contingencies associated with the funding commitment

The City of Peoria will provide $1,327,507 in matching funds. This match represents 82% of the project costs.

Peoria Total Match	Reclamation Grant	Total	% Peoria Match
$1,327,507	$300,000	**$1,627,507**	82%

The City is providing all non-Reclamation funds. The City's Public Works-Utility Department receives revenue generated from a number of approved fees including user fees and water resource fees. The City's 10-year Capital Improvement Program, approved in June 2013 by the City Council, includes funding for the City's matching share of the Peoria Implementation Project which officially were available as of July 1, 2013.

Attachment I is a draft Council Resolution that will be put forth to the Mayor and Council for approval at their February 18, 2014 Council Meeting. The Council Resolution acknowledges the City's financial commitment to funding its share of the proposed grant project at $1,327,507 from the Capital Improvement Program to receive a grant of $300,000 from the Bureau of Reclamation. There were no charges incurred prior to July 1, 2013.

All contributions are monetary with the exception of the burdened (wage and fringe benefits) salary costs itemized in the budgets shown below in the Budget Proposal; these costs are in-kind.

There are no funding partners. There are no funds requested or received from other Federal partners.

Table 1. Summary of non-Federal and Federal funding sources.

Funding Sources	**Funding Amount**
Non-Federal Entities	
City of Peoria CIP	$ 1,327,507
Non-Federal Subtotal:	**$** 1,327,507
Other Federal Entities	
	- 0-
Other Federal Subtotal:	**- 0-**
Requested Reclamation Funding:	**$ 300,000**
Total Project Funding:	**$ 1,627,507**

IV.D.4. (2) Budget Proposal

The City staff develops budgets for capital projects that include direct, indirect, environmental and contingency costs. The budget below identifies this level of detail.

Table 3.-Funding Sources

Funding Sources	Percent of total project cost	Total Cost by Source
Recipient funding	82%	$ 1,327,507
Reclamation Funding	18%	$ 300,000
Other Federal funding	0%	- 0-
Totals	100%	$ 1,627,507

Table 4. Butler WRFVadose Zone Recharge Wells

UT00309

BUDGET ITEM DESCRIPTION	COMPUTATION		RECIPIENT FUNDING	RECLAMATION FUNDING	TOTAL FUNDING
	$/Unit and Unit	Quantity			
SALARIES AND WAGES					
City Project Manager	$60	533	$26,224	$5,756	$31,980
Employee 2	$30	184	$4,526	$994	$5,520
FRINGE BENEFITS					
Full-time employees	$45	-	$15,375	$3,375	$18,750
Part-time employees					
TRAVEL					
Trip 1					
Trip 2					
SUPPLIES/MATERIALS					
Office supplies					
Preconstruction Services					
Construction (Internal funds)			$0	$0	$0
CONTRACTUAL/[1] CONSTRUCTION					
Construction			$1,082,110	$247,991	$1,330,100
Design			$107,901	$23,685	$131,586
Preconstruction Services			$32,050	$7,035	$39,085
Construction Management			$0	$0	$0
Materials Testing			$10,683	$2,345	$13,028
Permits			$33,770	$7,413	$41,183
Contingency			$0	$0	$0
Community Involvement			$0	$0	$0
TOTAL DIRECT COSTS			$1,321,210	$290,022	**$1,611,232**
INDIRECT COSTS - __%			$0	$0	
Sub-total			$1,311,232	$300,000	**$1,611,232**
ENVIRONMENTAL AND REGULATORY COMPLIANCE			$16,275	$0	$16,275
TOTAL PROJECT COSTS			**$1,327,507**	**$300,000**	**$1,627,507**

Burdened hourly = wage + fringe benefits

Budget Narrative

Salaries and Wages:

- City Project Manager: The budgeted amount estimates the level of effort expected by the City of Peoria assigned Project Manager. This budget amount is based upon the project manager's burdened hourly wage of $60 for a total of 533 hours. The City Project Manager will manage the project throughout its duration.
- City Inspector: The budgeted amount estimates the level of effort expected by the City of Peoria assigned project inspector. This budget amount is based upon the inspector's burdened hourly wage of $30 for a total of 184 hours. The City Inspector will be involved during the construction phase of the project.

Fringe Benefits:

- Fringe benefits are 50% additional to the paid wage.

Travel:
None.

Equipment:
Provided by contractor, none purchased and charged to the project.

Materials and Supplies
Provided by contractor under "*Contractual*"

Contractual /Construction:

- Design Fee: Expected cost for consultant to develop a design that is 100% complete. This fee will also include pre-construction services provided by contractor.
- Construction Permits: All permits associated with the approval of design and construction permits required by the City of Peoria and other governmental agencies. These fees will cover inspections by these agencies.
- Construction Management: Administrative fee associated with the engineer's and contractor's managing and coordination of the project.
- Materials Testing: Needed Quality Assurance of all materials used in the project. This work will typically be provided by a third party under a term contract with the City of Peoria.
- Community Involvement: This will include project signs, flyers and maintenance of a project hotline for the duration of the project. None anticipated for this project, however.

- Utility Relocations: Relocation of wet and dry utilities that may conflict with the construction of this project.
- Vadose Zone Wells: All costs associated with the construction of the 3 wells each with 0.50 MGD capacity, including mobilization, demobilization, traffic control, trenching, backfilling, valves, fittings, piping, backfill, subgrade preparation and surface restoration as required.

Environmental and Regulatory Compliance Costs:
The City, having partnered with Reclamation in 2009-2011 for the Challenge Grant project that constructed the genesis of the Butler Drive WRF reuse distribution system, is well aware of the required NEPA process for environmental compliance. Since the reservoir and booster pumps are to be located on an existing City site that has been evaluated previously, and the pipelines are to be located within public right of way, the City believes the NEPA process will involve largely records research.

Ultimately we will need a categorical exclusion as documented by a Categorical Exclusion Checklist (CEC). The CEC normally addresses Endangered Species Act, NHPA, and consultation with affected Tribes (there are none). We prefer that Reclamation staff complete these documents and invoice the grant funds for their work. We have provided adequate budget in the project cost estimates and funding to remunerate Reclamation or a private consultant.

Environmental compliance activities are budgeted at $16,275 (1% of total project cost) because all land has been extensively developed and modified in the past, there is no private land involved in the project, and the land is not in a natural state and consists of City property and City right of way.

Reporting
The City understands that recipients are required to report on the status of their project on a regular basis, and has done so successfully in its previous grant projects with Reclamation.

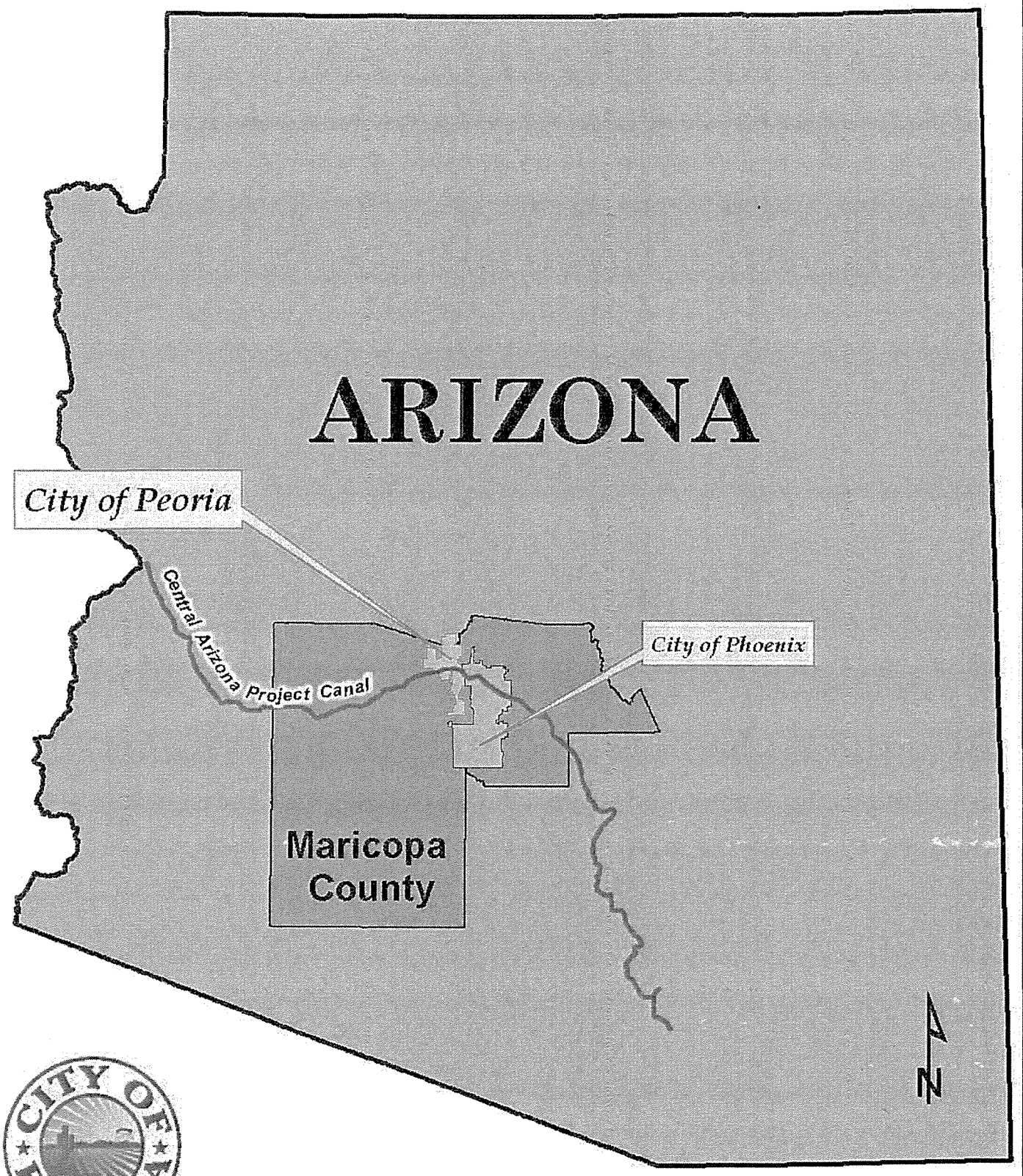
Other
There are no other costs.

Indirect Costs
The City is not requesting indirect costs.

Total Cost
The total project costs are $1,627,507. Peoria is seeking $300,000 in Reclamation grant funds. The City is funding the remainder of $1,327,507 in its entirety with no other funding partners.

Budget Forms

All required Federal budget forms (SF-424A, B and C) are submitted with this application through Grants.gov.



CITY OF PEORIA

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