
AUTHORIZING AND ELIGIBILITY REQUIREMENTS

Locally Not Cost Effective Water Conservation Programs and Measures

Within this application are two projects which are not locally cost effective water conservation projects, East Orosi CSD and Sultana CSD Water Conservation and Meter Projects; the present value of local benefits (detailed in Attachment 3) are less than the present value of local costs (detailed in Attachment 5) of implementing the project.

Project D: East Orosi CSD – Water Conservation and Meter Project

Monetized Benefits

The monetized benefits include reduced groundwater production due to lower water demands. These benefits are quantified in Attachment 3 – Project Justification and are monetized using the DWR Method. The guidelines and assumption used in the analysis include the following:

Without-Project and With Project. Without the project none of the costs will be incurred and no benefits will be realized. With the project all the costs will be incurred and all benefits are expected to be realized.

Period of Analysis: The period of analysis is 30 years for the water meters and 20 years for the ultra low flow toilets (ULFTs) (see **Attachment 1t**). The water meters are expected to last 30 years based on the experience of the nearby water meter programs (City of Fresno).

- Sunk Costs: The project does not include sunk costs.
- Opportunity Costs: The project does not include opportunity costs.
- Discount Rate: A 6% discount rate was used in the analysis.
- Dollar Value Base Year: All values are based on 2014 dollars.

Reduced Groundwater Production Costs

East Orosi delivered 92.7 AF of water in 2013-2014. The installation of water meters is expected to reduce water demands by 20% (18.53 acre-feet per year) since customers will purchase water on a volumetric basis and the installation of ULFT toilets at every residence is anticipated to reduce water consumption by 27.5 gallons per toilet per day (3.54 AF/yr for all 115 residences with 1 toilet per house) (see **Attachment 1q**, page 79). This will reduce the cost to pump, operate and maintain groundwater wells. Groundwater pumping is expected to reduce by 22.1 AF/yr. EOCSO estimates the cost to produce an acre foot of water to be \$631/AF. Assuming that approximately 50% of the costs are fixed and 50% variable, the value of conserved water is estimated to be \$631/AF x 50% = \$315. This is the value of local potable water and was used in the economic analysis. Groundwater pumping and delivery is the least expensive and most likely alternative water supply, and is therefore considered appropriate for the economic analysis. See Table ES-3 – Annual Benefit (**Attachment 1r**) a summary of the fiscal benefits associated with these items.

Project Costs

Construction and Engineering Costs

The total estimated costs for engineering, surveying, permitting, construction management and construction are presented in detail in Attachment 5 – Budget. These costs must be expended before the project can operate.

Administration Costs

The project administrative costs will include office staff time to implement the volumetric rates structure. It is estimated administration will take approximately 4 hours per month (48 hours per year) of office staff time. The burdened hourly rate for this staff is \$40. The administrative costs will average approximately \$1,920 per year (\$40*48). Also included in the Administration costs line item is the annual meter reading software fee of \$1,000.

AUTHORIZING AND ELIGIBILITY REQUIREMENTS*Operation Costs*

The project operational duties will be primarily performed by the system manager and should take approximately 6 hours per month; 4 hours per month to coordinate meter reading and 2 hours per month to upload the data and correct any anomalies. The burdened hourly rate associated with this staff is approximately \$40. Based on these assumptions, the operation cost will be \$2,880 per year (\$40*6*12).

Maintenance Costs

The water meters will require minimal routine maintenance; assuming the first five years will operate with no maintenance cost during the warranty period. It is anticipated approximately 10 meters per year will require maintenance after year 5.

The maintenance will be performed by field staff that has a burdened hourly rate of \$25. The maintenance should take no more than 2 hour per meter – 20 hours per year, which equate to a cost of \$500 per year after year 5.

Replacement Costs

The meters are assumed to have a useful life of 30 years; annualized replacement costs of meters are included in this analysis to develop the capital reserve that will be necessary upon replacement (115*\$292/30=\$1,118.82). The meter reading equipment is anticipated to have a useful life of 15 years; annualized replacement cost of the equipment is similarly included (\$12,800/15=\$853.33). However, ULFTs have an anticipated useful life of 20 years; however, it is assumed that the homeowners will be responsible for replacement of the fixtures and replacement costs are not included in this analysis.

Monitoring Costs

No additional monitoring costs are associated with this project; meter readings and associated administrative costs are included in administration costs above.

The lifecycle project costs are provided in DWR Economic **ES-5 – Annual Costs (Attachment 1r)**.

Benefit Cost Analysis

A financial analysis was performed over a 30-year period using a six percent discount rate. The costs (initial, administration, operation, and maintenance) and benefits (water conservation) were calculated over a 30-year period. The project benefit cost ratio is provided below:

$$\frac{\text{Project Benefits}}{\text{Project Costs}} = \frac{\$90,429.33}{\$405,432.95} = 0.22$$

Project E: Sultana CSD – Water Conservation and Meter ProjectMonetized Benefits

The monetized benefits include reduced groundwater production due to lower water demands. These benefits are quantified in Attachment 3 – Project Justification and are monetized using the DWR Method. The guidelines and assumption used in the analysis include the following:

Without-Project and With Project. Without the project none of the costs will be incurred and no benefits will be realized. With the project all the costs will be incurred and all benefits are expected to be realized.

Period of Analysis: The period of analysis is 30 years for the water meters and 20 years for the ultra low flow toilets (ULFTs) (see **Attachment 1t**). The water meters are expected to last 30 years based on the experience of the nearby water meter programs (City of Fresno).

- Sunk Costs: The project does not include sunk costs.

AUTHORIZING AND ELIGIBILITY REQUIREMENTS

- Opportunity Costs: The project does not include opportunity costs.
- Discount Rate: A 6% discount rate was used in the analysis.
- Dollar Value Base Year: All values are based on 2014 dollars.

Reduced Groundwater Production Costs

Sultana CSD delivered 178.1 AF of water in 2013. The installation of water meters is expected to reduce water demands by 20% (35.62 acre-feet per year) since customers will purchase water on a volumetric basis and the installation of ULFT toilets at every residence is anticipated to reduce water consumption by 27.5 gallons per toilet per day (7.45 AF/yr for all 115 residences with 1 toilet per house) (see **Attachment 1q**, page 79). This will reduce the cost to pump, operate and maintain groundwater wells. Groundwater pumping is expected to reduce by 43.1 AF/yr. SCSD estimates the cost to produce an acre foot of water to be \$555/AF. Assuming that approximately 50% of the costs are fixed and 50% variable, the value of conserved water is estimated to be \$555/AF x 50% = \$255. This is the value of local potable water and was used in the economic analysis. Groundwater pumping and delivery is the least expensive and most likely alternative water supply, and is therefore considered appropriate for the economic analysis. See Table ES-3 – Annual Benefit (**Attachment 1s**) a summary of the fiscal benefits associated with these items.

Project Costs*Construction and Engineering Costs*

The total estimated costs for engineering, surveying, permitting, construction management and construction are presented in detail in Attachment 5 – Budget. These costs must be expended before the project can operate.

Administration Costs

The project administrative costs will include office staff time to implement the volumetric rates structure. It is estimated administration will take approximately 6 hours per month (48 hours per year) of office staff time. The burdened hourly rate for this staff is \$40. The administrative costs will average approximately \$1,920 per year (\$40*48). Also included in the Administration costs line item is the annual meter reading software fee of \$1,000.

Operation Costs

The project operational duties will be primarily performed by the system manager and should take approximately 10 hours per month; 6 hours per month to coordinate meter reading and 4 hours per month to upload the data and correct any anomalies. The burdened hourly rate associated with this staff is approximately \$40. Based on these assumptions, the operation cost will be \$2,880 per year (\$40*6*12).

Maintenance Costs

The water meters will require minimal routine maintenance; assuming the first five years will operate with no maintenance cost during the warranty period. It is anticipated approximately 20 meters per year will require maintenance after year 5.

The maintenance will be performed by field staff that has a burdened hourly rate of \$25. The maintenance should take no more than 2 hour per meter – 40 hours per year, which equate to a cost of \$1,000 per year after year 5.

Replacement Costs

The meters are assumed to have a useful life of 30 years; annualized replacement costs of meters are included in this analysis to develop the capital reserve that will be necessary upon replacement ($242 * \$292 / 30 = \$2,354.38$). The meter reading equipment is anticipated to have a useful life of 15 years; annualized replacement cost of the equipment is similarly included ($\$12,800 / 15 = \853.33). However, ULFTs have an anticipated useful life of 20 years; however, it is assumed that the homeowners will be responsible for replacement of the fixtures and replacement costs are not included in this analysis.

AUTHORIZING AND ELIGIBILITY REQUIREMENTS*Monitoring Costs*

No additional monitoring costs are associated with this project; meter readings and associated administrative costs are included in administration costs above.

The lifecycle project costs are provided in DWR Economic **ES-5 – Annual Costs (Attachment 1s)**.

Benefit Cost Analysis

A financial analysis was performed over a 30-year period using a six percent discount rate. The costs (initial, administration, operation, and maintenance) and benefits (water conservation) were calculated over a 30-year period. The project benefit cost ratio is provided below:

$$\frac{\text{Project Benefits}}{\text{Project Costs}} = \frac{\$142,892.60}{\$711,688.14} = 0.20$$

Attachment 1q

MOU Regarding Urban Water Conservation in California

MEMORANDUM OF UNDERSTANDING
REGARDING
URBAN WATER CONSERVATION
IN CALIFORNIA

As Amended June 13, 2007

EXHIBIT 6

Table 1 Planning Table For Estimating Water Savings in Service Areas with Different Household Characteristics
Single Family
(Gallons per Household per Day)

Persons per Household	Toilets per Household															
	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5
2.0	22.8	24.3	25.7	27.1	28.5	29.9	31.3	32.7	34.1	35.5	37.0	38.4	39.8	41.2	42.6	44.0
2.1	23.8	25.4	27.0	28.5	30.0	31.5	33.0	34.5	36.0	37.4	38.9	40.4	41.8	43.3	44.6	45.9
2.2	24.6	26.4	28.0	29.6	31.2	32.8	34.3	35.9	37.4	38.9	40.4	41.9	43.4	44.8	46.1	47.4
2.3	25.3	27.1	28.8	30.5	32.2	33.8	35.4	37.0	38.5	40.0	41.6	43.0	44.5	45.9	47.2	48.4
2.4	25.8	27.7	29.5	31.2	32.9	34.6	36.2	37.8	39.3	40.9	42.4	43.8	45.2	46.6	47.9	49.0
2.5	26.4	28.2	30.0	31.8	33.5	35.2	36.8	38.4	40.0	41.5	42.9	44.4	45.7	47.0	48.2	49.3
2.6	26.8	28.6	30.5	32.3	34.0	35.6	37.3	38.8	40.3	41.8	43.3	44.6	45.9	47.2	48.3	49.3
2.7	27.1	28.9	30.8	32.6	34.3	35.9	37.5	39.0	40.5	41.9	43.3	44.6	45.9	47.0	48.0	48.9
2.8	27.3	29.1	31.0	32.8	34.4	36.0	37.6	39.1	40.5	41.8	43.1	44.4	45.5	46.6	47.5	48.2
2.9	27.5	29.2	31.1	32.8	34.4	36.0	37.4	38.8	40.2	41.5	42.7	43.8	44.8	45.8	46.6	47.2
3.0	27.5	29.3	31.0	32.7	34.2	35.7	37.1	38.4	39.6	40.8	41.9	42.9	43.8	44.6	45.3	45.8

Estimates in the body of the table are accurate within ± 5 percent of model estimated water savings.

Attachment 1r

East Orosi CSD Economic Analysis Tables

Table ES-3 – Annual Benefit
(All benefits should be in 2014 dollars)

Project: East Orosi Community Service District - Water Conservation and Meter Project

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Year	Type of Benefit	Measure of Benefit (Units)	Without Project	With Project	Change Resulting from Project (e) – (d)	Unit \$ Value ⁽¹⁾	Annual \$ Value ⁽¹⁾ (f) x (g)	Discount Factor ^{(1) (2)}	Discounted Benefits ⁽¹⁾ (h) x (i)
2014	Water Conservation	\$/AF	0.0	0	0.0	\$315	\$0	1	\$0
2015	Water Conservation	\$/AF	0.0	0	0.0	\$315	\$0	0.943	\$0
2016	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.89	-\$6,198
2017	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.84	-\$5,849
2018	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.792	-\$5,515
2019	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.747	-\$5,202
2020	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.705	-\$4,909
2021	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.665	-\$4,631
2022	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.627	-\$4,366
2023	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.592	-\$4,122
2024	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.558	-\$3,886
2025	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.527	-\$3,670
2026	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.497	-\$3,461
2027	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.469	-\$3,266
2028	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.442	-\$3,078
2029	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.417	-\$2,904
2030	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.394	-\$2,744
2031	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.371	-\$2,583
2032	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.35	-\$2,437
2033	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.331	-\$2,305
2034	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.312	-\$2,173
2035	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.294	-\$2,047
2036	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.278	-\$1,936
2037	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.262	-\$1,824
2038	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.247	-\$1,720
2039	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.233	-\$1,623
2040	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.22	-\$1,532
2041	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.207	-\$1,441
2042	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.196	-\$1,365
2043	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.185	-\$1,288
2044	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.174	-\$1,212
2045	Water Conservation	\$/AF	22.1	0	-22.1	\$315	-\$6,964	0.164	-\$1,142
Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table)									-\$90,429.33

Table ES-5 – Annual Costs of Project

(All costs should be in 2014 Dollars)

Project: East Orosi Community Service District - Water Conservation and Meter Project

Year	Initial Costs Grand Total Cost from Table 7 (row (i), column (d))	Adjusted Grant Total Cost ⁽¹⁾	Annual Costs ⁽²⁾					Discounting Calculations		
			Admin	Operation	Maintenance	Replacement	Other	Total Costs (a) + ... + (g)	Discount Factor ⁽³⁾	Discounted Project Costs (h) x (i)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
2014									1	\$0.00
2015	\$317,758	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$317,758	0.943	\$299,645.32
2016		\$0.00	\$2,920.00	\$2,880.00	\$0.00	\$1,972.15	\$0.00	\$7,772.15	0.89	\$6,917.21
2017		\$0.00	\$2,920.00	\$2,880.00	\$0.00	\$1,972.15	\$0.00	\$7,772.15	0.84	\$6,528.61
2018		\$0.00	\$2,920.00	\$2,880.00	\$0.00	\$1,972.15	\$0.00	\$7,772.15	0.792	\$6,155.54
2019		\$0.00	\$2,920.00	\$2,880.00	\$0.00	\$1,972.15	\$0.00	\$7,772.15	0.747	\$5,805.80
2020		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.705	\$5,831.87
2021		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.665	\$5,500.98
2022		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.627	\$5,186.64
2023		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.592	\$4,897.11
2024		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.558	\$4,615.86
2025		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.527	\$4,359.42
2026		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.497	\$4,111.26
2027		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.469	\$3,879.64
2028		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.442	\$3,656.29
2029		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.417	\$3,449.49
2030		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.394	\$3,259.23
2031		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.371	\$3,068.97
2032		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.35	\$2,895.25
2033		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.331	\$2,738.08
2034		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.312	\$2,580.91
2035		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.294	\$2,432.01
2036		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.278	\$2,299.66
2037		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.262	\$2,167.30
2038		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.247	\$2,043.22
2039		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.233	\$1,927.41
2040		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.22	\$1,819.87
2041		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.207	\$1,712.33
2042		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.196	\$1,621.34
2043		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.185	\$1,530.35
2044		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.174	\$1,439.35
2045		\$0.00	\$2,920.00	\$2,880.00	\$500.00	\$1,972.15	\$0.00	\$8,272.15	0.164	\$1,356.63
Total Present Value of Discounted Costs (Sum of column (j))										\$405,432.95
Transfer to Table ES-6, column (c), Proposal Benefits and Costs Summaries										

Attachment 1s

Sultana CSD Economic Analysis Tables

Table ES-3 – Annual Benefit
(All benefits should be in 2014 dollars)

Project: Sultana Community Service District - Water Conservation and Meter Project

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Year	Type of Benefit	Measure of Benefit (Units)	Without Project	With Project	Change Resulting from Project (e) – (d)	Unit \$ Value ⁽¹⁾	Annual \$ Value ⁽¹⁾ (f) x (g)	Discount Factor ^{(1) (2)}	Discounted Benefits ⁽¹⁾ (h) x (i)
2014	Water Conservation	\$/AF	0.0	0	0.00	\$255	\$0.00	1	\$0
2015	Water Conservation	\$/AF	0.0	0	0.0	\$255	\$0.00	0.943	\$0
2016	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.89	-\$9,793
2017	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.84	-\$9,243
2018	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.792	-\$8,715
2019	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.747	-\$8,220
2020	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.705	-\$7,758
2021	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.665	-\$7,317
2022	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.627	-\$6,899
2023	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.592	-\$6,514
2024	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.558	-\$6,140
2025	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.527	-\$5,799
2026	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.497	-\$5,469
2027	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.469	-\$5,161
2028	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.442	-\$4,864
2029	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.417	-\$4,588
2030	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.394	-\$4,335
2031	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.371	-\$4,082
2032	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.35	-\$3,851
2033	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.331	-\$3,642
2034	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.312	-\$3,433
2035	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.294	-\$3,235
2036	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.278	-\$3,059
2037	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.262	-\$2,883
2038	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.247	-\$2,718
2039	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.233	-\$2,564
2040	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.22	-\$2,421
2041	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.207	-\$2,278
2042	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.196	-\$2,157
2043	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.185	-\$2,036
2044	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.174	-\$1,915
2045	Water Conservation	\$/AF	43.1	0	-43.1	\$255	-\$11,003.59	0.164	-\$1,805
Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table)									-\$142,892.60

Table ES-5 – Annual Costs of Project

(All costs should be in 2014 Dollars)

Project: Sultana Community Service District - Water Conservation and Meter Project

Year	Initial Costs Grand Total Cost from Table 7 (row (i), column (d))	Adjusted Grant Total Cost ⁽¹⁾	Annual Costs ⁽²⁾					Discounting Calculations		
			Admin	Operation	Maintenance	Replacement	Other	Total Costs (a) +...+ (g)	Discount Factor ⁽³⁾	Discounted Project Costs (h) x (i)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
2014		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	1	\$0.00
2015	\$580,690.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$580,690.00	0.943	\$547,590.67
2016		\$0.00	\$3,880.00	\$4,800.00	\$0.00	\$3,207.71	\$0.00	\$11,887.71	0.89	\$10,580.06
2017		\$0.00	\$3,880.00	\$4,800.00	\$0.00	\$3,207.71	\$0.00	\$11,887.71	0.84	\$9,985.68
2018		\$0.00	\$3,880.00	\$4,800.00	\$0.00	\$3,207.71	\$0.00	\$11,887.71	0.792	\$9,415.07
2019		\$0.00	\$3,880.00	\$4,800.00	\$0.00	\$3,207.71	\$0.00	\$11,887.71	0.747	\$8,880.12
2020		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$0.00	\$12,887.71	0.705	\$9,085.84
2021		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$0.00	\$12,887.71	0.665	\$8,570.33
2022		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$0.00	\$12,887.71	0.627	\$8,080.59
2023		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$0.00	\$12,887.71	0.592	\$7,629.52
2024		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$0.00	\$12,887.71	0.558	\$7,191.34
2025		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$0.00	\$12,887.71	0.527	\$6,791.82
2026		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$0.00	\$12,887.71	0.497	\$6,405.19
2027		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$0.00	\$12,887.71	0.469	\$6,044.34
2028		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$0.00	\$12,887.71	0.442	\$5,696.37
2029		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$0.00	\$12,887.71	0.417	\$5,374.18
2030		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$0.00	\$12,887.71	0.394	\$5,077.76
2031		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$0.00	\$12,887.71	0.371	\$4,781.34
2032		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$0.00	\$12,887.71	0.35	\$4,510.70
2033		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$0.00	\$12,887.71	0.331	\$4,265.83
2034		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$0.00	\$12,887.71	0.312	\$4,020.97
2035		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$0.00	\$12,887.71	0.294	\$3,788.99
2036		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$0.00	\$12,887.71	0.278	\$3,582.78
2037		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$0.00	\$12,887.71	0.262	\$3,376.58
2038		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$1.00	\$12,888.71	0.247	\$3,183.51
2039		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$2.00	\$12,889.71	0.233	\$3,003.30
2040		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$3.00	\$12,890.71	0.22	\$2,835.96
2041		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$4.00	\$12,891.71	0.207	\$2,668.58
2042		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$5.00	\$12,892.71	0.196	\$2,526.97
2043		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$6.00	\$12,893.71	0.185	\$2,385.34
2044		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$7.00	\$12,894.71	0.174	\$2,243.68
2045		\$0.00	\$3,880.00	\$4,800.00	\$1,000.00	\$3,207.71	\$7.00	\$12,894.71	0.164	\$2,114.73
Total Present Value of Discounted Costs (Sum of column (j))										\$711,688.14
Transfer to Table ES-6, column (c), Proposal Benefits and Costs Summaries										

Attachment 1t

Ultra Low Flush Toilet Useful Life

WATER CONSERVATION



OVERVIEW OF RETROFIT STRATEGIES A Guide for Apartment Owners and Managers



Table 3. Estimated Water Savings and Costs

INDOOR WATER USE RETROFIT STRATEGY	WATER SAVINGS PER RETROFIT (GALLONS PER YEAR)	ESTIMATED IMPLEMENTATION COSTS PER RETROFIT	EASE OF IMPLEMENTATION	LONGEVITY (YEARS)
ULFT installation; high volume/multiple installation discount	3,650 – 7,300	\$110-\$195	0.7	20
Installation of high efficiency clothes washers; high volume/multiple installation discount	3,650 – 5,475	\$200 +	0.7	12
Implementation of submetering system	2,410 – 4,820	\$225 – \$500*	0.5	10
⚡ Leak detection and repair—toilets	1,095 – 2,555	\$11 – \$29	1	2
⚡ Installation of low-flow showerheads	1,095 – 2,190	\$17	1	10
⚡ Installation of low-flow faucet aerators	183 – 1,643	\$2	1	10
⚡ Installation of quick-closing flappers in toilets	730 – 1,460	\$14 – \$22	1	5
⚡ Installation of toilet displacement devices	365 – 1,095	\$2	1	5
⚡ Installation of toilet water level adjustment	365 – 1,095	\$20 – \$32	1	5
⚡ Leak detection and repairfaucets	219 – 438	\$7	1	2
⚡ Leak detection and repair—showerheads	219 – 438	\$14 – \$29	1	4
Elimination of narrow strips of turf	73,500	\$600	0.8	20
Reduction of lawn area	18,720	\$288	0.8	20
Installation of soil moisture or rain sensors	3,245	\$105	1	10
Replacement of sprinklers with drip systems	24,340	\$1,000 – \$1500*	0.7	10
Use of low-water consumption and native plants	13,990	\$3,000 – \$6,000	0.7	20
⚡ Installation of special faucets/hose bibs	6,388	\$28	1	10

* Additional maintenance costs involved, estimated as follows:

- Submetering: \$24–\$36 per unit per year
- Drip Systems: \$720 per year per thousand square-foot area

⚡ Quick pay-back strategies