TRANQUILLITY IRRIGATION DISTRICT

EAST-WEST INTERTIE WATER CONSERVATION PROJECT

COPY

FRESNO COUNTY, CA

APPLICATION SUBMITTED TO
UNITED STATES BUREAU OF RECLAMATION
FOR A
WaterSMART: WATER AND ENERGY EFFICIENCY GRANT

(FUNDING OPPORTUNITY ANNOUNCEMENT NO. R13SF80003)

Tranquillity Irrigation District

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January 2013

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TECHNICAL PROPOSAL

1 . Executive Summary

(A) General Project Information

Proposal Name: Tranquillity Irrigation District East-West Intertie Water Conservation Project
Date: January 14, 2013
Applicant Name: Tranquillity Irrigation District
City, County, State: Tranquillity, Fresno County, California

(B) Project Summary

The Tranquillity Irrigation District (TID or District) East-West Intertie Water Conservation Project is principally a Task A project (Water Conservation), and secondarily a Task B (Energy-Water Nexus) and Task D project (Water Markets). It also includes components of a Task C project (Benefits to Endangered Species). The East-West Intertie Project will physically connect two separate distribution systems in Tranquillity Irrigation District. This will allow water to move against gravity from the west system (supplied by TID Lift #1) to the east system (supplied by TID Lift #2). The project will include a pump structure and turnout from an existing canal that will pump 15 cfs into an approximately ½ mile long 21-inch diameter PVC pipeline into another canal. The facility will also include a flowmeter and SCADA control system. The project will improve operational flexibility, improve water reliability, and increase the area served by groundwater (which can currently only be utilized in the west system). The intertie will also reduce the conveyance path for some deliveries in the fall and spring, resulting in lower seepage, evaporation and dead storage losses estimated at 630 acre-feet/year. The project will also include raptor protection on new power poles, and an island in the District's Railroad Reservoir to provide habitat for various bird species. The project also includes photovoltaic cells with 13.5-kW capacity that will partially offset the energy used at the new pump station. The project can be completed within sixteen months of receiving funding.

(C) Project Length and Estimated Completion Date

Design work on the project began in late 2012. The project duration after contract award (assumed to be September 2013) would be approximately 16 months (including design, permitting and construction). However, the actual construction of the project is anticipated to take about 4 months. The entire project would be completed by the end of December 2014.

2 . Background Data

(A) LOCATION

Tranquillity Irrigation District was formed January 22, 1918, as a public agency initially designed to serve the District with water supplies (agricultural and drinking water), parks/recreation, energy production, streets and roads, and lighting. It is the second oldest such agency in Fresno County, and today provides agricultural and drinking water to its customers. A Board of Directors elected from the District at-large governs the District. The District is approximately 10,750 acres in size and is located in the west central portion of Fresno County in the Great Central Valley of California. The District farmland produces a variety of commodities including: cotton (pima and acala), canning tomatoes, alfalfa for seed, sugar beets and almonds. Its principal community is the unincorporated town of Tranquillity. The District is geographically adjacent to the Fresno Slough, a historic northern flood outlet of the Kings River.

Lands within the District boundaries are at the trough of the valley floor. State Highways 145, 180, and 33 are in close proximity. Adjacent agricultural water agencies include the James Irrigation District (JID) and Fresno Slough Water District (FSWD). A regional map is included as **Figure 1**.

(B) WATER SUPPLY SOURCE

The District receives water supplies from several sources, as detailed in **Table 1**. The District serves agricultural water supply to about 213 turnouts or connections.

Table 1. Annual Agricultural Water Supply Sources

Water Source	Total (AF)
Federal agricultural water (CVP)	up to 13,800
San Joaquin River Riparian water ("Rights Water", Schedule 2 CVP)	up to 20,200
Local/other (Kings River High Flow)	Varies from 0 - 40,000[1]
District groundwater	3,272[2]
Total	Typically 26,867[2]

[1] While TID is entitled to up to 1,000 AF/day (with a 50-year average annual high flow duration of 40 days per year with high flows), actual diversion capacity due to current limitations in facilities is closer to 500 AF/day.
[2] Average for 2000 through 2009.

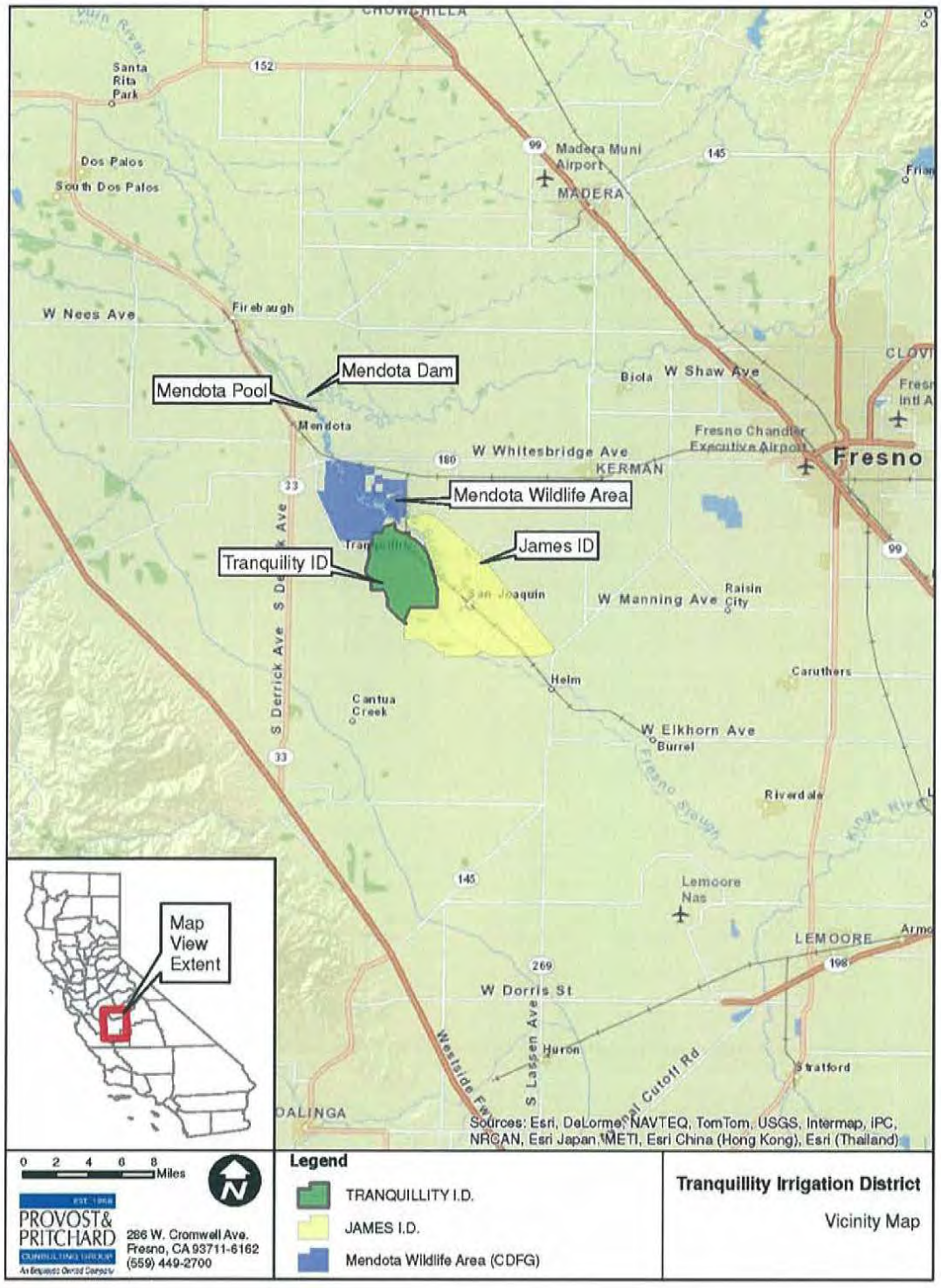

Figure 1. District Location Map

The District does not receive nor deliver State water, upslope drain water, or reclaimed water. The District owns, maintains, and operates the domestic/drinking water system

for the local Community of Tranquillity and throughout the rural areas of the District. The demand for these urban water uses is provided by groundwater pumping from M&I-only wells located within the community. Due to the small number of drinking water connections (about 350), the District is not deemed an urban water supplier. The District's surface water sources are used solely for agriculture.

As detailed above, the District relies on both surface and groundwater for irrigation demands. **Table 2** shows TID's surface and groundwater usage from 2000-2009, along with the corresponding CVP South of Delta (SOD) percent allocations and California percent of average precipitation.

Table 2. Surface and Groundwater Use (2000-2009)

	CVP SOD Water Year Allocation	California Precipitation	TID Surface Water Deliveries		TID Ag Groundwater Deliveries	
Year	% of CVP Contract Entitlement	% of Average Water Year [1]	Volume (AF)	%	Volume (AF)	%
2000	65%	95%	20,403	96%	889	4%
2001	51%	102%	25,618	97%	798	3%
2002	75%	83%	26,700	92%	2,167	8%
2003	80%	95%	25,834	92%	2,151	8%
2004	70%	96%	25,369	90%	2,731	10%
2005	85%	130%	21,401	94%	1,354	6%
2006	100%	105%	18,068	100%	0	0%
2007	50%	61%	20,288	98%	476	2%
2008	40%	76%	20,476	69%	9,136	31%
2009	10%	76%	17,655	58%	13,021	42%
Total	-	-	*221,812*	*87%*	*32,723*	*13%*
Avg	*63%*	*92%*	*22,181*	*87%*	*3,272*	*13%*

Note: [1] Source: Western Regional Climate Center, California Climate Tracker

Ideally, the CVP allocation percentage would match the percentage of average precipitation for any given year. However, due to issues such as Delta pumping restrictions, endangered species, CVPIA, etc., actual CVP supplies available to CVP contractors have historically been low relative to precipitation amounts, as illustrated in **Table 2**. These potential water shortages are a major impetus for this application.

Table 2 also shows that for typical years, groundwater constitutes approximately 13% of the District's water use. For all years included in **Table 2**, the District's maximum contractual surface water supply (approximately 33,000 AF) has not been fully available, and groundwater is pumped to supplement the surface water supply. This is due to CVP system not being able to reliably supply TID's CVP contract allocations each year. Typically, groundwater pumping begins in the middle of the irrigation season

and groundwater is sometimes the only water source available at the end of the irrigation season (August to October) during extremely dry years.

Groundwater Supplies

TID owns and operates 9 agricultural production wells. Four of these are within the District boundary and five are located on property owned by TID in the Fresno Slough Water District northwest of the District. The estimated capacity of all the wells is approximately 42 cfs combined.

Surface Water Supply

Riparian water (Schedule 2 CVP, Contract 14-06-200-701-A) is delivered without charge as a settlement of the District's water rights claims in the San Joaquin River. During normal and wet years 20,200 acre-feet is available, during dry years 15,700 acre-feet is available. The contract requires that the District take delivery of this water according to a predetermined schedule (see **Table 3** below).

Table 3. USBR Schedule 2 Schedule of Water Deliveries to TID (AF)

Hydrologic Year Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Normal	0	400	1,300	2,900	4,700	6,900	3,400	400	200	0	0	0
Dry	0	400	1,300	2,100	3,800	5,200	2,500	300	100	0	0	0

In addition, the District has a Central Valley Project South of Delta (SOD Water) contract (No. 14-06-200-701-A-LTR1) for up to 13,800 acre-feet of water each year. This water is usually delivered in the spring and summer months and varies each year based on demand, availability, and schedules set by the USBR. Other water used by the District includes Kings River high flows, and a small amount of operational spillwater from the neighboring James Irrigation District.

The District's groundwater pumping capacity is about 42 cfs total, which is not enough to meet peak demands. As a result, groundwater and surface water are normally blended to meet water demands. In the past, during dry years, TID began pumping early into Mendota Pool and pulled out the water later when the surface water supplies diminished. However, TID is now only permitted to store water in the Mendota Pool for a maximum of 30 days and is subjected to 5 percent storage losses.

(C) WATER SUPPLY SYSTEM

Conveyance System

TID's conveyance system includes two major systems, and eastern and western systems which are largely isolated from each other. The overall system includes approximately 17.3 miles of two main canals (Towne Ditch and Slough Canal), approximately 10.7 miles of seven laterals originating from the two main canals, and "stub" canals (8.8 miles) and pipelines (2.3 miles) that convey water from the laterals to the growers. Two lift pumps along the Fresno Slough pump water up into the two main

canals for delivery throughout the District. The four groundwater wells within TID's boundary discharge water into these main canals for distribution as well. The five production wells owned by TID but outside the District boundary discharge water into the Fresno Slough Canal along the north boundary of the District to serve the properties within Fresno Slough WD. The Fresno Slough Canal also has a lift pump station along the Fresno Slough.

The TID conveyance/distribution system is managed as automated level pools to avoid operational spills. Irrigation tail water is confined to the irrigated land and most water users typically irrigate using dead level fields or graded fields with blocked ends. On occasion, some water users will recycle tail water using temporary portable pumps. These pumps collect tail water from a temporary sump and pump the water back to the head of the irrigation run for reuse. Tranquillity ID can deliver groundwater for storage, sale, or exchange at either of two pump-in locations to the Mendota Pool, Tranquillity ID Lift #1, or the downstream end of the Fresno Slough Water District canal system.

TID is currently constructing the Railroad Reservoir, an off-channel reservoir in the northeast corner of the District. The reservoir will regulate groundwater supplies and Kings River high flows.

Land Use

TID is experiencing a slow trend of conversion of field crops to permanent crops. This trend is expected to continue at a slow gradual rate. In 2009 major crops included cotton (2,980 acres), tomatoes (1,793 acres), and miscellaneous seed crops (1,637 acres). Irrigation methods in 2009 included level basin flooding (69%) and drip irrigation (31%).

(D) Energy Efficiency

The District currently receives electric power from Pacific Gas and Electric (PG&E). A majority of the energy used by the District is to power the lift pumps and nine wells. The District periodically tests the pumping plant efficiency of the deep well pumps to understand their energy use and identify if wells are in need of repair or replacement.

(E) Past Working Relationships with Reclamation

The Tranquillity Irrigation District and its consulting engineer, Provost & Pritchard Consulting Group, have demonstrated that they can undertake a grant project, perform high quality work, manage funds, and meet deadlines. Below is a summary of Reclamation grant projects that the District has been awarded and were successfully completed on time and within budget since 2006.

USBR Drought Relief – SLDMWA Coordinated ARRA Funding – New Well Project

In 2009, the USBR provided a grant of up to $612,000 for the construction of two new irrigation production wells in the District. The wells will increase the availability and reliability of irrigation water for the District. The ARRA funds are intended to assist the District with supplementing water supplies to preserve permanent crops, minimize

economic loss for the surrounding community, and preserve employment. This grant money was provided through the USBR Drought Relief Funding program. A major benefit of the proposed East-West Intertie is that it will allow this well water to be delivered to the entire district, thus providing a year round supply for permanent crops, frost protection and during droughts.

USBR Field Services Program – Tranquillity ID 2007 Water Conservation Project
In 2007, the USBR provided a grant of $50,000 to Tranquillity Irrigation District (TID) for the purchase, installation, and programming of telemetry/SCADA equipment at four locations: a base station at the District's office, monitoring equipment on the upper reach on Mendota Pool, and two points of surface water delivery off of the Mendota Pool to Tranquillity ID (Tranquillity Lift#1 and Lift#2). This money was provided through the Water Conservation Field Services Program for the Mendota Pool Telemetry Project (#07FG200028).

USBR Field Services Program – TID Three District Interconnection Study
In 2006, the USBR provided a grant of $20,328 to the District to study possible interconnections between TID and James Irrigation District and up to four locations between TID and Fresno Slough Water District. Connections between these Districts have the potential to conserve water by reducing evaporation and seepage to a saline sink by decreasing the length that water has to travel, and also the potential to increase flexibility of water delivery and operations especially in outer areas of each District. This money was provided through the Water Conservation Field Services Program (#06FG204073). This study ultimately led to the concept for an East-West intertie, which is the subject of this grant application.

Other non-Reclamation funded projects that the District and their consultants have implemented include the following:

- With the California Department of Water Resources for the District's drinking water system, $896,090 for a 500,000 gallon water tank replacement & booster pumps in 2001 and $100,000 for a water system leak detection, inventory and rehabilitation study
- With the California Department of Public Health for remediation of arsenic in the drinking water, the District is currently conducting a new well feasibility study with $500,000 in grant funds
- For the Tranquillity Community Park, through Fresno County Community Development Block Grant Funds (ARRA) a $159,100 playground and park improvement project in 2009
- For the drinking water system, through Fresno County Community Development Block Grant funds, $178,773 for water system isolation valve replacements in 2007 and 2008

3 . Technical Project Description

The Tranquillity Irrigation District (TID or District) East-West Intertie Water Conservation Project will physically connect two separate distribution systems within TID. This will allow water to move against gravity from the west system (supplied by TID Lift #1) to the east system (supplied by TID Lift #2). The project will include a pump structure and turnout from an existing canal that will pump 15 cfs through an approximately ½ mile long 21-inch diameter PVC pipeline into another canal. The facility will also include a flowmeter and SCADA control system. The project will improve operational flexibility, improve water reliability, and increase the area served by groundwater (which can currently be sent only to the west system). The intertie will also reduce the conveyance path for some deliveries in the fall and spring, resulting in lower seepage and evaporation losses estimated at 630 acre-feet/year. The project will also include protection for raptors on new power poles, and an island in the District's Railroad Reservoir to provide habitat for various bird species. Lastly, the project will include solar panels located at the TID shop building to partially offset the energy usage at the pump station. The system will include 55 photovoltaic panels with a capacity of 13.5 kilowatts.

Figure 2 is a map showing the District facilities and boundaries, proposed intertie, area served by the intertie, location of railroad reservoir, and location of earth canals that will be circumvented with the intertie.

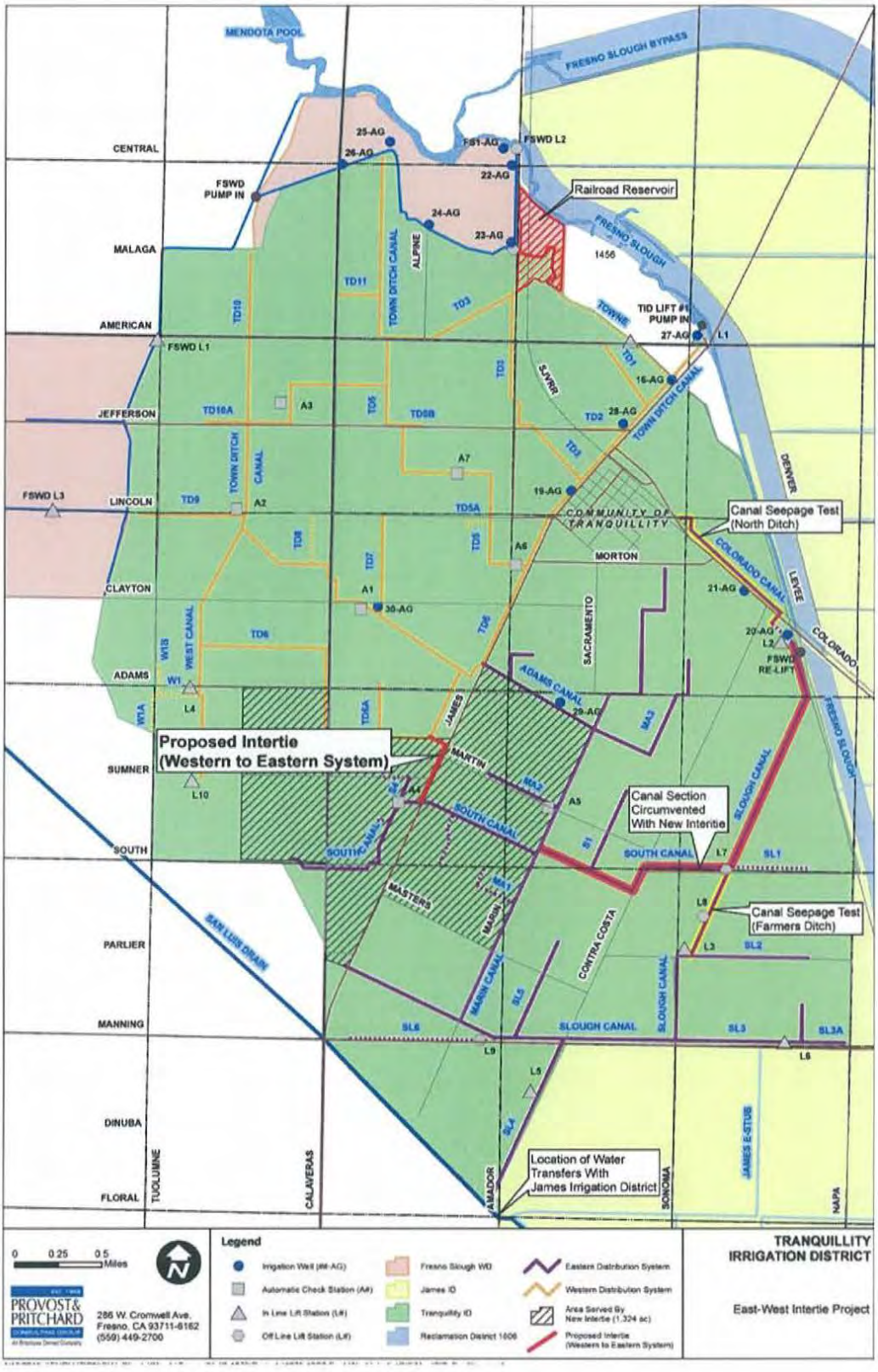

Figure 2 – East West Intertie Map

Tasks

The East-West Intertie Water Conservation Project will be broken into five major tasks:

Task 1 – Project Administration: This task involves overall project coordination, communication, contract management with USBR, budget requests, and contract revisions, if needed. This task will also include the organizing and attendance of progress meetings with USBR and stakeholders, and preparation of required progress reports and a draft and final report. It is anticipated that 2 semi-annual reports will also be required.

Task 2 – CEQA & NEPA Documentation/Permitting: This task includes complying with the California Environmental Quality Act, and assisting the USBR with complying with the National Environmental Policy Act. This task also includes relevant biological surveys, cultural resources surveys, and local permitting efforts.

Task 3 – Engineering Design: This task include preparation of the final plans, specifications and bidding documents for the pipeline, pump station, flowmeter and appurtenant structures. This task also includes detailed topographic surveying, boundary surveying, utility research and easement acquisition. A 30% design has already been completed (see **Appendix A**). Remaining design work will be completed in stages (50%, 90% and final design). Design of the solar system will be completed by the solar contractor. This task also includes preparing an engineer's cost estimate.

Task 4 – Construction Management: This task includes the bidding process which will comprise public bid advertisements and process, pre-bid meetings, answering questions during the bidding process, and evaluating submitted bids. This task also includes construction management activities consisting of construction administration, review/observation and related reporting, reviewing material testing results, review of submittals, contractor progress payment processing and change order review. This task will conclude with the preparation of final record drawings for the project.

Task 5 – Construction: This task includes construction of the pipeline, pump station, valving, metering facilities, and solar photovoltaic cells by a qualified contractor.

A breakdown of subtasks for each task is shown on the Project Schedule (see **Appendix B**)

Project Schedule.

A tentative project schedule is included in **Appendix B**. It is assumed that TID receives a signed contract for the award by September 30, 2013. TID believes that they can complete the work within the two year contract period. It is estimated that the proposed work can be designed and constructed, and the final report submitted in a 15-month period. This provides a 9-month buffer to accommodate unforeseen circumstances that may delay the project.

Engineering.
Planning and design efforts to date have included public outreach with local landowners, site visits and a 30% design (refer to **Appendix A**).

Water Summary

ITEM	QUANTITY (AF/YR)
Average Annual Water Supply	26,900[1]
Estimated Water Conserved after Project	630 AF
Estimated Water Better Managed	2,460 AF
New Water Marketed after Project	630 AF

[1] Average from 2000 through 2009.

Project Benefits Summary
Project benefits will include the following:

- *Water conservation* (630 AF/year)
- *Improved water management* (2,460 AF/year)
- *Improved water supply reliability* (important with recent and potential future CVP allocation reductions due to Delta issues)
- *Water marketing* (could allow additional water supplies to be sold to other CVP contractors, especially James Irrigation District which is in the same groundwater basin)
- *Wildlife habitat enhancement* (including waterfowl island in existing reservoir and raptor perches on power poles)
- *Photovoltaic solar panels (*capacity of 13.5-kilowatts, and annual generating capacity estimated at 21,595 kilowatt-hours*)*

Funding
TID will fund the dollars not contributed by federal funds with money available in the District's general fund. The District will provide a 56% or more cost share.

4 . Evaluation Criteria

(A) WATER CONSERVATION

Subcriteria No. A.1: Water Conservation

The project would result in both Water Conservation and Improved Water Management.

Subcriterion No. A.1(a) – Quantifiable Water Savings: Describe the amount of water saved.

The District's annual average water supply (surface and groundwater) is approximately 26,900 AF. This is the average water use between 2000 and 2009 (see **Table 2** for more details).

Summary
The project is estimated to conserve 630 AF/year, by reducing the conveyance length that water must travel to reach the south-central portion of the District. The quantity of water conserved is the sum of losses due to seepage, evaporation, and irrecoverable dead storage from the canal to be circumvented by the proposed intertie project. These calculations are shown in **Appendix C** and are described in detail below.

Problem Statement
Surface water is delivered to the southern part of the District through the eastern distribution system (purple system on **Figure 2**). Seepage losses are a large concern in winter months (October to March). During these periods deliveries are relatively small, but losses are high from initial wetting each time the canal is used, wasting their limited surface water supplies. During these periods water is in demand in the south central portion of the District (same as the area to be served by the intertie, as shown on **Figure 2**), but not in the southeastern portion of the District. The two areas have different cropping patterns/water demands due to different soil types. The south central area has lighter soils that are better for agriculture. The southeastern area is closer to the trough of the San Joaquin Valley, and has soils with higher clay content that are less desirable for crops, especially permanent crops. During the winter months water is conveyed 2.7 miles through the earth canals before deliveries are made. The intertie will provide an alternative route for the water. The water would be delivered to the intertie through other TID canals that are already wetted during the winter, thus reducing seepage losses.

Historical Seepage Estimates
Historical seepage losses were measured in the eastern distribution system in 1991. Ponding tests were performed in the North Ditch and Farmer Ditch, which are directly north and south of the canal section that will be circumvented by the intertie (see **Figure 2**). Water levels were observed in the canals for 3 days in the North Ditch and 6 days in the Farmer Ditch. The measured seepage rates were similar to seepage observed by

TID operations staff. The average seepage rates from these two canals was used in the analysis. The seepage loss calculations are found in **Appendix C**. Both of the ditches have substantial wet-up losses, with seepage reducing to about 1 inch per day after about 5 days. The length of canal that would be avoided by using the intertie is about 2.7 miles long and has a wetted width averaging 63 feet. This stretch of canal is shown on **Figure 2**.

Dead Storage Losses

The existing canal that delivers water to the project area is a level canal and water flows by gravity. When water is pumped from the canal there is some unavoidable dead storage lost. The dead storage is about 1-foot deep and cannot be pumped out because it is below the pumps or collects in undulations. This dead storage is lost every time the canal is filled (every two weeks from October to March).

Conservation Estimates

Detailed calculations in **Appendix C** show that seepage losses would be reduced by 438 AF/year. Evaporation losses would be reduced by 14 AF/year. Calculations in **Appendix C** also show that the dead storage losses would be reduced by 183 AF/year. As a result, total water conserved would be about 630 AF/year.

Subcriterion No. A.1(b) – Improved Water Management

The proposed intertie will offer many improvements to water management. Like most intertie projects, it will connect two separate water distribution systems and improve flexibility, redundancy and distribution capabilities. Specific water management improvements are listed below:

1. The new connection will increase redundancy by providing two water systems that can deliver water to eastern and southern TID. This will provide greater reliability in case one system is down for maintenance or repairs. For instance, under current conditions, no water can be delivered to the eastern system if Lift Station No. 2 on the Fresno Slough is out of service (see **Figure 2**).
2. Currently, only surface water can be delivered to the eastern system, but with the intertie groundwater can also be delivered to the system. This will be important during droughts when groundwater is the only available water supply or surface water supplies are limited. This will also provide a year-round supply for permanent crops, winter crops, frost protection, cultural practices and pre-irrigation.
3. The project will expand the service area of the Railroad Reservoir to the eastern distribution system. As a result, re-regulated water and floodwater stored in the reservoir can be delivered to the eastern system. This will help the District to better satisfy peak demands, and growers could experience less lead time when ordering water, and have greater flexibility in when they can turn off water.
4. The interconnection will be operated by a SCADA system. This will provide improved water management in the area served, allow remote operation, provide realtime data, prevent over deliveries, and better ability to respond to

unanticipated events. TID staff have other SCADA facilities and are familiar with how to operate and use SCADA to improve water management.

5. The intertie will allow more equitable water distribution by providing equal opportunities for the same water supplies (groundwater and surface water) throughout the entire district.
6. Water quality from surface water and groundwater varies. However, some groundwater wells have good groundwater quality (TDS range from 200 to 400 ppm) and at time Kings River floodwater has had marginal water quality (TDS of 800 to 1,000 ppm). The new facilities will provide greater ability to blend water supplies or deliver the best quality water.
7. The intertie could help reduce the potential for spills or canal overtopping in the western distribution system by providing an outlet for extra water.
8. Periodic peaks in irrigation demand, primarily caused by periods of abnormally high temperatures, often result in irrigation demands that exceed the combined flow rate capacity of the District's Fresno Slough lift pump stations. When this occurs, the District must operate its groundwater wells to supplement surface water supplies to satisfy demands. The intertie will allow groundwater to be delivered to the western distribution system and prevent temporary water shortages.
9. The intertie will provide a steadier and reliable water supply, and facilitate development of drip- and micro-irrigation systems in the area.

The intertie is being installed partially due to requests from growers who wanted increased reliability and water supplies in the area served by the intertie. These growers are interested in higher value permanent crops and water saving drip and micro-irrigation systems. Hence, the project will improve the District's capabilities to meet the evolving needs of local growers.

Subcriteria No. A.2: Percentage of Total Supply.

The project will directly conserve surface water by reducing the conveyance length to a portion of the District during winter months (October to March) when demands are relatively low. During these periods the canals lose a significant percentage of the flow to seepage and initial wetting. The water savings were estimated to be 630 AF (see Subcriteria A.1(a) above)

$$\text{Percentage of Total Supply Conserved} = \frac{630\ \text{AF}}{26{,}900\ \text{AF}} = 2.3\%$$

Water conserved can also be viewed in terms of the efficiency of the existing canal system during October to March. During this period, the area served by the intertie (1,320 acres) has an estimated water demand of 0.3 AF/acre for winter crops, permanent crops, frost protection, cultural practices, and pre-irrigation. This equates to a demand of 400 AF. Losses are estimated to be 630, so therefore the losses are reduced by almost 60%.

The water better managed would be equal to the water delivered to the area benefitting from the project, as shown on **Figure 2**. This area comprises 1,320 acres of cropped land. With an average water use of 2.8 AF/acre (TID 2010 Water Management Plan), and assuming that half of the water demands are delivered through the intertie, and an irrigation efficiency of 75%, the total water better managed in the area is 2,460 AF/year.

$$\text{Percentage of Total Supply Better Managed} = \frac{2{,}460 \text{ AF}}{26{,}900 \text{ AF}} = 9\%$$

Subcriteria No. A.3: Reasonableness of Cost:

The facilities proposed in this project include a pipeline and pump station, which have an assumed life of 50 years. Life expectancies were also determined with a combination of TID experience, manufacturer's information, and life expectancies listed for various facilities in *Design and Operation of Farm Irrigation Systems*, ASAE Monograph No. 3, 1981 (pg 58). With proper maintenance, structure life can easily be extended, as many structures in the District are much older than 50 years.

The estimated project cost per acre-foot conserved over the life of the project is estimated to be $22, as shown in the calculation below.

$$\frac{\$681{,}645}{(630 \text{ AF Conserved}) \times 50 \text{ years}} = \$22/\text{Acre-foot}$$

The estimated project cost per acre-foot of water better managed over the life of the project is estimated at $6, as shown in the calculation below.

$$\frac{\$681{,}645}{(2{,}460 \text{ AF Better Managed}) \times 50 \text{ years}} = \$6/\text{Acre-foot}$$

Details of project costs are included in **Appendix I**.

(B) ENERGY WATER-NEXUS

Criterion No. B – Energy-Water Nexus

Subcriteria No. B.1: Implementing Renewable Energy Projects Related to Water Management and Delivery

The project will include photovoltaic solar panels at the TID shop building to partially offset energy usage at the new pump station.

Tranquillity Irrigation District met with a representative of GCI Solar of Fresno, California (http://www.gcisolar.com) in January 2013. GCI visited TID's office and evaluated the

suitability of placing solar panels on the TID shop roof. GCI prepared a cost estimate to install a 13.5 kilowatt (kW) solar photovoltaic facility. The system will be designed and installed by a qualified solar contractor. The facility will have the following features.

Table 4 – Solar Panel Features

Description	Value
Total Capacity	13.5 kilowatts
Annual generating capacity	21,595 kilowatt-hours
No. of panels	55
Panel specification	Upsolar UP-M245P modules

The facility will be able to generate approximately 33% of the energy needed to operate the new pump station (21,595 kWh/yr versus 64,845 kWh/yr). Note that the intertie will not create new energy demands, since an equivalent amount of energy would be needed to bring water to the area through the eastern earth canal system. Therefore, the panels will replace conventional energy generation (coal, natural gas, etc.) with renewable energy. The facility will provide renewable energy for a life of 25-years. During this period it will generate 540,000 kw-hours of clean energy, and reduced pollution will be equivalent to 423 tons of CO2 or 1,380,000 miles not driven.

The solar system will not be placed directly at the pump station, but rather at the TID shop building where it can be installed on the shop roof. Placing the system on a roof is more economical than constructing a ground mounted system at the pump station.

Subcriteria No. B.2. - Increasing Energy Efficiency in Water Management.
The water conserved by the project (630 AF) would otherwise seep to the groundwater through canals. This water would then need to be pumped to be reused. The average groundwater depth in the area is 200 feet based on the TID Groundwater Management Plan (Provost & Pritchard, 2009). Detailed calculations in **Appendix D** document energy usage calculations for pumping groundwater from 200 feet. The estimated energy savings are summarized in **Table 5**.

Table 5 – Energy Savings from Water Conservation

Description	Unit Value	Quantity (AF)	Savings
Energy Savings	343 kWh/AF pumped from 200 ft depth	630	216,100 kWh
Cost Savings	$44.60 /AF pumped from 200 ft depth	630	$28,100

Some secondary energy efficiency benefits include:

- The pump station will be operated by SCADA, and eliminate the need to drive to the site daily to monitor and adjust equipment.
- The project will not create new energy demands. Water would be delivered downstream to the project area through the new pipeline or eastern canal system, and in both cases would experience the same pumping requirements. However, the pumping station will use a high efficiency variable-frequency-drive (VFD) pump. These have a higher efficiency than other pumps in the District which have a standard design.

(C) BENEFITS TO ENDANGERED SPECIES

Criterion No. C – Benefits to Endangered Species

The primary benefits to endangered species from the intertie project will be: 1) construction of a habitat island in the Railroad Reservoir; 2) raptor protection on new power poles; and 3) reduced reliance in Delta Water Supplies. These benefits are described below in addition to previous biological surveys in the area.

Biological Studies. Biological studies have included biological surveys for the Railroad Reservoir project in 2010 and 2011, and a search for sensitive species records in the project area using the California Natural Diversity Database.

Biological Surveys

Two biological surveys were performed in Tranquillity ID in 2010 and 2011 for the Railroad Reservoir project. These reports helped to identify species of concern in the area or potentially in the project area. The reports are listed below:

- *Biological Reconnaissance Survey for Sensitive Species and Habitats for the Tranquillity Irrigation District's Railroad Reservoir Project* (Halstead & Associates, September 2010)
- *Protocol Swainson's Hawk, Burrowing Owl, and Nesting Raptors Surveys for Tranquillity Irrigation District's Railroad Reservoir Project* (Halstead Associates, May 2011)

Raptors appear to be common in some parts of TID based on the special raptor survey. During the survey, biologists observed raptors nesting, migrating, flying and foraging in the area. Several hundred Swainsons Hawks were found about 1.5 miles north of the proposed intertie. Other raptors observed in the area included the Great Horned Owl, Red Tailed Hawk, Northern Harrier, and Merlin.

Sensitive Species Database

A search of the California Department of Fish and Game Natural Diversity Database in 2010 and 2012 showed a variety of sensitive birds and habitats in the general region of the reservoir. Sensitive bird species are shown in **Table 6**.

Table 6 – Potential Sensitive Birds in Tranquillity Irrigation District (excluding raptors)

Species	Federal	California
Tricolored Blackbird	Species of concern	Species of concern
White-faced Ibis	Species of concern	Species of concern
Bank Swallow	-	Threatened
Mountain Plover	Proposed as threatened	Species of concern
Western Yellow Billed Cuckoo	Species of concern	Species of concern

Furthermore, a search of the California Department of Fish and Game Natural Diversity Database showed a variety of sensitive raptors could potentially be in the region, as shown in **Table 7**.

Table 7 – Potential Sensitive Raptors in Tranquillity Irrigation District

Species	Federal	State
Western Burrowing Owl	Species of concern	Species of concern
Bald Eagle	Threatened	Endangered/Fully protected
American Peregrine Falcon	-	Endangered
Swainson's Hawk	-	Threatened
Short-eared Owl	Species of concern	Species of concern

Figure 3 is a map of recorded sightings of sensitive species in the immediate project vicinity. Some birds shown on the map include Swainson's hawk, burrowing owl, mountain plover, and tricolored blackbird.

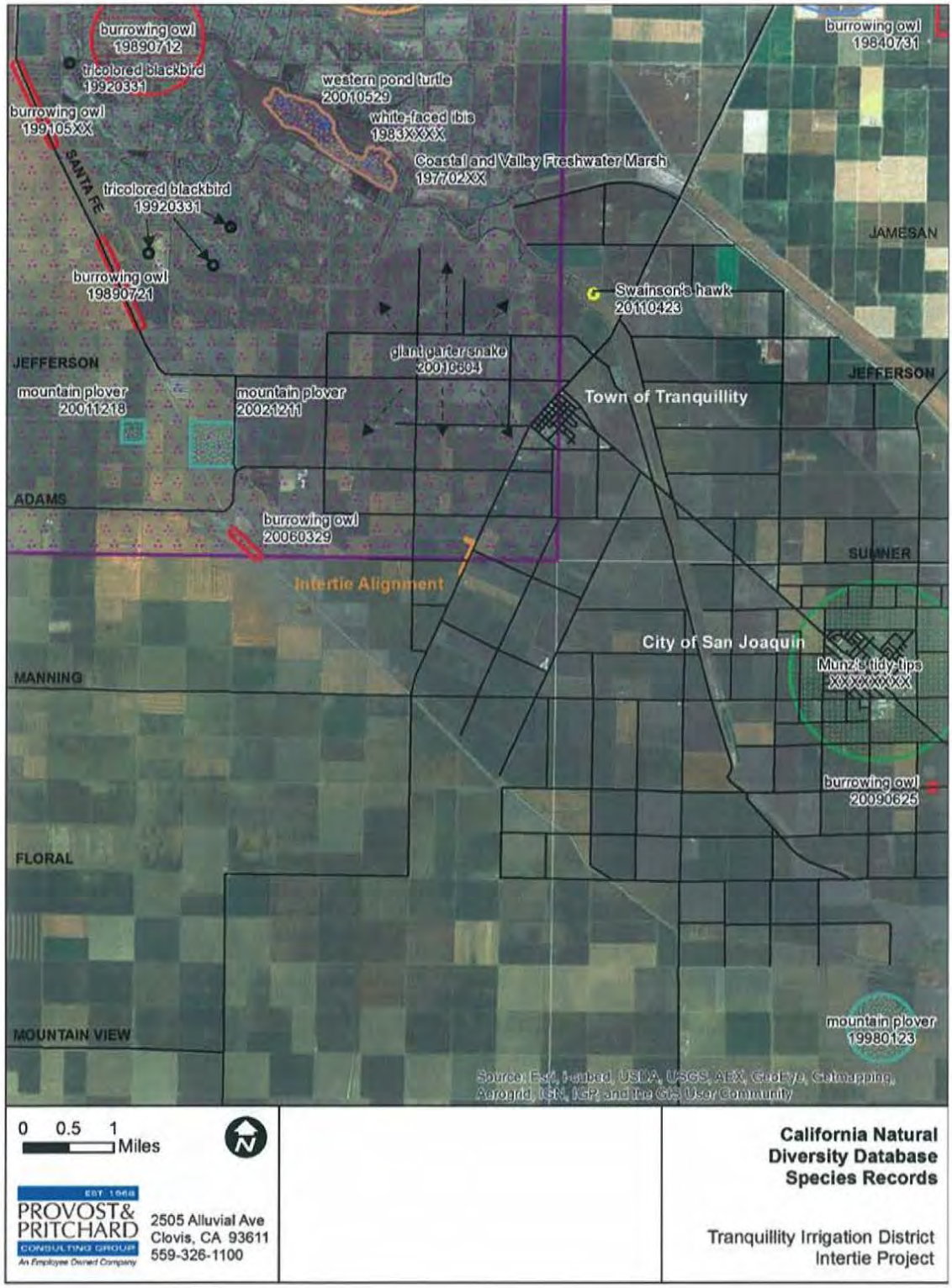

Figure 3 - California Natural Diversity Database Species Records

Based on the results of these studies, some project features were added to enhance habitat for several bird species including a habitat island and raptor protection on power

poles.

Habitat Island in Railroad Reservoir. The proposed project will include creation of a habitat island in the middle of Railroad Reservoir, which is located in the northeast corner of TID (see **Figure 2**). The reservoir is currently being constructed, and the design will be modified so it serves a dual purpose of storing water and improving wildlife habitat. The reservoir is an important facility linked to the pipeline, since it will store regulated floodwater and groundwater that can be delivered to the project area through the intertie. The island will provide waterfowl, shorebirds and other wildlife a safe, isolated area for resting and roosting. The island will have flat levee slopes (5H:1V), which will promote the growth of native wetland and upland vegetation to provide wildlife habitat. Water depths in the reservoir will vary, providing a variety of habitat environments for different species, including foraging areas for waterfowl, shorebirds, and other wildlife. These features will significantly improve habitat for wildlife in the area, which has been highly disturbed for many years due to agricultural activity. The island will be eight feet high (2 feet above the reservoir high- water level), and ten feet wide at the crest. It will have 5:1 slopes and therefore be about 90 feet wide by 90 feet wide.

The island will create new wetland and upland habitat in the region similar to that of the nearby California Department of Fish and Game Mendota Wildlife Area. The Wildlife Area, located approximately 1.5 miles northwest of the project's reservoir and across Fresno Slough, consists of approximately 11,825 acres of a combination of wetland and upland habitat (see **Figure 2**). Migratory bird species, including waterfowl, along the Pacific Flyway utilize the Wildlife Area during their migration. The Wildlife Area is open for upland game hunting. However, the project's reservoir would provide a similar habitat for these bird species that is protected from hunting and other activities that occur at the Wildlife Area.

Raptor Perches. The project will include a new power line extending approximately 700 feet from existing power lines to the pump station. The extension will include 4 or 5 new power poles. Power poles can benefit raptor species by providing a high spot to rest and survey for prey. However, power lines can be also be a danger and cause electrocution or death.

As a result, the power poles will include several features to protect raptors including: 1) Raptor frames, 2) 60-inch phase to phase clearance; and 3) covered wire bird guarding. TID's consulting engineer spoke with the local power company, Pacific Gas & Electric, who confirmed that these features can be added to the power poles.

Reduced Reliance on Delta Water Supplies. TID has rights to 13,800 AF of Federal agricultural CVP water, and 20,200 AF of Schedule 2 CVP water. These waters are usually delivered from the Sacramento-San Joaquin River Delta. Due to concerns for endangered species, especially the Delta smelt, pumping from the Delta has been

severely curtailed in recent years. The proposed project will benefit endangered species in the Delta in two ways:

1. The project will conserve up to 630 AF/year, and allow groundwater to be delivered to a larger area of the District. This will reduce reliance on Delta water supplies.
2. A major impetus for the project is to deliver steady, year-round water to southern TID so permanent crops can be planted and/or drip irrigation systems can be installed. This will modify water demands so there is less peak demand in the summer, and demands will be spread more evenly throughout the year. This will reduce demands on Delta water during critical low-flow periods in the summer.

The proposed measures (habitat island, raptor protection, and reduced reliance on Delta supplies) will have tangible benefits and make a small contribution to improving the status of several sensitive species.

(D) WATER MARKETING

Criterion No. D – Water Marketing
Briefly describe any water marketing elements included in the proposed project.

The proposed project will achieve water marketing by allowing TID to conserve its regular CVP contract water supply by redirecting water to different canals and reducing wet-up and seepage losses.

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

The project is estimated to conserve 630 AF/year of surface water. This water will be available to market to other water agencies. TID would prefer to market groundwater since there are no restrictions on transferring groundwater in Fresno County. Since some surface water will be conserved, TID will have less need to pump groundwater. This groundwater savings could be pumped and marketed to another agency.

The project will also provide a new mechanism to transfer groundwater to James Irrigation District. In the long-term, as other conservation projects are implemented, even more water could be marketed to James Irrigation District.

(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).*

History of Water Transfers
TID has a history of marketing water and is familiar with the legal, regulatory, environmental, and water management obstacles that need to be overcome. Recent

water transfers have included 3,367 AF to San Luis Water District in 2010.

Infrastructure for Making Water Transfers

TID has a unique combination of access and rights to various water resources, and equally unique geographical setting that could allow them to easily exchange water with many different water agencies. Mendota Pool is located just north of TID. This reservoir is primarily supplied water by the Delta Mendota Canal, but also the San Joaquin River and the Kings River during high flow events. Many west-side CVP contractors obtain their water supply from the Mendota Pool. Water could be transferred to any of the water contractors along the Pool. In addition, TID has the ability to sell water to CVP contractors along the Delta Mendota Canal and San Luis Canal (California Aqueduct). Through trades with third parties or through the use of the Cross Valley Canal, CVP contractors on the Friant-Kern Canal on the east side of the San Joaquin Valley could also be accessed.

James Irrigation District

The District can deliver water directly to neighboring James Irrigation District at the very southern tip of TID (near Almador Ave and Floral Ave, **Figure 2**). Currently, groundwater can only be delivered to the northern portion of TID, but with the intertie, it can be delivered to the entire District, including the connection with James Irrigation District. James Irrigation District has expressed verbal interest in purchasing groundwater from TID, and provided a letter of support for the project (see **Appendix F**). This is expected to be the primary mechanism for transferring water conserved by the project, and is a new transfer opportunity made possible by the proposed intertie.

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

Water transfers are expected to be primarily with James Irrigation District for agricultural use. James Irrigation District will need water during droughts and extended dry periods.

TID also plans to contact other neighboring agencies and solicit their interest in purchasing water. These agencies include Westlands Water District and the nearby Mendota Wildlife Refuge. TID has already held preliminary discussions with Westlands Water District on water transfers.

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

TID will obtain all necessary agreements, approvals and permits prior to marketing water. These will be obtained from USBR, DWR, and other relevant agencies. Pertinent legal issues will include water transfer and exchange regulations, place of use restrictions for CVP water, Reclamation law regarding uses of water, such as on Excess Lands. The current plan to market groundwater to James Irrigation District will not require Reclamation approval, and there are no restrictions in the County on transferring groundwater.

(5) ***Estimated duration of water transfers or market***

The water transfers and water market is expected to continue as long as the project facilities exist. The project facilities have a life expectancy of 50 years, and the life expectancy can be extended with proper maintenance and rehabilitation.

(E) OTHER CONTRIBUTIONS TO WATER SUSTAINABILITY

Criterion No. E – Other Contributions to Water Supply Sustainability

(1) ***Describe in detail the adaptation strategy that will be implemented through this WaterSMART Grant project. Identify the specific WaterSMART Basin Study where this adaptation strategy was developed.***

The project falls within the Sacramento-San Joaquin River Basin Study. This study is underway and no final adaptation strategies have been identified by USBR. However, a USBR representative stated that the 'Resource Management Strategies' in the 2009 California Water Plan Update will be a starting point for developing adaptation strategies. The project is consistent with the following 'Resources Management Strategies' from the 2009 California Water Plan Update:

Agricultural Water Use Efficiency
Agricultural water use efficiency will be improved by reducing seepage, evaporation and dead storage losses in an agricultural water delivery canal.

Conveyance – Regional-Local
The intertie will increase conveyance capabilities to a large portion of TID. Two separate distribution systems will be connected, and more than one option will be available to convey water to certain areas of the District.

System Reoperation
The project will provide a new facility that allows flexibility in deliveries and operations. The new operations will improve reliability, improve flexibility, and reduce conveyance losses.

Water Transfers
The project will conserve water that can be marketed to other agencies. The intertie will also allow groundwater to be delivered to the southern part of TID, and thus facilitate water transfers to the neighboring James Irrigation District

(2) ***Describe other benefits to water supply sustainability that are not described elsewhere.***

Mendota Dam Storage Restrictions

An important benefit to water supply sustainability is reducing reliance on water from Mendota Pool, the source of surface water supply for TID. The intertie will do this by providing a mechanism to deliver groundwater to the eastern distribution system. Recently, Mendota Pool and Mendota Dam have become a subject of concern. There is typically a high demand for storage in the Pool among numerous water users. Leak concerns at Mendota Dam along with silt and weed buildups in Mendota Pool have made it more difficult to get pool water to the District's pumping plants off of the Fresno Slough. Dam seepage prompted the Central California Irrigation District (CCID), who owns the Dam and manages the Pool, to lower the pool's surface elevation in 2006, to reduce pressure on the Dam. The California Division of Safety of Dams has also limited the water level behind Mendota Dam during the 2005, 2006 and future irrigation seasons to less than historic and preferred levels. There continue to be restriction on Mendota Pool water levels which bring uncertainty to TID surface water supplies, and also increase energy costs to lift water into the District.

Water Supply Shortages Due to Climate Variability and/or Heightened Competition

Climate change, or the increase in annual temperatures, is theorized to lead to an increase in flood flows due to an increase in the amount of rain that the Sierra Nevada Mountains receive in-lieu of snowpack during the winter. Climate change may also bring warmer and more intense precipitation events. These factors could result in an increase in high river flows during the winter and spring months, and a reduction in late spring and summer river flows. TID will have to rely more on water regulated in the Railroad Reservoir. The Railroad Reservoir is currently only connected to the western distribution system, but the intertie will allow this regulated water to be delivered to the entire District.

(3) ***Will the project help to expedite future on-farm irrigation improvements, including future on farm improvements that may be eligible for NRCS funding.***

List of fields and acreage that may be improved in the future

Most of the 1,320 acres that would be served by the proposed intertie uses level-basin flood irrigation. The landowners have generally not converted to high-efficiency irrigation systems due to the lack of a reliable, steady, year-round water supply. Hence, most of the entire acreage (1,320 acres) could be improved in the future.

Describe the on-farm improvements that can be made as a result of the project

The intertie will provide a more reliable water supply, with a more constant flow. Water will also be available year round. This will provide incentive for growers to consider planting higher value crops or permanent crops, and installing drip or micro irrigation systems.

Provide an explanation of how the proposed project would help to expedite such on-farm efficiency improvements

See above

Estimate the potential on-farm water savings that could result in acre-feet per year.
The area served by the intertie includes 1,320 acres. If 75% of this area is converted to drip or micro irrigation systems from the current level-basin irrigation method, then water savings would be:

1,320 acres x 2.8 acre-ft/acre x (90% - 75% efficiency) = 550 AF/year

Describe the number or percentage of shareholders that plan to participate in NRCS funding
The number of shareholders that would participate in NRCS funding is not precisely known. However, the intertie is being constructed partially due to requests from growers who want a more reliable water supply so they can plant permanent crops and install drip and micro irrigation systems. As a result, it is likely that participation would be high.

Describe the extent to which this project complements an existing or newly awarded AWEP project.
A local Agricultural Water Enhancement Program (AWEP) is being administered by the Kings River Conservation District (KRCD), a regional water management agency that covers most of the service area for the Kings River (http://www.krcd.org/water/water_management/awep.html). Since 2010, 176 growers in KRCD have received $6.4 million to treat 8,460 acres. TID is a member of KRCD and TID growers have full access to the AWEP benefits.

(4) ***Will the project make water available to address a specific concern?***

The project will conserve water and make it available for marketing to James Irrigation District or other local agencies. These agencies rely on Delta water for part of their supply, so it will reduce reliance on Delta water and address specific concerns related to Delta pumping restrictions.

The intertie will also provide a more reliable water supply to an area that has no access to groundwater, and suffers water shortages in the summer due to conveyance limitations.

(5) ***Does the project promote and encourage collaboration among parties? Is there widespread support for the project? Will the project help to prevent a water-related crisis or conflict?***

The Tranquillity ID Board of Directors has approved the proposed project (see **Appendix E**). The Board of Directors is comprised of local landowners, so this endorsement also represents support for the project from the local farmers. In addition, the District has received letters of support (see **Appendix F)** from the following entities:

1. Kings River Conservation District

2. Tranquillity Chamber of Commerce
3. James Irrigation District
4. Reclamation District 1606
5. Impacted landowner (Olivera)

(6) ***Will the project increase awareness of water and/or energy conservation and efficiency efforts?***

TID will publish an article about the project on their website. The article will discuss the renewable energy and energy conservation benefits of the project. This will help to educate many of the growers in TID.

The solar panels will also be placed on the TID shop roof and be visible to staff, local growers, and local citizens. This will provide a constant reminder of the District's commitment to renewable energy, and the value of solar energy in meeting local energy demands.

(F) IMPLEMENTATION AND RESULTS

Criterion No. F – Implementation and Results

Subcriteria No. F.1: Project Planning. Does the project have a Water Conservation Plan, System Optimization Review, and/or district or geographic area drought contingency plans in place?

The District has a Water Management Plan (2009) and a Groundwater Management Plan (2009). The Water Management Plan is equivalent to a Water Conservation Plan since it incorporates water conservation and drought contingency actions through best management practices (BMPs) according to the Agricultural Water Management Council and Reclamation guidelines. These two plans are available upon request.

Provide the following information regarding project planning:

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

Groundwater Management Plan

The project is consistent with many goals and statements in TID's Groundwater Management Plan (GMP) including the following:

- "*Interties could reduce conveyance losses and improve operational flexibility*". (pg 24)

- "*Replacement of some canals with pipelines*" (pg 39 of GMP)
- "*When the Districts have surplus surface water to transfer, they will make all reasonable attempts to transfer it to other agencies within the same groundwater basin. This will be done since a reduction in pumping in the neighboring districts has a beneficial impact on TID and FSWD groundwater levels.*" (pg 39)
- "*upgrade conveyance facilities for capacity and stability.* (pg 43)
- "*the Districts also strive to provide the best facilities for delivery of surface water supplies, since they are used conjunctively with groundwater.*" (pg 43)

Integrated Regional Water Management Plan
The project is also consistent with several Resource Management Strategies listed in the Kings Basin Integrated Regional Water Management Plan (IRWMP). These strategies include Agricultural Water Use Efficiency, Conveyance – Regional/Local, System Reoperation, and Water Transfers. These are discussed in Chapter 6 of the 2012 IRWMP (http://www.krcd.org/water/ukbirwma/docs_gov.html).

Water Management Plan
The proposed project is consistent with and supported by the District's Water Management Plan. According to the TID 2009 Water Management Plan, TID is seeing a shift towards higher value permanent crops, and micro and drip irrigation systems. Specifically, the plan says:

> "*There has also been a trend in the installation of more efficient sprinkler systems in the District, such as drip and micro-sprinkler systems. These sprinkler systems reduce peak demands and can reduce overall water usage through better water management, and, as a result provide greater flexibility in ordering and delivering water. It is expected that the trend of conversion to permanent crops and easier managed irrigation systems will continue in the future.*" (pg 36 of Water Management Plan)

These changes are an important motive for the project, and its ability to deliver a year round and more reliable water supply to portions of TID.

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

Railroad Reservoir
The design for the Railroad Reservoir is complete and the reservoir was under construction in January 2013. The project will include a bird habitat island in the middle of the reservoir.

Intertie Study
TID performed an Intertie Study in 2006 (see **Appendix G**). This study identified several intertie options.

Environmental Documentation
Previous biological studies for the Railroad Reservoir project have identified potential sensitive species in the area. A map showing records of sensitive species from a California database was also prepared and is shown in **Figure 3**.

Consultation with Landowner
The pipeline alignment will pass through private property. TID has contacted the landowner and explained the project and its benefits. The landowner has shown interest in the project and provided a letter of support (see **Appendix F**).

Preliminary Design
A 30% design plan has been developed for the pipeline, pump station, flowmeter, valves and appurtenant structures (see **Appendix A**).

(3) ***Describe how the project conforms to and meets the goals of any applicable planning efforts, and identify any aspect of the project that implements a feature of an existing water plan(s).***

In 2006, the USBR provided a grant of $20,328 to the District to study possible interconnections between TID in up to three locations with James Irrigation District and up to four locations between TID and Fresno Slough Water District. This money was provided through the Water Conservation Field Services Program (#06FG204073). The results were published in a 2008 study entitled "*Tranquillity Irrigation District Three District Interconnection Study*". The table of contents and executive summary of the report are included in **Appendix G**. This study developed ideas that eventually led to the concept for this proposed project.

Subcriteria No. F.2 - Readiness to Proceed

(1) ***Environmental/Plans/Design***
Work completed to date includes initial planning, 30% design, and a preliminary cost estimate. These efforts have helped to eliminate potential fatal flaws and confirmed to TID that the project is worth pursuing. The complete design and specifications are expected to be completed by the project award date (September 30, 2013). Permitting and environmental studies will begin in early 2013. No major environmental problems are anticipated.

(2) ***Project Implementation Plan***
The anticipated project schedule is included in **Appendix B**. It is anticipated that the NEPA environmental compliance process will begin in October 2013 and be complete and approved by January 2014, with construction bidding beginning in March of 2014. The project, including all construction and grant-related reporting, is anticipated to be completed by the end of December 2014.

(3) ***Permitting Requirements***

Permits and approvals needed for the project will primarily include a CEQA Initial Study, NEPA Compliance, and a Fresno County Encroachment Permit to construct the pipeline in a county road right-of-way. The NEPA environmental process will be performed after award of the grant and in coordination with the USBR. No major environmental issues are anticipated, and TID expects they will file a Finding of No Significant Impact (FONSI) for the NEPA compliance. Refer to the section on Environmental and Cultural Resources Compliance (pg 31) for more details on required permits.

Subcriteria No. F.3 - Performance Measures

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 following performance measures will be used to quantify actual benefits during project operations. Flows will generally be recorded on a monthly basis:

Water Conservation. Water conservation will be directly related to the volume of water sent through the intertie that circumvents the canals on the east side of the District. Calculations in **Appendix C** show that estimated savings are 630 AF/year. These are based on anticipated deliveries of 400 AF to the project area from October to March. The actual water conserved will be based on the water delivered each year, and the seepage rates presented in **Appendix C**.

Permanent Crops/Irrigation System Improvements. TID maintains annual records of cropping and irrigation methods. Changes in these two parameters could be directly attributed to the improved water reliability from the intertie. Statistics for the area served by the intertie will be maintained and compared during the first five years the intertie is operational.

Habitat. Habitat enhancement can be measured by the number of birds that utilize the island in Railroad Reservoir for habitat. TID staff will visually observe for the presence of birds on the island. Records will be documented semi-annually for the first two years.

Energy Savings. Energy savings will be based on the water conserved. According to calculations in **Appendix D**, energy conserved will equal 343 kwh/AF conserved. Therefore, the water conserved each year will be multiplied by this value to determine total annual energy savings.

Solar Power. The proposed solar photovoltaic cells will produce year round electricity. The TID energy bills will provide data on energy generated from the panels, which will be compared to the project goals.

(G) ADDITIONAL NON-FEDERAL FUNDING

Subcriterion No. G – Additional Non-Federal Funding

The proposal includes a cost share of 56% of the total project cost, based on the following formula:

$$\frac{\text{Cost Share}}{\text{Total Project Cost}} = \frac{\$381,645}{\$681,645} = 56\%$$

(H) CONNECTION TO RECLAMATION PROJECT ACTIVITIES

Subcriterion No. H – Connection to Reclamation Project Activities

The proposed project will benefit Tranquillity Irrigation District, who has a contract for Reclamation water. The District's surface water contracts include 13,800 AF of CVP project water (Contract No. 14-06-200-701-A-LTR1) and 20,200 AF of Schedule II CVP/riparian water (Contract 14-06-200-701-A). The CVP water is delivered by USBR from the Shasta Division (Delta water) or Friant Division (San Joaquin River water) according to water supply availability. This water is delivered to TID through Reclamation facilities including the Delta-Mendota Canal and Mendota Dam.

In 2009, the USBR provided a grant of up to $612,000 for the construction of two new irrigation production wells in the District. A major benefit of the proposed East-West Intertie is that it will allow this well water to be delivered to the entire district, thus providing a dry-year supply, and year round water for permanent crops, winter crops, frost protection and other cultural practices.

The project will also benefit other Reclamation contractors through water marketing opportunities. In particular, TID plans to market water to James Irrigation District, who possesses a CVP water rights contract (No. 14-06-200-700L).

PERFORMANCE MEASURE FOR QUANTIFYING ACTUAL POST-PROJECT BENEFITS

See Subcriterion F.3 on page 29 for specific information on performance measures.

ENVIRONMENTAL AND CULTURAL RESOURCES COMPLIANCE

(1) ***Will the project impact the surrounding environment (i.e., soil [dust], air, water [quality and quantity], animal habitat, etc.)? Please briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.***

The project will excavate soil to place a ½-mile long 21-inch diameter pipeline. Approximately 3 acres of land will be disturbed. The land is previously disturbed farmland and is currently planted with row crops on one side of the pipeline and orchards on the other side. The project will also include construction of a habitat island in the middle of Railroad Reservoir, an artificial regulation reservoir. The dust generated during Project construction will only be temporary and nothing more than is normal for the agricultural fields in the vicinity.

The California State Water Resources Control Board maintains a database called Geotracker that includes records of known contamination sites. This database was used to look for present or past contamination on or near the project site. **Figure 4** shows that no known contamination exists within one-mile of the site.

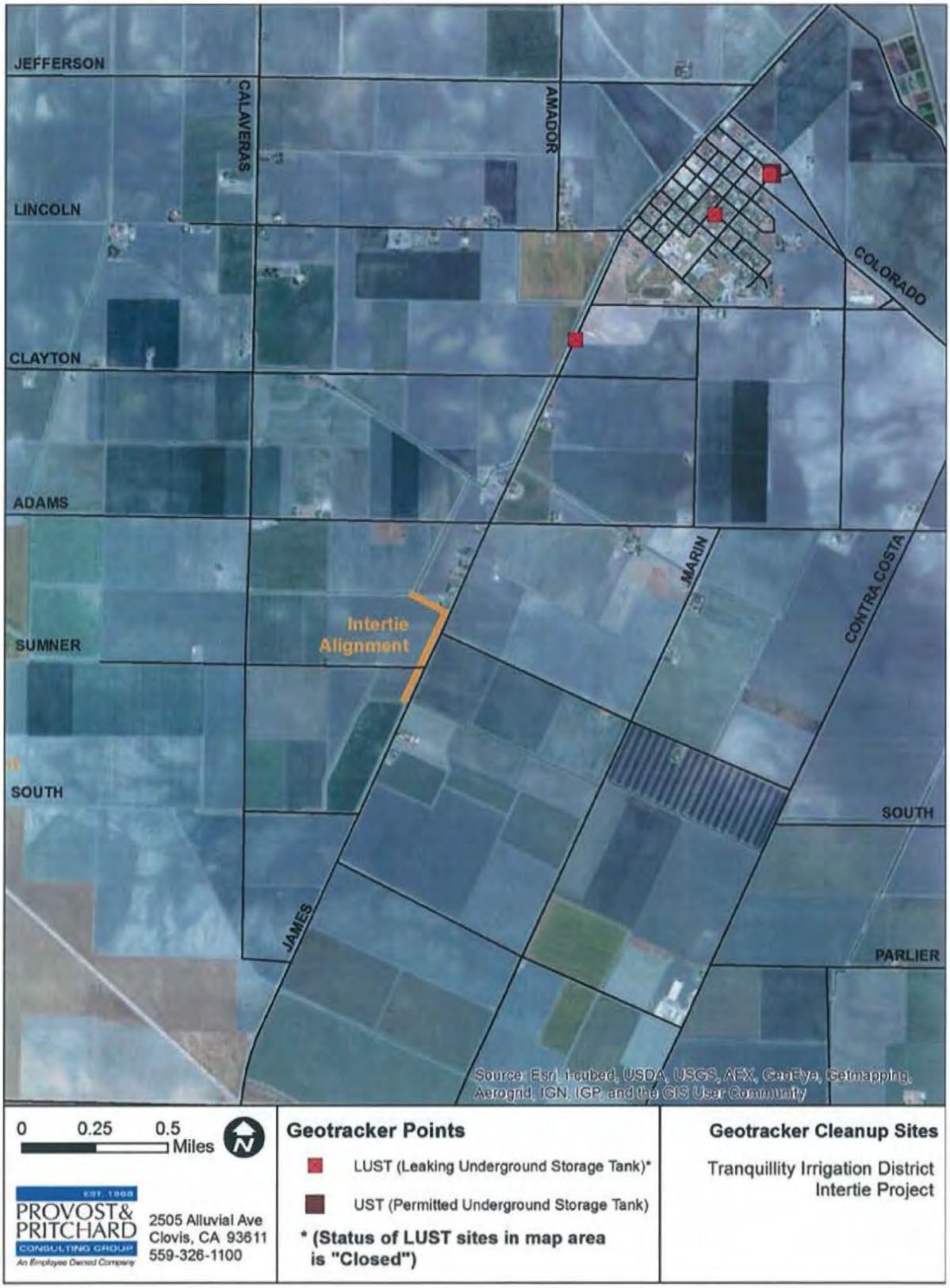

Figure 4 – Known Contamination Sites in Project Vicinity

(2) ***Are you aware of any species listed or proposed to be listed as a Federal endangered or threatened species, or designated Critical Habitat in the project area? If so, would they be affected by any activities associated with the proposed project?***

No special status species are known to be at the proposed project site. In addition, the project will include a linear facility (buried pipeline) and small pump station that will only disturb a small area of land.

Figure 3 in Section 4.C – Benefits to Endangered Species is a map showing recorded sightings of sensitive species in the immediate project vicinity. No sensitive species have been recorded at the site, but a portion of the pipeline alignment falls within the possible range of the Giant Gartner Snake, which is a federally threatened species. The record for the snake is labeled as 'sensitive' to protect the snakes from poachers. As a result, the polygon covers a large area (60 square miles or 38,400 acres) so the precise location of the snake cannot be determined. However, the database notes that the snake is '*Threatened by drainage of Mendota Pool for dam construction*". Mendota Pool is about three miles from the project site, so the snake may not be in the project area.

Prior to completing the design, a qualified biological consultant will perform a Biological Reconnaissance Survey to check for signs of the Giant Garter Snake and other sensitive species. If necessary, mitigation and avoidance measures will be employed to reduce risk to Giant Garter Snakes or other protected species.

(3) ***Are there wetlands or other surface waters inside the project boundaries that potentially fall under Federal Clean Water Act jurisdiction as "waters of the United States"? If so, please describe and estimate any impacts the project may have.***

There are no wetlands or other surface waters inside the project boundaries.

(4) ***When was the water delivery system constructed?***

Irrigation systems were first constructed in the area of the Tranquillity Irrigation District in 1885 and construction and rehabilitation has continued through the present. The TID Towne Ditch is believed to be constructed around 1911 and the Fresno Slough Water District's Fresno Slough Canal is believed to be constructed shortly thereafter.

(5) ***Will the project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.***

The proposed pipeline will connect to existing earth canals that were likely built in the

early 1900's. The connections will have minimal impact on the existing canals.

(6) ***Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.***

Previous inquiries have not identified any buildings, structures or features in the Tranquillity Irrigation District that are listed or eligible for listing on the National Register of Historic Places.

(7) ***Are there any known archeological sites in the proposed project area?***

The only known archeological site in the vicinity of the proposed project area is historic location of 'Fresno City'. 'Fresno City' was located at the head of navigation of the Fresno Slough and existed from approximately 1855 to 1875. There are no traces of it left or signs of existence, nor is the actual location for Fresno City known.

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

The nearby Community of Tranquillity is designated as a disadvantaged community, with residents primarily being farm workers. This project will benefit this community by improving the District's surface water and groundwater supply reliability. In addition, this project would increase the quantity of water available for irrigation in the region, improving the region's agricultural economy.

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

There are no tribal lands in the project's vicinity. Thus, there will be no impacts.

(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?***

The project will consist of a new pumping station and short pipeline that will be buried underground. It is not expected that these tasks will contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species in the area.

REQUIRED PERMITS OR APPROVALS

Applicants must state in the application whether any permits or approvals are required and explain the plan for obtaining such permits or approvals.

The anticipated permits and approvals needed for the project are described below. Both TID and their engineering consultant, Provost & Pritchard Consulting Group, have experience in securing these permits for other projects.

CEQA
A California Environmental Quality Act Initial Study will be prepared for the project. Based on the minimal impacts expected to agricultural land, it is expected that a Negative Declaration or Mitigated Negative Declaration will be filed.

NEPA
TID, in cooperation with USBR, will comply with the National Environmental Policy Act (NEPA), with the USBR being the lead agency. It is anticipated that an Environmental Assessment will be prepared and a Finding of No Significant Impact will be filed.

Fresno County Encroachment Permit
A Fresno County Encroachment Permit will be needed since part of the pipeline will be placed in County Road right-of-way. The county has historically granted these permits as long as all regulations are met.

Grading permit
In Fresno County, government agencies are exempt from the County Grading Ordinance, and therefore TID will not need a grading permit for the project.

Storm Water Pollution Prevention Plan (SWPPP)
The project will be exempt from a Storm Water Pollution Prevention Plan since it will disturb less than 5 acres and construction will be performed in the dry season. TID will apply for a waiver from the Regional Water Quality Control Board.

Dust Control Plan
The project will be exempt from a Dust Control Plan (DCP) since it will disturb less than 5 acres. The contractor will be responsible for filling out the paperwork for a waiver.

Water rights/transfer agreements
TID and any potential partners will secure the appropriate approvals for water transfers, exchanges, etc., that will be needed for water marketing. Water transfers will not be done as part of this grant application, but will be performed after the project is constructed.

Pipeline Easement Agreements

Based on a boundary survey, easement grant agreements will be prepared by TID, provided to landowners for approval, and executed to secure the necessary pipeline easements for the project. The impacted landowner has provided a letter indicating his willingness to provide an easement, and his overall support for the project (see **Appendix F**).

OFFICIAL RESOLUTION

Appendix E includes a resolution authorizing the preparation of this application and funding for the District's cost share. This resolution was adopted at the December 18, 2012 TID Board meeting. The Board of Directors is comprised of local landowners, so the resolution will also represent support for the project from local farmers.

PROJECT BUDGET

(1) ***A description of how the applicant will make its contribution to the cost share requirement, such as monetary and/or in-kind contributions and source funds contributed by the applicant (e.g., reserve account, tax revenue, and/or assessments).***

A copy of Tranquillity Irrigation District's most recent audit statement from December 2011 is included in **Appendix H**. The report shows that the District has $1.9 million in cash and cash equivalents that can be used as cost share. This exceeds the amount proposed for the Tranquillity ID cost share of $381,645. This money is not currently dedicated for other projects, recurring expenses, or debt payments, and is therefore available for use on the proposed project. The District may also use its own forces for portions of the project's construction.

(2) ***Describe any in-kind costs incurred before the anticipated project start date that the applicant seeks to include as project costs.***

(a) What project expenses have been incurred

Project expenses to date have included engineering fees from a local consultant to prepare the 30% design drawings and cost estimate. Between January 2013 and June 1, 2013 it is anticipated that the final design, project specifications, final engineering estimate, and some permitting will be completed.

(b) How they benefitted the project

The in-kind services have benefitted the project by identifying the project features, capital costs, and project benefits.

(c) The amount of expense
The expenses that will be incurred prior to the project start date (assumed to be October 1, 2013) are estimated to be $78,000 for planning, surveying, design and permitting efforts.

(d) The date of cost incurrence
These costs will be incurred from September 2012 to September 30, 2013.

(3) ***Provide the identity and amount of funding to be provided by funding partners, as well as the required letters of commitment.***

The project will not include any funding partners.

(4) ***Describe any funding requested or received from other Federal partners. Note: Federal funding may not be counted towards the applicant's 50 percent cost share for the Challenge Grant Implementation Program project unless otherwise allowed by statute.***

The Tranquillity Irrigation District has not sought other federal funding for the project.

(5) ***Describe any pending funding requests that have not yet been approved, and explain how the project will be affected if such funding is denied.***

The project is not dependent on other funding requests.

Table 8 – Summary of non-Federal and Federal funding sources

Funding Source	Funding Amount	Percentage
Non-Federal Entities		
1. Tranquillity ID	$381,645	56%
Non-Federal Subtotal:	$381,645	56%
Other Federal Entities	$0	0%
Requested Reclamation Funding:	$300,000	44%
Total Project Funding:	$681,645	100%

BUDGET PROPOSAL

BUDGET ITEM DESCRIPTION	COMPUTATION		RECIPIENT FUNDING	RECLAMATION FUNDING	TOTAL COST
	$/Unit and Unit	Quantity			
SALARIES AND WAGES					
FRINGE BENEFITS					
TRAVEL					
EQUIPMENT					
SUPPLIES/MATERIALS					
CONTRACTUAL/ CONSTRUCTION					
Project Administration	$17,760	1	$17,760	$0	$17,760
Engineering Design	$59,530	1	$59,530	$0	$59,530
Construction Management	$26,740	1	$26,740	$0	$26,740
Construction	$525,500	1	$225,500	$300,000	$525,500
ENVIRONMENTAL & REGULATORY COMPLIANCE (under contractual)	$43,365	1	$43,365	$0	$43,365
OTHER	$0		$0	$0	$0
Easement Acquisition	$8,750	1	$8,750	$0	$8,750
TOTAL DIRECT COSTS	$681,645	1	$381,645	$300,000	$681,645
INDIRECT COSTS - 0%	$0		$0	$0	$0
TOTAL PROJECT COSTS			$381,645	$300,000	$681,645

Construction costs include a 15% contingency. See estimates in **Appendix I** for more details.

BUDGET NARRATIVE

Detailed cost estimates for the project can be found in **Appendix I**.

Salaries and Wages – Since it is anticipated that the District will not perform the construction, there will be no District Salaries and Wages accrued. However, the District may elect to perform a portion of the construction.

Fringe Benefits – Since it is anticipated that the District will not perform the construction, there will be no District Fringe Benefits accrued.

Travel – Since it is anticipated that the District will not perform the construction, there will be no District travel expenses accrued.

Equipment – It is anticipated that all the heavy equipment that will be used in this Project will be supplied by the awarded contractor.

Materials and Supplies – All Material and Supply costs associated with the project are included in the contractual category. All material and supplies will be included under the awarded contract.

Contractual – TID plans to hire a contractor to perform the intertie construction. The construction costs were estimated by the District's engineering consultant, using unit prices from similar recent jobs, and judgment of constructability factors. TID will also contract with a local engineering consulting firm to complete the design and provide construction oversight. The rates shown for all contractual categories are for budgetary purposes; the actual rates in effect at the time the work is performed will be charged to the Project, but the total contract cost for engineering services will not increase.

Environmental and Regulatory Compliance Costs – A portion of the budget was set aside for environmental and regulatory compliance. These costs will be incurred by a consulting engineer and USBR staff. The total estimated costs are $43,365 which represents 6% of the total estimated Project cost.

Reporting – Reporting costs include consultant time to prepare semi-annual reports and a final report. The total cost was estimated based on person-hours and billing rates. These costs are included in the contractual category.

Other – A 15% contingency was added for the construction of the project primarily for uncertainty of costs at the time of construction, but also for uncertainty in quantities, neglected items and unforeseen circumstances. Contingency costs were only applied to the contractual construction efforts of the project (pipeline, pumping station, etc.). This contingency is considered appropriate based on the level of design currently completed (30%).

Indirect Costs – The Project will not have indirect costs.

Total Cost – Total Project Cost is estimated to be $681,645. The Federal share will be $300,000 (44% of the Total Project cost); and the applicant share will be $381,645 (56% of the Total Project Cost).

OMB Number: 4040 -38
Expiration Date: 06/30/2014

BUDGET INFORMATION - Construction Programs

NOTE: Certain Federal assistance programs require additional computations to arrive at the Federal share of project costs eligible for participation. If such is the case, you will be notified.

COST CLASSIFICATION	a. Total Cost	b. Costs Not Allowable for Participation	c. Total Allowable Costs (Columns a-b)
1. Administrative and legal expenses	$ 17,760	$ 0	$ 17,760
2. Land, structures, rights-of-way, appraisals, etc.	$ 8,750	$ 0	$ 8,750
3. Relocation expenses and payments	$ 0	$ 0	$ 0
4. Architectural and engineering fees	$ 102,895	$ 0	$ 102,895
5. Other architectural and engineering fees	$ 0	$ 0	$ 0
6. Project inspection fees	$ 26,740	$ 0	$ 26,740
7. Site work	$ 0	$ 0	$ 0
8. Demolition and removal	$ 0	$ 0	$ 0
9. Construction	$ 456,900	$ 0	$ 456,900
10. Equipment	$ 0	$ 0	$ 0
11. Miscellaneous	$ 0	$ 0	$ 0
12. SUBTOTAL *(sum of lines 1-11)*	$ 613,045	$ 0	$ 613,045
13. Contingencies	$ 68,600	$ 0	$ 68,600
14. SUBTOTAL	$	$ 0	$
15. Project (program) income	$ 0	$ 0	$ 0
16. TOTAL PROJECT COSTS *(subtract #15 from #14)*	$ 681,645	$ 0	$ 681,645

FEDERAL FUNDING

17. Federal assistance requested, calculate as follows: (Consult Federal agency for Federal percentage share.) Enter the resulting Federal share.	Enter eligible costs from line 16c Multiply X 44.0 %	$ 300,000

TRANQUILLITY IRRIGATION DISTRICT

WATERSMART GRANT APPLICATION

EAST-WEST INTERTIE WATER CONSERVATION PROJECT

APPENDIX C – WATER CONSERVATION CALCULATIONS

Tranquillity Irrigation District
East-West Intertie Water Conservation Project
Water Conservation Calculations

Results of Seepage Tests (August 1991)

(Seepage in inches/day)

Description	North Ditch	Farmer ditch
Width (ft)	12	7.75
Length(ft)	2060	750
Day 1	12.3	4.5
Day 2	4.8	3.3
Day 3	2.5	2.3
Day 4	**1**	1.5
Day 5	**1**	1
Day 6	**1**	1
Day 7	**1**	**1**
Average	3.4	2.1

Bold values are assumed due to lack of data

Assume average infiltration rate of 2.8 inches/day

Evaporation Losses

Month	ETo (inches)
Jan	1.34
Feb	2.1
Mar	4.13
Apr	6.14
May	8.23
Jun	8.68
Jul	8.92
Aug	8.2
Sep	6.36
Oct	4.48
Nov	2.34
Dec	1.33
Total	62.25

Canal Characteristics

Length	2.7 miles
Width	85 ft
Wetted Width	63 ft
Wetted Area	21 acres

Evaporation

October to March	15.72 inches
Delivery Period	7.86 inches
Wetted Area	21
Total Evap Losses	**14 AF**

Delivery Period

Months	Oct - March
Total Days	182
Frequency	Every Other Week
Delivery Days	91

Dead Storage Losses

Bottom Width	45 ft
Top Width	48 ft
Depth	1 ft
Length	2.7 miles
Volume	15 AF
No. of Occurrences (Oct - March)	12
Total Volume	**183 AF**

Total Percolation

(Seepage Rate x Wetted Area x Delivery Period)

Percolation = **438** AF

Total Water Conserved = Seepage Losses + Evaporation + Dead Storage = 634 AF/year

TRANQUILLITY IRRIGATION DISTRICT

WATERSMART GRANT APPLICATION

EAST-WEST INTERTIE WATER CONSERVATION PROJECT

APPENDIX D – WELL AND LIFT PUMP OPERATION COSTS

Tranquillity Irrigation District
WaterSMART

East-West Intertie Project
Intertie Pumping Costs

Q (cfs)	Q (gpm)	Bowl (ft)	1 Stage (ft)	Stated Bowl Efficiency	Pump Stage (hp)	Power at Meter (hp)	Power at Meter (kw)
15	6,735	20.0	20.0	82.0%	41	44	32.7

Shaft Length =	10	ft
Shaft Losses per cf =	1.5	hp/100ft
Assumed Motor Eff. =	95%	

Q (gpm)	Time (hr/af)	Power (hp)	Power (kw)	Power per Acre-Foot (kwh/af)	PUMPING COST @ $0.13 per kwh ($ per af)
6,735	0.806	44	32.7	**26.4**	$3.43

New Lift Pump Flowrate	2,460	AF/year	(1/2 demands for 1,320 acres, 2.8 AF/acre, and 75% irrigation efficiency)
New Energy Demand	64,845	kw/hours	
Additional Energy Costs	$8,430		

Tranquillity Irrigation District
WaterSMART

East-West Intertie Project
Typical Well Pumping Costs

Q (cfs)	Q (gpm)	Bowl (ft)	1 Stage (ft)	Stated Bowl Efficiency	Pump Stage (hp)	at Meter Power at Meter (hp)	Power at Meter (kw)
4.5	2,021	200.0	200.0	70.0%	146	171	127.7

Shaft Length =	550	ft
Shaft Losses per cf =	1.5	hp/100ft
Assumed Motor Eff. =	90%	

Q (gpm)	Time (hr/af)	Power (hp)	Power (kw)	Power per Acre-Foot (kwh/af)	PUMPING COST @ $0.13 per kwh ($ per af)
2,021	2.688	171	127.7	**343.1**	$44.61

TRANQUILLITY IRRIGATION DISTRICT

WATERSMART GRANT APPLICATION

EAST-WEST INTERTIE WATER CONSERVATION PROJECT

APPENDIX E – BOARD RESOLUTION

RESOLUTION NO. 2012-06

RESOLUTION OF THE
BOARD OF DIRECTORS
TRANQUILLITY IRRIGATION DISTRICT

FOR A GRANT FROM THE UNITED STATES BUREAU OF RECLAMATION WATERSMART: WATER AND ENERGY EFFICIENCY GRANT PROGRAM

Whereas, the Tranquillity Irrigation District is a public agency and is eligible to submit an application for funding from the WaterSMART: Water and Energy Efficiency Grant Program;

Whereas, the Tranquillity Irrigation District would like to construct a pipeline intertie between the eastern and western distribution systems (East-West Intertie Water Conservation Project), and have the project partially funded with monies from this grant program;

Whereas, Tranquillity Irrigation District will commit to the financial and legal obligations associated with receipt of financial assistance under the grant program;

Whereas, the Tranquillity Irrigation District Board of Directors has reviewed and supports the proposed application;

Whereas, the Tranquillity Irrigation District has the full capability to provide the amount of funding and/or in-kind contributions specified in the funding plan;

Whereas, if selected for a grant, the Tranquillity Irrigation District will work with United States Bureau of Reclamation to meet established deadlines for entering into a cooperative agreement.

RESOLVED by the Board of Directors of the Tranquillity Irrigation District that pursuant and subject to all of the terms and provisions of the WaterSMART: Water and Energy Efficiency Grant Program Application, and amendments thereto, application by this District be made to the United States Bureau of Reclamation to obtain a grant to develop a pipeline intertie and associated facilities.

The President of the Board of Directors and/or General Manager is hereby authorized and directed to prepare the necessary data, make investigations, sign, and file such application with the United States Bureau of Reclamation.

PASSED AND ADOPTED at a regular meeting of the Board of Directors of the Tranquillity Irrigation District on Dec. 18, 2012.

AYES: 3

NOES: 0

ABSENT: 0

ABSTAIN: 0

The foregoing resolution is hereby adopted.

Jerome Salvador
President of the Board of Directors

ATTEST:

Elizabeth Reeves
Secretary-Treasurer

TRANQUILLITY IRRIGATION DISTRICT

WATERSMART GRANT APPLICATION

EAST-WEST INTERTIE WATER CONSERVATION PROJECT

APPENDIX F – LETTERS OF SUPPORT

KRCD
Kings River Conservation District

4886 East Jensen Avenue
Fresno, California 93725

Tel: 559-237-5567
Fax: 559-237-5560

www.krcd.org

January 8, 2013

Mr. Danny Wade, General Manager
Tranquility Irrigation District
P.O. Box 487
Tranquility, CA 93668

Re: Letter of Support for Tranquility Irrigation District WaterSMART Grant Application

Dear Mr. Wade:

Kings River Conservation District (KRCD) understands that Tranquility Irrigation District (Tranquility I.D.) is applying for funding from the WaterSMART grant program aimed at achieving a sustainable water strategy to meet the nation's water needs. The funding will be used for a project to construct a pipeline intertie that will connect the two separate distribution systems in Tranquility I.D. The project will provide greater operational flexibility, improve water reliability, and reduce seepage losses by reducing the conveyance length for certain water deliveries.

KRCD supports the Tranquility I.D. project and the WaterSMART grant application. As a leading resource agency, KRCD appreciates the importance of conserving local water sources and managing the resource so it is available during periods of higher demand. We think this is an excellent effort and look forward to seeing the completion of the project.

Sincerely,

David Orth,
General Manager

SPS/sjs

L13-0007
File: 400.10

December 28, 2012

Mr. Danny Wade
Tranquillity Irrigation District
PO Box 487
Tranquillity, CA 93668

Re: Tranquillity Irrigation District Application for WaterSMART Grant
East-West Intertie Project

Dear Danny:

I am writing this letter to express our support for the efforts of the Tranquillity Irrigation District to develop the East-West Intertie Project. This project will include a pipeline intertie between the eastern and western distribution systems in the District. The project will offer significant improvements in water management, operational flexibility and water reliability. As a community that relies strongly on the agricultural industry, we strongly support projects that will improve farm productivity and water reliability. We feel that this would be an excellent use of Reclamation and District funds.

Respectfully,

Keith Eubanks, President
Chamber of Commerce
Community of Tranquillity

JAMES IRRIGATION DISTRICT

Incorporated February 16, 1920
8749 Ninth Street
Post Office Box 757
San Joaquin, California 93660-0757

BOARD OF DIRECTORS
Michael A. Carvalho, President
Robert Motte, Vice-President
Thomas W. Chaney
Micah H. Combs
Kenneth R. Hale

John Mallyon, General Manager
Donna Hanneman, Secretary/Treasurer

Telephone: (559) 693-4356
Facsimile: (559) 693-4357

January 7, 2013

Danny Wade, Manager
TRANQUILLITY IRRIGATION DISTRICT
Post Office Box 487
Tranquillity, CA 93668

SUBJECT: **LETTER OF SUPPORT**
Tranquillity Irrigation District - WaterSMART Grant Application

Dear Danny:

James Irrigation District is aware of the Tranquillity Irrigation District's plan to submit an application for grant funds for the development of an intertie to connect your two separate distribution systems. This project will improve water reliability and conserve water by reducing seepage losses. James Irrigation District is in support of your District's efforts to conserve and better manage water resources in the region. This support is provided since James Irrigation District is a neighboring agency sharing the same groundwater and surface water sources. We believe that it is crucial that regional water resources are used as efficiently as possible. Please accept our support for your proposed project.

Sincerely,

JAMES IRRIGATION DISTRICT

John Mallyon
GENERAL MANAGER

JM:dh

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RECLAMATION DISTRICT NO. 1606

Incorporated May 9, 1914

8749 Ninth Street
Post Office Box 757
San Joaquin, California 93660-0757

John Mallyon, Manager
Donna Hanneman, Secretary
Telephone: (559) 693-4356
Facsimile: (559) 693-4357

January 7, 2013

Danny Wade, Manager
TRANQUILLITY IRRIGATION DISTRICT
Post Office Box 487
Tranquillity, CA 93668

SUBJECT: **LETTER OF SUPPORT**
Tranquillity Irrigation District - WaterSMART Grant Application

Dear Danny:

Reclamation District No. 1606 ("RD1606") is very supportive of the Tranquillity Irrigation District's efforts to conserve and better manage water supplies in this region. We are familiar with and support your latest proposed project, which includes construction of an intertie to connect your two separate distribution systems.

Reclamation District No. 1606 is also a U.S. Bureau of Reclamation contractor, and while sharing much of the same surface supplies, we have common interests in protecting our water resources. Stewardship of the region's water supplies is a key to the future viability of this area's economy. The Tranquillity Irrigation District's application for grant funds would be an investment in our future.

Sincerely,

RECLAMATION DISTRICT NO. 1606

John Mallyon
MANAGER

JM:dh

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Jerry Olivera
PO Box 668
Tranquillity, CA 93668

January 15, 2013

Mr. Danny Wade
General Manager
Tranquillity Irrigation District
25390 W. Silveria Street
Tranquillity, Ca 93668

Dear Mr. Wade:

I am a long-time customer of the Tranquillity Irrigation District, and I am writing to express my full support for the proposed East-West Intertie Water Conservation Project. Given the current water issues our area is faced with, I understand we need to make every effort to conserve water when possible.

I understand that the current project alignment lies within my land (APN's 030-420-019 and 030-180-041), and I pledge to work with the District to make amicable arrangements to implement the project for the good of the District and the region.

Sincerely,

Jerry Olivera

TRANQUILLITY IRRIGATION DISTRICT

WATERSMART GRANT APPLICATION

EAST-WEST INTERTIE WATER CONSERVATION PROJECT

APPENDIX G – INTERTIE FEASIBILITY STUDY

2006 Water Conservation – Field Services Program

Final Program Performance Report

Grant #:06FG204073

Tranquillity Irrigation District – Three District Interconnection Study

Reporting Period: 1/31/08 to 12/31/08

Prepared for:

Maria E. Castaneda
Grants and Cooperative Agreements Officer
U. S. Bureau of Reclamation
Mid Pacific Region - Acquisition Services
2800 Cottage Way
Sacramento, CA 95825-1898

Prepared by:

Provost & Pritchard Consulting Group
Clovis, California

Date 12/23/08

TABLE OF CONTENTS

EXECUTIVE SUMMARY

In 2006 Tranquillity Irrigation District (TID or Tranquillity) applied for a US Bureau of Reclamation (Reclamation or Bureau) Water Conservation Field Services Program Grant to investigate 7 (seven) possible points of interconnection between Tranquillity and Fresno Slough Water District (FSWD or Fresno Slough), as well as Tranquillity and James Irrigation District (JID or James) with the purpose of reducing water losses and increasing flexibility of operations (see **Plate 1** for locations).

Water would be conserved primarily by reducing seepage and evaporation losses by decreasing the length that water has to travel thru District facilities, and also the potential to increase flexibility of water delivery and operations especially in outer areas of the Districts. It was estimated that 25 acre-feet/year could be conserved for each mile of shortened distance that the water travels.

In 2007 Tranquillity requested from Reclamation and was granted an extension of the project deadline from 12/31/2007 to 12/31/2008.

Progress reports along with payment requests were submitted to the Bureau in August of 2007 and February of 2008.

Through field visits, topographic surveys, capacity studies and meetings with the districts all of the possible points of interconnection (seven total) were investigated. Interconnections 1 thru 4 were between Fresno Slough and Tranquillity, with one of the connections existing at the time of the study. Interconnections 5 thru 7 were between Tranquillity and James and two of the connections already existing but were evaluated in greater detail.

Preliminary designs were completed and conceptual plans were prepared for the proposed points of interconnection. The findings for the study are summarized in **Table 1.**

Table 1. Interconnection Study Summary

Inter-connection #	Inter-connection Name	Design Flow (cfs)	Flow Direction	Approx. Cost	Existing Difference in Water Surfaces	Flow Method	Existing Facility
1	Lincoln	5	FSWD to TID	N/A	1.59'	Gravity	Yes
2	Jefferson	18	FSWD to TID	$142,600	0.97'	Gravity	No
3	American	7	FSWD to TID	$43,000	2.59'	Gravity	No
4	Railroad	20	FSWD to TID	$235,000	1.71'	Lift Pump	No
5	Lateral J	15	JID to TID	$62,300	6.58'	Lift Pump	Yes
6	E-Stub	15	JID to TID	N/A	0.13'	Gravity	Yes
7	Lateral E/C	20	TID to JID	$153,600	1.00'	Gravity	No

1. PROJECT DESCRIPTION

The project was a study of seven possible interconnections between Tranquillity Irrigation District (TID or Tranquillity) and neighboring Districts Fresno Slough Water District (FSWD or Fresno Slough) and James Irrigation District (JID or James). If

TRANQUILLITY IRRIGATION DISTRICT

WATERSMART GRANT APPLICATION

EAST-WEST INTERTIE WATER CONSERVATION PROJECT

APPENDIX H – TRANQUILLITY IRRIGATION DISTRICT AUDITED FINANCIAL STATEMENT

TRANQUILLITY IRRIGATION DISTRICT
STATEMENT OF NET ASSETS
December 31, 2011
(With Summarized Comparative Information For December 31, 2010)

	2011	2010
Assets		
Current Assets		
Cash and cash equivalents	$ 1,943,908	$ 2,116,601
Investment in securities	620,988	610,350
Accounts and other receivables	62,843	41,295
Materials and supplies inventory	21,718	26,638
Prepaid expenses and other current assets	88,585	87,856
Total current assets	2,738,042	2,882,740
Utility, plant, net of accumulated depreciation	7,256,331	6,380,157
Other Assets		
Notes receivable	-	3,198
Bond issuance and refunding fees, net of accumulated amortization	4,196	10,491
State administrative fee, net of accumulated amortization	17,345	20,814
Contributed Funds for DHCCP Project	429,916	429,916
Contributed funds for Intertie Project	12,259	12,259
Total other asets	463,716	476,678
Total assets	$ 10,458,089	$ 9,739,575
Liabilities		
Current liabilities		
Accounts payable and accrued expenses	$ 163,958	$ 89,681
Customers deposits and credit balances	37,814	28,561
Deposits	12,030	11,805
Note payable	-	55,586
Accrued vacation and sickleave	11,472	10,836
Current maturities of long-term debt	83,376	167,322
Total current liabilities	308,650	363,791
Long-term debt, net of current maturities	784,972	782,365
Deferred revenue	78,722	78,531
Total liabilities	1,172,344	1,224,687
Net Assets		
Invested in capital assets, net of related debt	6,817,899	5,860,586
Unrestricted	2,467,846	2,654,302
Total net assets	$ 9,285,745	$ 8,514,888

See accompanying notes to financial statements

TRANQUILLITY IRRIGATION DISTRICT

WATERSMART GRANT APPLICATION

EAST-WEST INTERTIE WATER CONSERVATION PROJECT

APPENDIX I – DETAILED COST ESTIMATES

TRANQUILLITY IRRIGATION DISTRICT
EAST-WEST INTERTIE WATER CONSERVATION PROJECT

ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Amount
Mobilization/Demobilization					
1	Mobilization/demobilization, bonds & insurance, worker protection, miscellaneous facilities and operations - 10%	1	LS	$41,500	$41,500
Concrete					
2	Precast Turnout	16.8	CY	$1,000	$16,800
3	Precast Pump Structure	8.5	CY	$1,000	$8,500
Pipeline					
4	48-inch Ø Concrete Pipe	20	LF	$192	$3,800
5	21-inch Ø PVC Pipe	2,350	LF	$84	$197,400
6	Steel Gooseneck Discharge	1	EA	$4,000	$4,000
7	Steel Pump Discharge and Appurtenances	1	EA	$21,000	$21,000
8	Pipeline Easement	1	EA	$8,750	$8,800
Mechanical					
9	Flowmeters (18")	1	EA	$2,000	$2,000
10	Pump and Motor (15 CFS)	1	EA	$35,000	$35,000
11	Slide Gate	1	EA	$5,000	$5,000
Solar Panels					
	Photovoltaic Cells	13.5	kW	$4,480	$60,500
Miscellaneous					
12	Powerline Extension	700	FT	$57	$39,900
13	Habitat Island	900	CY	$3	$2,700
14	SCADA Integration	1	EA	$10,000	$10,000
				Construction Subtotal	$456,900
				Contingency (15%)	$68,600
				Estimated Total	**$525,500**

Presented by:
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4th Day Energy
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Solar Electric Investment, Incentive and Energy Savings Analysis

Proposal for:
Tranquility Irrigation District

January 10, 2013

Site Location:
25390 W Silvieria Street
Tranquility, CA 93668

Utility: PG&E
Current Rate Schedule: AG-5 Rate C,F -- Agricultural

Historical Usage: 780,000 kWh/yr

System Information		Cost Information	
Proposed System DC Size	**13.5 kW DC (STC)**	Proposed System Cost per rated Watt	**$4.45 per DC (STC) Watt**
System's CEC AC Rating	**11.5 kW AC (CEC)**	Estimated Federal Tax Bracket	**28.0%**
55 Upsolar UP-M245P modules and 55 Enphase Energy M215-60-2LL-S2x inverters		Current Utility Rate are as high as	**9.3 ¢/kWh**
Location's Avg Sun Hours	**5.7 Sun Hours**	Current Utility Rate Average	**9.3 ¢/kWh**
Estimated Annual Production	**21,595 kWh/yr**	**Estimated First Year Utility Savings**	**$2,025 per year**

Gross System Cost with Sales Tax		**$60,000**
	Rebate: $0.00 per CEC AC Watt	**$0**
		$0
Estimated Fees NOT included in system contract price		**$700**
		$0
		$0
		$0
PBI Incentive		**$1**
Net System Cost with Tax Benefits & Incentives		**$60,700**

ESTIMATE OF TOTAL PROJECT COST

Tranquillity Irrigation District
East-West Intertie Water Conservation Project

									Subconsulting Labor Costs				Contracted Costs			Totals	
	Principal Engineer	Senior Engineer	Biologist/Planner	Associate Engineer	Engineer-In-Training	Land Surveyor	Two Man GPS Survey Crew	Geotechnical Subconsultant (Geotech. Investigation and Materials Testing)	Attorney/ Appraiser/ Real Property	Biological/Archeological Subconsultant	Permitting Fees	Bureau of Reclamation	Contracted Labor, Material & Equipment Cost	Contingencies	Total Engineering Hours	Total Cost
STAFF HOURS																
Rate / Hour	$170	$135	$120	$115	$90	$120	$210							15%		
Task 1 Project Administration																
Task 1.1 Bureau Reporting & Contract Management	8	20	0	40	20	0	0	$0	$0	$0	$0	$0	$0	$0	**88**	**$10,460**
Task 1.2 Draft Project Report	4	8	0	24	8	0	0	$0	$0	$0	$0	$0	$0	$0	**44**	**$5,240**
Task 1.3 Final Project Report	2	4	0	4	8	0	0	$0	$0	$0	$0	$0	$0	$0	**18**	**$2,060**
															Task 1 Total =	**$17,760**
Task 2 CEQA & NEPA Documentation/Permitting																
Task 2.1 Environmental Compliance (CEQA)	0	8	140	0	0	0	0	$0	$0	$0	$2,100	$0	$0	$0	**148**	**$19,980**
Task 2.2 Environmental Compliance (NEPA)	0	0	20	0	0	0	0	$0	$0	$0	$0	$5,000	$0	$0	**20**	**$7,400**
Task 2.3 Biological Site Survey & Mitigation Measures	0	0	8	0	0	0	0	$0	$0	$4,700	$0	$0	$0	$0	**8**	**$5,660**
Task 2.4 Cultural Resources Survey	0	4	0	0	0	0	0	$0	$0	$3,900	$0	$0	$0	$0	**4**	**$4,440**
Task 2.5 Power Connection Permitting	0	0	0	32	0	0	0	$0	$0	$0	$0	$0	$0	$0	**32**	**$3,680**
Task 2.6 Fresno County Encroachment Permit	0	0	0	8	0	0	0	$0	$0	$0	$500	$0	$0	$0	**8**	**$1,420**
Task 2.7 Regional Water Quality Control Board: SWPPP Waiver	0	0	0	4	0	0	0	$0	$0	$0	$325	$0	$0	$0	**4**	**$785**
															Task 2 Total =	**$43,365**
Task 3 Engineering Design																
Task 3.1 Topographic and Boundary Survey	0	0	0	6	0	12	32	$0	$0	$0	$0	$0	$0	$0	**50**	**$8,850**
Task 3.2 Easement Acquisition	0	0	0	4	0	0	0	$0	$8,750	$0	$0	$0	$0	$0	**4**	**$9,210**
Task 3.3 Utility Research	0	0	0	0	8	0	0	$0	$0	$0	$0	$0	$0	$0	**8**	**$720**
Task 3.4 Structural Design	0	12	0	4	0	0	0	$0	$0	$0	$0	$0	$0	$0	**16**	**$2,080**
Task 3.5 30% Design	10	20	0	50	20	0	0	$0	$0	$0	$0	$0	$0	$0	**100**	**$11,950**
Task 3.6 50% Design	4	8	0	40	20	0	0	$0	$0	$0	$0	$0	$0	$0	**72**	**$8,160**
Task 3.7 90% Design	8	16	0	50	20	0	0	$0	$0	$0	$0	$0	$0	$0	**94**	**$11,070**
Task 3.8 Generation of Specifications and Final Design	2	4	0	20	20	0	0	$10,000	$0	$0	$0	$0	$0	$0	**46**	**$14,980**
Task 3.9 Engineers Cost Estimate	2	0	0	8	0	0	0	$0	$0	$0	$0	$0	$0	$0	**10**	**$1,260**
															Task 3 Total =	**$68,280**
Task 4 Construction Management																
Task 4.1 Project Bid and Award	2	0	0	12	12	0	0	$0	$0	$0	$0	$0	$0	$0	**26**	**$2,800**
Task 4.2 Construction Staking	0	0	0	4	0	0	10	$0	$0	$0	$0	$0	$0	$0	**14**	**$2,560**
Task 4.3 Construction Inspection/Miscellaneous Engineering	4	0	0	96	20	0	0	$5,000	$0	$0	$0	$0	$0	$0	**120**	**$18,520**
Task 4.4 Record Drawings	0	0	0	4	8	0	8	$0	$0	$0	$0	$0	$0	$0	**20**	**$2,860**
															Task 4 Total =	**$26,740**
Task 5 Construction																
Task 5.1 East-West Intertie	0	0	0	0	0	0	0	$0	$0	$0	$0	$0	$456,900	$68,600	**0**	**$525,500**
															Task 5 Total =	**$525,500**
Total Hours:	46	104	168	410	164	12	50									
Total Cost:	$7,820	$14,040	$20,160	$47,150	$14,760	$1,440	$10,500	$15,000	$8,750	$8,600	$2,925	$5,000	$456,900	$68,600	**492**	**$681,645**

TOTAL ESTIMATED PROJECT COST: **$681,645**