STEVINSON
water district

Lateral Canal Pipelining Project

2004 Water Use Efficiency Proposal Solicitation Package

Submitted to the California Department of Water Resources
Office of Water Use Efficiency

January 11, 2005

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Project Information Form

Applying for:	❑ Urban	☑ Agricultural
1. (Section A) **Urban or Agricultural Water Use Efficiency Implementation Project**	❑(a) implementation of Urban Best Management Practice, #_____ ☑ (b) implementation of Agricultural Efficient Water Management Practice, #5 Line or pipe ditches and canals ❑ (c) implementation of other projects to meet California Bay-Delta Program objectives, Targeted Benefit # or Quantifiable Objective #, if applicable _____ ❑ (d) Specify other: _____	
2. Section B) **Urban or Agricultural Research and Development; Feasibility Studies, Pilot, or Demonstration Projects; Training, Education or Public Information; Technical Assistance**	❑ (e) research and development, feasibility studies, pilot, or demonstration projects ❑ (f) training, education or public information programs with statewide application ❑ (g) technical assistance ❑ (h) other	
3. Principal applicant (Organization or affiliation):	Stevinson Water District	
4. Project Title:	Lateral Canal Piping Project	
5. Person authorized to sign and submit proposal and contract:	Name, Title Mailing Address Telephone Fax E-mail	Robert Kelley, General Manager Stevinson Water District 25079 W. River Road Stevinson, CA 95374 209-634-4908 209-634-2601 wildcatkel@onemain.com
6. Contact person (if different):	Name, Title Mailing Address Telephone Fax E-mail	
7. Grant funds requested (dollar amount): *(from Table C-1, column VI)*		$896,000
8. Applicant funds pledged (dollar amount):		$107,200
9.Total project costs (dollar amount): *(from Table C-1, column IV, row n)*		$1,003,200

10. Percent of State share requested (%) *(from Table C-1)* — 89%
11. Percent of local share as match (%) *(from Table C-1)* — 11%
12. Is your project locally cost effective?

    Locally cost effective means that the benefits to an entity (in dollar terms) of implementing a program exceed the costs of that program within the boundaries of that entity.

    (If yes, provide information that the project in addition to Bay-Delta benefit meets one of the following conditions: broad transferable benefits, overcome implementation barriers, or accelerate implementation.)

    ❑ (a) yes
    ☑ (b) no

13. Is your project required by regulation, law or contract?

    If no, your project is eligible.

    If yes, your project may be eligible only if there will be accelerated implementation to fulfill a future requirement and is not currently required.

    Provide a description of the regulation, law or contract and an explanation of why the project is not currently required.

    ❑ (a) yes
    ☑ (b) no

14. Duration of project (month/year to month/year):
15. State Assembly District where the project is to be conducted: — 26
16. State Senate District where the project is to be conducted: — 12
17. Congressional district(s) where the project is to be conducted: — 18
18. County where the project is to be conducted: — Merced
19. Location of project (longitude and latitude) — -120, 37
20. How many service connections in your service area (urban)?
21. How many acre-feet of water per year does your agency serve?
22. Type of applicant (select one):

    ❑ (a) City
    ❑ (b) County
    ❑ (c) City and County
    ❑ (d) Joint Powers Authority
    ☑ (e) Public Water District
    ❑ (f) Tribe
    ❑ (g) Non Profit Organization
    ❑ (h) University, College
    ❑ (i) State Agency
    ❑ (j) Federal Agency
    ❑ (k) Other
        ❑ (i) Investor-Owned Utility
        ❑ (ii) Incorporated Mutual Water Co.
        ❑ (iii) Specify _____

23. Is applicant a disadvantaged community? If 'yes' include annual median household income. (Provide supporting documentation.)

    ☑ (a) yes, $35,927 median household income
    ❑ (b) no

Signature Page

By signing below, the official declares the following:

The truthfulness of all representations in the proposal;

The individual signing the form has the legal authority to submit the proposal on behalf of the applicant;

There is no pending litigation that may impact the financial condition of the applicant or its ability to complete the proposed project;

The individual signing the form read and understood the conflict of interest and confidentiality section and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant;

The applicant will comply with all terms and conditions identified in this PSP if selected for funding; and

The applicant has legal authority to enter into a contract with the State.

Robert D Kelley	Robert D Kelley MANAGER	12/23/04
Signature	Name and title	Date

Certification Page

Certification of Preliminary Plans and Specifications

I, Naser James Bateni, a California registered civil engineer, have directly supervised the preparation of the preliminary plans and specifications and reviewed the documents presented in support of this grant application. Based on this information and any other knowledge I have regarding the proposed project, I find that the project is feasible and that it can be designed, constructed, and operated to accomplish the purpose for which it is planned. The information I have reviewed to document this statement includes "Statement of Work, Section 2: Technical/Scientific Merit, Feasibility" of this Water Use Efficiency Grant Application.

REGISTERED PROFESSIONAL ENGINEER
NASER J. BATENI
No. C 36128
Exp. 6/30/06
CIVIL
STATE OF CALIFORNIA

Naser Bateni

Original signature and stamp with expiration date

Statement of Work: Section 1, Relevance and Importance

Located at the confluence of the Merced and San Joaquin Rivers in Merced County, Stevinson Water District (SWD) provides water to 7,560 acres of irrigated land within its service area and 1,340 acres of neighboring land. SWD also delivers surface water to the Merquin County Water District (MCWD), pursuant to contractual obligations, to serve 6,000 acres of agricultural land. In the combined districts, water is distributed through 66,900 feet of open ditch laterals. The locations of SWD and MCWD (collectively, the Districts) are shown in Figure 1.

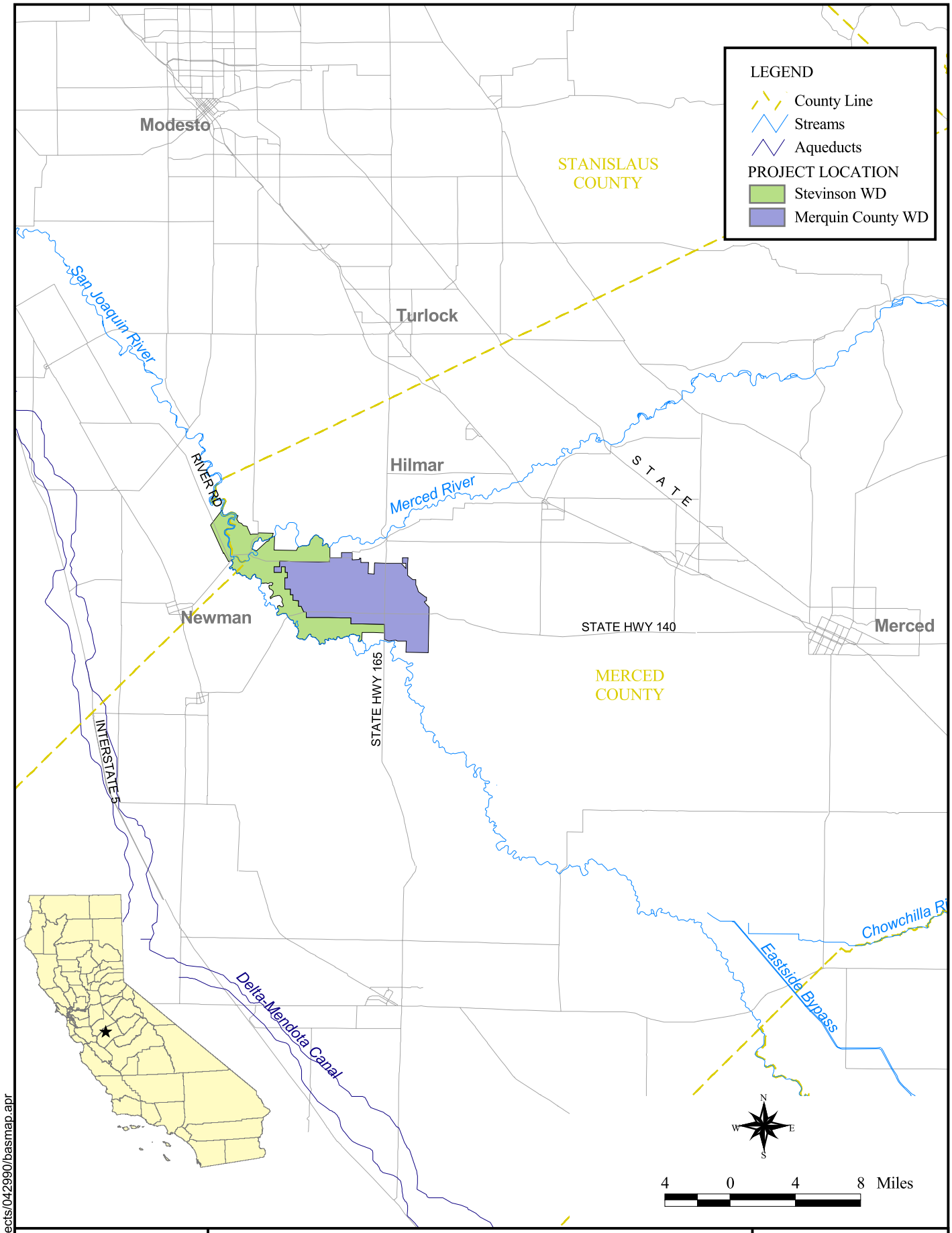
Working together, SWD and MCWD have developed an Integrated Water Resource Plan (IWRP) that provides a road map for the coordinated management of water resources in the two districts. The IWRP combines the functions of an agricultural water management plan and a groundwater management plan by developing a comprehensive program of infrastructure and management improvements to address a broad range of issues facing the Districts. The IWRP in an integrated approach toward water resource management that emphasizes water conservation, groundwater management, and the coordinated operation of groundwater and surface water facilities to meet current and future water management challenges.

Water conservation is central to the implementation of the IWRP because local residents now suffer from a variety of problems brought about by high water tables. The IWRP has identified lateral seepage as one source of the region's high groundwater table, which:

- Interferes with crop production both directly by reducing aeration in the root zone and indirectly by increasing soil salinity
- Causes standing water that creates a nuisance for local residents, causes mosquito control problems, and has the potential to become a pathway for cross-contamination between septic systems and private wells used for drinking water
- Increases storm runoff and flooding by restricting the depth of available soil moisture storage

As a result, the IWRP contains a four-phase program of lateral pipelining activity. Construction of Phase I has received funding support from the U.S. Bureau of Reclamation's FY 2004 Challenge Grant Program. Proposition 50 Water Use Efficiency program funding is being requested for the construction of Phase II, which will convert approximately 3.7 miles of open ditch laterals to closed pipes. The project could be constructed within a two-year period with final design scheduled to begin in early 2006.

Both SWD and MCWD are public water districts. Although the laterals to be lined extend through both SWD and MCWD, SWD is the local surface water supplier and is filing this grant application. SWD holds senior (pre-1914) water rights to the Merced and San Joaquin



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Lateral Canal Pipe Lining Project - Phase II

General Location

DECEMBER 2004

FIGURE 1

11-05-04 S:/GIS/Projects/042990/basmap.apr

Rivers and has water delivery agreements with the Merced Irrigation District. Water diverted under SWD's rights is then delivered to MCWD. SWD's status as a water supplier to entities including MCWD enables it to enter into financial and infrastructure improvement agreements that MCWD cannot entertain. In addition, SWD has a greater administrative and technical capacity.

Project Goals and Objectives

The goals of this project fall within the goals of the IWRP. The primary project goal is to conserve water and, by conserving water, to improve water supply reliability. Water will be conserved directly by eliminating lateral seepage and evapotranspiration losses and indirectly by providing the system infrastructure needed to improve water measurement and operational flexibility.

A portion of the conserved water will generate local benefits by supporting the SWD's policy of providing water to support regional users, such as duck clubs and agricultural water users, who, in the absence of the project, will continue to withdraw water from the San Joaquin River system and to stress the river and the Delta. However, the majority of the project benefits will accrue to the Bay-Delta through a reduction in seepage to saline losses and an improvement of Bay-Delta water quality and the timing of water supply availability. The project will also improve local and regional water supply reliability and, therefore, reduce stresses on the Bay-Delta system.

A secondary benefit will be the lowering of locally high water tables that will result from the elimination of lateral seepage. Water table control is expected to increase crop production, improve management of soil salinity, and allow better control of storm water.

Local Issues

Lateral ditch seepage contributes to the high groundwater table that limits local cropping to corn, alfalfa, and pasture; creates local mosquito control problems due to standing water; has the potential to compromise groundwater quality due to cross-contamination between wells and septic systems; and contributes to local flooding.

Piping the lateral ditches will facilitate greater flexibility and responsiveness in irrigation deliveries, enabling growers to (1) apply less water using current irrigation practices and (2) consider converting to low-volume application techniques that require flexible deliveries from the water supplier for effective operation. These conservation measures will both contribute to water supply security and address problems arising because of the locally high water table.

Lastly, by lowering local water tables, lateral pipelining will enhance the project area's capacity to absorb winter precipitation. Increased infiltration of winter storm water will reduce local flooding and inhibit soil salinization caused by the capillary rise of moderately saline groundwater into the root zone.

Regional Issues

The project is valuable to the region because (1) it is a central component of a regional integrated water management strategy and (2) the water conserved by lateral pipelining will enable the expansion of the SWD's long-standing program of providing water to support regional water users. An example of SWD's support of regional water uses is the water transfer that has been approved to convey SWD water to the East Bear Creek Unit of the San Luis National Wildlife Refuge.

Bay-Delta Issues

The project is needed for the Bay-Delta because it conserves water that degrades in quality after seeping from open ditch laterals. Bay-Delta benefits include direct contributions toward the attainment of the following two benefits targeted by the California Bay-Delta Authority:

- 131 – Flow: Provide flow to improve aquatic ecosystem conditions in the San Joaquin River
- 140 – Quality: Reduce salinity to enhance and maintain beneficial uses in the San Joaquin River at Vernalis

The primary flow paths affected by project implementation are seepage and evaporation from lateral ditches, both of which would be eliminated. Routing of conserved water to regional users will enable this water to substitute for flow now diverted from streams that are tributary to the San Joaquin River, therefore reducing pressure on an already stressed Bay-Delta system.

Although most lateral seepage remains in the basin, the quality of this seepage is degraded by mixing with locally saline groundwater (TDS greater than 600 milligrams per liter [mg/L]). Water remaining in the basin causes the high groundwater levels that contribute to local flooding during winters when the Delta is not in balance. In addition, a portion of the seepage is consumed by evaporation and by vegetation. This component of the seepage forgone by lateral pipelining will be categorized as a net water savings as will all forgone evaporation.

In summary, the project helps relieve stress on the Bay-Delta system through the following mechanisms:

- Elimination of evaporation from lateral canal water surfaces
- Elimination of evapotranspiration from canal bank vegetation
- Increased flows of good quality water to the San Joaquin River when the Delta is in balance
- Decreased return of poorer quality water to the San Joaquin River when the Delta is out of balance

The mechanisms providing these benefits are described in detail in the section of this application devoted to quantification of Bay-Delta benefits.

State Issues

By generating a net increase in summer flows in the San Joaquin River downstream of Stevinson, the project will add to the river's assimilative capacity, thereby contributing to compliance with the state water quality standards at Vernalis.

Federal Issues

The project conserves water within an area designated as a "hot spot" in the U.S. Bureau of Reclamation's Water 2025 program. Federal interest in the IWRP is shown by the award of a Challenge Grant to fund a portion of Phase I of the lateral pipelining program (the only challenge grant awarded in California's Central Valley). In addition, diversion reductions will contribute to compliance with provisions of the Clean Water Act (in particular, Total Maximum Daily Loads [TMDL] developed for the San Joaquin River).

SWD has submitted a grant application to the State Water Resources Control Board for its Agricultural Drainage Control Project, a component of the IWRP, which will develop artificial wetlands on SWD lands near the San Joaquin River. The Agricultural Drainage Control Project is intended to assist in the implementation of the TMDL for salinity and boron in the lower San Joaquin River, which has been developed under the federal Clean Water Act.

Consistency with Local or Regional Water Management Plans

With assistance from the California Department of Water Resources (DWR), the Districts have developed the IWRP to comprehensively address regional water management issues that affect both agricultural and residential water users. Groundwater management in the project area is implemented in coordination with the Merced Area Groundwater Pool Interests (MAGPI), which has developed a regional groundwater management plan. This plan serves as an umbrella strategy for specific actions to be implemented under the IWRP that would affect regional groundwater levels.

The monitoring and assessment elements of the IWRP are consistent with the approach that the Water Use Efficiency program has adopted for monitoring and assessment.

Implementation of Water Demand Management Activities Identified in Urban or Agricultural Water Management Plans

To better assess current conditions and to monitor progress in IWRP implementation, the Districts first must improve their understanding of the groundwater system. SWD initiated a groundwater monitoring program in November 2004. In addition, as noted above, funding has been obtained from the U.S. Bureau of Reclamation to support Phase 1 of the lateral pipelining program. Last, SWD is planning to implement the Agricultural Drainage Control Project.

Importance of Project Implementation on Current Water Management Activities or Initiation of New Activities

The funding requested in this application is for Phase II of the IWRP's four-phase lateral pipelining program. The project area is considered an economically disadvantaged community. Therefore, the timing of implementation is contingent upon receipt of grant funding. In addition, timely implementation of the Phase II project is important for the implementation of other water management actions recommended in the IWRP.

In particular, the Phase II Lateral Pipelining Project will facilitate the transfer of water to other water users and improvements in water measurement and system control that are prerequisites for implementing on-farm water conservation measures.

It is estimated that the project will reduce annual seepage by approximately 1,060 acre-feet. In addition to eliminating this cause of regionally high groundwater, the project will eliminate evaporation from the lateral water surface and canal bank evapotranspiration, resulting in an additional annual water savings of 45 acre-feet.

Although the evaluation of project costs and benefits is based solely on water savings directly attributable to the Phase II lateral pipelining, improvements in system operation and on-farm management are expected to increase the future volumes of conserved water. In particular, lateral pipelining will improve flow measurement and system responsiveness to variable delivery requirements. Lower water table elevations and improved operational capabilities will facilitate the production of higher-valued crops and the conversion to low-volume on-farm systems.

Statement of Work: Section 2, Technical/Scientific Merit, Feasibility

The Phase II Lateral Pipelining Project will convert approximately 19,660 feet of open ditch laterals to pipeline. This represents almost 30 percent of the 66,857 feet of open ditch laterals to be pipelined during all four phases. Table 1 describes the current status of the conveyance system, its location, lateral type, lengths, amount of piping to be installed, flow capacity, and estimated current losses. The laterals to be piped in Phase II are shown in bold in Table 1 and in red on Figure 2.

By essentially eliminating losses from pipelined laterals the project will promote water supply reliability by conserving water that now evaporates, is lost to poor quality groundwater, or contributes to the region's excessively high groundwater table.

Preliminary Plans and Specifications and Certification Statements

Estimate of Conserved Water

Table 2 shows the calculated water losses attributable to infiltration from project laterals. An estimated 1,083 acre-feet of water are lost to seepage. An additional 45 acre-feet are estimated to be lost through evaporation and phreatophyte uptake, for a total loss of 1,128 acre-feet.

Seepage losses were estimated using equations that were developed to analyze groundwater mounding beneath septic drain fields (Finnemore 1993). Septic drain fields are long, linear features with characteristics similar to irrigation laterals. Parameters required to compute average groundwater percolation rates are width and length of the lateral, saturated thickness of the aquifer, permeability and specific yield of the soils, and duration of the recharge.

The depth of water in the lateral ditches was assumed to be constant and laterals were assumed to be roughly trapezoidal in shape with 8-foot bottom widths and 16-foot top widths. The method analyzes overlapping recharge cones of 8-foot-square nodes (bottom width and an equal length) laid end to end. It was found that multiples of 500-foot lengths could be used as a variable to estimate a reasonable infiltration rate for each lateral.

Discontinuous clay layers that have been found throughout the project area range from between 15 feet and 30 feet below ground surface. Therefore, a saturated aquifer thickness of 15 feet was assumed for the mounding calculations. The depth to groundwater in the project area ranges from 3 feet to 22 feet below ground surface, based on wells monitored by DWR. A maximum mound height of 10 feet was assumed for calculations. Average U.S. Department of Agriculture permeability ranges were used for local soil types: loamy sand, 2.6 feet per day; fine sandy loam, 8 feet per day; and sand, 26 feet per day. A specific yield of 20 percent was applied based on the available hydrogeologic data. During the growing season, laterals were assumed to operate 80 percent of the time.

Table 1 Conveyance System Existing Conditions

Conveyance Name	Location	Total Lateral Length[1] (ft)	Mitigated Laterals: Relocated Length[2] (ft)	Mitigated Laterals: Replacement Length[3] (ft)	Lateral Capacity (cfs)	Seepage Losses (af/y)	Canal Evaporation Losses (af/y)	ET Losses (af/y)
Sprole Ditch	Parallel 1st Ave. between Blow Rd and Wainwright Rd then north to Well 22	Converted[4]	NA[5]	NA[5]		NA[5]	NA[5]	NA[5]
Stoerk Ditch	Parallel 2nd Ave. between Northrup Rd. to1/2-mile west of Cemetary Rd.	Converted[4]	NA[5]	NA[5]		NA[5]	NA[5]	NA[5]
Strait Ditch	1/4-mile south of 2nd Ave.between Wainwright to 1/4-mile west of Northrup Rd.	Converted[4]	NA[5]	NA[5]		NA[5]	NA[5]	NA[5]
Bull Hill Ditch	1/8-mile south of 4th Ave. between Wainwright Rd and Northrup Rd. North 3/8-mile between Edminister Rd and Northrup Rd	Converted[4]	NA[5]	NA[5]		NA[5]	NA[5]	NA[5]
Lemus Ditch	Parallel southside of the East Side Canal between McCullagh Rd and Lander Ave.	Converted[4]	NA[5]	NA[5]		NA[5]	NA[5]	NA[5]
McDonald Ditch	1/4-mile north of State Hwy 140 between Northrup Rd and and Lander Ave.	8,500[6]	NA[5]	NA[5]	22	NA[5]	NA[5]	NA[5]
Gooseneck Ditch	**1/2-mile north of 4th Ave. between 1/4-mile east of Keaton Rd. to 1/8-mile west of Northrup Rd.**	**8,180**	**2,640**	**5,540**	**12**	**592**	**8.9**	**3.0**
Hotel Ditch	**Parallel Lander Ave between East Side Canal and State Hwy 140**	**4,750**	**4,750**	**0**	**24**	**317**	**7.5**	**2.5**
Nelander Ditch	**1/8-mile east of Nelander Rd between East Side Canal and 4th Ave.**	**6,730**	**0**	**6,730**	**12**	**174**	**17.3**	**5.8**
Clark Ditch	Straddling McCullagh Rd (1/4-mile west and 200-feet east)	Phase I	NA	5,300	12	168	11.4	3.8
Koch Ditch	1/8-mile north of 2nd Ave between 1/4-mile east of McCullagh and 1/4-mile east of Lander Ave.	9,750	NA	9,750	12	243	20.9	7.0
4th Avenue Ditch	Parallel 4th Ave. between Northrup and Lander Ave.	Phase I	NA	1,780	22	44	3.9	1.3
Highline No.1 Ditch	State Hwy 140 south to Bose Rd	Phase I	NA	10,705	25	811	23.0	7.7
Rice Field Ditch	1/4-mile south of 6th Ave between Lander Ave to 1/2-mile east of Van Clief Rd.	Phase I	NA	5,280	12	132	11.4	3.8
Green Ditch	1/4-mile south of State Hwy 140 between McCullagh Rd and Lander Rd	11,145	NA	11,145	12	278	24.1	8.0
Pump Ditch	1/4-mile west of Van Clief Rd between East Side Canal to 1/4-mile north of 1st Ave.	2,000	NA	2,000	18	50	4.4	1.5
Highline No.2 Ditch	Parallel State Hwy 140 east of Van Clief Rd	3,666	NA	3,666	12	322	7.8	2.6
1st Avenue Ditch	East along 1st Avenue to Lander Avenue	1,500	NA	1,500	??[7]	37	3.3	1.1
	Totals (include Phase I lengths)	66,857	7,390	63,396	-	3,168	144	48
				TOTAL LOSSES				**3,360**

Notes:
1 - Total length of unlined ditch to be converted or abandoned as part of this project.
2 - Relocated length is the amount of unlined lateral that is being mitigated for water loss. The proposed pipeline will be installed in a different location and may be of different length.
3 - Replacement length is the amount of unlined lateral that is being mitigated for water loss. The proposed pipeline will be installed within the same location as the existing unlined lateral.
4 - Converted - Ditches have been converted into closed conduit
5 - NA - Not Applicable
6 - Not part of this project
7 - Unknown capacity.

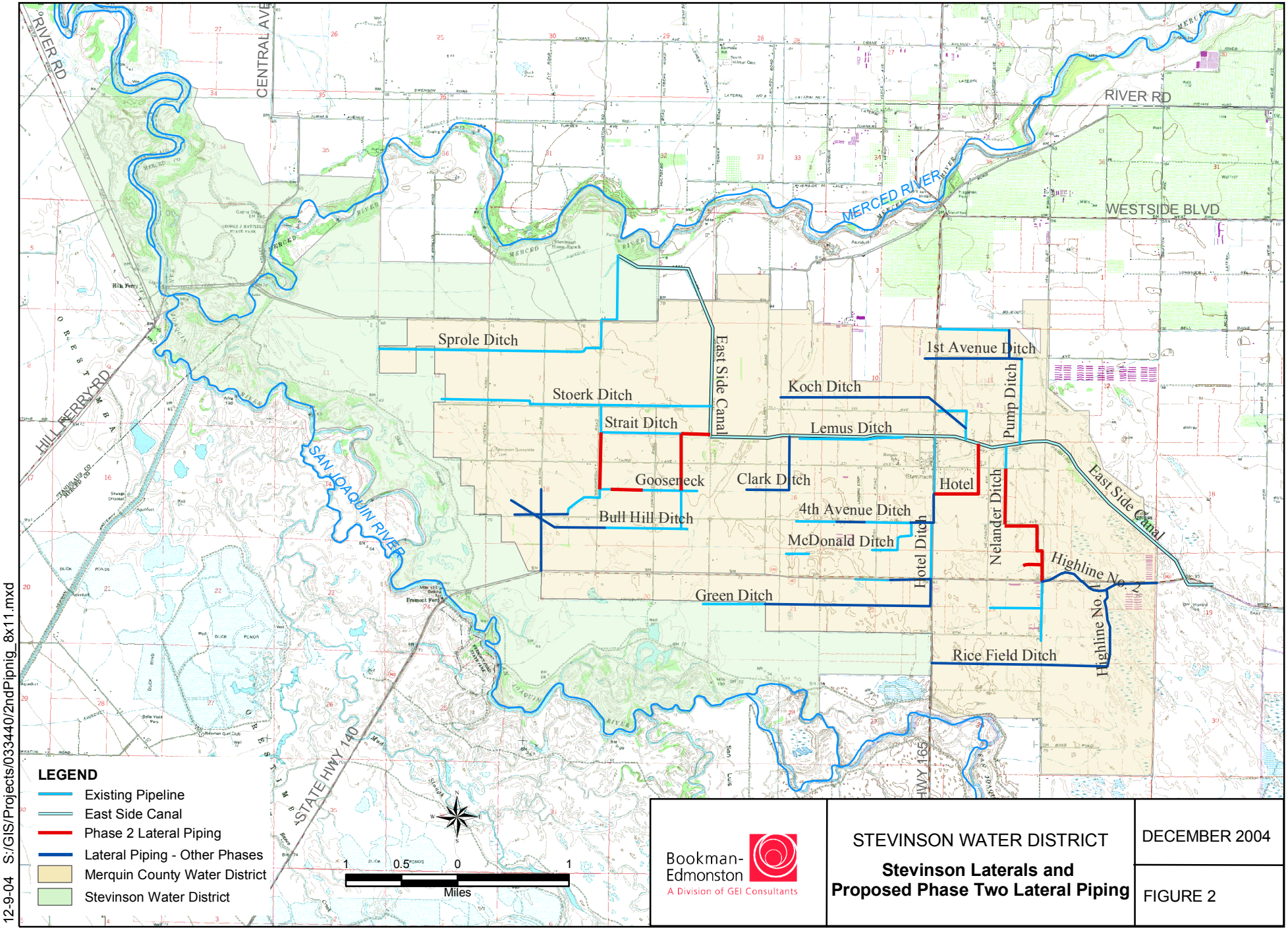
RIVER RD
CENTRAL AVE
RIVER RD
WESTSIDE BLVD
MERCED RIVER
HILL FERRY RD
SAN JOAQUIN RIVER
STATE HWY 140
HWY 165
Sprole Ditch
Stoerk Ditch
Strait Ditch
Gooseneck
Bull Hill Ditch
East Side Canal
Koch Ditch
Lemus Ditch
Clark Ditch
4th Avenue Ditch
McDonald Ditch
Green Ditch
1st Avenue Ditch
Pump Ditch
Hotel
Hotel Ditch
Nelander Ditch
East Side Canal
Highline No. 2
Highline No. 1
Rice Field Ditch
LEGEND
Existing Pipeline
East Side Canal
Phase 2 Lateral Piping
Lateral Piping - Other Phases
Merquin County Water District
Stevinson Water District
1
0.5
0
1
Miles
Bookman-Edmonston
A Division of GEI Consultants
STEVINSON WATER DISTRICT
Stevinson Laterals and
Proposed Phase Two Lateral Piping
DECEMBER 2004
FIGURE 2
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Table 2 Stevinson Water District Lateral Infiltration Losses

1	2	3	4	5	6	7	8	9	10	11	12	13	14
				Infiltration Volume (AF/Month)									
Laterals	**Project Lateral Length (ft)**	**Soil Description**	**Seasonal Range of Infiltration Rates (ft/mo)**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Subtotal Infiltration (AF)**	**Reduction due to Siltation at 20%**	**Total Infiltration Per Ditch (AF)**
Gooseneck Ditch												5	
Relocate Gooseneck Ditch half-way between Northrup Rd and Edmister Rd	2,880	Loamy Sand	68.7 - 18.5	28	15	12	10	9	9	6	89	71	**592**
	5,300	Sand	162.5 - 98.85	127	102	93	87	84	81	77	651	521	
Hotel Ditch													
Relocate from East Side Canal to Lander Ave.	2,040	Loamy Sand	68.7 - 18.5	20	11	8	7	7	5	5	63	50	**317**
	2,710	Sand	162.5 - 98.85	65	53	48	45	42	41	39	333	266	
Nelander Ditch													
Pipeline extension between 3rd Ave and 4th Ave and construct pipeline from 4th Ave to State Hwy 140	6,730	Loamy Sand	68.7 - 18.5	70	35	28	24	22	20	19	218	174	**174**

Total Ditch Length **19,660** **Total Infiltration Losses** **1,083**

Column Notes

1. Location of improvement
2. Lateral length needing improvement
3. Soil found on ditch alignment
4. Range of infiltration rates calculated from the soil permeability values in the Merced County NRCS soil survey.

5-11. Infiltration volumes (AF/Month) that occurs along each ditch for each month of a 7-month irrigation season. The calculations assume an 8-foot canal bottom width, aquifer thickness = 15-ft, Sy = 0.20, maximum mound hieght = 10-ft, months = 30-days, laterals are full 80% of the time. Reference Equation, Fennemore, 1993 Groundwater Vol. 31, No. 6, Estimate Groundwater Mounding Beneath Septic Drain Fields

12. Subtotal Infiltration (AF) loss occuring within each ditch for each particular soil type
13. Reduction of infiltration rate due to siltation
14. Total infiltration per ditch

Initial unrestricted and expected long-term reductions in seepage rates are shown on Figure 3. The initial estimated losses were modified based on the assumption that losses would be reduced by 20 percent because of siltation (Kraatz 1971).

Evaporation and transpiration losses along the lateral ditches were estimated with calculations that assume an irrigation season evaporation of approximately 3.6 feet per square foot of open water (adjusted for periods when laterals are not flowing) and that assume transpiration from ditch bank vegetation equals an additional 2.5 feet per foot of canal length. When combined, the estimates for direct evaporation and for ditch bank evapotranspiration yield an annual loss of 45 acre-feet for the Phase II pipelining project.

Project Design Assumptions

The following considerations and assumptions were used in the preliminary design of the lateral pipelines.

- A minimum hydraulic grade line extending two feet above the ground surface was assumed to provide adequate head for deliveries at all lateral turnouts.
- It was assumed that no water would be diverted until the piped laterals were flowing full.
- If a portion of a lateral had already been converted to pipe, it was assumed that the pipe was adequate and that no replacement or rehabilitation would be needed.
- Pipelines were sized to produce flow velocities of less than 5 feet per second and reasonable friction losses. Because cast-in-place pipe has already been installed in some lateral reaches and is being used in the Phase I project, cast-in-place concrete pipe having a roughness coefficient (C) of 130 would be considered for Phase II.

The Bernoulli equation was used to calculate the distribution of pressures throughout the system. This equation is based on the initial pressure, elevation changes, changes in velocity, and friction losses. The resultant pressure is determined by recalculating the Bernoulli equation for each pipe section within a particular lateral until the last pipe section is reached. The differences between each lateral yielded different system pressures and friction losses. Calculated pipe diameters are shown in Table 3.

The initial hydraulic investigations for the project were based on current system demand capacities and cast-in-place concrete pipe as the assumed piping material. It is recommended that the final design be based on information obtained from detailed field surveys that would provide ground and roadway elevations, precise lateral lengths and alignments, potential alignment obstructions, and reference points for diversion structures, piping hardware, and pipe joints. Final designs will be prepared by a registered engineer who will verify the preliminary design.

Figure 3 Average Infiltration Rates over a 7-Month Irrigation Season

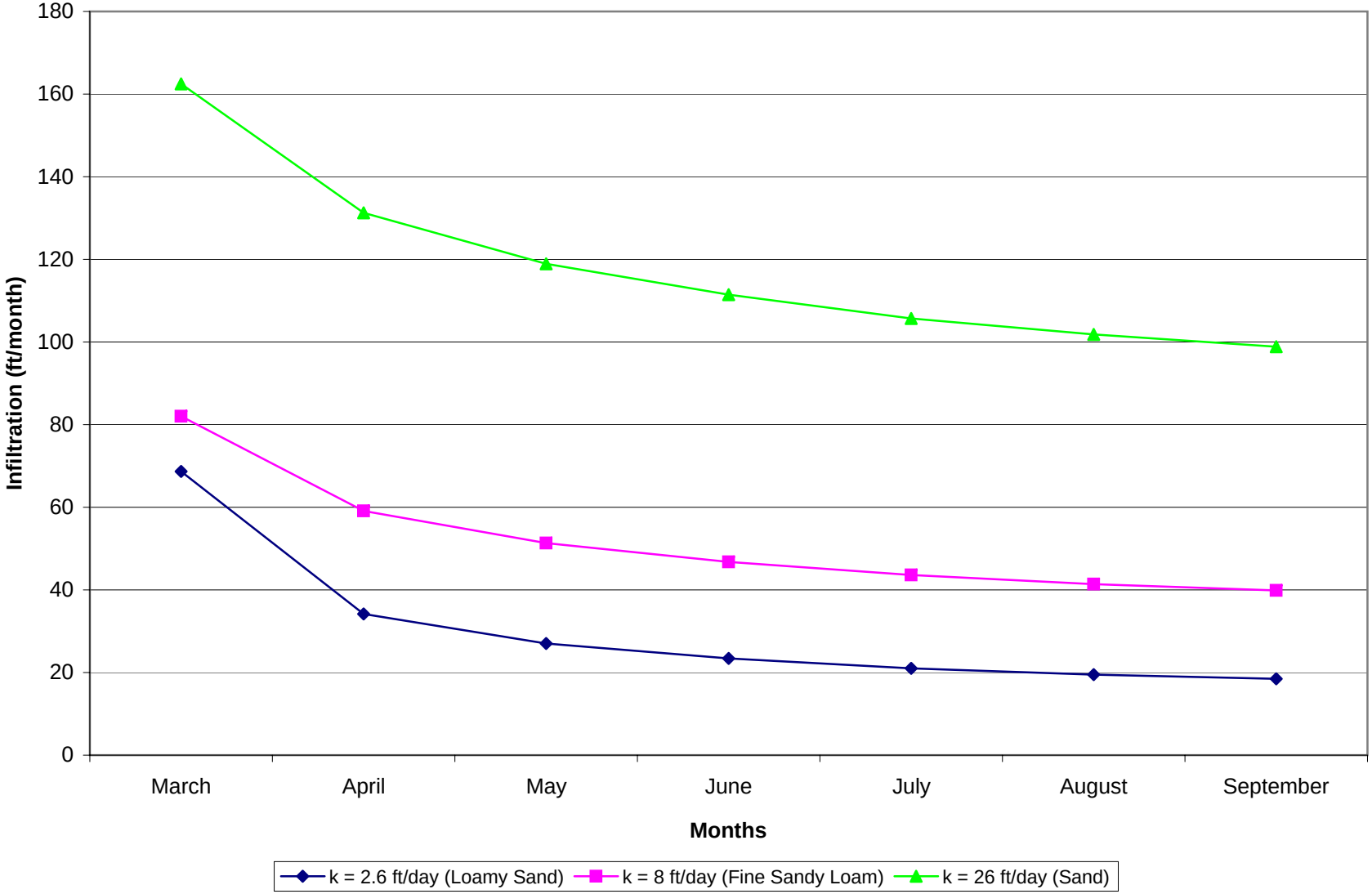


Table 3
Calculated Required Pipe Diameters

Lateral	Flow Capacity (cfs)	Approx. Elevation Change (ft)	Length (ft)	Pipe Friction Loss (ft)	Required Pipe Diameter (inches)	Standpipe Height* (ft)
Gooseneck 1	12	-0.4	2,600	0.73	36	7
Gooseneck 2	12	2.7	1,525	0.41	36	7
Gooseneck 3	12	3.4	2,600	0.73	36	7
Gooseneck 4	2.9	--	1,455	0.05	30	15
Hotel	24	5	4,750	2.72	42	7
Nelander	12	2	6,730	7.1	30	9

*Standpipe height equals the calculated water surface elevation plus two feet.

Material Assessment for Piping the Conveyance System

Several types of piping material were considered when analyzing the project. The variables associated with selecting the pipe material included material quality control, installation quality control, ease of installation, ease of repair, ease of connecting fittings, resistance to corrosion, resistance to cracking, susceptibility to floating, material longevity, and cost. The top-ranked pipe materials are high-density polyethylene (HDPE) and cast-in-place concrete pipe. The analysis of materials led to the selection of cast-in-place concrete pipe as the preferred material, primarily because of its much lower cost. Final design will verify this recommendation.

Construction Method

The proposed construction method assumes that cast-in-place concrete pipe will be constructed in the invert of the lateral canals, which will have been excavated or filled as needed to establish the design hydraulic grade line. Construction tasks would include:

- Clearing, grubbing and disposal of spoil
- Trimming the canal bottom
- Laying and joining pipe
- Installing turnouts and other control devices
- Backfilling

Geotechnical investigations have determined that bedding material need not be imported for construction. Construction surveys will be conducted to ensure that the pipe is laid at the design grade and that outlets are placed at the correct locations and elevations. Spoil from excavation and soil scraped off adjacent fields will be used for backfill.

The determination drawn from the preceding analyses is that the project is technically feasible. Because the construction of Phase I of the lateral piping project will be completed prior to the initiation of Phase II, the detailed construction practices developed during construction of Phase I will be applied to Phase II. Therefore, in terms of construction technique, Phase II will benefit from the experience gained during Phase I.

Task List and Schedule

The Lateral Pipelining Project is divided into the following tasks and deliverables:

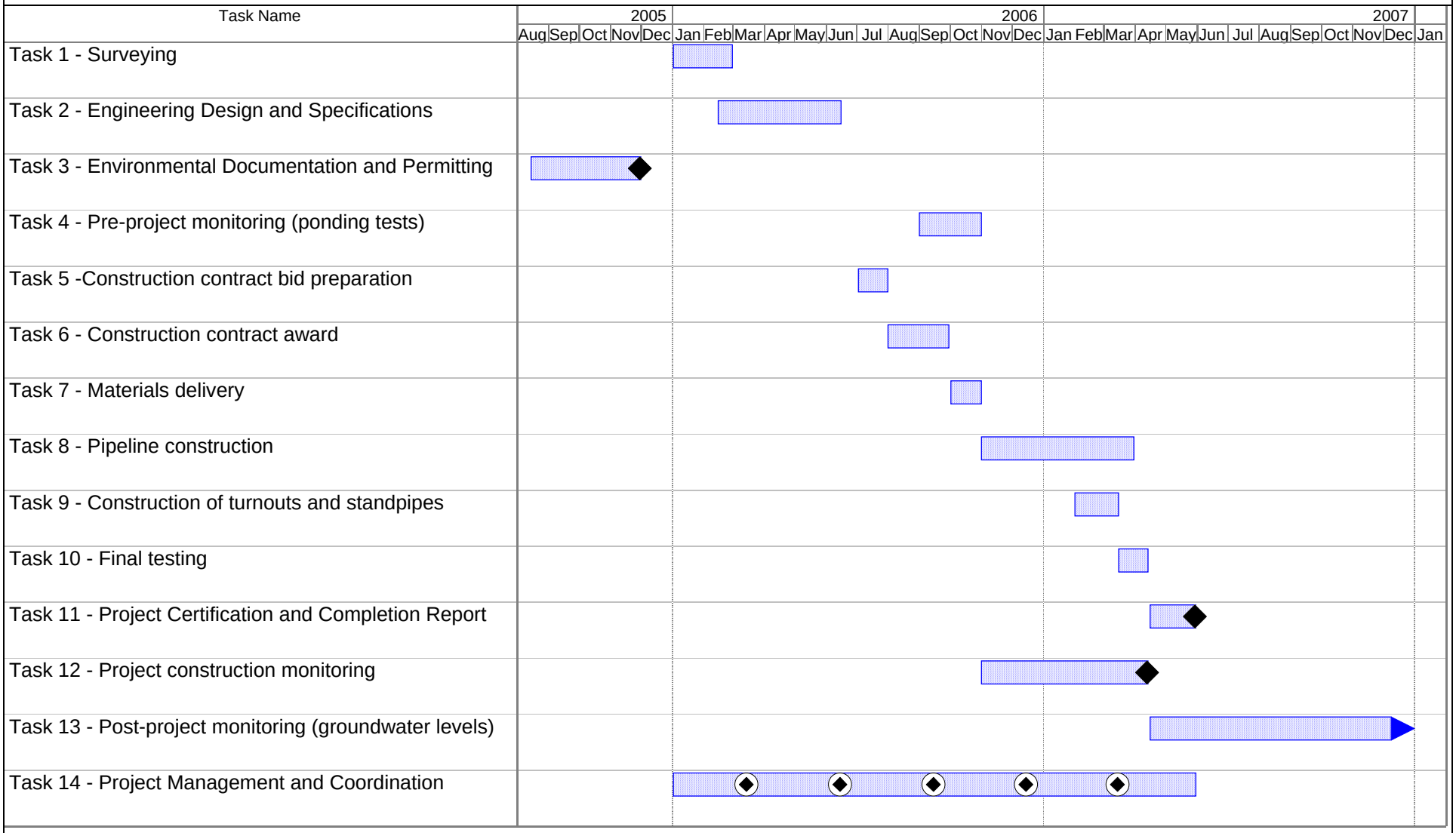
- Signing of grant agreement
- Surveying
- Pre-project monitoring and assessment (ponding tests) and delivery of findings
- Project engineering and specifications and delivery of final plans and specifications
- Environmental documentation and permitting
- Construction contract bid preparation and delivery of bid documents
- Construction contract advertising and awarding and delivery of bid evaluation report
- Materials delivery
- Pipeline construction
- Construction of turnouts, standpipes, etc.
- Final testing and delivery of the project completion report
- Post-project monitoring and evaluation and delivery of annual monitoring and evaluation reports over a five-year post-project period.

The construction schedule assumes 20 days for vegetation removal, 60 days for pipeline installation, 30 days for the fitting of turnouts and standpipes, 5 days for the placement of measurement and monitoring devices, 5 days for testing, and 3 days for mobilization and demobilization.

Construction is anticipated to start in November 2006, to be completed in March 2007 and to require approximately 115 working days. The Task List with task numbers is shown on the project schedule (Figure 4).

The project budget is shown on Table C-1. The project contingency is estimated as 10 percent of the projected construction costs. Historical operation and maintenance budgets from SWD and MCWD indicate that the cost of operating and maintaining the open ditch laterals is equivalent to about $1.25 per acre-foot of delivered water. Conversion of the open ditch laterals to pipelines is conservatively estimated to reduce operation and maintenance

Figure 4
STEVINSON WATER DISTRICT
Lateral Canal Pipelining Project Schedule



Task		Quarterly Progress Reports	
Final Reports		Monitoring Continues for 5 Years	

Project: LateralPiping 2 Schedule
Date: Wed 1/5/05

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costs by 75 percent. Therefore, the projected annual operation and maintenance costs to deliver 4,000 acre-feet will be approximately $13,700.

Certification that the preliminary plans and specifications have been prepared by a California registered civil engineer and that the project is feasible is presented at the beginning of this application.

Environmental Documentation

The proposed pipelining project will comply with all applicable federal, state and local laws and water rights. California water laws and the CALFED program support and promote water use efficiency projects in California. This project will reduce water use and improve water supply availability to all Delta water users.

Prior to the implementation of this project, the California Environmental Quality Act (CEQA) guidelines will be followed to adequately study potential environmental impacts. CEQA compliance will be completed utilizing CEQA guidelines. Compliance with CEQA includes an Initial Study. A draft Initial Study Checklist has been completed and is included in Appendix B. Biological and cultural surveys have not been completed, but will be performed prior to completion of the Final Initial Study and will assist with the CEQA determination.

All environmental documentation will be completed prior to the implementation and construction of the project. The schedule for the preparation of environmental documentation presented below assumes that the Districts will be notified in July 2006 of project acceptance:

- Field surveys 8/15/05 – 9/15/05
- Draft Initial Study 9/1/05 – 9/30/05
- Public review of Draft Initial Study 10/1/05 – 11/1/05
- Negative Declaration 11/05
- Acquisition of permits 11/05

In addition to the CEQA requirements, a Storm Water Pollution Prevention Plan and Erosion Control Permit will be submitted for approval by the Central Valley Regional Water Quality Control Board.

Statement of Work: Section 3, Monitoring and Assessment

Project reporting on construction and water conservation activities will be divided into four parts.

Description of Pre-Project Conditions and Data Baselines

For each lateral to be piped in Phase II, seepage rates will be computed at the end of the 2005 irrigation season, using constant-head ponding tests performed according to standard U.S. Bureau of Reclamation procedures. To monitor groundwater conditions in the vicinity of the canals, shallow drive-point monitoring wells will be installed to supplement existing wells to determine the size, growth, and reduction of the mound under the canal. Water levels in these wells will be measured weekly with an electric sounder (0.1-foot accuracy) until irrigation ends and monthly thereafter. Pre-project conditions will also be recorded, using photographs of the unlined laterals and the areas adjacent to laterals with visible indications of high water tables, such as abundant vegetation. Finally, delivery records for five years prior to the project will be assembled to obtain a baseline for inflows to and deliveries from the project laterals. Baseline monitoring will be completed with the submission of a baseline condition technical memorandum. A pre-project seepage assessment will report the results of the ponding tests and other pre-project monitoring.

Monitoring Methodologies and Project Monitoring Data Collected to Assess Project Results

Construction Reporting

A photographic record will be maintained of construction activity. Construction progress reports will be filed monthly. The project budget includes a full-time construction inspector and a part-time engineer/supervisor on site. Moisture conditions in and under the canal will be noted, using the network of monitoring wells. A budget and construction status report will be included in the quarterly progress reports to be submitted to DWR. Construction reporting will end with the certification of project completion.

Post-Project Monitoring

Water table elevations will be monitored, using the network of well points and monitoring wells. Lateral inflows and deliveries will be measured by the metering installed as part of Phase II construction. Photographs will be taken of areas identified in the pre-project phase as showing evidence of high water tables. CIMIS data from the Merced CIMIS station will be used as a record of pre- and post-project weather conditions.

Evaluation of Success in Relation to Project Goals and Objectives

The lateral pipelining project has two main objectives:

- Water conservation
- Water table control

A separate "yardstick" will be applied to determine the success of the project in meeting each of these objectives.

Water Conservation

The project's success in meeting its objective of conserving approximately 1,130 acre-feet of water will be confirmed by comparing the results of pre-project seepage tests with the value of zero seepage that will be the post-project condition. Pre-project estimates of water losses to canal evaporation and canal bank evapotranspiration will be refined, based on site inspections to better determine the extent of canal bank vegetation. Here again, because post-project evaporation and evapotranspiration should be zero, analyses will concentrate on accurately depicting the pre-project condition. In addition, data on pre-project water deliveries will be compared with post-project data to learn how observations drawn from these records compare with observed reductions in seepage and computed reductions in evaporation and evapotranspiration.

Water Table Control

The project's success in meeting its water table control objective will be determined through an analysis of pre-project and post-project water table elevations collected from the shallow groundwater monitoring network. These data will provide accurate observations of the impact of pipelining on irrigation season groundwater elevations in the immediate vicinity of the piped laterals. The influence of pipelining on groundwater levels farther from the laterals is expected to be difficult to verify because the impacts of lateral pipelining will be overshadowed by the effects of irrigation practices.

Consideration of External Factors

Due to the nature of the lateral piping, external factors are not expected to have an important impact on the monitoring and assessment of project performance. This is because the key yardsticks of performance are driven by pre-project lateral seepage, which can be directly measured through ponding tests and is little affected by weather, cropping, or social conditions. In addition, no matter how post-project conditions may differ from the pre-project setting, post-project lateral losses should be negligible.

Information About How Data and Other Information Will Be Handled, Stored, Reported, and Made Accessible to DWR and Others

Flow measurement and delivery data will be downloaded to the SWD computer system weekly, while groundwater levels will be hand-recorded monthly. A user-friendly Microsoft Access database will be designed and installed on an SWD computer to generate routine reports and to support the analysis of monitoring data. Annual reports of benefits and costs,

based on analyses of data contained in this database will be presented in the final project report and prepared for five years after the completion of the project.

Estimated Costs Associated with the Implementation of the Monitoring and Evaluation Plan

The estimated cost to implement the monitoring and evaluation plan is $45,000. This includes performance of ponding tests on each of the three laterals, installation of shallow monitoring wells, and other aspects of pre-project and post project monitoring, analysis, and reporting.

Qualifications of the Applicants and Cooperators

Resume of Project Manager

Bob Kelley, General Manager of Stevinson Water District, will be the Project Manager. He will supervise the bidding and hiring of all consultants and contractors, track the budget, and ensure that quarterly reports are completed and submitted to DWR. His resume is included in Appendix A.

External Cooperators

A qualified water resources consultant will support SWD in implementing the Phase II Lateral Pipelining Project. The selected consultant will have knowledge of the Districts and their operations and of the design and construction of piped irrigation distribution systems. The consultant will also have a demonstrated capacity to complete grant-funded projects in a timely manner and within the available budget.

Previous Water Use Efficiency Grant Projects

SWD has not been a recipient of previous Water Use Efficiency grants.

Disadvantaged Community Status

SWD and MCWD qualify as disadvantaged communities. The median average income of the service area of the SWD is $35,933 and of the MCWD is $35,941. Appendix C documents the disadvantaged community status of the project area.

Outreach, Community Involvement, and Acceptance

Phase II of the lateral pipelining program is an element of the IWRP, which is a joint effort of the SWD and the MCWD. Input from the General Manager of MCWD has been instrumental in the development of the water budget, the estimation of groundwater pumping and water conservation, the piping of laterals, and many other issues in the IWRP. A letter of support from the MCWD is included in Appendix D.

SWD's General Manager attends MAGPI meetings and has briefed MAGPI attendees regarding the IWRP and the lateral pipelining project.

Development of the IWRP has been a cooperative effort between the Districts and DWR. DWR Division of Planning and Local Assistance staff have reviewed all elements of the IWRP, including the lateral pipelining program, and provided significant guidance to the overall program approach.

The project also has strong support locally, local interests have indicated their support as shown in the letters in Appendix D. There are no known entities opposing this project.

Innovation

Together, SWD and MCWD are implementing an innovative water management plan with specific goals to relieve high groundwater levels through water conservation. A three-pronged conjunctive management approach is being implemented to:

- Eliminate lateral seepage
- Increase groundwater pumping
- Facilitate improved on-farm water management

As well as conserving water and addressing problems caused by high water tables, the plan also presents an integrated approach to addressing drainage treatment and discharge and demonstrates the benefits of collaboration among districts having similar water management problems.

Benefits and Cost

Table C-1: Project Implementation Costs (Budget)

Table C-1 presents total costs for the Phase II Lateral Pipelining Project. Costs are based upon cost information developed for the Phase I Lateral Pipelining Project, including bids received for installation of cast-in-place concrete pipe.

Table C-2: Annual Operations and Maintenance Costs

Replacing the open ditch laterals with pipelines is expected to reduce the cost of operating and maintaining the converted laterals. Table C-2 presents estimated annual post-project operation and maintenance costs. These costs are approximately 25 percent of the current costs and will remain an SWD responsibility.

Table C-3: Total Annual Project Costs

Table C-3 summarizes annual costs by combining total annualized costs from Table C-1 and annual operation and maintenance costs from Table C-2.

Table C-4: Capital Recovery Factor

A capital recovery factor representing a 6 percent interest rate and a 30-year project life has been used to develop annualized project costs. It is expected that the Phase II facilities will have a service life that exceeds 30 years, based on the use of cast-in-place concrete as a construction material and given a reasonable level of maintenance.

Table C-5: Project Annual Physical Benefits (Qualitative and Quantitative)

The Phase II project conserves water through the elimination of seepage, evaporation, and evapotranspiration. Elimination of evaporation and evapotranspiration is a clear water conservation benefit because it prevents water from being lost from the basin. Water that now seeps from unlined laterals remains in the basin, but by mixing with saline groundwater, the quality and utility of seepage water is degraded. Some of the water that remains in the basin causes additional local flooding during the winter and returns to the San Joaquin River when the Delta is not in balance. Thus, the elimination of evaporation, evapotranspiration, and seepage will enhance water supply security.

Implementation of the project will reduce the volume of diverted water required by SWD to meet its water supply obligations. This reduced diversion will remain in the Merced–San Joaquin River system, and, by so doing, will benefit the Bay-Delta. These benefits can be divided into two categories:

- Direct Bay-Delta benefits – water that flows directly through the Merced and San Joaquin Rivers to the Bay-Delta interdependently of any actions by SWD
- Indirect Bay-Delta benefits – water that is diverted by SWD to meet the needs of wildlife refuges and duck clubs or agricultural users who currently divert directly

Applicant: Stevinson Water District

Table C-1: Project Costs (Budget) in Dollars)

	Category (I)	Project Costs $ (II)	Contingency % (ex. 5 or 10) (III)	Project Cost + Contingency $ (IV)	Applicant Share $ (V)	State Share Grant $ (VI)	Life of investment (years) (VII	Capital Recovery Factor (VIII)	Annualized Costs $ (IX)
	Administration[1]								
	Salaries, wages	**$40,000**	**10**	**$44,000**	**$44,000**	**$0**	**30**	**0.0726**	**$3,194**
	Fringe benefits	**$12,000**	**10**	**$13,200**	**$13,200**	**$0**	**30**	**0.0726**	**$958**
	Supplies	$0	0	$0	$0	$0	0	0.0000	$0
	Equipment	$0	0	$0	$0	$0	0	0.0000	$0
	Consulting services	$0	0	$0	$0	$0	0	0.0000	$0
	Travel	$0	0	$0	$0	$0	0	0.0000	$0
	Other	$0	0	$0	$0	$0	0	0.0000	$0
(a)	Total Administration Costs	**$52,000**		**$57,200**	**$57,200**	**$0**			**$4,153**
(b)	Planning/Design/Engineering	**$65,000**	**10**	**$71,500**	**$0**	**$71,500**	**30**	**0.0726**	**$5,191**
(c)	Equipment Purchases/Rentals/Rebates/Vouchers	$0	0	$0	$0	$0	0	0.0000	$0
(d)	Materials/Installation/Implementation	$0	0	$0	$0	$0	0	0.0000	$0
(e)	Implementation Verification	**$10,000**	**10**	**$11,000**	**$0**	**$11,000**	**30**	**0.0726**	**$799**
(f)	Project Legal/License Fees	$0	0	$0	$0	$0	0	0.0000	$0
(g)	Structures	$0	0	$0	$0	$0	0	0.0000	$0
(h)	Land Purchase/Easement	$0	0	$0	$0	$0	0	0.0000	$0
(i)	Environmental Compliance/Mitigation/Enhancement	**$40,000**	**10**	**$44,000**	**$0**	**$44,000**	**30**	**0.0726**	**$3,194**
(j)	Construction	**$680,000**	**10**	**$748,000**	**$25,000**	**$723,000**	**30**	**0.0726**	**$54,305**
(k)	Other (Specify)	$0	0	$0	$0	$0	0	0.0000	$0
(l)	Monitoring and Assessment	**$45,000**	**10**	**$49,500**	**$25,000**	**$24,500**	**30**	**0.0726**	**$3,594**
(m)	Report Preparation	**$20,000**	**10**	**$22,000**	**$0**	**$22,000**	**30**	**0.0726**	**$1,597**
(n)	**TOTAL**	**$912,000**		**$1,003,200**	**$107,200**	**$896,000**			**$72,832**
(o)	Cost Share -Percentage				11	89			

1- excludes administration O&M.

Applicant: **Stevinson Water District**

Table C-2: Annual Operations and Maintenance Costs

Operations (1) (I)	Maintenance (II)	Other (III)	Total (IV) (I + II + II)
$3,000	$10,700		$13,700

(1) Include annual O & M administration costs here.

Table C-3: Total Annual Project Costs

Annual Project Costs (1) (I)	Annual O&M Costs (2) (II)	Total Annual Project Costs (III) (I + II)
$72,832	$13,700	$86,532

(1) From Table C-1, row (n) column (IX)
(2) From Table C-2, column (IV)

Table C- 4: Capital Recovery Table (1)

Life of Project (in years)	Capital Recovery Factor
1	1.0600
2	0.5454
3	0.3741
4	0.2886
5	0.2374
6	0.2034
7	0.1791
8	0.1610
9	0.1470
10	0.1359
11	0.1268
12	0.1193
13	0.1130
14	0.1076
15	0.1030
16	0.0990
17	0.0954
18	0.0924
19	0.0896
20	0.0872
21	0.0850
22	0.0830
23	0.0813
24	0.0797
25	0.0782
26	0.0769
27	0.0757
28	0.0746
29	0.0736
30	0.0726
31	0.0718
32	0.0710
33	0.0703
34	0.0696
35	0.0690
36	0.0684
37	0.0679
38	0.0674
39	0.0669
40	0.0665
41	0.0661
42	0.0657
43	0.0653
44	0.0650
45	0.0647
46	0.0644
47	0.0641
48	0.0639
49	0.0637
50	0.0634

(1) Based on 6% discount rate.

Applicant: **Stevinson Water District**

Table C-5 Project Annual Physical Benefits (Quantitative and Qualitative Description of Benefits)

	Qualitative Description - Required of all applicants[1]				**Quantitative Benefits - where data are available [2]**
	Description of physical benefits (in-stream flow and timing, water quantity and water quality) for:	Time pattern and Location of Benefit	Project Life: Duration of Benefits	State Why Project Bay Delta benefit is Direct[3] Indirect [4] or Both	Quantified Benefits (in-stream flow and timing, water quantity and water quality)
Bay Delta	instream flow and timing, reduction in salt load, better temporal distribution of salt load (see application text)	see application text and Tables 4 and 5	30 years	Directly supports Bay-Delta objectives during the life of the project	425
Local	NA	NA	30 years	**Not applicable.**	not applicable

[1] The qualitative benefits should be provided in a narrative description. Use additional sheet.

[2] Direct benefits are project outcomes that contribute to a CALFED objective within the Bay-Delta system during the life of the project.

[3] Indirect benefits are project outcomes that help to reduce dependency on the Bay-Delta system. Indirect benefits may be realized over time.

[4] The project benefits that can be quantified (i.e. volume of water saved or mass of constituents reduced) should be provided.

from groundwater or the river system. In these instances, actions by SWD will either substitute for existing diversions or will be used to meet environmental needs. In either case, Bay-Delta benefits are coupled with actions by SWD.

Both direct and indirect Bay-Delta benefits offer mechanisms through which the Phase II project will enable water to remain in the Bay-Delta system undiminished in quality or quantity.

Bay-Delta Benefits

Estimated Bay-Delta Annual Net Water Savings

The elimination of evaporation and evapotranspiration reduces both losses from the basin and diversions needed to meet SWD operational obligations. As a result, water conserved by the elimination of evaporation and evapotranspiration is available to generate the direct and indirect Bay-Delta benefits described above.

The Bay-Delta benefits of eliminating seepage are more complex. Much of the water lost because of seepage is prevented from percolating to underlying aquifers by a clay layer that slopes toward the San Joaquin River. Therefore, it is likely that some seepage contributes to base flow in the river. This water is altered in two respects as it seeps from laterals and flows toward the river.

- Its quality is diminished because seepage is degraded by mixing with relatively saline groundwater (TDS greater than 600 mg/L).

- Its timing is altered. While lateral seepage occurs primarily in the summer, because the laterals are located about 2.5 miles from the San Joaquin River, the seepage path between the laterals and the river attenuates the flow so that irrigation season seepage contributes to river flows both when the Delta is in balance and when it is not.

In addition, the volume of lateral seepage that ultimately reaches the San Joaquin River or its tributaries is diminished in two ways. As shown in Figure 5, there are discontinuities in the clay layers down-gradient from the project laterals. At these locations, water can percolate directly to underlying aquifers that are not hydraulically connected to the San Joaquin River system. In other areas, the prevalence of shallow clay layers results in a perched water table that enables seepage to be consumed by vegetation or to be evaporated through capillary upflux.

As a result of these factors, an estimated 60 to 70 percent of lateral seepage now discharges to the San Joaquin River. Therefore, total net Bay-Delta water savings generated by the project are approximately 45 acre-feet of direct evaporation and evapotranspiration plus 65 percent of the 1,085 acre-feet of reduced seepage (380 acre-feet). Thus, the project is anticipated to:

- Reduce groundwater return flows to the San Joaquin River near Stevinson by approximately 705 acre-feet per year

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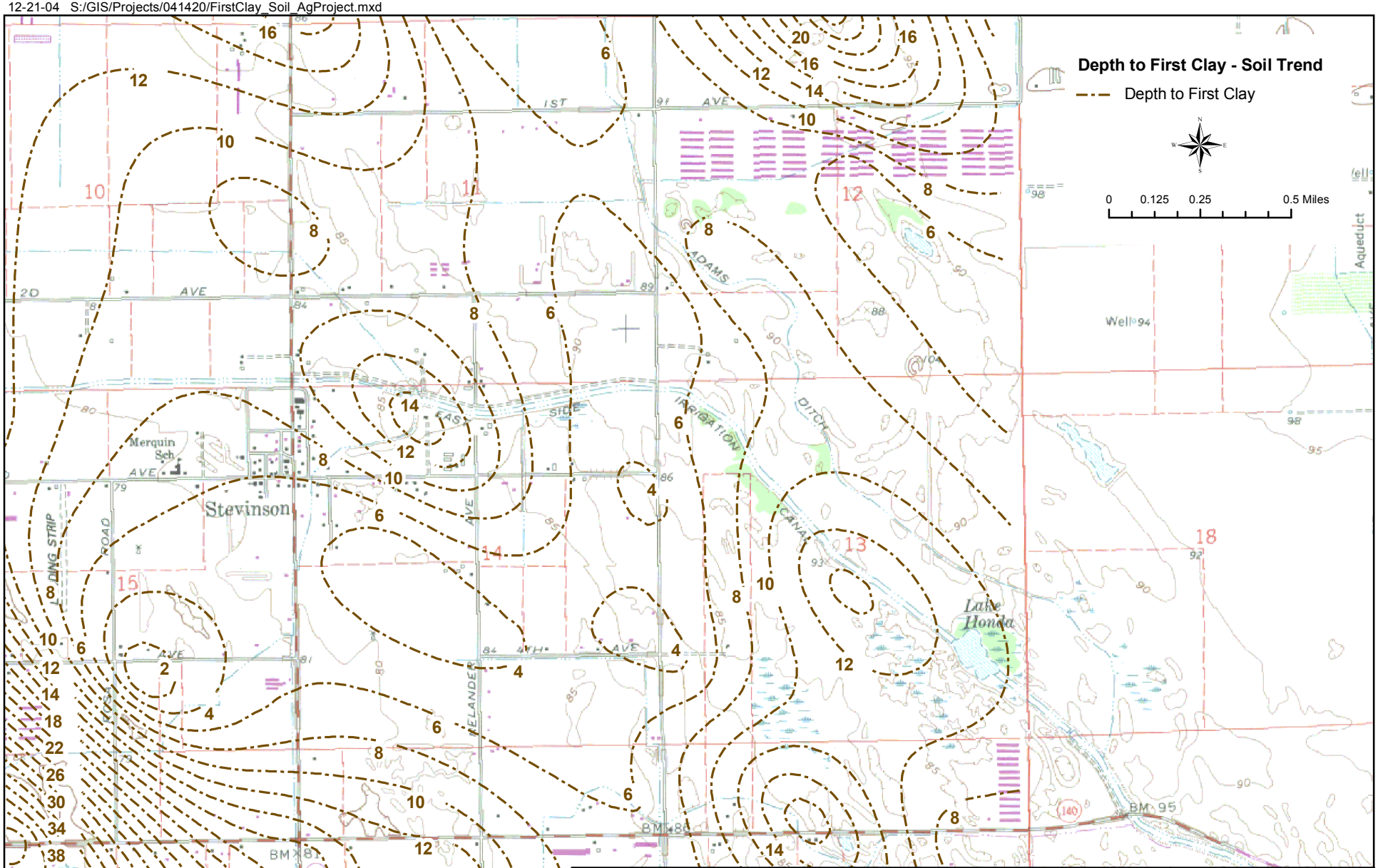

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STEVINSON WATER DISRICT

Depth to First Clay: Deposition Interpreted from Historical Soil Deposition Patterns

DECEMBER 2004

FIGURE 5

- Reduce withdrawals from the San Joaquin River system by about 1,130 acre-feet per year
- Generate a net increase in flow at the Delta of approximately 425 acre-feet per year, with the bulk of this increase occurring during the summer

Change in Salt Loading and Concentration

The computation of changes in salt loading resulting from the project is based on the flow balance discussed above. Groundwater return flows to the San Joaquin River near Stevinson are assumed to have an average salinity of over 600 mg/L. Therefore, if the project reduces return flows by 705 acre-feet per year, salt discharges will decrease by approximately 75 tons.

The average salinity of the water now being withdrawn from tributaries to the San Joaquin River by duck clubs and other regional entities varies with the source of water. However, a reasonable approximation of the average value is 100 mg/L, based on an average value for water diverted from the Merced River of approximately 70 mg/L. Therefore, reducing withdrawals from the San Joaquin River system by 1,130 acre-feet per year will increase the salt load in the river by about 21 tons.

Therefore, the project is expected to reduce salt loading to the Bay-Delta by the difference between these two values, 54 tons.

Because salinity standards are expressed in terms of concentrations, the more important benefit to the Delta is that by reducing the quantity of relatively saline groundwater entering the river system and augmenting the volume of high quality tributary flows, the project will reduce the salt concentration in the San Joaquin River and increase its capacity to assimilate salt discharges.

The quantitative impact of the project on salinity concentrations has not been analyzed for this application. However, given that the average irrigation season concentration of the San Joaquin River near Stevinson computed from 155 readings taken between April 15 and September 30, 2003, was 985 mg/L, the importance of efforts to reduce salt concentrations during the summer is clear.

Flow and Timing Benefits

It is important to note the seasonal component of the changes in flow to the Delta. While the reductions in withdrawals from the San Joaquin River system will be concentrated in the summer, the reductions in groundwater returns to the San Joaquin River and its tributaries will extend over the entire year, due to the attenuation caused by the slow movement of groundwater. As a result, flow increases resulting from the project will be concentrated when augmentation is most valuable, enabling the project to contribute to improving the timing of San Joaquin River flows.

Table 4 illustrates the expected seasonal distribution of changes in flow resulting from implementation of Phase II. On an annual basis, project implementation will increase flows

Table 4 Monthly Distribution of Net Flow Impacts of the Project (ac-ft)

	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total
Without Project Evap/Evapotranspiration	0	0	0	3	6	8	9	10	6	3	0	0	45
With Project Evap/Evapotranspiration	0	0	0	0	0	0	0	0	0	0	0	0	0
Reduction in Evap/Evapotranspiration	0	0	0	3	6	8	9	10	6	3	0	0	45
Without Project Groundwater Outflow	51	43	34	43	51	60	67	72	76	76	72	60	705
With Project Groundwater Outflow	0	0	0	0	0	0	0	0	0	0	0	0	0
Change in Outflow	-51	-43	-34	-43	-51	-60	-67	-72	-76	-76	-72	-60	-705
Without Project Withdrawals - evap	0	0	0	129	172	250	215	198	121	0	0	0	1085
With Project Withdrawals	0	0	0	0	0	0	0	0	0	0	0	0	0
Reduction in Withdrawals	0	0	0	129	172	250	215	198	121	0	0	0	1085
Net Change in flow to Delta	**-51**	**-43**	**-34**	**89**	**127**	**198**	**157**	**136**	**51**	**-73**	**-72**	**-60**	**425**

Table 5 Monthly Distribution of Salt Loading Impacts of the Project (tons)

	January	February	March	April	May	June	July	August	September	October	November	December	Annual Total
Without Project Groundwater Outflow	4	4	4	5	6	7	7	8	9	8	7	6	75
With Project Groundwater Outflow	0	0	0	0	0	0	0	0	0	0	0	0	0
Change in Outflow	-4	-4	-4	-5	-6	-7	-7	-8	-9	-8	-7	-6	-75
Without Project Withdrawals	0	0	0	3	3	4	5	4	2	0	0	0	21
With Project Withdrawals	0	0	0	0	0	0	0	0	0	0	0	0	0
Reduction in Withdrawals	0	0	0	3	3	4	5	4	2	0	0	0	21
Net Change in flow to Delta	**-4**	**-4**	**-4**	**-2**	**-3**	**-3**	**-2**	**-4**	**-7**	**-8**	**-7**	**-6**	**-54**

in the San Joaquin River by approximately 425 acre-feet. However, the increase in flows to the Delta from April through September is estimated to be approximately 760 acre-feet. This increase in flows during the summer is counterbalanced by a reduction in flows during the remainder of the year caused by the forgone discharge of lateral seepage to the river. Because months projected to have reductions in flow cover the months when the Delta is in balance and the months immediately preceding this period, the impacts of these reductions on conditions in the Delta are expected to be minimal.

Table 5 shows the monthly distribution of reductions in salt loading resulting from project implementation. This table illustrates that during the summer, the concentrated augmentation of flows is accompanied by small decreases in salt loading. Both of these effects have a positive influence on salt concentrations. During the winter, when groundwater discharge to the river system is reduced, this reduction in the inflow of moderately saline water translates directly to a reduction in salt loading.

Local Benefits

Salt Load Reduction

The quality of conserved water is higher than that of the underlying groundwater. Converting the lateral ditches to pipelines will redirect conserved water from a flow path where it becomes degraded when it reaches the water table. This redirection protects the quality of the conserved water, but results in an insignificant reduction in local salt loading. Therefore, there is no local benefit associated with a reduction in salt loading.

Changes in In-Stream Flow/Timing

Lateral pipelining is not expected to affect the volume or pattern of diversions from the Merced River because the conserved water will continue to be diverted for conveyance to regional water users.

Water Quality Benefits

No local water quality benefit is being claimed for this project because it produces an insignificant reduction in salt loading to the project area.

Table C-6: Project Annual Local Monetary Benefits

Applying conserved water locally will be contrary to the project's secondary objective of reducing water table elevations. Therefore, any local benefits will be monetary benefits that result from substitution of SWD water for water now diverted from the river system by regional entities including duck clubs and agriculture.

Sale of water to these entities will create a local monetary benefit whose extent is indeterminate because it will depend upon both the volume of water that is transferred by SWD and the price it receives.

Applicant: **Stevinson Water District**

Table C-6 Project Annual Local Monetary Benefits

ANNUAL LOCAL BENEFITS	ANNUAL QUANTITY	UNIT OF MEASUREMENT	ANNUAL MONETARY BENEFITS
(a) Avoided Water Supply Costs (Current or Future Source)	0		$0
(b) Avoided Energy Costs	0		$0
(c) Avoided Waste Water Treatment Costs	0		$0
(d) Avoided Labor Costs	0		$0
(e) Other (describe)	See application text		$7,783
(f) Total [(a) + (b) + (c) + (d) + (e)]			$7,783

Table C-7 Project Local Monetary Benefits and Project Costs

(a) Total Annual Monetary Benefits [(Table C-6, row (f)]		$7,783
(b) Total Annual Project Costs (Table C-3, column III)		$86,532

Table C-8 Applicant's Cost Share and Description

Applicant's cost share %: (from Table C-1, row o, column V)	**11**
Describe how the cost share (based on relative balance between Bay-Delta and Local Benefits) is derived. (See Section A-7 for description.)	
Provide Description in a narrative form.	

Given the uncertainty in predicting annual local monetary benefits and the disadvantaged status of the project area, rather than presenting a speculative estimate of local monetary benefits, SWD proposes to (1) fully support project administration and (2) support the groundwater monitoring component of the monitoring and assessment program and provide $25,000 of funding for project construction. This contribution is equivalent to 11 percent of the project cost.

Although SWD could claim an exemption from the requirement for a local cost share, SWD believes that an 11 percent local contribution is indicative of the value of the local water conservation benefits and represents the importance of the project to the area. This local contribution is presented in Tables C-1 and C-6.

Table C-7: Project Local Monetary Benefits and Project Costs

Table C-7 compares annual Project Local Monetary Benefits with total annualized Project Costs. This table indicates that local monetary benefits are equivalent to 11 percent of project costs.

Table C-8: Applicants Cost Share and Description

Because the Districts are in a disadvantaged, low-income area, this project could claim an exemption from the requirement for a local cost share. However, because of the importance of the project to the area, SWD will commit $107,200 toward implementation of the project.

Appendix A

Resume for Robert D. Kelley, Jr.

Education: B.S. Degree in Economics University of California, Davis 1975

Experience: ***Manager of Stevinson Water District since December 2002.***

His duties include managing, operating, and maintaining the District, which supplies water to approximately 3,750 acres within the District and supplies surface water to 5,800 acres in Merquin County Water District. The District operates nine riparian lift pumps and 13 wells within its service area. Mr. Kelley oversees all aspects of water distribution including delivery schedule, manages the District operation and maintenance program, holds public meetings, reviews and approves the District's financials and payrolls, develops District budgets, and ensures that the District's equipment is maintained in good working condition.

Mr. Kelley also manages the District's water management and planning programs. He managed the development of an Integrated Water Resource Plan for the Stevinson and Merquin County Water Districts, which was funded by a grant from the Department of Water Resources, Division of Planning and Local Assistance. The proposed Lateral Piping Project was developed under the IWRP. He is now managing a Water Quality Investigation Program funded by AB 303 Program and the implementation of Phase I of the Lateral Piping Project.

From 1976 to 2002, Mr. Kelley was the President of Stevinson Water District.

President of the East Side Canal & Irrigation Company, December 22, 1988 to present:

Mr. Kelley is responsible for the management of the East Side Canal, including the day-to-day operation and maintenance of the canal and its two lift pumps. The 26-mile-long canal supplies irrigation water to approximately 5,800 acres within Merquin County Water District, and 16,900 acre-feet out of District. Duties include all aspects of water distribution, holding meetings, paying bills, developing budgets, and ensuring that the equipment is maintained in good working order. The Stevinson Water District and the East Side Canal share a combined operating budget of $420,000.

Appendix B

Draft Environmental Checklist

Attachment B – Environmental Checklist Form

1. Project title: **Lateral Canal Pipelining Project – Phase Two**

2. Lead agency name and address:

   Stevinson Water District
   25079 W. River Road
   Stevinson, CA 95374

3. Contact person and phone number: **Mr. Robert Kelley, (209) 634-4908**

4. Project location: **Merced County, California**

5. Project sponsor's name and address:

   Mr. Robert Kelley
   Stevinson Water District
   25079 W. River Road
   Stevinson, CA 95374

6. General plan designation: **Agriculture**

7. Zoning: **A-1**

8. Description of project: (Describe the whole action involved, including but not limited to later phases of the project, and any secondary, support, or off-site features necessary for its implementation. Attach additional sheets if necessary.)

   The Stevinson Water District and the U.S. Bureau of Reclamation are proposing to install approximately 20,000 feet of pipe in open ditch lateral canals. The District has chronically high groundwater levels that may adversely affect agricultural practices. Installing pipe in the laterals will assist the District to conserve water and manage groundwater elevations and groundwater quality within the project area.

9. Surrounding land uses and setting: (Briefly describe the project's surroundings.)

   The project is located in the San Joaquin Valley, in Merced County, at the confluence of the San Joaquin and Merced Rivers. The project area and surrounding land in Merced County is an agriculturally converted floodplain. The dominant local agricultural practice is pastures, alfalfa, and field crops.

10. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.)

    Regional Water Quality Control Board – Storm Water Pollution Prevention Plan (SWPPP)

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agriculture Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Geology/Soils
☐ Hazards & Hazardous Materials	☐ Hydrology/Water Quality	☐ Land Use/Planning
☐ Mineral Resources	☐ Noise	☐ Population/Housing
☐ Public Services	☐ Recreation	☐ Transportation/Traffic
☐ Utilities/Service Systems	☐ Mandatory Findings of Significance	

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature	Date
Printed name	For

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
I. AESTHETICS—Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☐	☒
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒
II. AGRICULTURE RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? **Source: CA Farmland Mapping and Monitoring Program (FMMP), 2000**	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
III. AIR QUALITY—Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☐	☒
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☒
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒
IV. BIOLOGICAL RESOURCES—Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service? **Survey required. Mitigation measures will be created and followed to protect any potential sensitive species.**	☐	☐	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☐	☐

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒
V. CULTURAL RESOURCES—Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5? **Survey required. Mitigation measures will be created and followed to protect any potential cultural or archaeological resources.**	☐	☐	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☐	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☐
VI. GEOLOGY AND SOILS—Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒
The proposed project is located approximately 15 miles east of the San Andreas fault. The project will be designed and constructed in accordance with California Building Codes.				
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
VII. HAZARDS AND HAZARDOUS MATERIALS—Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? **The nearest site listed in Government Code Section 65962.5 in located in Atwater, California, approximately 15 miles east of the Stevinson Water District.**	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒
VIII. HYDROLOGY AND WATER QUALITY—Would the project: a) Violate any water quality standards or waste discharge requirements? **All potential violations will be reduced and eliminated by following a SWPPP (which will be completed prior to construction.)**	☐	☐	☒	☐

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)? **The project area has chronically high groundwater levels. The proposed project will assist in lowering the groundwater to manageable levels.**	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☐	☒
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒
f) Otherwise substantially degrade water quality?	☐	☐	☐	☒
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures-to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
IX. LAND USE AND PLANNING—Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒
X. MINERAL RESOURCES—Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒
XI. NOISE—Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? **Construction may require equipment that could exceed local noise ordinances for brief intervals. The project area is not densely populated. Residents who could be sensitive receptors of construction noise will be notified in advance of construction activities. Construction will take place between 7 a.m. and 6 p.m.**	☐	☐	☒	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
c) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project? **Construction may require equipment that could exceed local noise ordinances for brief intervals. Residents who could be sensitive receptors of construction noise will be notified in advance of construction activities. Construction will take place between 7 a.m. and 6 p.m.**	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
XII. POPULATION AND HOUSING--Would the project: a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
XIII. PUBLIC SERVICES a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒
XIV. RECREATION—				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒
XV. TRANSPORTATION/TRAFFIC—Would the project:				
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	☐	☐	☐	☒
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Result in inadequate parking capacity?	☐	☐	☐	☒
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
XVI. UTILITIES AND SERVICE SYSTEMS—Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒
XVII. MANDATORY FINDINGS OF SIGNIFICANCE—				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☐	☒

Issues	Potentially Significant Impact	Less Than Significant With Mitigation	Less Than Significant Impact	No Impact
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☐	☒
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

Appendix C

Disadvantaged Communities Documentation

Census Calculations

Census Website – http://factfinder.census.gov

The following links were used to determine disadvantaged status:

- Datasets - Census 2000 Summary 3 File - Detailed Tables

The State Water Resource Control Board instructions for determining a location's disadvantaged community status specifically request use of Median Household Income for 2000. The census website provides datasets collected from the 2000 census (year 1999).

- Table 53 within Detailed Tables provides Median Household Incomes for 1999
- Table 14 within Detailed Tables provides Household Type by Household Size for 1999

Census data can be found in different ways for various region sizes. The following geographic datasets were tested for income.

- Census Tracts
- Census Tracts/Census Blocks
- Zip Codes

Census tracts/blocks gave the most precise data, but may be skewed by a few large incomes for the area. An analysis of zip codes and census tracts provides a broader overview.

Results for Stevinson Water District and Merquin County Water District (Merced County) are presented below:

- Stevinson Water District (see Attachment 1 for location and census designations)
    - Census Tracts (Merced: 4 = $40,755; Stanislaus: 34 = $32,266)
    - Census Tracts / Census Blocks (Merced: 4 = $35,000; 5 = $50,341; 6 = $36,129) (Stanislaus: 2 = $28,333)
    - Weighted Household Income = $35,933
    - Zip Codes (95313 = $37,917; 95324 = $40,941; 95374 = $35,746; 95360 = $39,225)

- Merquin County Water District (see Attachment 2 for location and census designations)
  - Census Tracts (4 = $40,755, 3.03 = $35,947, 9.01 = $31,651)
  - Census Tracts / Census Blocks (4 – 6 = $36,129) (3.03 – 1 = $35,644) (9.01 – 1 = $31,328)
  - Block Area within District:
    - Census Tract 4, Block 6 = 76%
    - Census Tract 3.03, Block 1 = 7%
    - Census Tract 9.01, Block 1 = 17%
  - Weighted Household Income = $35,941
  - Zip Codes (95374 = $35,746; 95322 = $37,766)

Technique for Computing Weighted Median Household Income

- Determine the Income per Household for 1999 (2000 census) by Census Block.
- Determine the Number of Households per Census Block.
- Calculate the number of households within the project area, assuming an even distribution of households. (Calculated by area, using the Total acres of the Census Block and the Total Census Block acres within the project area. Multiple the percent of the census block within the project area with the total households).
- Calculate a weighted household income using the income per households and households within the project area (see Attachment 3 for computations).

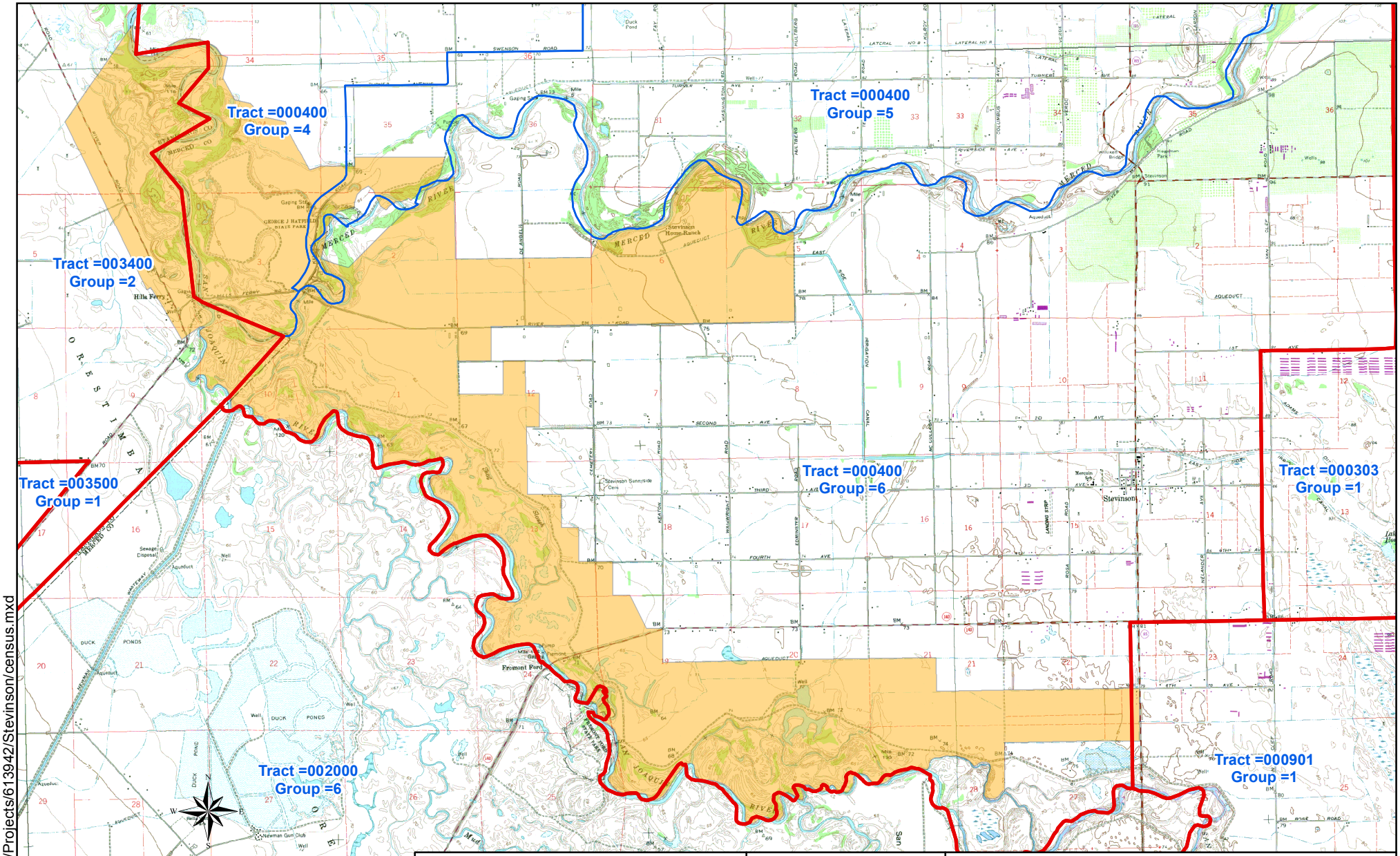
Demonstration of Water Use

The Agricultural Drainage Control Project will support beneficial uses of water in the Stevinson Water District and the Merquin County Water District in the following ways:

- Agricultural irrigation is a beneficial use of the San Joaquin River, the first downstream body of water from the Districts. By increasing the Districts' capacity to capture and recycle agricultural drainage through their irrigation delivery system, the project will reduce the current practice of augmenting surface water deliveries with groundwater. Because both the salinity and the cost of the recycled water are expected to be lower than those of groundwater, the project will provide a benefit to the communities with respect to this use.
- Residents of the affected communities rely exclusively on groundwater for domestic use, a second designated beneficial use of the San Joaquin River. One of the purposes of the project is to create a groundwater mound to obstruct intrusion of saline groundwater from the west side of the San Joaquin Valley (see Figure 2 of the

Grant Proposal). Attainment of this project purpose will improve the quality of groundwater available to domestic users in the most pronounced zone of intrusion.

These purposes are described in greater detail in the Integrated Water Resources Plan that has been developed by the Districts with support from DWR.



09-16-04 S:/GIS/Projects/613942/Stevinson/census.mxd

Stevinson Water District,
Merced County, California

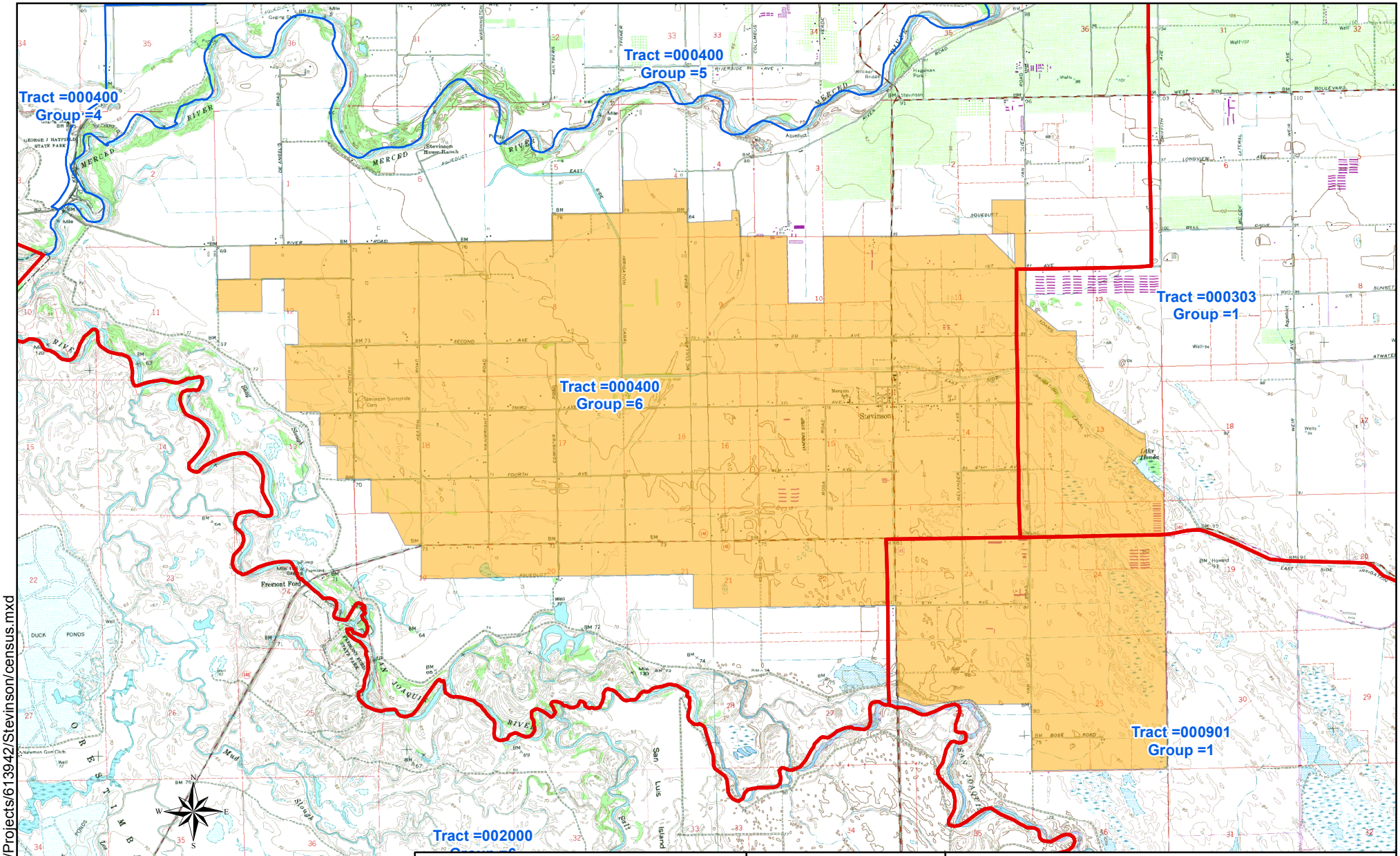
Agricultural Drainage Control Project

Bookman-Edmonston
A Division of GEI Consultants

CENSUS TRACT AND BLOCK DESIGNATIONS

NOVEMBER 2004

ATTACHMENT 1



09-16-04 S:/GIS/Projects/613942/Stevinson/census.mxd

SOURCE: US Census, Tiger Data, 2000

Merquin County Water District,
Merced County, California

Agricultural Drainage Control Project

Bookman-Edmonston
A Division of GEI Consultants

CENSUS TRACT AND BLOCK DESIGNATIONS

NOVEMBER 2004

ATTACHMENT 2

ATTACHMENT 3
CALCULATIONS FOR DISADVANTAGED COMMUNITY STATUS
STEVINSON AND MERQUIN COUNTY WATER DISTRICTS

STEVINSON WATER DISTRICT

Census Tract	Census Block	Total Acres of Census Block (GIS)	Acres within Project Area (GIS)	% Acres within Project Area	Total Households (Census)	Households in Project Area	Income by Household (Census)	Income X Households	Weighted Income
4	4	10,648	99	0.930%	230	2	$35,000	$74,845	
4	5	7,651	236	3.085%	219	7	$50,341	$340,063	
4	6	19,587	5,362	27.375%	462	126	$36,129	$4,569,375	
34	2	13,558	932	6.874%	230	16	$28,333	$447,961	
						151		**$5,432,245**	**$35,933**

MERQUIN COUNTY WATER DISTRICT

Census Tract	Census Block	Total Acres of Census Block (GIS)	Acres within Project Area (GIS)	% Acres within Project Area	Total Households (Census)	Households in Project Area	Income by Household (Census)	Income x Households	Weighted Income
303	1	19,246	800	4.157%	345	14	$35,644	$511,158	
4	6	19,587	8,560	43.702%	462	202	$36,129	$7,294,638	
901	1	117,804	1,916	1.626%	450	7	$31,328	$229,288	
						224		**$8,035,084**	**$35,941**

Appendix D

Letters of Support

December 14, 2004

Ms. Debra Gonzalez
Department of Water Resources
Office of Water Use Efficiency
P.O. Box 942836
Sacramento, California, 94236-0001

Subject: Endorsement of the Stevinson Water District Phase II - Lateral Pipelining Project

Dear Ms. Gonzalez:

The Merquin County Water District (MCWD) supports and endorses the efforts of Stevinson Water District (SWD) to conserve water by pipelining laterals in the distribution system of our two districts. These improvements will conserve water, improve operational flexibility within SWD and MCWD and provide flow and water quality benefits to the Bay-Delta.

The Bureau of Reclamation's designation of the San Joaquin Basin as an area of "high potential for water supply crises" is a recognition of the importance of water use efficiency efforts in this area. Therefore, we encourage the Department to assist SWD in implementing the Phase II – Lateral Pipelining Project. The award of Water Use Efficiency money is vital in enabling small districts such as SWD to leverage their own resources to implement effective water management projects.

Sincerely, Rick Jones

Rick Jones
19276 W. 6th Avenue
Stevinson, CA 95374

December 14, 2004

Ms. Debra Gonzalez
Department of Water Resources
Office of Water Use Efficiency
P.O. Box 942836
Sacramento, California, 94236-0001

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Sincerely,

David Nerovino
24509 W River Rd Stevinson
Mail: 19828 Golf Rd Helman
209 6328168

December 14, 2004

Ms. Debra Gonzalez
Department of Water Resources
Office of Water Use Efficiency
P.O. Box 942836
Sacramento, California, 94236-0001

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Sincerely,

Douglas L. Wells
16509 W. River Rd.
Livingston, Ca. 95334

December 14, 2004

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Department of Water Resources
Office of Water Use Efficiency
P.O. Box 942836
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Sincerely,

Frank Amaral

2848 N. LANDER AVE
Stevinson, Cal. 95374
Phone (209) 634-7533

December 14, 2004

Ms. Debra Gonzalez
Department of Water Resources
Office of Water Use Efficiency
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Sincerely,

Rodney Buckley
19605 3rd. Ave
Stevinson, Ca. 95374

December 14, 2004

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Department of Water Resources
Office of Water Use Efficiency
P.O. Box 942836
Sacramento, California, 94236-0001

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Sincerely,

Lloyd Virgo

Lloyd Virgo
18901 W. Bose Road
Stevinson, CA 95374

December 14, 2004

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Department of Water Resources
Office of Water Use Efficiency
P.O. Box 942836
Sacramento, California, 94236-0001

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Sincerely,

Adam Azevedo
22368 W. 2nd
Stevinson, CA 95374