

**Table 20 – Proposal Benefits and Costs Summary**

Proposal: Westside IRWM  
Agency: Solano County Water Agency

Project	Project Proponent	Total Present Value Project Costs <sup>(1)</sup>	Total Present Value Project Benefits			From Section D1 – Cost-Effectiveness Analysis, Cost Savings	From Section D2 – Briefly describe the main Non-monetized benefits
			From Section D3 – Monetized <sup>(2)</sup>	From Section D4 – Flood Damage Reduction <sup>(3)</sup>	Total		
(a)	(b)	(c)	(d)	(e)	(f) = (d) + (e)	(g)	(h)
Dixon Main Drain / V-drain Enlargement Project	Dixon Regional Watershed Joint Powers Authority	\$3,318,866.89	N/A	\$339,550.06	\$339,550.06	N/A	Enables construction of Eastside Drainage Project with a future benefit area of 11,600 acres, helps resolve public water resource conflicts, restores native vegetation, improves water quality, creates wetlands
Middle Creek Flood Damage Reduction and Ecosystem Restoration Project	Lake County Watershed Protection District	\$1,467,035.00	\$1,626,106.00	\$190,687.00	\$1,816,793.00	N/A	The project will protect fish populations, improve drinking water quality and the quality of wastewater, reduce greenhouse gasses, increase habitat for the Giant Garter snake, and increase area groundwater levels.
Lower Putah Creek Main Channel Restoration: Monticello Dam to Dry Creek	Solano County Water Agency	\$1,483,635.00	N/A	N/A	N/A	N/A	Controls invasive weeds, restores natural channel form and function, enhances fish and wildlife habitat, enhances public access to public lands.
Wastewater Storage Ponds and Disposal Improvements	Lake Berryessa Resort Improvement District	\$7,675,231.00	\$10,938,200.00	N/A	N/A	\$4,168,679.00	(1) Protect and enhance recreational activities on Lake Berryessa; (2) Address a critical wastewater treatment, storage, and disposal issue for a DAC. Addresses the following benefit #'s from Table 12: 4,5,and 13
Regional Collaborative Water Use Efficiency Program	Solano County Water Agency	N/A	N/A	N/A	N/A	N/A	Reduced municipal water demand, reduced agricultural water demand, increased water reliability, availability of water conservation fixtures to DACs, increased spring and summer in-stream flows, reduced demand on groundwater, reduced energy use and greenhouse gas emissions (reduced pumping, fertilizer, and pesticide inputs), and decreased leaching of plant nutrients
Water Tank Replacement Project	Lake Berryessa Resort Improvement District	\$2,312,975.00	\$3,930,510.00	N/A	\$3,930,510.00	\$1,344,625.00	(1) Project will bring water tank structures and foundations to current seismic code; (2) Address a critical water quality and reliability issue for a DAC. Addresses the following benefit #'s from Table 12: 4,5,and 13
WDCWA Portion of the Sacramento River Joint Intake Project	WDCWA	\$19,060,740.08	\$186,293,200.16	N/A	\$186,293,200.16	N/A	Protect fish populations by replacing one of the largest unscreened intakes on the Sacramento River north of the Sacramento/San Joaquin Delta. Replacing the existing intake will safeguard migrating fish, several species of which are listed for protection under the Endangered Species Act. The new structure will meet the current criteria for fish screen design as defined by the Department of Fish and Game, National Marine Fisheries Service and the U.S. Fish and Wildlife Service.
Abandoned Well Incentive Program	Yolo County Flood Control & Water Conservation District	\$1,462,050.00	N/A	N/A	N/A	N/A	The main benefits are to social health and safety by preventing contamination of groundwater drinking water sources. Additional safety benefits include covering open boreholes (falling hazard prevention). Also, proper well abandonment is a permanent, long term solution that improves the management of California Groundwater Resources. (Table 12, #'s 1,7,10,12)

(1) From Table 19, or RWMG method  
(2) From Table 15 or RWMG method  
(3) From Table 18 or RWMG method

**ATTACHMENT 8**  
**Benefits and Cost Analysis**  
**Proposal: Westside IRWM**  
**Project: Abandoned Well Incentive Program**

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We have used the DWR Method of Analysis to calculate benefits and costs for the project. This method includes Sections D1 through D5.

Section D1 – Cost-Effective Analysis – NOT INCLUDED (applicable for small projects only)

Section D2 – Non Monetized Benefits Analysis

- Table 12 – Non Monetized Benefits Checklist

Section D3 – Monetized Benefits Analysis – NOT INCLUDED

Section D4 – Flood Damage Reduction Benefits Analysis – NOT INCLUDED

Section D5 – Project Benefits and Costs Summary

- Table 19 – Annual Costs of Project
- Table 20 – Proposal Benefits and Costs Summary

<b>Table 10 – Common types of benefits to report</b>	
<b>Project: Abandoned Well Incentive Program</b>	
Water Quality	Benefits include, reduced costs of protecting beneficial uses, avoided water quality project costs; avoided water treatment costs; and water supply benefits caused by water quality improvements.

Table 12. Non-monetized Benefits Checklist		
Project: Abandoned Well Incentive Program		
No.	Question	Enter "Yes", "No" or "Neg"
<b>Community/Social Benefits</b>		
<b>Will the proposal</b>		
1	<b>Provide education or technology benefits?</b>	Yes
	The Well Abandoned Well Incentive Program has an outreach component that will provide an educational benefit. Members of the community will become more aware of the importance of protecting groundwater quality by properly destroying abandoned wells. The Farm Bureaus and RCD's will use their current networks to spread the word through regularly schedule meetings, newsletters, and websites.	
2	<b>Provide social recreation or access benefits?</b>	No
3	<b>Help avoid, reduce or resolve various public water resources conflicts?</b>	No
4	<b>Promote social health and safety?</b>	Yes
	The Well Program will promote safety by removing the water related hazard of open bore holes.	
5	<b>Have other social benefits?</b>	No
<b>Environmental Stewardship Benefits:</b>		
<b>Will the proposal</b>		
6	<b>Benefit wildlife or habitat in ways that were not quantified in Attachment 7?</b>	No
7	<b>Improve water quality in ways that were not quantified in Attachment 7?</b>	No
8	<b>Reduce net emissions in ways that were not quantified in Attachment 7?</b>	No
9	<b>Provide other environmental stewardship benefits, other than those claimed in Sections D1, D3 or D4?</b>	No
<b>Sustainability Benefits:</b>		
<b>Will the proposal</b>		
10	<b>Improve the overall, long-term management of California groundwater resources?</b>	Yes
	More than 10 million AF of groundwater is stored in the aquifers of the Sac Westside region. Once groundwater is	
11	<b>Reduce demand for net diversions for the regions from the Delta?</b>	No
12	<b>Provide a long-term solution in place of a short-term one?</b>	No
13	<b>Promote energy savings or replace fossil fuel based energy sources with renewable energy and</b>	No
14	<b>Improve water supply reliability in ways not quantified in Attachment 7?</b>	Yes
	Water supply reliability will be improved by reducing the need to replace shallow wells with deeper wells, reducing	
15	<b>Other (If the above listed categories do not apply, provide non-monetized benefit description)?</b>	

Table 19. Annual Costs of Project											
(All costs should be in 2012 Dollars)											
Project: Abandoned Well Incentive Program											
Year	Initial Costs Grand Total Cost from Table 6 (row (i), column (d)) (a)	Adjusted Grant Total Cost <sup>(1)</sup> (b)	Annual Costs <sup>(2)</sup>					Discounting Calculations			
			Admin (c)	Operation (d)	Maintenance (e)	Replacement (f)	Other (g)	Total Costs (a) +...+ (g) (h)	Discount Factor (i)	Discounted Project Costs (h) x (i) (j)	
2012	\$ 1,462,050.00								\$ 1,462,050.00	1.000	\$1,462,050.00
in perpetuity									\$ -		\$ -
<b>Total Present Value of Discounted Costs (Sum of Column (j))</b>										<b>\$1,462,050.00</b>	
Comments: Well destruction is a permanent, one-time process with no follow up maintenance.											
(1) If any, based on opportunity costs, sunk costs and associated costs											
(2) The incremental change in O&M costs attributable to the project											

**ATTACHMENT 8**  
**Benefits and Cost Analysis**  
**Proposal: Westside IRWM**  
**Project: WDCWA Portion of the Sacramento River Joint Intake Project**

<b>Table 10. Project Benefits</b>	
<b>Water Supply</b>	<p>The WDCWA Portion of the Sacramento River Joint Intake Project is a key element of the WDCWA surface water project, a project that will provide a new water supply to meet existing needs. The surface water project has the right to divert up to 45,000 acre-feet of water per year from the Sacramento River. A water treatment facility will be constructed to initially supply up to 30 million gallons of water per day.</p> <p>The project will allow the Cities of Davis and Woodland to use a mix of groundwater and surface water in the summer months when Sacramento River water supplies are more limited. It will also allow the Cities to store water using aquifer storage and recovery (ASR) wells during the low-demand months and withdraw the stored water during the high-demand months of the summer.</p>
<b>Water Quality</b>	<p>The project will improve drinking water quality by decreasing the levels of TDS, arsenic, hexavalent chromium, nitrate and hardness in drinking water.</p> <p>The project will improve the quality of treated wastewater discharges by reducing the levels of selenium, manganese, TDS and boron in the water supply.</p> <p>The project will improve the quality of groundwater in the area. Reduced groundwater pumping in the Cities of Woodland and Davis will cause an increase in groundwater levels which will prevent contaminants from being drawn down into the groundwater table.</p>
<b>Ecosystem Improvement</b>	<p>The project will replace one of the largest remaining unscreened intakes on the Sacramento River north of the Sacramento / San Joaquin Delta. The project is vital to improve the protection of juvenile Chinook Salmon, Steelhead Trout and Green Sturgeon.</p> <p>Improved quality of wastewater discharge will decrease salt loading in the Sacramento River and the Delta.</p> <p>The project will create 1.46 acres of new Giant Garter Snake habitat.</p> <p>The project will produce fewer greenhouse gases than the alternative</p>

## ATTACHMENT 8

### Benefits and Cost Analysis

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	project, well head treatment of groundwater.
<b>Public Recreation and Public Access</b>	The project will replace one of the largest remaining unscreened intakes on the Sacramento River north of the Sacramento / San Joaquin Delta, protecting and enhancing fishing and boating opportunities in the River and Delta.
<b>Power Cost Savings and Power Production</b>	<p>The project will reduce groundwater pumping in the Cities of Woodland and Davis. This will cause an increase in groundwater levels which will decrease the energy used to pump agricultural wells in the area.</p> <p>Treating water from the intake will result in a lower energy use than the alternative project which is treating water at the wellhead and disposing of the brine byproduct.</p>
<b>Other</b>	The project will reduce consumer costs associated with high TDS and hardness in the current water supply. Examples of costs include purchasing bottled water, replacing plumbing fixtures, and purchasing, operating, and maintaining water softeners.

**Table 15 – Annual Benefit**  
(All benefits should be in 2012 dollars)

Proposal: Westside IRWM  
Project: WDCWA Portion of Sacramento River Joint Intake 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 <sup>(1)</sup>	Annual \$ Value <sup>(1)</sup> (f) x (g)	Discount Factor <sup>(1)</sup>	Discounted Benefits <sup>(1)</sup> (h) x (i)
<b>2012</b>	none						0	1.000	-
<b>2013</b>	none						0	0.943	-
<b>2014</b>	none						0	0.890	-
<b>2015</b>	none						0	0.840	-
<b>2016</b>	New Water Supply	Acre-Feet/year	0	28,680	28,680	309	8,862,120	0.792	<b>7,018,799</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.792	<b>3,168,000</b>
<b>2017</b>	New Water Supply	Acre-Feet/year	0	28,680	28,680	309	8,862,120	0.747	<b>6,620,004</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.747	<b>2,988,000</b>
<b>2018</b>	New Water Supply	Acre-Feet/year	0	28,680	28,680	309	8,862,120	0.705	<b>6,247,795</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.705	<b>2,820,000</b>
<b>2019</b>	New Water Supply	Acre-Feet/year	0	28,680	28,680	309	8,862,120	0.665	<b>5,893,310</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.665	<b>2,660,000</b>
<b>2020</b>	New Water Supply	Acre-Feet/year	0	28,680	28,680	309	8,862,120	0.627	<b>5,556,549</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.627	<b>2,508,000</b>
<b>2021</b>	New Water Supply	Acre-Feet/year	0	28,680	28,680	309	8,862,120	0.592	<b>5,246,375</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.592	<b>2,368,000</b>
<b>2022</b>	New Water Supply	Acre-Feet/year	0	28,680	28,680	309	8,862,120	0.558	<b>4,945,063</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.558	<b>2,232,000</b>
<b>2023</b>	New Water Supply	Acre-Feet/year	0	28,680	28,680	309	8,862,120	0.527	<b>4,670,337</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.527	<b>2,108,000</b>
<b>2024</b>	New Water Supply	Acre-Feet/year	0	28,680	28,680	309	8,862,120	0.497	<b>4,404,474</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.497	<b>1,988,000</b>
<b>2025</b>	New Water Supply	Acre-Feet/year	0	28,680	28,680	309	8,862,120	0.469	<b>4,156,334</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.469	<b>1,876,000</b>
<b>2026</b>	New Water Supply	Acre-Feet/year	0	28,680	28,680	309	8,862,120	0.442	<b>3,917,057</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.442	<b>1,768,000</b>
<b>2027</b>	New Water Supply	Acre-Feet/year	0	28,680	28,680	309	8,862,120	0.417	<b>3,695,504</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.417	<b>1,668,000</b>
<b>2028</b>	New Water Supply	Acre-Feet/year	0	28,680	28,680	309	8,862,120	0.394	<b>3,491,675</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.394	<b>1,576,000</b>
<b>2029</b>	New Water Supply	Acre-Feet/year	0	28,680	28,680	309	8,862,120	0.371	<b>3,287,847</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.371	<b>1,484,000</b>

**Table 15 – Annual Benefit**  
(All benefits should be in 2012 dollars)

Proposal: Westside IRWM  
Project: WDCWA Portion of Sacramento River Joint Intake 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 <sup>(1)</sup>	Annual \$ Value <sup>(1)</sup> (f) x (g)	Discount Factor <sup>(1)</sup>	Discounted Benefits <sup>(1)</sup> (h) x (i)
<b>2030</b>	New Water Supply	Acre-Feet/year	0	28,680	28,680	309	8,862,120	0.350	<b>3,101,742</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.350	<b>1,400,000</b>
<b>2031</b>	New Water Supply	Acre-Feet/year	0	28,680	28,680	309	8,862,120	0.331	<b>2,933,362</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.331	<b>1,324,000</b>
<b>2032</b>	New Water Supply	Acre-Feet/year	0	28,680	28,680	309	8,862,120	0.312	<b>2,764,981</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.312	<b>1,248,000</b>
<b>2033</b>	New Water Supply	Acre-Feet/year	0	28,680	28,680	309	8,862,120	0.294	<b>2,605,463</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.294	<b>1,176,000</b>
<b>2034</b>	New Water Supply	Acre-Feet/year	0	28,680	28,680	309	8,862,120	0.278	<b>2,463,669</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.278	<b>1,112,000</b>
<b>2035</b>	New Water Supply	Acre-Feet/year	0	28,680	28,680	309	8,862,120	0.262	<b>2,321,875</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.262	<b>1,048,000</b>
<b>2036</b>	New Water Supply	Acre-Feet/year	0	28,680	33,160	322	10,677,520	0.247	<b>2,637,347</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.247	<b>988,000</b>
<b>2037</b>	New Water Supply	Acre-Feet/year	0	28,680	33,160	322	10,677,520	0.233	<b>2,487,862</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.233	<b>932,000</b>
<b>2038</b>	New Water Supply	Acre-Feet/year	0	28,680	33,160	322	10,677,520	0.220	<b>2,349,054</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.220	<b>880,000</b>
<b>2039</b>	New Water Supply	Acre-Feet/year	0	28,680	33,160	322	10,677,520	0.207	<b>2,210,247</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.207	<b>828,000</b>
<b>2040</b>	New Water Supply	Acre-Feet/year	0	28,680	33,160	322	10,677,520	0.196	<b>2,092,794</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.196	<b>784,000</b>
<b>2041</b>	New Water Supply	Acre-Feet/year	0	28,680	33,160	400	13,264,000	0.185	<b>2,453,840</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.185	<b>740,000</b>
<b>2042</b>	New Water Supply	Acre-Feet/year	0	28,680	33,160	400	13,264,000	0.174	<b>2,307,936</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.174	<b>696,000</b>
<b>2043</b>	New Water Supply	Acre-Feet/year	0	28,680	33,160	400	13,264,000	0.164	<b>2,175,296</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.164	<b>656,000</b>
<b>2044</b>	New Water Supply	Acre-Feet/year	0	28,680	33,160	400	13,264,000	0.155	<b>2,055,920</b>

**Table 15 – Annual Benefit**  
(All benefits should be in 2012 dollars)

Proposal: Westside IRWM  
Project: WDCWA Portion of Sacramento River Joint Intake 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 <sup>(1)</sup>	Annual \$ Value <sup>(1)</sup> (f) x (g)	Discount Factor <sup>(1)</sup>	Discounted Benefits <sup>(1)</sup> (h) x (i)
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.155	<b>620,000</b>
<b>2045</b>	New Water Supply	Acre-Feet/year	0	28,680	33,160	400	13,264,000	0.146	<b>1,936,544</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.146	<b>584,000</b>
<b>2046</b>	New Water Supply	Acre-Feet/year	0	28,680	33,160	400	13,264,000	0.138	<b>1,830,432</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.138	<b>552,000</b>
<b>2047</b>	New Water Supply	Acre-Feet/year	0	28,680	33,160	400	13,264,000	0.130	<b>1,724,320</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.130	<b>520,000</b>
<b>2048</b>	New Water Supply	Acre-Feet/year	0	28,680	33,160	400	13,264,000	0.123	<b>1,631,472</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.123	<b>492,000</b>
<b>2049</b>	New Water Supply	Acre-Feet/year	0	28,680	33,160	400	13,264,000	0.116	<b>1,538,624</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.116	<b>464,000</b>
<b>2050</b>	New Water Supply	Acre-Feet/year	0	28,680	33,160	400	13,264,000	0.109	<b>1,445,776</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.109	<b>436,000</b>
<b>2051</b>	New Water Supply	Acre-Feet/year	0	28,680	38,200	400	15,280,000	0.103	<b>1,573,840</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.103	<b>412,000</b>
<b>2052</b>	New Water Supply	Acre-Feet/year	0	28,680	38,200	400	15,280,000	0.097	<b>1,482,160</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.097	<b>388,000</b>
<b>2053</b>	New Water Supply	Acre-Feet/year	0	28,680	38,200	400	15,280,000	0.092	<b>1,405,760</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.092	<b>368,000</b>
<b>2054</b>	New Water Supply	Acre-Feet/year	0	28,680	38,200	400	15,280,000	0.087	<b>1,329,360</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.087	<b>348,000</b>
<b>2055</b>	New Water Supply	Acre-Feet/year	0	28,680	38,200	400	15,280,000	0.082	<b>1,252,960</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.082	<b>328,000</b>
<b>2056</b>	New Water Supply	Acre-Feet/year	0	28,680	38,200	400	15,280,000	0.077	<b>1,176,560</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.077	<b>308,000</b>
<b>2057</b>	New Water Supply	Acre-Feet/year	0	28,680	38,200	400	15,280,000	0.073	<b>1,115,440</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.073	<b>292,000</b>
<b>2058</b>	New Water Supply	Acre-Feet/year	0	28,680	38,200	400	15,280,000	0.069	<b>1,054,320</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.069	<b>276,000</b>

**Table 15 – Annual Benefit**  
(All benefits should be in 2012 dollars)

Proposal: Westside IRWM  
Project: WDCWA Portion of Sacramento River Joint Intake 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 <sup>(1)</sup>	Annual \$ Value <sup>(1)</sup> (f) x (g)	Discount Factor <sup>(1)</sup>	Discounted Benefits <sup>(1)</sup> (h) x (i)
<b>2059</b>	New Water Supply	Acre-Feet/year	0	28,680	38,200	400	15,280,000	0.065	<b>993,200</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.065	<b>260,000</b>
<b>2060</b>	New Water Supply	Acre-Feet/year	0	28,680	38,200	400	15,280,000	0.061	<b>932,080</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.061	<b>244,000</b>
<b>2061</b>	New Water Supply	Acre-Feet/year	0	28,680	38,200	400	15,280,000	0.058	<b>886,240</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.058	<b>232,000</b>
<b>2062</b>	New Water Supply	Acre-Feet/year	0	28,680	38,200	400	15,280,000	0.055	<b>840,400</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.055	<b>220,000</b>
<b>2063</b>	New Water Supply	Acre-Feet/year	0	28,680	38,200	400	15,280,000	0.052	<b>794,560</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.052	<b>208,000</b>
<b>2064</b>	New Water Supply	Acre-Feet/year	0	28,680	38,200	400	15,280,000	0.049	<b>748,720</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.049	<b>196,000</b>
<b>2065</b>	New Water Supply	Acre-Feet/year	0	28,680	38,200	400	15,280,000	0.046	<b>702,880</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.046	<b>184,000</b>
<b>Last Year of Project Life</b>	New Water Supply	Acre-Feet/year	0	28,680	38,200	400	15,280,000	0.043	<b>657,040</b>
	Reduced Consumer Cost	Million dollars/year	0	4,000,000	4,000,000	1	4,000,000	0.043	<b>172,000</b>

(1) Complete these columns if dollar value is being claimed for the benefit.

Total Present Value of Discounted Benefits Based on Unit Value **186,293,200**

Comments: Value of reduced consumer cost is documented in Attachment 7 Table 9, Value of water provided is based on \$400 per acre-ft, the typical cost for water transfers in California. WDCWA will pay \$260 per acre-ft on the first 10,000 acre-ft for the first 24 years of the project so this amount is deducted from the value for the first 24 years (400-260=140). Calculations of value for each volume are shown below.

Cost per unit on 28,680 MGD during the first 24 years:				Cost per unit on 28,680 MGD during the first 24 years:			
	Amount in ac-ft	Unit \$ Value	Annual \$ Value		Amount in ac-ft	Unit \$ Value	Annual \$ Value
First 10,000 ac-ft	10,000	140	1,400,000	First 10,000 ac-ft	10,000	140	1,400,000
Remaining Amount	18,680	400	7,472,000	Remaining Amount	23,160	400	9,264,000
Total in ac-ft	28,680			Total in ac-ft	33,160		
		Total Value	8,872,000			Total Value	10,664,000
		Unit Value for 28,680 based on Total Value	309			Unit Value for 28,680 based on Total Value	322

**Table 16– Annual Costs of Avoided Projects**

(All avoided costs should be in 2012 dollars)

Project: WDCWA Portion of Sacramento River Joint Intake Project

(a)	Costs				Discounting Calculations	
	(b)	(c)	(d)	(e)	(f)	(g)
Year	Alternative (Avoided Project Name): _____ Avoided Project Description:				Discount Factor	Discounted Costs (e) x (f)
	Avoided Capital Costs	Avoided Replacement Costs	Avoided Operations and Maintenance Costs	Total Cost Avoided for Individual Alternatives (b) + (c) + (d)		
2012	*				1.000	
2013					0.943	
2014					0.899	
2015					0.839	
...					...	
Last Year of Project Life					...	
<b>Total Present Value of Discounted Costs</b>						
<b>(%) Avoided Cost Claimed by Project</b>						
<b>Total Present Value of Discounted Avoided Project Costs Claimed by alternative Project</b>						

\*Comments: Well head treatment was the alternative to the Project. The alternative has a much higher cost. Because the benefits calculated in Table 15 are much higher than the project cost and to avoid double counting as described in the instructions for Table 15, we did not include cost of avoided projects in Table 16. Costs for avoiding the alternative project can be provided if needed.

**Table 19 – Annual Costs of Project**

(All costs should be in 2012 Dollars)

Project: WDCWA Portion of Sacramento River Joint Intake Project

Year	Initial Costs Grand Total Cost from Table 6 (row (i), column (d))	Adjusted Grant Total Cost <sup>(1)</sup>	Annual Costs <sup>(2)</sup>					Discounting Calculations		
			Admin	Operation	Maintenance	Replacemen t	Other	Total Costs (a) +...+ (g)	Discount Factor	Discounted Project Costs (h) x (i)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
2012	200,000							200,000	1.000	200,000
2013	1,338,344							1,338,344	0.943	1,262,058
2014	3,076,688							3,076,688	0.890	2,738,252
2015	3,076,688							3,076,688	0.840	2,584,418
2016	1,538,344		10,000	287,500	80,000	100,000		2,015,844	0.792	1,596,548
2017			20,000	575,000	160,000	100,000		855,000	0.747	638,685
2018			20,000	575,000	160,000	100,000		855,000	0.705	602,775
2019			20,000	575,000	160,000	100,000		855,000	0.665	568,575
2020			20,000	575,000	160,000	100,000		855,000	0.627	536,085
2021			20,000	575,000	160,000	100,000		855,000	0.592	506,160
2022			20,000	575,000	160,000	100,000		855,000	0.558	477,090
2023			20,000	575,000	160,000	100,000		855,000	0.527	450,585
2024			20,000	575,000	160,000	100,000		855,000	0.497	424,935
2025			20,000	575,000	160,000	100,000		855,000	0.469	400,995
2026			20,000	575,000	160,000	100,000		855,000	0.442	377,910
2027			20,000	575,000	160,000	100,000		855,000	0.417	356,535
2028			20,000	575,000	160,000	100,000		855,000	0.394	336,870
2029			20,000	575,000	160,000	100,000		855,000	0.371	317,205
2030			20,000	575,000	160,000	100,000		855,000	0.350	299,250
2031			20,000	575,000	160,000	100,000		855,000	0.331	283,005
2032			20,000	575,000	160,000	100,000		855,000	0.312	266,760
2033			20,000	575,000	160,000	100,000		855,000	0.294	251,370
2034			20,000	575,000	160,000	100,000		855,000	0.278	237,690
2035			20,000	575,000	160,000	100,000		855,000	0.262	224,010
2036			20,000	575,000	160,000	100,000		855,000	0.247	211,185
2037			20,000	575,000	160,000	100,000		855,000	0.233	199,215
2038			20,000	575,000	160,000	100,000		855,000	0.220	188,100
2039			20,000	575,000	160,000	100,000		855,000	0.207	176,985
2040			20,000	575,000	160,000	100,000		855,000	0.196	167,580
2041			20,000	575,000	160,000	100,000		855,000	0.185	158,175
2042			20,000	575,000	160,000	100,000		855,000	0.174	148,770
2043			20,000	575,000	160,000	100,000		855,000	0.164	140,220
2044			20,000	575,000	160,000	100,000		855,000	0.155	132,525
2045			20,000	575,000	160,000	100,000		855,000	0.146	124,830
2046			20,000	575,000	160,000	100,000		855,000	0.138	117,990
2047			20,000	575,000	160,000	100,000		855,000	0.130	111,150
2048			20,000	575,000	160,000	100,000		855,000	0.123	105,165
2049			20,000	575,000	160,000	100,000		855,000	0.116	99,180
2050			20,000	575,000	160,000	100,000		855,000	0.109	93,195
2051			20,000	575,000	160,000	100,000		855,000	0.103	88,065
2052			20,000	575,000	160,000	100,000		855,000	0.097	82,935
2053			20,000	575,000	160,000	100,000		855,000	0.092	78,660
2054			20,000	575,000	160,000	100,000		855,000	0.087	74,385
2055			20,000	575,000	160,000	100,000		855,000	0.082	70,110
2056			20,000	575,000	160,000	100,000		855,000	0.077	65,835
2057			20,000	575,000	160,000	100,000		855,000	0.074	62,928
2058			20,000	575,000	160,000	100,000		855,000	0.069	58,995
2059			20,000	575,000	160,000	100,000		855,000	0.065	55,575
2060			20,000	575,000	160,000	100,000		855,000	0.061	52,155
2061			20,000	575,000	160,000	100,000		855,000	0.058	49,590
2062			20,000	575,000	160,000	100,000		855,000	0.055	47,025
2063			20,000	575,000	160,000	100,000		855,000	0.052	44,460
2064			20,000	575,000	160,000	100,000		855,000	0.049	41,895
2066			20,000	575,000	160,000	100,000		855,000	0.046	39,330
Last Year of Project Life			20,000	575,000	160,000	100,000		855,000	0.043	36,765
<b>Total Present Value of Discounted Costs (Sum of Column (j))</b>										<b>19,060,740</b>

**Comments:**

(1) If any, based on opportunity costs, sunk costs and associated costs

(2) The incremental change in O&M costs attributable to the project

**Table 20. Proposal Benefits and Costs Summary**

Proposal: Westside IRWMP

Agency: WDCWA Portion of Sacramento River Joint Intake Project

Project	Project Proponent	Total Present Value Project Costs <sup>(1)</sup>	Total Present Value Project Benefits			From Section D2 – Briefly describe the main Non-monetized benefits
			From Section D3 – Monetized <sup>(2)</sup>	From Section D4 – Flood Damage Reduction <sup>(3)</sup>	Total	
(a)	(b)	(c)	(d)	(e)	(f) = (d) + (e)	(g)
WDCWA Portion of Sacramento River Joint Intake Project	WDCWA	\$ 19,060,740	\$ 186,293,200		\$ 186,293,200	

(1) From Table 19 or RWMG method

(2) From Table 15 or RWMG method

(3) From Table 18 or RWMG method

## **ATTACHMENT 8**

### **Benefits and Cost Analysis**

#### **Proposal: Westside IRWM**

#### **Project: Dixon Main Drain/V-drain Enlargement Project**

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We have used the DWR Method of Analysis to calculate benefits and costs for the project. This method includes Sections D1 through D5.

Section D1 – Cost-Effective Analysis – NOT INCLUDED (applicable for small projects only)

Section D2 – Non Monetized Benefits Analysis

- Table 12 – Non Monetized Benefits Checklist

Section D3 – Monetized Benefits Analysis – NOT INCLUDED

Section D4 – Flood Damage Reduction Benefits Analysis includes the following attached tables:

- Table 17 – Calculation of Expected Annual Damage, Main Drain / V-Drain Enlargement Project
- Tables 17.A through 17.J – Depth Damage Calculations, Backup Information for Table 17
- Table 18 – Present Value of Expected Annual Damage Benefits, Main Drain / V-Drain Enlargement Project

Section D5 – Project Benefits and Costs Summary

- Table 19 – Annual Costs of Project, Main Drain / V-Drain Enlargement Project
- Table 20 – Proposal Benefits and Costs Summary

## ATTACHMENT 8 Benefits and Cost Analysis

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The Dixon Main Drain/V-Drain Enlargement Project will provide the following benefits:

<b>Table 10. Project Benefits</b>	
<b>Water Supply</b>	The project will enhance water reuse opportunities through the constructions of a weir, pump intake and associated facilities that will allow the adjacent landowners to more easily use the agricultural runoff in the Dixon Main Drain.
<b>Water Quality</b>	<p>The project will decrease sediment load in the DMD / V-Drain and Haas Slough by lowering water velocity through enlarging the channel, and decreasing bank erosion through planting channel banks and installing fencing to prevent cattle from trampling banks.</p> <p>The project will decrease E. coli and other contaminants in DMD / V-Drain and Haas Slough by installing fencing to prevent cattle from depositing urine and manure.</p>
<b>Ecosystem Improvement</b>	<p>The project will create 5-6 acres of new wetlands.</p> <p>The project will plant 50 acres of uplands with a variety of native perennial grasses replacing non-native species in the existing ruderal habitat.</p>
<b>Public Recreation and Public Access</b>	None
<b>Power Cost Savings and Power Production</b>	None
<b>Other</b>	<p>The project will reduce localized flooding on 836 acres in the 10- and 100- year storms preventing \$260,000 - \$680,000 in damages in the localized area.</p> <p>The project will enable the construction of the Eastside Drain Project which will provide flood protection to 600 acres of existing and future urban development and reduced flooding for 11,600 acres of agricultural lands.</p> <p>The project will help resolve existing conflicts between the City and various agricultural agencies regarding flood control in the watershed through cooperatively developing a flood control project that will meet the needs of both.</p>

**Project: Dixon Main Drain/V-drain Enlargement Project**

**Table 12. Non-monetized Benefits Checklist**

No.	Question	Enter "Yes", "No" or "Neg"
<b>Community/Social Benefits</b> <b>Will the proposal</b>		
1	<b>Provide education or technology benefits?</b>	No
	Examples are not limited to, but may include: <ul style="list-style-type: none"> <li>- Include educational features that should result in water supply, water quality, or flood damage reduction benefits?</li> <li>- Develop, test or document a new technology for water supply, water quality, or flood damage reduction</li> <li>- Provide some other education or technological benefit?</li> </ul>	
2	<b>Provide social recreation or access benefits?</b>	No
	Examples are not limited to, but may include: <ul style="list-style-type: none"> <li>- Provide new or improved outdoor recreation opportunities?</li> <li>- Provide more access to open space?</li> <li>- Provide some other recreation or public access benefit?</li> </ul>	
3	<b>Help avoid, reduce or resolve various public water resources conflicts?</b>	yes
	The watershed area (northeastern Solano County) has been fraught with conflict and court cases due to increasing runoff from urban development and changing agricultural practices. The lack of cooperation and deficiency in planning became apparent as a result of the flooding from storms in 1996 and 1997. This project was cooperatively developed to meet the needs of both the City and the different agricultural agencies. The project will improve regional drainage and flood control while resolving the regional conflict between the Dixon Watershed Joint Power Authority member agencies which have been in the courts since the 1980's.	
4	<b>Promote social health and safety?</b>	No
	Examples are not limited to, but may include: <ul style="list-style-type: none"> <li>- Increase urban water supply reliability for fire-fighting and critical services following seismic events?</li> <li>- Reduce risk to life from dam failure or flooding?</li> <li>- Reduce exposure to water-related hazards?</li> </ul>	
5	<b>Have other social benefits?</b>	No
	Examples are not limited to, but may include: <ul style="list-style-type: none"> <li>- Redress or increase inequitable distribution of environmental burdens?</li> <li>- Have disproportionate beneficial or adverse effects on disadvantaged communities, Native Americans, or other distinct cultural groups?</li> </ul>	
<b>Environmental Stewardship Benefits:</b> <b>Will the proposal</b>		
6	<b>Benefit wildlife or habitat in ways that were not quantified in Attachment 7?</b>	yes
	The Project will seed approximately 50 acres of uplands with a variety of native perennial grasses replacing existing non-native species in the area. Fencing will protect native vegetation from grazing cattle. Project will create approximately 5-6 acres of wetlands.	
7	<b>Improve water quality in ways that were not quantified in Attachment 7?</b>	yes
	The project restores native vegetation in the channel, decreases water velocity in the channel during high flow events and installs fencing to exclude cattle from the channel. These improvements will improve water quality in the channels and downstream in Haas Slough. The project will create 5-6 additional acres of wetlands which will be vegetated, approximately 50 acres of upland areas will be planted and 24 acres of channel area will be fenced off from cattle.	
8	<b>Reduce net emissions in ways that were not quantified in Attachment 7?</b>	No
	Examples are not limited to, but may include: <ul style="list-style-type: none"> <li>- Reduce net production of greenhouse gasses?</li> <li>- Reduce net emissions of other harmful chemicals into the air or water?</li> </ul>	
9	<b>Provide other environmental stewardship benefits, other than those claimed in Sections D1, D3 or D4?</b>	
<b>Sustainability Benefits:</b> <b>Will the proposal</b>		
10	<b>Improve the overall, long-term management of California groundwater resources?</b>	No
	Examples are not limited to, but may include: <ul style="list-style-type: none"> <li>- Reduce extraction of non-renewable groundwater?</li> <li>- Promote aquifer storage or recharge?</li> </ul>	
11	<b>Reduce demand for net diversions for the regions from the Delta?</b>	No
12	<b>Provide a long-term solution in place of a short-term one?</b>	No
13	<b>Promote energy savings or replace fossil fuel based energy sources with renewable energy and resources?</b>	No
14	<b>Improve water supply reliability in ways not quantified in Attachment 7?</b>	No
	Examples are not limited to, but may include: <ul style="list-style-type: none"> <li>- Provide a more flexible mix of water sources?</li> <li>- Reduce likelihood of catastrophic supply outages?</li> <li>- Reduce supply uncertainty?</li> <li>- Reduce supply variability?</li> </ul>	
15	<b>Other (If the above listed categories do not apply, provide non-monetized benefit description)?</b>	

**Table 17. Calculation of Expected Annual Damage Main Drain / V-Drain Expansion Project**

Hydrologic Event	Event Exceedance Probability	Event Damage if Flood Structures Fail	Probability Structural Failure		Expected Event Damage		Interval Probability	Average Damage in Interval		Average Damage in Interval times Interval Probability	
			Without Project	With Project	Without Project	With Project		Without Project	With Project	Without Project	With Project
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(i)	(j)	(k)	(l)	(m)
					(c) x (d)	(c) x (e)	from (b)	from (f)	from (g)	(i) x (j)	(i) x (k)
5-year	0.2				\$0	\$0				\$0.00	\$0
10-Year	0.1				\$ 263,071.80	\$0	0.1	\$131,536	\$0	\$13,153.59	\$0
100-Year	0.01				\$682,225	\$0	0.09	\$472,648	\$0	\$4,726.48	\$0
200-Year	0.005				\$783,767	\$0	0.005	\$732,996	\$0	\$3,664.98	\$0
Expected Annual Damages, Without and With Project										\$21,545.05	\$0.00

Note: Damage calculations are for the Main Drain/V-Drain Project prior to construction of any upstream improvements that will be constructed with the Eastside Drain Project. In this condition the Main Drain/V-Drain will have the capacity for the large storm events. If the Eastside Drain is constructed, the overall system will not have capacity for these large events.

Expected Annual Damage Calculation

Project: Dixon Main Drain/V-drain Enlargement Project

Damage Estimates

Table 17.A

Category	Description	Units	Replacement Cost per Unit	Contents Value, % of Replacement Cost	Relocation Cost per month per unit
1	Residence Singe Family no basement	SF	\$45.00	30%	\$1.00
12	Livestock Barn	SF	\$6.00	200%	\$1.00
924	Hi Value Annuals	ACRE	\$2,500.00		

Depth Damage Estimates for Infrastructure

Table 17.B

Category	Description	Depth				
		-1	0	1	2	3
1	Residence Singe Family no basement	0	10%	21%	28%	33%
12	Livestock Barn	0	0%	10%	10%	10%
924	Hi Value Annuals	0	0%	3%	10%	25%

Depth Damage Estimates for Contents

Table 17.C

Category	Description	Depth				
		-1	0	1	2	3
1	Residence Singe Family no basement	0	0%	44%	75%	85%
12	Livestock Barn	0	50%	100%	100%	100%
924	Hi Value Annuals	0	8%	11%	22%	28%

Note: Damage and depth drainage information is from Appendix V, VI, and VII of the following study, "Drainage Project Benefit and Agricultural Drainage Payment Capacity for the Dixon Watershed Drainage Plan Alternative, prepared by Hazard Mitigation Economics. A copy of this study is located in Appendix A of Attachment 3.

Depth Damage Estimates for Relocation Cost, Source: FEMA BCA Tables

Table 17.D

Category	Description	Depth				
		-1	0	1	2	3
	Residential and Commercial	0.0	0.0	2.1	4.3	5.6

Building and Infrastructure Inventory, Source: Aerial Photography and Flooded Areas Shown on Figure 7-1 in Attachment 7.

Table 17.E

Category	Description	Units	Area A, North of Sikes Rd			Total Area A
1	Residence Singe Family no basement	SF	1600	900	900	3400
12	Livestock Barn	SF	20000	4200		24200
924	Hi Value Annuals	ACRE	346			346

Table 17.F

Category	Description	Units	Area B, South of Sikes Road			Total Area B
1	Residence Singe Family no basement	SF				0
12	Livestock Barn	SF				0
924	Hi Value Annuals	ACRE	490			490

Depth Damage Calculations, Main Drain / V-Drain Project

Table 17.G

Category	Total Area A	Units	Infrastructure Cost	Contents Cost	Relocation Cost	Depth -1			Depth 0			Depth 1			Depth 2			Depth 3		
						Infrastructure	Contents	Relocation	Infrastructure	Contents	Relocation	Infrastructure	Contents	Relocation	Infrastructure	Contents	Relocation	Infrastructure	Contents	Relocation
1	3,400	SF	\$153,000	\$45,900	\$3,400	\$0	\$0	\$0	\$15,300	\$0	\$0	\$32,130	\$20,196	\$7,140	\$42,840	\$39,015	\$14,620	\$50,490	\$39,015	\$19,040
12	24,200	SF	\$145,200	\$290,400	\$24,200	\$0	\$0	\$0	\$0	\$145,200	\$0	\$14,520	\$290,400	\$50,820	\$14,520	\$290,400	\$104,060	\$14,520	\$290,400	\$135,520
924	346	ACRE	\$865,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$25,950	\$0	\$0	\$86,500	\$0	\$0	\$0	\$0	\$0	
					Sub-Totals	\$0	\$0	\$0	\$15,300	\$145,200	\$0	\$72,600	\$310,596	\$57,960	\$143,860	\$329,415	\$118,680	\$281,260	\$329,415	\$154,560
					Area A Totals	\$0	\$0	\$0	\$160,500	\$145,200	\$0	\$441,156	\$591,955	\$0	\$765,235	\$0	\$0	\$0	\$0	\$0

Table 17.H

Category	Total Area B	Units	Infrastructure Cost	Contents Cost	Relocation Cost	Depth -1			Depth 0			Depth 1			Depth 2			Depth 3		
						Infrastructure	Contents	Relocation												
1	0	SF	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
12	0	SF	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
924	490	ACRE	\$1,225,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$36,750	\$0	\$0	\$122,500	\$0	\$0	\$306,250	\$0	\$0	
					Sub-Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$36,750	\$0	\$0	\$122,500	\$0	\$0	\$306,250	\$0	\$0
					Area B Totals	\$0	\$0	\$0	\$0	\$0	\$0	\$36,750	\$0	\$0	\$122,500	\$0	\$0	\$306,250	\$0	\$0

Expected Event Damage without Project

Table 17.I

Storm	Ground Elevation		Water Surface		Depth of Flooding		Damage		Total Damage
	Area A	Area B	Area A	Area B	Area A	Area B	Area A	Area B	
5-year	17.5	14	17.4	14	-0.1	0	\$0	\$0	\$0
10-year	17.5	14	17.8	14.5	0.3	0.5	\$244,697	\$18,375	\$263,072
100-year	17.5	14	19.4	15.8	1.9	1.8	\$576,875	\$105,350	\$682,225
200-year	17.5	14	19.9	16	2.4	2	\$661,267	\$122,500	\$783,767

Expected Event Damage with Project

Table 17.J

Storm	Ground Elevation		Water Surface		Depth of Flooding		Damage		Total Damage
	Area A	Area B	Area A	Area B	Area A	Area B	Area A	Area B	
5-year	17.5	14	14.8	12.2	-2.7	-1.8	\$0	\$0	\$0
10-year	17.5	14	15	12.2	-2.5	-1.8	\$0	\$0	\$0
100-year	17.5	14	16.1	13.5	-1.4	-0.5	\$0	\$0	\$0
200-year	17.5	14	16.5	13.8	-1	-0.2	\$0	\$0	\$0

<b>Table 18. Present Value of Expected Annual Damage Benefits</b>			
Project: <u>Main Drain / V-Drain Expansion Project</u>			
<b>(a)</b>	Expected Annual Damage Without Project <sup>(1)</sup>		<b>\$21,545.05</b>
<b>(b)</b>	Expected Annual Damage With Project <sup>(1)</sup>		<b>\$0.00</b>
<b>(c)</b>	Expected Annual Benefit	(a) – (b)	<b>\$21,545.05</b>
<b>(d)</b>	Present Value Coefficient <sup>(2)</sup>		<b>15.76</b>
<b>(e)</b>	<b>Present Value of Future Benefits</b> <b>Transfer to Table 17, column (d).</b>	<b>(c) x (d)</b>	<b>\$339,550.06</b>
<i>(1) This program assumes no land use changes in the floodplain. So, EAD will be constant over analysis period.</i>			
<i>(2) 6% discount rate; 50-year analysis period (could vary depending upon lifecycle of project).</i>			

**Table 19. Annual Costs of Project**  
 (All costs should be in 2012 Dollars)  
 Project: Dixon Main Drain / V-Drain Enlargement Project

Year	Initial Costs Grand Total Cost from Table 6 (row (i), column (d)) (a)	Adjusted Grant Total Cost <sup>(1)</sup> (b)	Annual Costs <sup>(2)</sup>					Discounting Calculations		
			Admin (c)	Operation (d)	Maintenance (e)	Replacement (f)	Other (g)	Total Costs (a) + ... + (g) (h)	Discount Factor (i)	Discounted Project Costs (h) x (i) (j)
2012	\$ 3,205,754.89							\$ 3,205,754.89	1.000	\$ 3,205,754.89
2013					7200			\$ 7,200.00	0.943	\$ 6,789.60
2014					7200			\$ 7,200.00	0.890	\$ 6,408.00
2015					7200			\$ 7,200.00	0.840	\$ 6,048.00
2016					7200			\$ 7,200.00	0.792	\$ 5,702.40
2017					7200			\$ 7,200.00	0.747	\$ 5,378.40
2018					7200			\$ 7,200.00	0.705	\$ 5,076.00
2019					7200			\$ 7,200.00	0.665	\$ 4,788.00
2020					7200			\$ 7,200.00	0.627	\$ 4,514.40
2021					7200			\$ 7,200.00	0.592	\$ 4,262.40
2022					7200			\$ 7,200.00	0.558	\$ 4,017.60
2023					7200			\$ 7,200.00	0.527	\$ 3,794.40
2024					7200			\$ 7,200.00	0.497	\$ 3,578.40
2025					7200			\$ 7,200.00	0.469	\$ 3,376.80
2026					7200			\$ 7,200.00	0.442	\$ 3,182.40
2027					7200			\$ 7,200.00	0.417	\$ 3,002.40
2028					7200			\$ 7,200.00	0.394	\$ 2,836.80
2029					7200			\$ 7,200.00	0.371	\$ 2,671.20
2030					7200			\$ 7,200.00	0.350	\$ 2,520.00
2031					7200			\$ 7,200.00	0.331	\$ 2,383.20
2032					7200			\$ 7,200.00	0.312	\$ 2,246.40
2033					7200			\$ 7,200.00	0.294	\$ 2,116.80
2034					7200			\$ 7,200.00	0.278	\$ 2,001.60
2035					7200			\$ 7,200.00	0.262	\$ 1,886.40
2036					7200			\$ 7,200.00	0.247	\$ 1,778.40
2037					7200			\$ 7,200.00	0.233	\$ 1,677.60
2038					7200			\$ 7,200.00	0.220	\$ 1,584.00
2039					7200			\$ 7,200.00	0.207	\$ 1,490.40
2040					7200			\$ 7,200.00	0.196	\$ 1,411.20
2041					7200			\$ 7,200.00	0.185	\$ 1,332.00
2042					7200			\$ 7,200.00	0.174	\$ 1,252.80
2043					7200			\$ 7,200.00	0.164	\$ 1,180.80
2044					7200			\$ 7,200.00	0.155	\$ 1,116.00
2045					7200			\$ 7,200.00	0.146	\$ 1,051.20
2046					7200			\$ 7,200.00	0.138	\$ 993.60
2047					7200			\$ 7,200.00	0.130	\$ 936.00
2048					7200			\$ 7,200.00	0.123	\$ 885.60
2049					7200			\$ 7,200.00	0.116	\$ 835.20
2050					7200			\$ 7,200.00	0.109	\$ 784.80
2051					7200			\$ 7,200.00	0.103	\$ 741.60
2052					7200			\$ 7,200.00	0.097	\$ 698.40
2053					7200			\$ 7,200.00	0.092	\$ 662.40
2054					7200			\$ 7,200.00	0.087	\$ 626.40
2055					7200			\$ 7,200.00	0.082	\$ 590.40
2056					7200			\$ 7,200.00	0.077	\$ 554.40
2057					7200			\$ 7,200.00	0.073	\$ 525.60
2058					7200			\$ 7,200.00	0.069	\$ 496.80
2059					7200			\$ 7,200.00	0.065	\$ 468.00
2060					7200			\$ 7,200.00	0.061	\$ 439.20
2061					7200			\$ 7,200.00	0.058	\$ 417.60
<b>Total Present Value of Discounted Costs (Sum of Column (j))</b>										<b>\$ 3,318,866.89</b>

Comments: Maintenance cost is based on the actual average JPA costs to maintain open channels of \$2400 per mile for the three miles of channel in the project. The gravity flow channel has no operations costs and no mechanical component that would need replacing. No JPA administration cost will be charged to the project once it is constructed.

(1) If any, based on opportunity costs, sunk costs and associated costs  
 (2) The incremental change in O&M costs attributable to the project

**ATTACHMENT 8**  
**Benefits and Cost Analysis**  
**Proposal: Westside IRWM**  
**Project: Lower Putah Creek Restoration: Monticello Dam to Dry Creek**

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We have used the DWR Method of Analysis to calculate benefits and costs for the project. This method includes Sections D1 through D5.

Section D1 – Cost-Effective Analysis – NOT INCLUDED (applicable for small projects only)

Section D2 – Non Monetized Benefits Analysis

- Table 12 – Non Monetized Benefits Checklist

Section D3 – Monetized Benefits Analysis – NOT INCLUDED

Section D4 – Flood Damage Reduction Benefits Analysis – NOT INCLUDED

Section D5 – Project Benefits and Costs Summary

- Table 19 – Annual Costs of Project, Lower Putah Creek Main Channel Restoration
- Table 20 – Proposal Benefits and Costs Summary

## ATTACHMENT 8 Benefits and Cost Analysis

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The Lower Putah Creek Main Channel Restoration Project will provide the following benefits:

<b>Table 10. Project Benefits</b>	
<b>Water Supply</b>	Channel narrowing will reduce summer infiltration losses (currently 50%) while creation of floodplains will increase groundwater recharge in high flow events.
<b>Water Quality</b>	The project will lower water temperature by a net 1.5 degrees Celcius at Dry Creek.
<b>Ecosystem Improvement</b>	The project will control 19 net acres of invasive weeds; restore/enhance native vegetation on 96 acres; create 13 net acres (8,000 linear feet) of functional floodplains; create 2,500 linear feet of new side channel salmonid rearing habitat; increase the number of riparian-dependent and riparian obligate bird species in the project area by 50% (from 10 species to 15 species); extend perennial salmonid habitat below Putah Diversion Dam by 1.5 miles
<b>Public Recreation and Public Access</b>	Improve access to the water's edge on public lands in the Interdam Reach by 6,800 linear feet; extend perennial salmonid (trout fishing) habitat through the City of Winters (to Highway 505).
<b>Power Cost Savings and Power Production</b>	None
<b>Other</b>	The project will engage the public in propagating and planting native vegetation.

Proposal: Westside IRWM

Project: Lower Putah Creek Restoration: Monticello Dam to Dry Creek

Table 12. Non-monetized Benefits Checklist

No.	Question	Enter "Yes", "No" or "Neg"
	<b>Community/Social Benefits</b> <b>Will the proposal</b>	
1	<b>Provide education or technology benefits?</b>	Yes
	Examples are not limited to, but may include: <ul style="list-style-type: none"> <li>- Include educational features that should result in water supply, water quality, or flood damage reduction benefits?</li> <li>- Develop, test or document a new technology for water supply, water quality, or flood damage reduction</li> <li>- Provide some other education or technological benefit?</li> </ul>	
2	<b>Provide social recreation or access benefits?</b>	Yes
	Examples are not limited to, but may include: <ul style="list-style-type: none"> <li>- Provide new or improved outdoor recreation opportunities?</li> <li>- Provide more access to open space?</li> <li>- Provide some other recreation or public access benefit?</li> </ul>	
3	<b>Help avoid, reduce or resolve various public water resources conflicts?</b>	Yes
	The Putah Creek Accord settled ten years of litigation over flows in Putah Creek that were designed to resolve conflicts over environmental benefit of flows. The Lower Putah Creek Coordinating Committee was formed by the Accord to monitor flows and environmental benefits. The durability of the Accord depends on achieving the anticipated benefits of additional flows for the environment. The proposed project supports Accord flows by maximizing environmental benefit through restored channel form and function, enhanced recreational access to public lands and associated fish and wildlife benefits.	
4	<b>Promote social health and safety?</b>	Yes
	Promotes public health and social well-being by providing greater access to outdoor recreation	
5	<b>Have other social benefits?</b>	No
	<b>Environmental Stewardship Benefits:</b> <b>Will the proposal</b>	
6	<b>Benefit wildlife or habitat in ways that were not quantified in Attachment 7?</b>	yes
	The project will engage the community in habitat enhancement projects helping to build community support for conservation and habitat enhancement	
7	<b>Improve water quality in ways that were not quantified in Attachment 7?</b>	No
8	<b>Reduce net emissions in ways that were not quantified in Attachment 7?</b>	No
9	<b>Provide other environmental stewardship benefits, other than those claimed in Sections D1, D3 or D4?</b>	
	<b>Sustainability Benefits:</b> <b>Will the proposal</b>	
10	<b>Improve the overall, long-term management of California groundwater resources?</b>	No
11	<b>Reduce demand for net diversions for the regions from the Delta?</b>	No
12	<b>Provide a long-term solution in place of a short-term one?</b>	Yes
	Restoring functional floodplain elevations will allow natural recruitment and self-perpetuation of native vegetation.	
13	<b>Promote energy savings or replace fossil fuel based energy sources with renewable energy and resources?</b>	No
14	<b>Improve water supply reliability in ways not quantified in Attachment 7?</b>	No
	Examples are not limited to, but may include: <ul style="list-style-type: none"> <li>- Provide a more flexible mix of water sources?</li> <li>- Reduce likelihood of catastrophic supply outages?</li> <li>- Reduce supply uncertainty?</li> <li>- Reduce supply variability?</li> </ul>	
15	<b>Other (If the above listed categories do not apply, provide non-monetized benefit description)?</b>	

**Table 19. Annual Costs of Project**

(All costs should be in 2012 Dollars)

Project: Lower Putah Creek Main Channel Restoration

Year	Initial Costs Grand Total Cost from Table 6 (row (i), column (a))	Adjusted Grant Total Cost <sup>(1)</sup> (b)	Annual Costs <sup>(2)</sup>					Discounting Calculations		
			Admin (c)	Operation (d)	Maintenance (e)	Replacement (f)	Other (g)	Total Costs (a) +...+ (g) (h)	Discount Factor (i)	Discounted Project Costs (h) x (i) (j)
2012										
2013	\$ 1,422,700.00								1.000	\$ 1,422,700.00
2014									0.943	
2015									0.890	
2016									0.840	
2017									0.792	
2018					5000				0.747	\$ 3,735.00
2019					5000				0.705	\$ 3,525.00
2020					5000				0.665	\$ 3,325.00
2021					5000				0.627	\$ 3,135.00
2022					5000				0.592	\$ 2,960.00
2023					5000				0.558	\$ 2,790.00
2024					5000				0.527	\$ 2,635.00
2025					5000				0.497	\$ 2,485.00
2026					5000				0.469	\$ 2,345.00
2027					5000				0.442	\$ 2,210.00
2028					5000				0.417	\$ 2,085.00
2029					5000				0.394	\$ 1,970.00
2030					5000				0.371	\$ 1,855.00
2031					5000				0.350	\$ 1,750.00
2032					5000				0.331	\$ 1,655.00
2033					5000				0.312	\$ 1,560.00
2034					5000				0.294	\$ 1,470.00
2035					5000				0.278	\$ 1,390.00
2036					5000				0.262	\$ 1,310.00
2037					5000				0.247	\$ 1,235.00
2038					5000				0.233	\$ 1,165.00
2039					5000				0.220	\$ 1,100.00
2040					5000				0.207	\$ 1,035.00
2041					5000				0.196	\$ 980.00
2042					5000				0.185	\$ 925.00
2043					5000				0.174	\$ 870.00
2044					5000				0.164	\$ 820.00
2045					5000				0.155	\$ 775.00
2046					5000				0.146	\$ 730.00
2047					5000				0.138	\$ 690.00
2048					5000				0.130	\$ 650.00
2049					5000				0.123	\$ 615.00
2050					5000				0.116	\$ 580.00
2051					5000				0.109	\$ 545.00
2052					5000				0.103	\$ 515.00
2053					5000				0.097	\$ 485.00
2054					5000				0.092	\$ 460.00
2055					5000				0.087	\$ 435.00
2056					5000				0.082	\$ 410.00
2057					5000				0.077	\$ 385.00
2058					5000				0.073	\$ 365.00
2059					5000				0.069	\$ 345.00
2060					5000				0.065	\$ 325.00
2061					5000				0.061	\$ 305.00
2062					5000				0.058	\$ 290.00

**Total Present Value of Discounted Costs (Sum of Column (j)) \$ 1,483,635.00**

Comments: Maintenance costs include spot spraying weeds, clearing deadfall and storm debris, repairing side channels.

(1) If any, based on opportunity costs, sunk costs and associated costs

(2) The incremental change in O&M costs attributable to the project

**Table 20. Proposal Benefits and Costs Summary**

Proposal: Dixon Watershed Management Plan

Agency: Dixon Regional Watershed Joint Powers Authority

Project	Project Proponent	Total Present Value Project Costs <sup>(1)</sup>	Total Present Value Project Benefits			From Section D2 – Briefly describe the main Non-monetized benefits
			From Section D3 – Monitized <sup>(2)</sup>	From Section D4 – Flood Damage Reduction <sup>(3)</sup>	Total	
(a)	(b)	(c)	(d)	(e)	(f) = (d) + (e)	(g)
Lower Putah Creek Main Channel Restoration	Solano County Water Agency	\$ 1,483,635.00	\$ -			Controls invasive weeds, restores natural channel form and function, enhances fish and wildlife habitat, enhances public access to public lands.

(1) From Table 19 or RWMG method

(2) From Table 15 or RWMG method

(3) From Table 18 or RWMG method

Table 9a – Annual Project Physical Benefits

Project Name: Middle Creek Flood Damage Reduction and Ecosystem Restoration Project			
Type of Benefit Claimed: Acres of floodplain purchased			
Measure of Benefit Claimed (Name of Units): Acres			
Additional Information About this Measure: None			
(a)	(b)	(c)	(d)
Year	Without Project	With Project	Physical Benefits
			Change Resulting from Project (b) – (c)
2012	0	0	0
2013	0	0	0
2014	0	0	0
2015	0	160	160
2016	0	160	160
2017	0	160	160
2018	0	160	160
2019	0	160	160
2020	0	160	160
2021	0	160	160
2022	0	160	160
2023	0	160	160
2024	0	160	160
2025	0	160	160
2026	0	160	160
2027	0	160	160
2028	0	160	160
2029	0	160	160
2030	0	160	160
2031	0	160	160
2032	0	160	160
2033	0	160	160
2034	0	160	160
2035	0	160	160
2036	0	160	160
2037	0	160	160
2038	0	160	160
2039	0	160	160
2040	0	160	160
2041	0	160	160
2042	0	160	160
2043	0	160	160
2044	0	160	160
2045	0	160	160
2046	0	160	160
2047	0	160	160
2048	0	160	160
2049	0	160	160
2050	0	160	160
2051	0	160	160
2052	0	160	160
2053	0	160	160
2054	0	160	160
2055	0	160	160
2056	0	160	160
2057	0	160	160
2058	0	160	160
2059	0	160	160
2060	0	160	160
2061	0	160	160
2062	0	160	160
2063	0	160	160
2064	0	160	160
2065	0	160	160
2066	0	160	160
2067	0	160	160
2068	0	160	160
2069	0	160	160
2070	0	160	160
2071	0	160	160
2072	0	160	160
2073	0	160	160
2074	0	160	160
2075	0	160	160
2076	0	160	160
2077	0	160	160
2078	0	160	160
2079	0	160	160
2080	0	160	160
2081	0	160	160
2082	0	160	160
2083	0	160	160
2084	0	160	160
2085	0	160	160
2086	0	160	160
2087	0	160	160
2088	0	160	160
2089	0	160	160
2090	0	160	160
2091	0	160	160
2092	0	160	160
2093	0	160	160
2094	0	160	160
2095	0	160	160
2096	0	160	160
2097	0	160	160
2098	0	160	160
2099	0	160	160
2100	0	160	160
2101	0	160	160
2102	0	160	160
2103	0	160	160
2104	0	160	160
2105	0	160	160
2106	0	160	160
2107	0	160	160
2108	0	160	160
2109	0	160	160
2110	0	160	160
2111	0	160	160
2112	0	160	160
2113	0	160	160
2114	0	160	160

Comments: For the first ten years after levee removal, water quality is not significantly improved, so the number of visitor days does not change. Beginning in 2030, water quality is significantly improved, causing recreation to increase by 6.3%.

**Table 9b – Annual Project Physical Benefits**

Project Name: Middle Creek Flood Damage Reduction and Ecosystem Restoration Project  
 Type of Benefit Claimed: Increase in visitor days to Clear Lake, apportioned using 2.7% ratio of project cost  
 Measure of Benefit Claimed (Name of Units): Visitor Days  
 Additional Information About this Measure: None

(a)	(b)	(c)	(d)
Year	Without Project	With Project	Physical Benefits Change Resulting from Project (b) – (c)
2012	36578	36578	0
2013	36578	36578	0
2014	36578	36578	0
2015	36578	36578	0
2016	36578	36578	0
2017	36578	36578	0
2018	36578	36578	0
2019	36578	36578	0
2020	36578	36578	0
2021	36578	36578	0
2022	36578	36578	0
2023	36578	36578	0
2024	36578	36578	0
2025	36578	36578	0
2026	36578	36578	0
2027	36578	36578	0
2028	36578	36578	0
2029	36578	38882	2304
2030	36578	38882	2304
2031	36578	38882	2304
2032	36578	38882	2304
2033	36578	38882	2304
2034	36578	38882	2304
2035	36578	38882	2304
2036	36578	38882	2304
2037	36578	38882	2304
2038	36578	38882	2304
2039	36578	38882	2304
2040	36578	38882	2304
2041	36578	38882	2304
2042	36578	38882	2304
2043	36578	38882	2304
2044	36578	38882	2304
2045	36578	38882	2304
2046	36578	38882	2304
2047	36578	38882	2304
2048	36578	38882	2304
2049	36578	38882	2304
2050	36578	38882	2304
2051	36578	38882	2304
2052	36578	38882	2304
2053	36578	38882	2304
2054	36578	38882	2304
2055	36578	38882	2304
2056	36578	38882	2304
2057	36578	38882	2304
2058	36578	38882	2304
2059	36578	38882	2304
2060	36578	38882	2304
2061	36578	38882	2304
2062	36578	38882	2304
2063	36578	38882	2304
2064	36578	38882	2304
2065	36578	38882	2304
2066	36578	38882	2304
2067	36578	38882	2304
2068	36578	38882	2304
2069	36578	38882	2304
2070	36578	38882	2304
2071	36578	38882	2304
2072	36578	38882	2304
2073	36578	38882	2304
2074	36578	38882	2304
2075	36578	38882	2304
2076	36578	38882	2304
2077	36578	38882	2304
2078	36578	38882	2304
2079	36578	38882	2304
2080	36578	38882	2304
2081	36578	38882	2304
2082	36578	38882	2304
2083	36578	38882	2304
2084	36578	38882	2304
2085	36578	38882	2304
2086	36578	38882	2304
2087	36578	38882	2304
2088	36578	38882	2304
2089	36578	38882	2304
2090	36578	38882	2304
2091	36578	38882	2304
2092	36578	38882	2304
2093	36578	38882	2304
2094	36578	38882	2304
2095	36578	38882	2304
2096	36578	38882	2304
2097	36578	38882	2304
2098	36578	38882	2304
2099	36578	38882	2304
2100	36578	38882	2304
2101	36578	38882	2304
2102	36578	38882	2304
2103	36578	38882	2304
2104	36578	38882	2304
2105	36578	38882	2304
2106	36578	38882	2304
2107	36578	38882	2304
2108	36578	38882	2304
2109	36578	38882	2304
2110	36578	38882	2304
2111	36578	38882	2304
2112	36578	38882	2304
2113	36578	38882	2304
2114	36578	38882	2304

Comments: For the first ten years after levee removal, water quality is not significantly improved, so the number of visitor days does not change. Beginning in 2030, water quality is significantly improved, causing recreation to increase by 6.3%.

Table 9c – Annual Project Physical Benefits

Project Name: Middle Creek Flood Damage Reduction and Ecosystem Restoration Project  
 Type of Benefit Claimed: Avoided Water Supply Purchases, apportioned using 2.7% ratio of project cost  
 Measure of Benefit Claimed (Name of Units): Acre-feet  
 Additional Information About this Measure: None

(a)	(b)	(c)	(d)
Year	Physical Benefits		
	Without Project	With Project	Change Resulting from Project (b) – (c)
2012	0	0	0
2013	0	0	0
2014	0	0	0
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	0	0
2021	0	86	86
2022	0	86	86
2023	0	86	86
2024	0	86	86
2025	0	86	86
2026	0	86	86
2027	0	86	86
2028	0	86	86
2029	0	86	86
2030	0	86	86
2031	0	86	86
2032	0	86	86
2033	0	86	86
2034	0	86	86
2035	0	86	86
2036	0	86	86
2037	0	86	86
2038	0	86	86
2039	0	86	86
2040	0	86	86
2041	0	86	86
2042	0	86	86
2043	0	86	86
2044	0	86	86
2045	0	86	86
2046	0	86	86
2047	0	86	86
2048	0	86	86
2049	0	86	86
2050	0	86	86
2051	0	86	86
2052	0	86	86
2053	0	86	86
2054	0	86	86
2055	0	86	86
2056	0	86	86
2057	0	86	86
2058	0	86	86
2059	0	86	86
2060	0	86	86
2061	0	86	86
2062	0	86	86
2063	0	86	86
2064	0	86	86
2065	0	86	86

2066	0	86	86
2067	0	86	86
2068	0	86	86
2069	0	86	86
2070	0	86	86
2071	0	86	86
2072	0	86	86
2073	0	86	86
2074	0	86	86
2075	0	86	86
2076	0	86	86
2077	0	86	86
2078	0	86	86
2079	0	86	86
2080	0	86	86
2081	0	86	86
2082	0	86	86
2083	0	86	86
2084	0	86	86
2085	0	86	86
2086	0	86	86
2087	0	86	86
2088	0	86	86
2089	0	86	86
2090	0	86	86
2091	0	86	86
2092	0	86	86
2093	0	86	86
2094	0	86	86
2095	0	86	86
2096	0	86	86
2097	0	86	86
2098	0	86	86
2099	0	86	86
2100	0	86	86
2101	0	86	86
2102	0	86	86
2103	0	86	86
2104	0	86	86
2105	0	86	86
2106	0	86	86
2107	0	86	86
2108	0	86	86
2109	0	86	86
2110	0	86	86
2111	0	86	86
2112	0	86	86
2113	0	86	86
2114	0	86	86

Comments: With the project, the Clear Lake water suppliers receive, on average, 86 acre-feet of water each year at no cost that they would not receive without the project.

**Table 9d – Annual Project Physical Benefits**

Project Name: Middle Creek Flood Damage Reduction and Ecosystem Restoration Project

Type of Benefit Claimed: Restoration of floodplain ecosystem habitat, apportioned using 2.7% ratio of project cost

Measure of Benefit Claimed (Name of Units): Acres

Additional Information About this Measure: None

(a)	(b)	(c)	(d)
	Physical Benefits		
Year	Without Project	With Project	Change Resulting from Project (b) – (c)
2012	8	8	0
2013	8	8	0
2014	8	8	0
2015	8	8	0
2016	8	8	0
2017	8	8	0
2018	8	8	0
2019	8	8	0
2020	8	8	0
2021	8	8	0
2022	8	8	0
2023	8	8	0
2024	8	8	0
2025	8	8	0
2026	8	8	0
2027	8	8	0
2028	8	8	0
2029	8	8	0
2030	8	45	37
2031	8	45	37
2032	8	45	37
2033	8	45	37
2034	8	45	37
2035	8	45	37
2036	8	45	37
2037	8	45	37
2038	8	45	37
2039	8	45	37
2040	8	45	37
2041	8	45	37
2042	8	45	37
2043	8	45	37
2044	8	45	37
2045	8	45	37
2046	8	45	37
2047	8	45	37
2048	8	45	37
2049	8	45	37
2050	8	45	37
2051	8	45	37
2052	8	45	37
2053	8	45	37
2054	8	45	37
2055	8	45	37
2056	8	45	37

2057	8	45	37
2058	8	45	37
2059	8	45	37
2060	8	45	37
2061	8	45	37
2062	8	45	37
2063	8	45	37
2064	8	45	37
2065	8	45	37
2066	8	45	37
2067	8	45	37
2068	8	45	37
2069	8	45	37
2070	8	45	37
2071	8	45	37
2072	8	45	37
2073	8	45	37
2074	8	45	37
2075	8	45	37
2076	8	45	37
2077	8	45	37
2078	8	45	37
2079	8	45	37
2080	8	45	37
2081	8	45	37
2082	8	45	37
2083	8	45	37
2084	8	45	37
2085	8	45	37
2086	8	45	37
2087	8	45	37
2088	8	45	37
2089	8	45	37
2090	8	45	37
2091	8	45	37
2092	8	45	37
2093	8	45	37
2094	8	45	37
2095	8	45	37
2096	8	45	37
2097	8	45	37
2098	8	45	37
2099	8	45	37
2100	8	45	37
2101	8	45	37
2102	8	45	37
2103	8	45	37
2104	8	45	37
2105	8	45	37
2106	8	45	37
2107	8	45	37
2108	8	45	37
2109	8	45	37
2110	8	45	37
2111	8	45	37

<b>2112</b>	8	45	37
<b>2113</b>	8	45	37
<b>2114</b>	8	45	37

Comments: Beginning 10 years after the levees are breached, 37 acres of floodplain ecosystem habitat is created that otherwise would not be without the project.

**Table 9e – Annual Project Physical Benefits**

Project Name: Middle Creek Flood Damage Reduction and Ecosystem Restoration Project  
 Type of Benefit Claimed: Kilowatt-hours saved, apportioned using 2.7% ratio of project cost  
 Measure of Benefit Claimed (Name of Units): Kilowatt-hours  
 Additional Information About this Measure: None

(a)	(b)	(c)	(d)
	Physical Benefits		
Year	Without Project	With Project	Change Resulting from Project (b) – (c)
2012	0	0	0
2013	0	0	0
2014	0	0	0
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	5400	0	5400
2021	5400	0	5400
2022	5400	0	5400
2023	5400	0	5400
2024	5400	0	5400
2025	5400	0	5400
2026	5400	0	5400
2027	5400	0	5400
2028	5400	0	5400
2029	5400	0	5400
2030	5400	0	5400
2031	5400	0	5400
2032	5400	0	5400
2033	5400	0	5400
2034	5400	0	5400
2035	5400	0	5400
2036	5400	0	5400
2037	5400	0	5400
2038	5400	0	5400
2039	5400	0	5400
2040	5400	0	5400
2041	5400	0	5400
2042	5400	0	5400
2043	5400	0	5400
2044	5400	0	5400
2045	5400	0	5400
2046	5400	0	5400
2047	5400	0	5400
2048	5400	0	5400
2049	5400	0	5400
2050	5400	0	5400
2051	5400	0	5400
2052	5400	0	5400
2053	5400	0	5400
2054	5400	0	5400
2055	5400	0	5400

2056	5400	0	5400
2057	5400	0	5400
2058	5400	0	5400
2059	5400	0	5400
2060	5400	0	5400
2061	5400	0	5400
2062	5400	0	5400
2063	5400	0	5400
2064	5400	0	5400
2065	5400	0	5400
2066	5400	0	5400
2067	5400	0	5400
2068	5400	0	5400
2069	5400	0	5400
2070	5400	0	5400
2071	5400	0	5400
2072	5400	0	5400
2073	5400	0	5400
2074	5400	0	5400
2075	5400	0	5400
2076	5400	0	5400
2077	5400	0	5400
2078	5400	0	5400
2079	5400	0	5400
2080	5400	0	5400
2081	5400	0	5400
2082	5400	0	5400
2083	5400	0	5400
2084	5400	0	5400
2085	5400	0	5400
2086	5400	0	5400
2087	5400	0	5400
2088	5400	0	5400
2089	5400	0	5400
2090	5400	0	5400
2091	5400	0	5400
2092	5400	0	5400
2093	5400	0	5400
2094	5400	0	5400
2095	5400	0	5400
2096	5400	0	5400
2097	5400	0	5400
2098	5400	0	5400
2099	5400	0	5400
2100	5400	0	5400
2101	5400	0	5400
2102	5400	0	5400
2103	5400	0	5400
2104	5400	0	5400
2105	5400	0	5400
2106	5400	0	5400
2107	5400	0	5400
2108	5400	0	5400
2109	5400	0	5400
2110	5400	0	5400

<b>2111</b>	5400	0	5400
<b>2112</b>	5400	0	5400
<b>2113</b>	5400	0	5400
<b>2114</b>	5400	0	5400

Comments: 5,400 kilowatt-hours of energy use per year pumping floodwater out of the floodplain are saved from undertaking the project.

**Project: Middle Creek Flood Damage Reduction and Ecosystem Restoration Project**

**Table 10- Common Types of Benefits to Report**

Water supply	Benefits include avoided water supply purchase costs.
Water Quality	Benefits include avoided water quality project costs.
Ecosystem Improvement	Ecosystem improvement includes habitat restoration, protection, or preservation, and enhancement of native fish and wildlife enhancement.
Recreation and Public Access	Recreation and public access benefits include increased amount of use such as visitor days.
Power Cost Savings and Power Production	Power cost savings and power production benefits from avoided future post-flood pumping costs.
Other	None

Project: Middle Creek Flood Damage Reduction and Ecosystem Restoration Project

Table 12 – Non-monetized Benefits Checklist

No	Question	Enter “Yes”, “No” or “Neg”
	<b>Community/Social Benefits</b> Will the proposal	
1	<b>Provide education or technology benefits?</b> Examples are not limited to, but may include: - Include educational features that should result in water supply, water quality, or flood damage reduction benefits? - Develop, test, or document a new technology for water supply, water quality, or flood damage reduction management? - Provide some other education or technological benefit?	No
2	<b>Provide social recreation or access benefits?</b> Examples are not limited to, but may include: - Provide new or improved outdoor recreation opportunities? - Provide more access to open space? - Provide some other recreation or public access benefit?	No1
3	<b>Help avoid, reduce or resolve various public water resources conflicts?</b> Examples are not limited to, but may include: - Provide more opportunities for public involvement in water management? - Help avoid or resolve an existing conflict as evidenced by recurring fines or litigation? - Help meet an existing state mandate (e.g., water quality, water conservation, flood control)?	Yes
4	<b>Promote social health and safety?</b> Examples are not limited to, but may include: - Increase urban water supply reliability for fire-fighting and critical services following seismic events? - Reduce risk to life from dam failure or flooding? - Reduce exposure to water-related hazards?	No1
5	<b>Have other social benefits?</b> Examples are not limited to, but may include: - Redress or increase inequitable distribution of environmental burdens? - Have disproportionate beneficial or adverse effects on disadvantaged communities, Native Americans, or other distinct cultural groups?	Yes
	<b>Environmental Stewardship Benefits:</b> Will the proposal	
6	<b>Benefit wildlife or habitat in ways that were not quantified in Attachment 7?</b> Examples are not limited to, but may include: - Cause an increase in the amount or quality of terrestrial, aquatic, riparian or wetland habitat? - Contribute to an existing biological opinion or recovery plan for a listed special status species? - Preserve or restore designated critical habitat of a listed species? - Enhance wildlife protection or habitat?	No1
7	<b>Improve water quality in ways that were not quantified in Attachment 7?</b> Examples are not limited to, but may include: - Cause an improvement in water quality in an impaired water body or sensitive habitat? - Prevent water quality degradation? - Cause some other improvement in water quality?	No1
8	<b>Reduce net emissions in ways that were not quantified in Attachment 7?</b> Examples are not limited to, but may include: - Reduce net production of greenhouse gasses? - Reduce net emissions of other harmful chemicals into the air or water?	No
9	<b>Provide other environmental stewardship benefits, other than those claimed in Sections D1, D3, or D4?</b>	No
	<b>Sustainability Benefits:</b> Will the proposal	
10	<b>Improve the overall, long-term management of California groundwater resources?</b> Examples are not limited to, but may include: - Reduce extraction of non-renewable groundwater? - Promote aquifer storage or recharge?	No
11	<b>Reduce demand for net diversions for the regions from the Delta?</b>	No
12	<b>Provide a long-term solution in place of a short-term one?</b>	Yes
13	<b>Promote energy savings or replace fossil fuel based energy sources with renewable energy and resources?</b> Examples are not limited to, but may include: - Reduce net energy use on a permanent basis? - Increase renewable energy production? - Include new buildings or modify buildings to include certified LEED features? - Provide a net increase in recycling or reuse of materials? - Replace unsustainable land or water management practices with recognized sustainable practices?	No
14	<b>Improve water supply reliability in ways not quantified in Attachment 7?</b> Examples are not limited to, but may include: - Provide a more flexible mix of water sources? - Reduce likelihood of catastrophic supply outages? - Reduce supply uncertainty? - Reduce supply variability?	No
15	<b>Other (If the above listed categories do not apply, provide non-monetized benefit description)?</b>	No

**Table 15a – Annual Benefit**  
(All benefits should be in 2012 dollars)

Project: Middle Creek Flood Damage Reduction and Ecosystem Restoration 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 <sup>(1)</sup>	Annual \$ Value <sup>(1)</sup> (f) x (g)	Discount Factor <sup>(1)</sup>	Discounted Benefits <sup>(1)</sup> (h) x (i)
2012								1.000	
2013								0.943	
2014								0.890	
2015								0.840	
2016								0.792	
2017								0.747	
2018								0.705	
2019								0.665	
2020								0.627	
2021	Recreation	Visitor Days	36578	36578	0	\$62.02	\$0.00	0.592	\$0
2021	Avoided Water Supply Cost	Acre-feet	0	86	86	\$71.19	\$6,121.93	0.592	\$3,624
2021	Natural Floodplain Habitat	Acres	8	8	0	\$3,200.00	\$0.00	0.592	\$0
2021	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.592	\$384
2022	Recreation	Visitor Days	36578	36578	0	\$62.02	\$0.00	0.558	\$0
2022	Avoided Water Supply Cost	Acre-feet	0	86	86	\$72.96	\$6,274.97	0.558	\$3,504
2022	Natural Floodplain Habitat	Acres	8	8	0	\$3,200.00	\$0.00	0.558	\$0
2022	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.558	\$362
2023	Recreation	Visitor Days	36578	36578	0	\$62.02	\$0.00	0.527	\$0
2023	Avoided Water Supply Cost	Acre-feet	0	86	86	\$74.79	\$6,431.85	0.527	\$3,388
2023	Natural Floodplain Habitat	Acres	8	8	0	\$3,200.00	\$0.00	0.527	\$0
2023	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.527	\$341
2024	Recreation	Visitor Days	36578	36578	0	\$62.02	\$0.00	0.497	\$0
2024	Avoided Water Supply Cost	Acre-feet	0	86	86	\$76.66	\$6,592.65	0.497	\$3,276
2024	Natural Floodplain Habitat	Acres	8	8	0	\$3,200.00	\$0.00	0.497	\$0
2024	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.497	\$322
2025	Recreation	Visitor Days	36578	36578	0	\$62.02	\$0.00	0.469	\$0
2025	Avoided Water Supply Cost	Acre-feet	0	86	86	\$78.58	\$6,757.46	0.469	\$3,168
2025	Natural Floodplain Habitat	Acres	8	8	0	\$3,200.00	\$0.00	0.469	\$0
2025	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.469	\$304
2026	Recreation	Visitor Days	36578	36578	0	\$62.02	\$0.00	0.442	\$0
2026	Avoided Water Supply Cost	Acre-feet	0	86	86	\$80.54	\$6,926.40	0.442	\$3,064
2026	Natural Floodplain Habitat	Acres	8	8	0	\$3,200.00	\$0.00	0.442	\$0
2026	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.442	\$287
2027	Recreation	Visitor Days	36578	36578	0	\$62.02	\$0.00	0.417	\$0
2027	Avoided Water Supply Cost	Acre-feet	0	86	86	\$82.55	\$7,099.56	0.417	\$2,962
2027	Natural Floodplain Habitat	Acres	8	8	0	\$3,200.00	\$0.00	0.417	\$0
2027	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.417	\$270
2028	Recreation	Visitor Days	36578	36578	0	\$62.02	\$0.00	0.394	\$0
2028	Avoided Water Supply Cost	Acre-feet	0	86	86	\$84.62	\$7,277.05	0.394	\$2,865
2028	Natural Floodplain Habitat	Acres	8	8	0	\$3,200.00	\$0.00	0.394	\$0
2028	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.394	\$255
2029	Recreation	Visitor Days	36578	36578	0	\$62.02	\$0.00	0.371	\$0
2029	Avoided Water Supply Cost	Acre-feet	0	86	86	\$86.73	\$7,458.97	0.371	\$2,770
2029	Natural Floodplain Habitat	Acres	8	8	0	\$3,200.00	\$0.00	0.371	\$0
2029	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.371	\$241
2030	Recreation	Visitor Days	36578	36578	0	\$62.02	\$0.00	0.350	\$0
2030	Avoided Water Supply Cost	Acre-feet	0	86	86	\$88.90	\$7,645.45	0.350	\$2,679
2030	Natural Floodplain Habitat	Acres	8	8	0	\$3,200.00	\$0.00	0.350	\$0

2030	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.350	\$227
2031	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.331	\$47,228
2031	Avoided Water Supply Cost	Acre-feet	0	86	86	\$91.12	\$7,836.58	0.331	\$2,590
2031	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.331	\$39,133
2031	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.331	\$214
2032	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.312	\$44,555
2032	Avoided Water Supply Cost	Acre-feet	0	86	86	\$93.40	\$8,032.50	0.312	\$2,505
2032	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.312	\$36,918
2032	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.312	\$202
2033	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.294	\$42,033
2033	Avoided Water Supply Cost	Acre-feet	0	86	86	\$95.74	\$8,233.31	0.294	\$2,422
2033	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.294	\$34,828
2033	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.294	\$191
2034	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.278	\$39,654
2034	Avoided Water Supply Cost	Acre-feet	0	86	86	\$98.13	\$8,439.14	0.278	\$2,342
2034	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.278	\$32,857
2034	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.278	\$180
2035	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.262	\$37,409
2035	Avoided Water Supply Cost	Acre-feet	0	86	86	\$100.58	\$8,650.12	0.262	\$2,265
2035	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.262	\$30,997
2035	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.262	\$170
2036	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.247	\$35,292
2036	Avoided Water Supply Cost	Acre-feet	0	86	86	\$103.10	\$8,866.37	0.247	\$2,190
2036	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.247	\$29,242
2036	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.247	\$160
2037	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.233	\$33,294
2037	Avoided Water Supply Cost	Acre-feet	0	86	86	\$105.67	\$9,088.03	0.233	\$2,117
2037	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.233	\$27,587
2037	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.233	\$151
2038	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.220	\$31,410
2038	Avoided Water Supply Cost	Acre-feet	0	86	86	\$108.32	\$9,315.23	0.220	\$2,048
2038	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.220	\$26,026
2038	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.220	\$142
2039	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.207	\$29,632
2039	Avoided Water Supply Cost	Acre-feet	0	86	86	\$111.02	\$9,548.12	0.207	\$1,980
2039	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.207	\$24,552
2039	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.207	\$134
2040	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.196	\$27,954
2040	Avoided Water Supply Cost	Acre-feet	0	86	86	\$113.80	\$9,786.82	0.196	\$1,915
2040	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.196	\$23,163
2040	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.196	\$127
2041	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.185	\$26,372
2041	Avoided Water Supply Cost	Acre-feet	0	86	86	\$116.65	\$10,031.49	0.185	\$1,851
2041	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.185	\$21,852
2041	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.185	\$120
2042	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.174	\$24,879
2042	Avoided Water Supply Cost	Acre-feet	0	86	86	\$119.56	\$10,282.28	0.174	\$1,790
2042	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.174	\$20,615
2042	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.174	\$113
2043	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.164	\$23,471
2043	Avoided Water Supply Cost	Acre-feet	0	86	86	\$122.55	\$10,539.33	0.164	\$1,731
2043	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.164	\$19,448

2043	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.164	\$106
2044	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.155	\$22,142
2044	Avoided Water Supply Cost	Acre-feet	0	86	86	\$125.61	\$10,802.82	0.155	\$1,674
2044	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.155	\$18,347
2044	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.155	\$100
2045	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.146	\$20,889
2045	Avoided Water Supply Cost	Acre-feet	0	86	86	\$128.75	\$11,072.89	0.146	\$1,619
2045	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.146	\$17,308
2045	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.146	\$95
2046	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.138	\$19,707
2046	Avoided Water Supply Cost	Acre-feet	0	86	86	\$131.97	\$11,349.71	0.138	\$1,565
2046	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.138	\$16,329
2046	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.138	\$89
2047	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.130	\$18,591
2047	Avoided Water Supply Cost	Acre-feet	0	86	86	\$135.27	\$11,633.45	0.130	\$1,514
2047	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.130	\$15,404
2047	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.130	\$84
2048	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.123	\$17,539
2048	Avoided Water Supply Cost	Acre-feet	0	86	86	\$138.65	\$11,924.29	0.123	\$1,464
2048	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.123	\$14,533
2048	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.123	\$80
2049	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.116	\$16,546
2049	Avoided Water Supply Cost	Acre-feet	0	86	86	\$142.12	\$12,222.40	0.116	\$1,415
2049	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.116	\$13,710
2049	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.116	\$75
2050	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.109	\$15,610
2050	Avoided Water Supply Cost	Acre-feet	0	86	86	\$145.67	\$12,527.96	0.109	\$1,369
2050	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.109	\$12,934
2050	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.109	\$71
2051	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.103	\$14,726
2051	Avoided Water Supply Cost	Acre-feet	0	86	86	\$149.32	\$12,841.15	0.103	\$1,323
2051	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.103	\$12,202
2051	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.103	\$67
2052	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.097	\$13,892
2052	Avoided Water Supply Cost	Acre-feet	0	86	86	\$153.05	\$13,162.18	0.097	\$1,280
2052	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.097	\$11,511
2052	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.097	\$63
2053	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.092	\$13,106
2053	Avoided Water Supply Cost	Acre-feet	0	86	86	\$156.87	\$13,491.24	0.092	\$1,237
2053	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.092	\$10,860
2053	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.092	\$59
2054	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.087	\$12,364
2054	Avoided Water Supply Cost	Acre-feet	0	86	86	\$160.80	\$13,828.52	0.087	\$1,197
2054	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.087	\$10,245
2054	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.087	\$56
2055	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.082	\$11,664
2055	Avoided Water Supply Cost	Acre-feet	0	86	86	\$164.82	\$14,174.23	0.082	\$1,157
2055	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.082	\$9,665
2055	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.082	\$53
2056	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.077	\$11,004
2056	Avoided Water Supply Cost	Acre-feet	0	86	86	\$168.94	\$14,528.59	0.077	\$1,119
2056	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.077	\$9,118

2056	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.077	\$50
2057	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.073	\$10,381
2057	Avoided Water Supply Cost	Acre-feet	0	86	86	\$173.16	\$14,891.80	0.073	\$1,082
2057	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.073	\$8,602
2057	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.073	\$47
2058	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.069	\$9,794
2058	Avoided Water Supply Cost	Acre-feet	0	86	86	\$177.49	\$15,264.10	0.069	\$1,046
2058	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.069	\$8,115
2058	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.069	\$44
2059	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.065	\$9,239
2059	Avoided Water Supply Cost	Acre-feet	0	86	86	\$181.93	\$15,645.70	0.065	\$1,012
2059	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.065	\$7,656
2059	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.065	\$42
2060	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.061	\$8,716
2060	Avoided Water Supply Cost	Acre-feet	0	86	86	\$186.47	\$16,036.84	0.061	\$978
2060	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.061	\$7,222
2060	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.061	\$40
2061	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.058	\$8,223
2061	Avoided Water Supply Cost	Acre-feet	0	86	86	\$191.14	\$16,437.76	0.058	\$946
2061	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.058	\$6,813
2061	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.058	\$37
2062	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.054	\$7,757
2062	Avoided Water Supply Cost	Acre-feet	0	86	86	\$195.92	\$16,848.71	0.054	\$915
2062	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.054	\$6,428
2062	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.054	\$35
2063	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.051	\$7,318
2063	Avoided Water Supply Cost	Acre-feet	0	86	86	\$200.81	\$17,269.92	0.051	\$884
2063	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.051	\$6,064
2063	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.051	\$33
2064	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.048	\$6,904
2064	Avoided Water Supply Cost	Acre-feet	0	86	86	\$205.83	\$17,701.67	0.048	\$855
2064	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.048	\$5,721
2064	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.048	\$31
2065	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.046	\$6,513
2065	Avoided Water Supply Cost	Acre-feet	0	86	86	\$210.98	\$18,144.21	0.046	\$827
2065	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.046	\$5,397
2065	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.046	\$30
2066	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.043	\$6,145
2066	Avoided Water Supply Cost	Acre-feet	0	86	86	\$216.25	\$18,597.82	0.043	\$800
2066	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.043	\$5,091
2066	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.043	\$28
2067	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.041	\$5,797
2067	Avoided Water Supply Cost	Acre-feet	0	86	86	\$221.66	\$19,062.77	0.041	\$773
2067	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.041	\$4,803
2067	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.041	\$26
2068	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.038	\$5,469
2068	Avoided Water Supply Cost	Acre-feet	0	86	86	\$227.20	\$19,539.33	0.038	\$748
2068	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.038	\$4,531
2068	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.038	\$25
2069	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.036	\$5,159
2069	Avoided Water Supply Cost	Acre-feet	0	86	86	\$232.88	\$20,027.82	0.036	\$723
2069	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.036	\$4,275

2069	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.036	\$23
2070	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.034	\$4,867
2070	Avoided Water Supply Cost	Acre-feet	0	86	86	\$238.70	\$20,528.51	0.034	\$699
2070	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.034	\$4,033
2070	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.034	\$22
2071	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.032	\$4,592
2071	Avoided Water Supply Cost	Acre-feet	0	86	86	\$244.67	\$21,041.73	0.032	\$676
2071	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.032	\$3,805
2071	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.032	\$21
2072	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.030	\$4,332
2072	Avoided Water Supply Cost	Acre-feet	0	86	86	\$250.79	\$21,567.77	0.030	\$654
2072	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.030	\$3,589
2072	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.030	\$20
2073	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.029	\$4,087
2073	Avoided Water Supply Cost	Acre-feet	0	86	86	\$257.06	\$22,106.96	0.029	\$632
2073	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.029	\$3,386
2073	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.029	\$19
2074	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.027	\$3,855
2074	Avoided Water Supply Cost	Acre-feet	0	86	86	\$263.48	\$22,659.64	0.027	\$611
2074	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.027	\$3,194
2074	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.027	\$17
2075	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.025	\$3,637
2075	Avoided Water Supply Cost	Acre-feet	0	86	86	\$270.07	\$23,226.13	0.025	\$591
2075	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.025	\$3,014
2075	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.025	\$16
2076	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.024	\$3,431
2076	Avoided Water Supply Cost	Acre-feet	0	86	86	\$276.82	\$23,806.78	0.024	\$572
2076	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.024	\$2,843
2076	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.024	\$16
2077	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.023	\$3,237
2077	Avoided Water Supply Cost	Acre-feet	0	86	86	\$283.74	\$24,401.95	0.023	\$553
2077	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.023	\$2,682
2077	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.023	\$15
2078	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.021	\$3,054
2078	Avoided Water Supply Cost	Acre-feet	0	86	86	\$290.84	\$25,012.00	0.021	\$535
2078	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.021	\$2,530
2078	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.021	\$14
2079	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.020	\$2,881
2079	Avoided Water Supply Cost	Acre-feet	0	86	86	\$298.11	\$25,637.30	0.020	\$517
2079	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.020	\$2,387
2079	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.020	\$13
2080	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.019	\$2,718
2080	Avoided Water Supply Cost	Acre-feet	0	86	86	\$305.56	\$26,278.23	0.019	\$500
2080	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.019	\$2,252
2080	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.019	\$12
2081	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.018	\$2,564
2081	Avoided Water Supply Cost	Acre-feet	0	86	86	\$313.20	\$26,935.19	0.018	\$483
2081	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.018	\$2,124
2081	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.018	\$12
2082	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.017	\$2,419
2082	Avoided Water Supply Cost	Acre-feet	0	86	86	\$321.03	\$27,608.57	0.017	\$467
2082	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.017	\$2,004

2082	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.017	\$11
2083	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.016	\$2,282
2083	Avoided Water Supply Cost	Acre-feet	0	86	86	\$329.06	\$28,298.78	0.016	\$452
2083	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.016	\$1,891
2083	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.016	\$10
2084	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.015	\$2,153
2084	Avoided Water Supply Cost	Acre-feet	0	86	86	\$337.28	\$29,006.25	0.015	\$437
2084	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.015	\$1,784
2084	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.015	\$10
2085	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.014	\$2,031
2085	Avoided Water Supply Cost	Acre-feet	0	86	86	\$345.71	\$29,731.41	0.014	\$423
2085	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.014	\$1,683
2085	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.014	\$9
2086	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.013	\$1,916
2086	Avoided Water Supply Cost	Acre-feet	0	86	86	\$354.36	\$30,474.69	0.013	\$409
2086	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.013	\$1,588
2086	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.013	\$9
2087	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.013	\$1,807
2087	Avoided Water Supply Cost	Acre-feet	0	86	86	\$363.22	\$31,236.56	0.013	\$395
2087	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.013	\$1,498
2087	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.013	\$8
2088	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.012	\$1,705
2088	Avoided Water Supply Cost	Acre-feet	0	86	86	\$372.30	\$32,017.47	0.012	\$382
2088	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.012	\$1,413
2088	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.012	\$8
2089	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.011	\$1,609
2089	Avoided Water Supply Cost	Acre-feet	0	86	86	\$381.60	\$32,817.91	0.011	\$369
2089	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.011	\$1,333
2089	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.011	\$7
2090	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.011	\$1,518
2090	Avoided Water Supply Cost	Acre-feet	0	86	86	\$391.14	\$33,638.36	0.011	\$357
2090	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.011	\$1,257
2090	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.011	\$7
2091	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.010	\$1,432
2091	Avoided Water Supply Cost	Acre-feet	0	86	86	\$400.92	\$34,479.32	0.010	\$345
2091	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.010	\$1,186
2091	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.010	\$6
2092	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.009	\$1,351
2092	Avoided Water Supply Cost	Acre-feet	0	86	86	\$410.95	\$35,341.30	0.009	\$334
2092	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.009	\$1,119
2092	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.009	\$6
2093	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.009	\$1,274
2093	Avoided Water Supply Cost	Acre-feet	0	86	86	\$421.22	\$36,224.83	0.009	\$323
2093	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.009	\$1,056
2093	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.009	\$6
2094	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.008	\$1,202
2094	Avoided Water Supply Cost	Acre-feet	0	86	86	\$431.75	\$37,130.45	0.008	\$312
2094	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.008	\$996
2094	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.008	\$5
2095	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.008	\$1,134
2095	Avoided Water Supply Cost	Acre-feet	0	86	86	\$442.54	\$38,058.72	0.008	\$302
2095	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.008	\$940

2095	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.008	\$5
2096	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.007	\$1,070
2096	Avoided Water Supply Cost	Acre-feet	0	86	86	\$453.61	\$39,010.18	0.007	\$292
2096	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.007	\$886
2096	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.007	\$5
2097	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.007	\$1,009
2097	Avoided Water Supply Cost	Acre-feet	0	86	86	\$464.95	\$39,985.44	0.007	\$282
2097	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.007	\$836
2097	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.007	\$5
2098	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.007	\$952
2098	Avoided Water Supply Cost	Acre-feet	0	86	86	\$476.57	\$40,985.07	0.007	\$273
2098	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.007	\$789
2098	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.007	\$4
2099	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.006	\$898
2099	Avoided Water Supply Cost	Acre-feet	0	86	86	\$488.48	\$42,009.70	0.006	\$264
2099	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.006	\$744
2099	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.006	\$4
2100	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.006	\$847
2100	Avoided Water Supply Cost	Acre-feet	0	86	86	\$500.70	\$43,059.94	0.006	\$255
2100	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.006	\$702
2100	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.006	\$4
2101	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.006	\$799
2101	Avoided Water Supply Cost	Acre-feet	0	86	86	\$513.21	\$44,136.44	0.006	\$247
2101	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.006	\$662
2101	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.006	\$4
2102	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.005	\$754
2102	Avoided Water Supply Cost	Acre-feet	0	86	86	\$526.04	\$45,239.85	0.005	\$239
2102	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.005	\$625
2102	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.005	\$3
2103	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.005	\$712
2103	Avoided Water Supply Cost	Acre-feet	0	86	86	\$539.20	\$46,370.85	0.005	\$231
2103	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.005	\$590
2103	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.005	\$3
2104	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.005	\$671
2104	Avoided Water Supply Cost	Acre-feet	0	86	86	\$552.68	\$47,530.12	0.005	\$223
2104	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.005	\$556
2104	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.005	\$3
2105	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.004	\$633
2105	Avoided Water Supply Cost	Acre-feet	0	86	86	\$566.49	\$48,718.37	0.004	\$216
2105	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.004	\$525
2105	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.004	\$3
2106	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.004	\$597
2106	Avoided Water Supply Cost	Acre-feet	0	86	86	\$580.66	\$49,936.33	0.004	\$209
2106	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.004	\$495
2106	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.004	\$3
2107	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.004	\$564
2107	Avoided Water Supply Cost	Acre-feet	0	86	86	\$595.17	\$51,184.74	0.004	\$202
2107	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.004	\$467
2107	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.004	\$3
2108	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.004	\$532
2108	Avoided Water Supply Cost	Acre-feet	0	86	86	\$610.05	\$52,464.36	0.004	\$195
2108	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.004	\$441

2108	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.004	\$2
2109	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.004	\$502
2109	Avoided Water Supply Cost	Acre-feet	0	86	86	\$625.30	\$53,775.97	0.004	\$189
2109	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.004	\$416
2109	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.004	\$2
2110	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.003	\$473
2110	Avoided Water Supply Cost	Acre-feet	0	86	86	\$640.93	\$55,120.37	0.003	\$183
2110	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.003	\$392
2110	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.003	\$2
2111	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.003	\$446
2111	Avoided Water Supply Cost	Acre-feet	0	86	86	\$656.96	\$56,498.38	0.003	\$177
2111	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.003	\$370
2111	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.003	\$2
2112	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.003	\$421
2112	Avoided Water Supply Cost	Acre-feet	0	86	86	\$673.38	\$57,910.84	0.003	\$171
2112	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.003	\$349
2112	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.003	\$2
2113	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.003	\$397
2113	Avoided Water Supply Cost	Acre-feet	0	86	86	\$690.22	\$59,358.61	0.003	\$165
2113	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.003	\$329
2113	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.003	\$2
2114	Recreation	Visitor Days	36578	38882	2304	\$62.02	\$142,894.08	0.003	\$375
2114	Avoided Water Supply Cost	Acre-feet	0	86	86	\$707.47	\$60,842.57	0.003	\$160
2114	Natural Floodplain Habitat	Acres	8	45	37	\$3,200.00	\$118,400.00	0.003	\$311
2114	Avoided Energy Cost	Kilowatt-hours	5400	0	-5400	\$0.12	\$648.00	0.003	\$2
Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table)									\$1,626,106
Comments:									

(1) Complete these columns if dollar value is being claimed for the benefit.

\$1,816,793

**Project: Middle Creek Flood Damage Reduction and Ecosystem Restoration**

**Table 17 – Summary Calculation of Expected Annual Damage: 17a + 17b**

Hydrologic Event	Event Exceedance Probability	Event Damage if Flood Structures Fail	Probability Structural Failure		Expected Event Damage		Interval Probability	Average Damage in Interval		Average Damage in Interval times Interval Probability	
			Without Project	With Project	Without Project	With Project		Without Project	With Project	Without Project	With Project
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(i)	(j)	(k)	(l)	(m)
					(c) x (d)	(c) x (e)	from (b)	from (f)	from (g)	(i) x (j)	(i) x (k)
5-year	0.2	\$64,463	1	0	\$64,463	\$0				\$0	\$0
20-Year	0.05	\$75,161	1	0	\$75,161	\$0	0.15	\$69,812	\$0	\$10,472	\$0
100-Year	0.01	\$86,489	1	0	\$86,489	\$0	0.04	\$80,825	\$0	\$3,233	\$0
Total Expected Annual Damages, Without and With Project										\$13,705	\$0.00

**Table 17a – Agricultural Expected Annual Damages, Without and With Project**

Hydrologic Event	Event Exceedance Probability	Event Damage if Flood Structures Fail	Probability Structural Failure		Expected Event Damage		Interval Probability	Average Damage in Interval		Average Damage in Interval	
			Without Project	With Project	Without Project	With Project		Without Project	With Project	Without Project	With Project
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(i)	(j)	(k)	(l)	(m)
					(c) x (d)	(c) x (e)	from (b)	from (f)	from (g)	(i) x (j)	(i) x (k)
5-year	0.2	\$56,016	1	0	\$56,016	\$0				\$0	\$0
20-Year	0.05	\$58,755	1	0	\$58,755	\$0	0.15	\$57,386	\$0	\$8,608	\$0
100-Year	0.01	\$58,988	1	0	\$58,988	\$0	0.04	\$58,872	\$0	\$2,355	\$0
										\$10,963	\$0.00

**Table 17b – Levee Repair and Flood Fight Expected Annual Damages, Without and With Project**

Hydrologic Event	Event Exceedance Probability	Event Damage if Flood Structures Fail	Probability Structural Failure		Expected Event Damage		Interval Probability	Average Damage in Interval		Average Damage in Interval	
			Without Project	With Project	Without Project	With Project		Without Project	With Project	Without Project	With Project
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(i)	(j)	(k)	(l)	(m)
					(c) x (d)	(c) x (e)	from (b)	from (f)	from (g)	(i) x (j)	(i) x (k)
5-year	0.2	\$8,446	1	0	\$8,446	\$0				\$0	\$0
20-Year	0.05	\$16,405	1	0	\$16,405	\$0	0.15	\$12,426	\$0	\$1,864	\$0
100-Year	0.01	\$27,501	1	0	\$27,501	\$0	0.04	\$21,953	\$0	\$878	\$0
										\$2,742	\$0.00

**Table 18 – Annual Flood Damage Avoidance Benefit\***

(All benefits should be in 2012 dollars)

Project: Property Acquisition, Middle Creek Flood Damage Reduction and Ecosystem Restoration 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 <sup>(1)</sup>	Annual \$ Value <sup>(1)</sup> (f) x (g)	Discount Factor <sup>(1)</sup>	Discounted Benefits <sup>(1)</sup> (h) x (i)
2013	Expected Annual Damage, Agriculture		\$0	\$0.00	\$0	\$1.00	\$0	0.943	\$0
2013	Expected Annual Damage, Levee Repair and Flood Fight		\$0	\$0.00	\$0	\$1.00	\$0	0.943	\$0
2014	Expected Annual Damage, Agriculture		\$0	\$0.00	\$0	\$1.00	\$0	0.890	\$0
2014	Expected Annual Damage, Levee Repair and Flood Fight		\$0	\$0.00	\$0	\$1.00	\$0	0.890	\$0
2015	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.840	\$9,205
2015	Expected Annual Damage, Levee Repair and Flood Fight		\$0	\$0.00	\$0	\$1.00	\$0	0.840	\$0
2016	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.792	\$8,683
2016	Expected Annual Damage, Levee Repair and Flood Fight		\$0	\$0.00	\$0	\$1.00	\$0	0.792	\$0
2017	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.747	\$8,192
2017	Expected Annual Damage, Levee Repair and Flood Fight		\$0	\$0.00	\$0	\$1.00	\$0	0.747	\$0
2018	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.705	\$7,728
2018	Expected Annual Damage, Levee Repair and Flood Fight		\$0	\$0.00	\$0	\$1.00	\$0	0.705	\$0
2019	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.665	\$7,291
2019	Expected Annual Damage, Levee Repair and Flood Fight		\$0	\$0.00	\$0	\$1.00	\$0	0.665	\$0
2020	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.627	\$6,878
2020	Expected Annual Damage, Levee Repair and Flood Fight		\$0	\$0.00	\$0	\$1.00	\$0	0.627	\$0
2021	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.592	\$6,489
2021	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.592	\$1,623
2022	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.558	\$6,122
2022	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.558	\$1,531
2023	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.527	\$5,775
2023	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.527	\$1,444
2024	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.497	\$5,448
2024	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.497	\$1,363
2025	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.469	\$5,140
2025	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.469	\$1,286
2026	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.442	\$4,849
2026	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.442	\$1,213
2027	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.417	\$4,574
2027	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.417	\$1,144
2028	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.394	\$4,315
2028	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.394	\$1,079
2029	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.371	\$4,071
2029	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.371	\$1,018
2030	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.350	\$3,841
2030	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.350	\$961
2031	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.331	\$3,623
2031	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.331	\$906
2032	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.312	\$3,418
2032	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.312	\$855
2033	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.294	\$3,225
2033	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.294	\$807
2034	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.278	\$3,042
2034	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.278	\$761
2035	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.262	\$2,870
2035	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.262	\$718
2036	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.247	\$2,708
2036	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.247	\$677
2037	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.233	\$2,554
2037	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.233	\$639
2038	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.220	\$2,410
2038	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.220	\$603
2039	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.207	\$2,273
2039	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.207	\$569
2040	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.196	\$2,145
2040	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.196	\$536
2041	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.185	\$2,023
2041	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.185	\$506
2042	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.174	\$1,909
2042	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.174	\$477
2043	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.164	\$1,801
2043	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.164	\$450
2044	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.155	\$1,699
2044	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.155	\$425
2045	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.146	\$1,603
2045	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.146	\$401
2046	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.138	\$1,512
2046	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.138	\$378
2047	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.130	\$1,426
2047	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.130	\$357
2048	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.123	\$1,346
2048	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.123	\$337
2049	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.116	\$1,269
2049	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.116	\$318
2050	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.109	\$1,198
2050	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.109	\$300
2051	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.103	\$1,130



2094	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.008	\$23
2095	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.008	\$87
2095	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.008	\$22
2096	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.007	\$82
2096	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.007	\$21
2097	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.007	\$77
2097	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.007	\$19
2098	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.007	\$73
2098	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.007	\$18
2099	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.006	\$69
2099	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.006	\$17
2100	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.006	\$65
2100	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.006	\$16
2101	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.006	\$61
2101	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.006	\$15
2102	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.005	\$58
2102	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.005	\$14
2103	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.005	\$55
2103	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.005	\$14
2104	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.005	\$51
2104	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.005	\$13
2105	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.004	\$49
2105	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.004	\$12
2106	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.004	\$46
2106	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.004	\$11
2107	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.004	\$43
2107	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.004	\$11
2108	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.004	\$41
2108	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.004	\$10
2109	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.004	\$38
2109	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.004	\$10
2110	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.003	\$36
2110	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.003	\$9
2111	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.003	\$34
2111	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.003	\$9
2112	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.003	\$32
2112	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.003	\$8
2113	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.003	\$30
2113	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.003	\$8
2114	Expected Annual Damage, Agriculture		-\$10,963	\$0.00	\$10,963	\$1.00	\$10,963	0.003	\$29
2114	Expected Annual Damage, Levee Repair and Flood Fight		-\$2,742	\$0.00	\$2,742	\$1.00	\$2,742	0.003	\$7
Total Present Value of Discounted Benefits Based on Unit Value									\$190,687

Comments:

(1) Complete these columns if dollar value is being claimed for the benefit.

Note that the information in this table is the same as that presented in Table 18 found in the PSP. However, the structure of this table is different than the Table 18 found in the PSP because the timing of when the benefits accrue do not align with the expected life of the project and required a more detailed

\*

**Table 19a – Annual Costs of Project**

(All costs should be in 2012 Dollars)

Project: Middle Creek Flood Damage Reduction and Ecosystem Restoration Project

Year	Initial Costs Grand Total Cost from Table 7 (row (i), column (d))	Adjusted Grant Total Cost <sup>(1)</sup>	Annual Costs <sup>(2)</sup>					Discounting Calculations		
			Admin	Operation	Maintenance	Replacement	Other	Total Costs (a) +...+ (g)	Discount Factor	Discounted Project Costs (h) x (i)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
2012								\$ -	1.000	\$ -
2013								\$ -	0.943	\$ -
2014	\$ 1,063,888							\$ 1,063,888	0.890	\$ 946,857
2015								\$ 35,172	0.840	\$ 29,531
2016								\$ 35,172	0.792	\$ 27,860
2017								\$ 35,172	0.747	\$ 26,283
2018								\$ 35,172	0.705	\$ 24,795
2019								\$ 35,172	0.665	\$ 23,391
2020								\$ 35,172	0.627	\$ 22,067
2021								\$ 35,172	0.592	\$ 20,818
2022								\$ 35,172	0.558	\$ 19,640
2023								\$ 35,172	0.527	\$ 18,528
2024								\$ 35,172	0.497	\$ 17,479
2025								\$ 35,172	0.469	\$ 16,490
2026								\$ 35,172	0.442	\$ 15,557
2027								\$ 35,172	0.417	\$ 14,676
2028								\$ 35,172	0.394	\$ 13,845
2029								\$ 35,172	0.371	\$ 13,062
2030								\$ 35,172	0.350	\$ 12,322
2031								\$ 35,172	0.331	\$ 11,625
2032								\$ 35,172	0.312	\$ 10,967
2033								\$ 35,172	0.294	\$ 10,346
2034								\$ 35,172	0.278	\$ 9,760
2035								\$ 35,172	0.262	\$ 9,208
2036								\$ 35,172	0.247	\$ 8,687
2037								\$ 35,172	0.233	\$ 8,195
2038								\$ 35,172	0.220	\$ 7,731
2039								\$ 35,172	0.207	\$ 7,294
2040								\$ 35,172	0.196	\$ 6,881
2041								\$ 35,172	0.185	\$ 6,491
2042								\$ 35,172	0.174	\$ 6,124
2043								\$ 35,172	0.164	\$ 5,777
2044								\$ 35,172	0.155	\$ 5,450
2045								\$ 35,172	0.146	\$ 5,142
2046								\$ 35,172	0.138	\$ 4,851
2047								\$ 35,172	0.130	\$ 4,576
2048								\$ 35,172	0.123	\$ 4,317
2049								\$ 35,172	0.116	\$ 4,073
2050								\$ 35,172	0.109	\$ 3,842
2051								\$ 35,172	0.103	\$ 3,625
2052								\$ 35,172	0.097	\$ 3,419
2053								\$ 35,172	0.092	\$ 3,226
2054								\$ 35,172	0.087	\$ 3,043
2055								\$ 35,172	0.082	\$ 2,871
2056								\$ 35,172	0.077	\$ 2,709
2057								\$ 35,172	0.073	\$ 2,555
2058								\$ 35,172	0.069	\$ 2,411
2059								\$ 35,172	0.065	\$ 2,274
2060								\$ 35,172	0.061	\$ 2,145
2061								\$ 35,172	0.058	\$ 2,024
2062								\$ 35,172	0.054	\$ 1,909
2063								\$ 35,172	0.051	\$ 1,801
2064								\$ 35,172	0.048	\$ 1,699
2065								\$ 35,172	0.046	\$ 1,603
2066								\$ 35,172	0.043	\$ 1,512
2067								\$ 35,172	0.041	\$ 1,427

2068							\$ 35,172	\$ 35,172	0.038	\$ 1,346
2069							\$ 35,172	\$ 35,172	0.036	\$ 1,270
2070							\$ 35,172	\$ 35,172	0.034	\$ 1,198
2071							\$ 35,172	\$ 35,172	0.032	\$ 1,130
2072							\$ 35,172	\$ 35,172	0.030	\$ 1,066
2073							\$ 35,172	\$ 35,172	0.029	\$ 1,006
2074							\$ 35,172	\$ 35,172	0.027	\$ 949
2075							\$ 35,172	\$ 35,172	0.025	\$ 895
2076							\$ 35,172	\$ 35,172	0.024	\$ 845
2077							\$ 35,172	\$ 35,172	0.023	\$ 797
2078							\$ 35,172	\$ 35,172	0.021	\$ 752
2079							\$ 35,172	\$ 35,172	0.020	\$ 709
2080							\$ 35,172	\$ 35,172	0.019	\$ 669
2081							\$ 35,172	\$ 35,172	0.018	\$ 631
2082							\$ 35,172	\$ 35,172	0.017	\$ 595
2083							\$ 35,172	\$ 35,172	0.016	\$ 562
2084							\$ 35,172	\$ 35,172	0.015	\$ 530
2085							\$ 35,172	\$ 35,172	0.014	\$ 500
2086							\$ 35,172	\$ 35,172	0.013	\$ 472
2087							\$ 35,172	\$ 35,172	0.013	\$ 445
2088							\$ 35,172	\$ 35,172	0.012	\$ 420
2089							\$ 35,172	\$ 35,172	0.011	\$ 396
2090							\$ 35,172	\$ 35,172	0.011	\$ 374
2091							\$ 35,172	\$ 35,172	0.010	\$ 352
2092							\$ 35,172	\$ 35,172	0.009	\$ 332
2093							\$ 35,172	\$ 35,172	0.009	\$ 314
2094							\$ 35,172	\$ 35,172	0.008	\$ 296
2095							\$ 35,172	\$ 35,172	0.008	\$ 279
2096							\$ 35,172	\$ 35,172	0.007	\$ 263
2097							\$ 35,172	\$ 35,172	0.007	\$ 248
2098							\$ 35,172	\$ 35,172	0.007	\$ 234
2099							\$ 35,172	\$ 35,172	0.006	\$ 221
2100							\$ 35,172	\$ 35,172	0.006	\$ 209
2101							\$ 35,172	\$ 35,172	0.006	\$ 197
2102							\$ 35,172	\$ 35,172	0.005	\$ 186
2103							\$ 35,172	\$ 35,172	0.005	\$ 175
2104							\$ 35,172	\$ 35,172	0.005	\$ 165
2105							\$ 35,172	\$ 35,172	0.004	\$ 156
2106							\$ 35,172	\$ 35,172	0.004	\$ 147
2107							\$ 35,172	\$ 35,172	0.004	\$ 139
2108							\$ 35,172	\$ 35,172	0.004	\$ 131
2109							\$ 35,172	\$ 35,172	0.004	\$ 123
2110							\$ 35,172	\$ 35,172	0.003	\$ 116
2111							\$ 35,172	\$ 35,172	0.003	\$ 110
2112							\$ 35,172	\$ 35,172	0.003	\$ 104
2113							\$ 35,172	\$ 35,172	0.003	\$ 98
2114							\$ 35,172	\$ 35,172	0.003	\$ 92
Total Present Value of Discounted Costs (Sum of column (j))										\$ 1,467,035
Transfer to Table 20, column (c), Proposal Benefits and Costs Summaries										
Comments:										

- (1) If any, based on opportunity costs, sunk costs and associated costs  
(2) The incremental change in O&M costs attributable to the project

**Table 19b – Annual Costs of Full Floodplain Restoration Project**

(All costs should be in 2012 Dollars)

Project: Middle Creek Flood Damage Reduction and Ecosystem Restoration Project

Year	Initial Costs Grand Total Cost from Table 7 (row (i), column (d))	Adjusted Grant Total Cost <sup>(1)</sup>	Annual Costs <sup>(2)</sup>					Discounting Calculations		
			Admin	Operation	Maintenance	Replacement	Other	Total Costs (a) +...+ (g)	Discount Factor	Discounted Project Costs (h) x (i)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
2010	\$ 8,968,516						\$ 855,693	\$ 9,824,209	1.000	\$ 9,824,209
2011	\$ 1,494,753						\$ 285,231	\$ 1,779,984	1.000	\$ 1,779,984
2012	\$ 1,494,753						\$ 325,978	\$ 1,820,731	1.000	\$ 1,820,731
2013	\$ 1,494,753						\$ 366,726	\$ 1,861,478	0.943	\$ 1,756,111
2014	\$ 1,494,753						\$ 407,473	\$ 1,902,225	0.890	\$ 1,692,974
2015	\$ 1,494,753						\$ 448,220	\$ 1,942,973	0.840	\$ 1,631,357
2016	\$ 1,494,753						\$ 488,967	\$ 1,983,720	0.792	\$ 1,571,292
2017	\$ 1,494,753						\$ 529,715	\$ 2,024,467	0.747	\$ 1,512,800
2018	\$ 11,744,485						\$ 570,462	\$ 12,314,947	0.705	\$ 8,681,552
2019	\$ 11,744,485						\$ 611,209	\$ 12,355,694	0.665	\$ 8,217,242
2020	\$ 12,464,485						\$ 651,957	\$ 13,116,441	0.627	\$ 8,229,418
2021					\$ 30,000		\$ 651,957	\$ 681,957	0.592	\$ 403,649
2022					\$ 30,000		\$ 651,957	\$ 681,957	0.558	\$ 380,801
2023					\$ 30,000		\$ 651,957	\$ 681,957	0.527	\$ 359,246
2024					\$ 30,000		\$ 651,957	\$ 681,957	0.497	\$ 338,912
2025					\$ 30,000		\$ 651,957	\$ 681,957	0.469	\$ 319,728
2026					\$ 30,000		\$ 651,957	\$ 681,957	0.442	\$ 301,630
2027					\$ 30,000		\$ 651,957	\$ 681,957	0.417	\$ 284,557
2028					\$ 30,000		\$ 651,957	\$ 681,957	0.394	\$ 268,450
2029					\$ 30,000		\$ 651,957	\$ 681,957	0.371	\$ 253,254
2030					\$ 30,000		\$ 651,957	\$ 681,957	0.350	\$ 238,919
2031					\$ 30,000		\$ 651,957	\$ 681,957	0.331	\$ 225,396
2032					\$ 30,000		\$ 651,957	\$ 681,957	0.312	\$ 212,637
2033					\$ 30,000		\$ 651,957	\$ 681,957	0.294	\$ 200,601
2034					\$ 30,000		\$ 651,957	\$ 681,957	0.278	\$ 189,246
2035					\$ 30,000		\$ 651,957	\$ 681,957	0.262	\$ 178,534
2036					\$ 30,000		\$ 651,957	\$ 681,957	0.247	\$ 168,429
2037					\$ 30,000		\$ 651,957	\$ 681,957	0.233	\$ 158,895
2038					\$ 30,000		\$ 651,957	\$ 681,957	0.220	\$ 149,901
2039					\$ 30,000		\$ 651,957	\$ 681,957	0.207	\$ 141,416
2040					\$ 30,000		\$ 651,957	\$ 681,957	0.196	\$ 133,411
2041					\$ 30,000		\$ 651,957	\$ 681,957	0.185	\$ 125,860
2042					\$ 30,000		\$ 651,957	\$ 681,957	0.174	\$ 118,736
2043					\$ 30,000		\$ 651,957	\$ 681,957	0.164	\$ 112,015
2044					\$ 30,000		\$ 651,957	\$ 681,957	0.155	\$ 105,674
2045					\$ 30,000		\$ 651,957	\$ 681,957	0.146	\$ 99,693
2046					\$ 30,000		\$ 651,957	\$ 681,957	0.138	\$ 94,050
2047					\$ 30,000		\$ 651,957	\$ 681,957	0.130	\$ 88,726
2048					\$ 30,000		\$ 651,957	\$ 681,957	0.123	\$ 83,704
2049					\$ 30,000		\$ 651,957	\$ 681,957	0.116	\$ 78,966
2050					\$ 30,000		\$ 651,957	\$ 681,957	0.109	\$ 74,496
2051					\$ 30,000		\$ 651,957	\$ 681,957	0.103	\$ 70,279
2052					\$ 30,000		\$ 651,957	\$ 681,957	0.097	\$ 66,301
2053					\$ 30,000		\$ 651,957	\$ 681,957	0.092	\$ 62,548
2054					\$ 30,000		\$ 651,957	\$ 681,957	0.087	\$ 59,008
2055					\$ 30,000		\$ 651,957	\$ 681,957	0.082	\$ 55,668
2056					\$ 30,000		\$ 651,957	\$ 681,957	0.077	\$ 52,517
2057					\$ 30,000		\$ 651,957	\$ 681,957	0.073	\$ 49,544
2058					\$ 30,000		\$ 651,957	\$ 681,957	0.069	\$ 46,740
2059					\$ 30,000		\$ 651,957	\$ 681,957	0.065	\$ 44,094
2060					\$ 30,000		\$ 651,957	\$ 681,957	0.061	\$ 41,598
2061					\$ 30,000		\$ 651,957	\$ 681,957	0.058	\$ 39,244
2062					\$ 30,000		\$ 651,957	\$ 681,957	0.054	\$ 37,022
2063					\$ 30,000		\$ 651,957	\$ 681,957	0.051	\$ 34,927
2064					\$ 30,000		\$ 651,957	\$ 681,957	0.048	\$ 32,950
2065					\$ 30,000		\$ 651,957	\$ 681,957	0.046	\$ 31,085

2066				\$ 30,000	\$ 651,957	\$ 681,957	0.043	\$ 29,325	
2067				\$ 30,000	\$ 651,957	\$ 681,957	0.041	\$ 27,665	
2068				\$ 30,000	\$ 651,957	\$ 681,957	0.038	\$ 26,099	
2069				\$ 30,000	\$ 651,957	\$ 681,957	0.036	\$ 24,622	
2070				\$ 30,000	\$ 651,957	\$ 681,957	0.034	\$ 23,228	
2071				\$ 30,000	\$ 651,957	\$ 681,957	0.032	\$ 21,913	
2072				\$ 30,000	\$ 651,957	\$ 681,957	0.030	\$ 20,673	
2073				\$ 30,000	\$ 651,957	\$ 681,957	0.029	\$ 19,503	
2074				\$ 30,000	\$ 651,957	\$ 681,957	0.027	\$ 18,399	
2075				\$ 30,000	\$ 651,957	\$ 681,957	0.025	\$ 17,358	
2076				\$ 30,000	\$ 651,957	\$ 681,957	0.024	\$ 16,375	
2077				\$ 30,000	\$ 651,957	\$ 681,957	0.023	\$ 15,448	
2078				\$ 30,000	\$ 651,957	\$ 681,957	0.021	\$ 14,574	
2079				\$ 30,000	\$ 651,957	\$ 681,957	0.020	\$ 13,749	
2080				\$ 30,000	\$ 651,957	\$ 681,957	0.019	\$ 12,971	
2081				\$ 30,000	\$ 651,957	\$ 681,957	0.018	\$ 12,236	
2082				\$ 30,000	\$ 651,957	\$ 681,957	0.017	\$ 11,544	
2083				\$ 30,000	\$ 651,957	\$ 681,957	0.016	\$ 10,890	
2084				\$ 30,000	\$ 651,957	\$ 681,957	0.015	\$ 10,274	
2085				\$ 30,000	\$ 651,957	\$ 681,957	0.014	\$ 9,692	
2086				\$ 30,000	\$ 651,957	\$ 681,957	0.013	\$ 9,144	
2087				\$ 30,000	\$ 651,957	\$ 681,957	0.013	\$ 8,626	
2088				\$ 30,000	\$ 651,957	\$ 681,957	0.012	\$ 8,138	
2089				\$ 30,000	\$ 651,957	\$ 681,957	0.011	\$ 7,677	
2090				\$ 30,000	\$ 651,957	\$ 681,957	0.011	\$ 7,243	
2091				\$ 30,000	\$ 651,957	\$ 681,957	0.010	\$ 6,833	
2092				\$ 30,000	\$ 651,957	\$ 681,957	0.009	\$ 6,446	
2093				\$ 30,000	\$ 651,957	\$ 681,957	0.009	\$ 6,081	
2094				\$ 30,000	\$ 651,957	\$ 681,957	0.008	\$ 5,737	
2095				\$ 30,000	\$ 651,957	\$ 681,957	0.008	\$ 5,412	
2096				\$ 30,000	\$ 651,957	\$ 681,957	0.007	\$ 5,106	
2097				\$ 30,000	\$ 651,957	\$ 681,957	0.007	\$ 4,817	
2098				\$ 30,000	\$ 651,957	\$ 681,957	0.007	\$ 4,544	
2099				\$ 30,000	\$ 651,957	\$ 681,957	0.006	\$ 4,287	
2100				\$ 30,000	\$ 651,957	\$ 681,957	0.006	\$ 4,044	
2101				\$ 30,000	\$ 651,957	\$ 681,957	0.006	\$ 3,815	
2102				\$ 30,000	\$ 651,957	\$ 681,957	0.005	\$ 3,599	
2103				\$ 30,000	\$ 651,957	\$ 681,957	0.005	\$ 3,396	
2104				\$ 30,000	\$ 651,957	\$ 681,957	0.005	\$ 3,203	
2105				\$ 30,000	\$ 651,957	\$ 681,957	0.004	\$ 3,022	
2106				\$ 30,000	\$ 651,957	\$ 681,957	0.004	\$ 2,851	
2107				\$ 30,000	\$ 651,957	\$ 681,957	0.004	\$ 2,690	
2108				\$ 30,000	\$ 651,957	\$ 681,957	0.004	\$ 2,537	
2109				\$ 30,000	\$ 651,957	\$ 681,957	0.004	\$ 2,394	
2110				\$ 30,000	\$ 651,957	\$ 681,957	0.003	\$ 2,258	
2111				\$ 30,000	\$ 651,957	\$ 681,957	0.003	\$ 2,130	
2112				\$ 30,000	\$ 651,957	\$ 681,957	0.003	\$ 2,010	
2113				\$ 30,000	\$ 651,957	\$ 681,957	0.003	\$ 1,896	
2114				\$ 30,000	\$ 651,957	\$ 681,957	0.003	\$ 1,789	
2115				\$ 30,000	\$ 651,957	\$ 681,957	0.002	\$ 1,688	
2116				\$ 30,000	\$ 651,957	\$ 681,957	0.002	\$ 1,592	
2117				\$ 30,000	\$ 651,957	\$ 681,957	0.002	\$ 1,502	
2118				\$ 30,000	\$ 651,957	\$ 681,957	0.002	\$ 1,417	
2119				\$ 30,000	\$ 651,957	\$ 681,957	0.002	\$ 1,337	
2120				\$ 30,000	\$ 651,957	\$ 681,957	0.002	\$ 1,261	
Total Present Value of Discounted Costs (Sum of column (j))								\$ 53,827,785	
Transfer to Table 20, column (c), Proposal Benefits and Costs Summaries									
Comments:									

(1) If any, based on opportunity costs, sunk costs and associated costs

(2) The incremental change in O&M costs attributable to the project

## **Section D1.**

### **Statement of Cost-Effectiveness**

#### **Project name: Regional Collaborative Water Use Efficiency Program**

#### **Question 1 Types of benefits provided**

The Regional Collaborative Water Use Efficiency Program will directly reduce potable water use by implementing water-efficiency incentive and educational programs, thereby increasing reliability of existing water supplies. The Program will also reduce stormwater runoff, indirectly improve stream flow and other environmental benefits by reducing demands on surface and groundwater supplies, and reduce water use and improve stormwater runoff quality through broad education. Improving water use efficiency and reducing wasteful water use practices throughout the region will also help agencies address statewide, regional and local water conservation initiatives.

The total project budget is \$250,400.

- i. Statewide water demand reduction targets set forth in SBx7-7 legislation that meets the Governor's water conservation goal of 20 percent per capita reduction by the year 2020.
- ii. Support implementation of the conservation component of water agency Water Supply Management Plans and Urban Water Management Plans.
- iii. Facilitate compliance with the Best Management Practices as set forth in the California Urban Water Conservation Council's Memorandum of Understanding Regarding Urban Water Conservation in California.
- iv. Support the regional goals in the Westside Integrated Regional Water Management Plan.

Incentive offers combined with education and outreach will achieve the following objectives:

- i. Influence consumer choice towards water-efficient products and services.
- ii. Promote sustainable and water-efficient practices through consumer education, on-site consultation, training classes, workshops, public outreach and marketing.
- iii. Target disadvantaged and low-income communities through consumer rebates for the purchase and installation of water saving fixtures.

The Program will not only reduce potable water use but wastewater treatment, as well. Less water and wastewater to pump and treat, in turn, will reduce energy consumption and the associated greenhouse gas emissions.

By reducing overall water use, energy demand and costs associated with the pumping of raw water, treatment plant operation, the distribution of finished, potable water, and wastewater collection and treatment are all likewise reduced. Reduction in treatment process chemicals also means less energy needed to produce and transport the chemicals. We can expect valuable reductions in summer energy demand due to implementation of these proposed water use efficiency measures. This benefits the State's power grid during high demand periods, as well as

Attachment 8. Benefits and Cost Analysis

providing the greatest cost savings to the individual water agencies and cities. The reduction in energy demand reduces the carbon footprint of overall water delivery.

**Table 1**

HET Rebate Program Savings (HET savings based on single family)										
	Flush Volume <sup>1</sup>	Average Flushes Per Day/Person <sup>2</sup>	Average Persons Per Household <sup>3</sup>	Average Toilets per household	Gallons Usage per Day	Total Annual Program Savings (gals/year) <sup>4</sup>	Total Annual Program Savings (acre-feet/year) <sup>4</sup>	Life of Savings (yrs)	Total Water Savings (gals)	Total Program Savings (acre-feet) <sup>4</sup>
Existing Toilet Stock	3.5	5	3	2	27					
HET	1.3	5	3	2	10					
Savings	2.2				17	3,412,750	10.5	10	34,127,500	105

1) Measured mean toilet Flush volume of 3.5 gpf rated toilets in single-family homes (EBMUD 2001 Water Cons Mrkt Penetration Study)  
 2) Average toilet use per day in homes (Amy Vicker).  
 3) Average persons per household. CA Dept of Finance 2010 census data: 2.90  
 4) 550 HETs installed

Combined, these program elements target significant indoor and outdoor end uses of water in the residential, commercial, industrial and institutional sectors. Beyond the projected life span of water-savings fixtures, implementation of the Program will influence and transform markets and standards towards higher efficiency and foster long-term “passive” water savings after implementation is complete.

Long-term water and energy savings results from adoption of water-efficient technology through informed consumer choice and through behavioral changes in water use practices. Therefore, outreach and education are integral to the Program.

**Question 2 Have alternative methods been considered to achieve the same types and amounts of physical benefits as the proposed project been identified?**

The only other alternative to the proposed project is to increase reliance on surface water supply sources and to increase groundwater pumping. Surface water supplies are limited and becoming more expensive. Increased groundwater pumping would result in depletion of aquifers and higher energy costs.

**Question 3 If the proposed project is not the least cost alternative, why is it the preferred alternative?**

The proposed Program will result in efficiencies on a regional scale, increase visibility of the Program, and improve coordination among existing individual agency programs. The range of incentive offers and public outreach strategies provides the implementing agencies with flexibility to respond to a variety of consumer demand and program participation levels, thereby improving overall program outcomes.

**Provide an explanation of any accomplishments of the proposed project that are different from the alternative project or methods.**

## Attachment 8. Benefits and Cost Analysis

The proposed project will achieve the goal of meeting future water supply needs without increasing reliance of surface or groundwater sources.

**Comments:** Water agencies and local governments throughout the region have limited financial resources and need additional funding to ensure that educational resources and financial incentives are available to address the water supply challenge.

This Program supports the conservation component of each agency's Future Water Supply Plan and Urban Water Management Plans, is consistent with the CUWCC's MOU for Best Management Practices and the Westside Integrated Regional Water Management Plan (IRWMP), and will support meeting the water conservation goal of 20 percent reduction by 2020 (SBX7-7).

## ATTACHMENT 8 - BENEFITS AND COST ANALYSIS

Table 10 – Common types of benefits to report  
Project name: Wastewater Storage Ponds and Disposal Improvements

<b>Water Supply</b>	<i>Not applicable.</i>
<b>Water Quality</b>	<i>Avoided wastewater treatment, storage, and disposal operations and maintenance (O&amp;M) costs. As shown on Table 16, included herein, the District would be required to initiate emergency hauling operations which on average would result in an increase of approximately \$945,000 in O&amp;M costs annually.</i>
	<i>Improved water quality for Lake Berryessa through the elimination of wastewater discharges. From 2005 to 2012 the District would on average discharge 3.5 million gallons of wastewater to the Lake.</i>
<b>Ecosystem Improvement</b>	<i>Restoring oak woodland habitat at a 2:1 or greater ratio. The proposed project would replant 420 oaks to mitigate any impacts caused by the construction of the capacity upgrades.</i>
<b>Recreation and Public Access</b>	<i>The project will eliminate the amount of wastewater that is discharged to Lake Berryessa, which will protect and enhance recreational activities (fishing, boating, swimming, ect.) on the lake.</i>
<b>Power Cost Savings and Power Production</b>	<i>The project will eliminate the use of diesel fuel for the disposal of wastewater and ultimately reduce the District consumption by 30%.</i>

**ATTACHMENT 8 - BENEFITS AND COST ANALYSIS (updated 03-22-13)**

Table 11 – Statement of Cost-Effectiveness

Project name: Wastewater Storage Ponds and Disposal Improvements	
Question 1	<i>Types of benefits provided:</i>
Question 2	<i>Have alternative methods been considered to achieve the same types and amounts of physical benefits as the proposed project been identified?</i>
Question 3	<i>If the proposed project is not the least cost alternative, why is it the preferred alternative? Provide an explanation of any accomplishments of the proposed project that are different from the alternative project or methods.</i>
Comments and Assumptions:	

**ATTACHMENT 8 - BENEFITS AND COST ANALYSIS**

Table 12 – Non-monetized Benefits Checklist-Project name: Wastewater Storage Ponds and Disposal Improvements

No.	Question	Enter “Yes”, “No” or “Neg”
	<b>Community/Social Benefits</b> <b>Will the proposal</b>	
<b>1</b>	<b>Provide education or technology benefits?</b>	<b>NO</b>
	Examples are not limited to, but may include: <ul style="list-style-type: none"> <li>- Include educational features that should result in water supply, water quality, or flood damage reduction benefits?</li> <li>- Develop, test, or document a new technology for water supply, water quality, or flood damage reduction management?</li> <li>- Provide some other education or technological benefit?</li> </ul>	
<b>2</b>	<b>Provide social recreation or access benefits?</b>	<b>YES</b>
	<b>The project will eliminate the amount of wastewater that is discharged to Lake Berryessa, which will protect and enhance recreational activities (fishing, boating, swimming, etc.) on the lake.</b>	
	Examples are not limited to, but may include: <ul style="list-style-type: none"> <li>- Provide new or improved outdoor recreation opportunities?</li> <li>- Provide more access to open space?</li> <li>- Provide some other recreation or public access benefit?</li> </ul>	
<b>3</b>	<b>Help avoid, reduce or resolve various public water resources conflicts?</b>	<b>YES</b>
	<b>The completion of the project will help resolve an existing conflict evidenced by recurring fines and litigation. Additionally the completion of the project ensures compliance with mandates from the state.</b>	
	Examples are not limited to, but may include: <ul style="list-style-type: none"> <li>- Provide more opportunities for public involvement in water management?</li> <li>- Help avoid or resolve an existing conflict as evidenced by recurring fines or litigation?</li> <li>- Help meet an existing state mandate (e.g., water quality, water conservation, flood control)?</li> </ul>	
<b>4</b>	<b>Promote social health and safety?</b>	<b>YES</b>
	<b>Project will eliminate wastewater discharges to the Lake and increase the health and safety of Lake users.</b>	
	Examples are not limited to, but may include: <ul style="list-style-type: none"> <li>- Increase urban water supply reliability for fire-fighting and critical services following seismic events?</li> <li>- Reduce risk to life from dam failure or flooding?</li> <li>- Reduce exposure to water-related hazards?</li> </ul>	
<b>5</b>	<b>Have other social benefits?</b>	<b>YES</b>
	<b>The project addresses a critical wastewater treatment, storage, and disposal need of a Disadvantaged Community.</b>	
	Examples are not limited to, but may include: <ul style="list-style-type: none"> <li>- Redress or increase inequitable distribution of environmental burdens?</li> <li>- Have disproportionate beneficial or adverse effects on disadvantaged communities, Native Americans, or other distinct cultural groups?</li> </ul>	
	<b>Environmental Stewardship Benefits:</b> <b>Will the proposal</b>	
<b>6</b>	<b>Benefit wildlife or habitat in ways that were not quantified in Attachment 7?</b>	<b>YES</b>
	<b>The project will be replacing oak woodland habitat at a 2:1 ratio (or 420 blue oak trees).</b>	
	Examples are not limited to, but may include: <ul style="list-style-type: none"> <li>- Cause an increase in the amount or quality of terrestrial, aquatic, riparian or wetland habitat?</li> <li>- Contribute to an existing biological opinion or recovery plan for a listed special status species?</li> <li>- Preserve or restore designated critical habitat of a listed species?</li> <li>- Enhance wildlife protection or habitat?</li> </ul>	
<b>7</b>	<b>Improve water quality in ways that were not quantified in Attachment 7?</b>	<b>YES</b>
	<b>The project will improve the water quality of Lake Berryessa by eliminating the discharge of wastewater.</b>	
	Examples are not limited to, but may include: <ul style="list-style-type: none"> <li>- Cause an improvement in water quality in an impaired water body or sensitive habitat?</li> <li>- Prevent water quality degradation?</li> <li>- Cause some other improvement in water quality?</li> </ul>	

8	<b>Reduce net emissions in ways that were not quantified in Attachment 7?</b>	YES
	<b>The project will be converting all existing pumps to an electrical service and no longer utilize a diesel driven generator. This will reduce net emissions from the site.</b>	
	Examples are not limited to, but may include: <ul style="list-style-type: none"> <li>- Reduce net production of greenhouse gasses?</li> <li>- Reduce net emissions of other harmful chemicals into the air or water?</li> </ul>	
9	<b>Provide other environmental stewardship benefits, other than those claimed in Sections D1, D3, or D4?</b>	YES
	<b>Protection of Lake Berryessa through the elimination of wastewater discharges to Lake Berryessa.</b>	
	<b>Sustainability Benefits: Will the proposal</b>	
10	<b>Improve the overall, long-term management of California groundwater resources?</b>	NO
	Examples are not limited to, but may include: <ul style="list-style-type: none"> <li>- Reduce extraction of non-renewable groundwater?</li> <li>- Promote aquifer storage or recharge?</li> </ul>	
11	<b>Reduce demand for net diversions for the regions from the Delta?</b>	NO
12	<b>Provide a long-term solution in place of a short-term one?</b>	YES
	<b>The existing wastewater facility is not adequately sized to handle future build-out flows and Inflow/Infiltration experienced from the collection system during the wet winter months. The construction of additional storage and disposal capacity is a more cost-effective way of eliminating discharges to Lake Berryessa versus having to haul wastewater during the stormy months every year.</b>	
13	<b>Promote energy savings or replace fossil fuel based energy sources with renewable energy and resources?</b>	NO
	<b>Energy savings will be realized in not having to conduct emergency wastewater hauling annually, which entails trucks mobilizing to the site daily to remove wastewater from the ponds and carrying it to an appropriate discharge point.</b>	
	Examples are not limited to, but may include: <ul style="list-style-type: none"> <li>- Reduce net energy use on a permanent basis?</li> <li>- Increase renewable energy production?</li> <li>- Include new buildings or modify buildings to include certified LEED features?</li> <li>- Provide a net increase in recycling or reuse of materials?</li> <li>- Replace unsustainable land or water management practices with recognized sustainable practices?</li> </ul>	
14	<b>Improve water supply reliability in ways not quantified in Attachment 7?</b>	NO
	Examples are not limited to, but may include: <ul style="list-style-type: none"> <li>- Provide a more flexible mix of water sources?</li> <li>- Reduce likelihood of catastrophic supply outages?</li> <li>- Reduce supply uncertainty?</li> <li>- Reduce supply variability?</li> </ul>	
15	<b>Other (If the above listed categories do not apply, provide non-monetized benefit description)?</b>	N/A

**ATTACHMENT 8 - BENEFITS AND COST ANALYSIS**

**Table 16 – Annual Costs of Avoided Projects**

(All avoided costs should be in 2012 dollars)

Project: Water Tank Replacement Project

(a) Year	Costs				Discounting Calculations	
	(b) Avoided Capital Costs	(c) Avoided Replacement Costs	(d) Avoided Operations and Maintenance Costs	(e) Total Cost Avoided for Individual Alternatives (b) + (c) + (d)	(f) Discount Factor	(g) Discounted Costs (e) x (f)
	Alternative (Avoided Project Name): Emergency Temporary Wastewater Trucking Avoided Project Description: In the event of that there is no additional storage capacity the District would need to haul wastewater from the pond site to an acceptable discharge location. Model assumes 3.5 Million Gallons need to be hauled.					
2012	0	0	945000	945000	1.000	\$945,000
2013	0	0	945000	945000	0.943	\$891,135
2014	0	0	945000	945000	0.899	\$849,555
2015	0	0	945000	945000	0.840	\$793,800
2016	0	0	945000	945000	0.792	\$748,440
2017	0	0	945000	945000	0.747	\$705,915
2018	0	0	945000	945000	0.705	\$666,225
2019	0	0	945000	945000	0.665	\$628,425
2020	0	0	945000	945000	0.627	\$592,515
2021	0	0	945000	945000	0.592	\$559,440
2022	0	60000	945000	1005000	0.558	\$560,790
2023	0	0	945000	945000	0.527	\$498,015
2024	0	0	945000	945000	0.497	\$469,665
2025	0	0	945000	945000	0.469	\$443,205
2026	0	0	945000	945000	0.442	\$417,690
2027	0	0	945000	945000	0.417	\$394,065
2028	0	0	945000	945000	0.394	\$372,330
2029	0	0	945000	945000	0.371	\$350,595
2030	0	0	945000	945000	0.350	\$330,750
2031	0	0	945000	945000	0.331	\$312,795
2032	0	60000	945000	1005000	0.312	\$313,560
2033	0	0	945000	945000	0.294	\$277,830
2034	0	0	945000	945000	0.278	\$262,710
2035	0	0	945000	945000	0.262	\$247,590
2036	0	0	945000	945000	0.247	\$233,415
2037	0	0	945000	945000	0.233	\$220,185
2038	0	0	945000	945000	0.220	\$207,900
2039	0	0	945000	945000	0.207	\$195,615
2040	0	0	945000	945000	0.196	\$185,220
2041	0	0	945000	945000	0.185	\$174,825
2042	0	60000	945000	1005000	0.174	\$174,870
<b>Total Present Value of Discounted Costs</b>						<b>\$11,843,910</b>
(%) Avoided Cost Claimed by Project						<b>100%</b>
<b>Total Present Value of Discounted Avoided Project Costs Claimed by Alternative Project</b>						<b>\$11,843,910</b>

Comments and Assumptions: Life expectancy of the storage ponds and disposal sprayfield is 30-years. Please reference the attached Emergency Hauling Worksheet, which is based on actual costs incurred by the District in 2008 but modified to represent 2012 dollars.

**ATTACHMENT 8 - BENEFITS AND COST ANALYSIS**

Table 19 – Annual Costs of Project

(All costs should be in 2012 Dollars)

Project: Wastewater Storage Ponds and Disposal Improvements

Year	Initial Costs Grand Total Cost from Table 7 (row (l), column (e))	Adjusted Grant Total Cost <sup>(1)</sup> (b)	Annual Costs <sup>(2)</sup>						Discounting Calculations	
			Admin (c)	Operation (d)	Maintenance (e)	Replacement (f)	Other (g)	Total Costs (h)	Discount Factor (i)	Discounted Project Costs (j)
2012	0	0	50000	30000	30000	0	0	110000	1.000	\$110,000.00
2013	0	0	50000	30000	30000	0	0	110000	0.943	\$103,730.00
2014	6525000	0	50000	24000	24000	0	0	6623000	0.890	\$5,894,470.00
2015	0	0	50000	24000	24000	0	0	98000	0.840	\$82,320.00
2016	0	0	50000	24000	24000	0	0	98000	0.792	\$77,616.00
2017	0	0	50000	24000	24000	0	0	98000	0.747	\$73,206.00
2018	0	0	50000	24000	24000	0	0	98000	0.705	\$69,090.00
2019	0	0	50000	24000	24000	0	0	98000	0.665	\$65,170.00
2020	0	0	50000	24000	24000	0	0	98000	0.627	\$61,446.00
2021	0	0	50000	24000	24000	0	0	98000	0.592	\$58,016.00
2022	0	0	50000	24000	24000	0	0	98000	0.558	\$54,684.00
2023	0	0	50000	24000	24000	60000	0	158000	0.527	\$83,266.00
2024	0	0	50000	24000	24000	0	0	98000	0.497	\$48,706.00
2025	0	0	50000	24000	24000	0	0	98000	0.469	\$45,962.00
2026	0	0	50000	24000	24000	0	0	98000	0.442	\$43,316.00
2027	0	0	50000	24000	24000	0	0	98000	0.417	\$40,866.00
2028	0	0	50000	24000	24000	0	0	98000	0.394	\$38,612.00
2029	0	0	50000	24000	24000	0	0	98000	0.371	\$36,358.00
2030	0	0	50000	24000	24000	0	0	98000	0.350	\$34,300.00
2031	0	0	50000	24000	24000	0	0	98000	0.331	\$32,438.00
2032	0	0	50000	24000	24000	0	0	98000	0.312	\$30,576.00
2033	0	0	50000	24000	24000	60000	0	158000	0.294	\$46,452.00
2034	0	0	50000	24000	24000	0	0	98000	0.278	\$27,244.00
2035	0	0	50000	24000	24000	0	0	98000	0.262	\$25,676.00
2036	0	0	50000	24000	24000	0	0	98000	0.247	\$24,206.00
2037	0	0	50000	24000	24000	0	0	98000	0.233	\$22,834.00
2038	0	0	50000	24000	24000	0	0	98000	0.220	\$21,560.00
2039	0	0	50000	24000	24000	0	0	98000	0.207	\$20,286.00
2040	0	0	50000	24000	24000	0	0	98000	0.196	\$19,208.00
2041	0	0	50000	24000	24000	0	0	98000	0.185	\$18,130.00
2042	0	0	50000	24000	24000	15000	0	113000	0.174	\$19,662.00
Total Present Value of Discounted Costs (Sum of column (j))										\$7,329,406.00
Transfer to Table 20, column (c), Proposal Benefits and Costs Summaries										

Comments: Column C = Staff Time \* 20% for wastewater disposal tasks; Column D and E are based on 2013 6 month actuals and assumes a reduction of 20% upon project completion; Column F = Assumes 30-year life expectancy for tank.

(1) If any, based on opportunity costs, sunk costs and associated costs

(2) The incremental change in O&M costs attributable to the project

**ATTACHMENT 8 - BENEFITS AND COST ANALYSIS**

**Table 20 – Proposal Benefits and Costs Summary**

Proposal: Westside IRWMP

Agency: Lake Berryessa Resort Improvement District

Project	Project Proponent	Total Present Value Project Costs <sup>(1)</sup>	Total Present Value Project Benefits			From Section D1 – Cost-Effectiveness Analysis, Cost Savings <sup>(5)</sup>	From Section D2 – Briefly describe the main Non-monetized benefits
			From Section D3 – Monetized <sup>(2)</sup>	From Section D4 – Flood Damage Reduction <sup>(3)</sup>	Total		
(a)	(b)	(c)	(d)	(e)	(f) = (d) + (e)	(g)	(h)
<b>Wastewater Storage Ponds and Disposal Improvements</b>	Lake Berryessa Resort Improvement District	\$7,329,406	See Note 4.			\$4,514,504	(1) Protect and enhance recreational activities on Lake Berryessa; (2) Address a critical wastewater treatment, storage, and disposal issue for a DAC.

(1) From Table 19, or RWMG method

(2) From Table 15 or RWMG method

(3) From Table 18 or RWMG method

(4) Avoided Project Costs used in analysis

(5) Represents difference in total costs of Table 16 versus Table 19.

## ATTACHMENT 8 - BENEFITS AND COST ANALYSIS

Table 10 – Common types of benefits to report  
Project name: Water Tank Replacement Project

<b>Water Supply</b>	<i>Completion of the project will ensure a realizable water supply can be provided to the subdivision. Avoided Operations and Maintenance (O&amp;M) costs related to transferring water to different water pressure zones.</i>
<b>Water Quality</b>	<i>Avoided water quality costs incurred by the District, which may include additional chemicals, testing, reporting, O&amp;M fees etc.</i>
<b>Ecosystem Improvement</b>	<i>Not applicable.</i>
<b>Recreation and Public Access</b>	<i>Not applicable.</i>
<b>Power Cost Savings and Power Production</b>	<i>The project will be installing a SCADA system for remote monitoring of the two pump stations which should reduce the amount of site visits required by operators to transfer water to different zones.</i>
	<i>There will be a reduction in the amount of energy used to replace water lost due to tank leakage.</i>

## ATTACHMENT 8 - BENEFITS AND COST ANALYSIS

Table 11 – Statement of Cost-Effectiveness

Project name: Water Tank Replacement Project	
Question 1	<i>Types of benefits provided:</i>
Question 2	<i>Have alternative methods been considered to achieve the same types and amounts of physical benefits as the proposed project been identified?</i>
Question 3	<i>If the proposed project is not the least cost alternative, why is it the preferred alternative? Provide an explanation of any accomplishments of the proposed project that are different from the alternative project or methods.</i>
Comments:	

**ATTACHMENT 8 - BENEFITS AND COST ANALYSIS**

Table 12 – Non-monetized Benefits Checklist

No.	Question	Enter "Yes", "No" or "Neg"
<p><b>Community/Social Benefits</b>  <b>Will the proposal</b></p>		
1	<p><b>Provide education or technology benefits?</b></p>	NO
<p>Examples are not limited to, but may include:</p> <ul style="list-style-type: none"> <li>- Include educational features that should result in water supply, water quality, or flood damage reduction benefits?</li> <li>- Develop, test, or document a new technology for water supply, water quality, or flood damage reduction management?</li> <li>- Provide some other education or technological benefit?</li> </ul>		
2	<p><b>Provide social recreation or access benefits?</b></p>	NO
<p>Examples are not limited to, but may include:</p> <ul style="list-style-type: none"> <li>- Provide new or improved outdoor recreation opportunities?</li> <li>- Provide more access to open space?</li> <li>- Provide some other recreation or public access benefit?</li> </ul>		
3	<p><b>Help avoid, reduce or resolve various public water resources conflicts?</b></p>	YES
<p><b>The completion of the project will help resolve an existing conflict evidenced by the recurring violations.</b></p>		
<p>Examples are not limited to, but may include:</p> <ul style="list-style-type: none"> <li>- Provide more opportunities for public involvement in water management?</li> <li>- Help avoid or resolve an existing conflict as evidenced by recurring fines or litigation?</li> <li>- Help meet an existing state mandate (e.g., water quality, water conservation, flood control)?</li> </ul>		
4	<p><b>Promote social health and safety?</b></p>	YES
<p><b>Project will increase the reliability of water supply to the subdivision. The completion of the project will bring the water tanks to the current seismic code.</b></p>		
<p>Examples are not limited to, but may include:</p> <ul style="list-style-type: none"> <li>- Increase urban water supply reliability for fire-fighting and critical services following seismic events?</li> <li>- Reduce risk to life from dam failure or flooding?</li> <li>- Reduce exposure to water-related hazards?</li> </ul>		
5	<p><b>Have other social benefits?</b></p>	YES
<p><b>The project addresses a critical water supply and quality need of a DAC.</b></p>		
<p>Examples are not limited to, but may include:</p> <ul style="list-style-type: none"> <li>- Redress or increase inequitable distribution of environmental burdens?</li> <li>- Have disproportionate beneficial or adverse effects on disadvantaged communities, Native Americans, or other distinct cultural groups?</li> </ul>		
<p><b>Environmental Stewardship Benefits:</b>  <b>Will the proposal</b></p>		
6	<p><b>Benefit wildlife or habitat in ways that were not quantified in Attachment 7?</b></p>	NO
<p>Examples are not limited to, but may include:</p> <ul style="list-style-type: none"> <li>- Cause an increase in the amount or quality of terrestrial, aquatic, riparian or wetland habitat?</li> <li>- Contribute to an existing biological opinion or recovery plan for a listed special status species?</li> <li>- Preserve or restore designated critical habitat of a listed species?</li> <li>- Enhance wildlife protection or habitat?</li> </ul>		
7	<p><b>Improve water quality in ways that were not quantified in Attachment 7?</b></p>	YES
<p><b>The completion of the project will reduce the water storage supplies exposure to the environment which will eliminate health hazards and increase the water quality.</b></p>		
<p>Examples are not limited to, but may include:</p> <ul style="list-style-type: none"> <li>- Cause an improvement in water quality in an impaired water body or sensitive habitat?</li> <li>- Prevent water quality degradation?</li> <li>- Cause some other improvement in water quality?</li> </ul>		
8	<p><b>Reduce net emissions in ways that were not quantified in Attachment 7?</b></p>	NO
<p>Examples are not limited to, but may include:</p> <ul style="list-style-type: none"> <li>- Reduce net production of greenhouse gasses?</li> <li>- Reduce net emissions of other harmful chemicals into the air or water?</li> </ul>		

9	<b>Provide other environmental stewardship benefits, other than those claimed in Sections D1, D3, or D4?</b>	NO
	<b>Sustainability Benefits:</b> <b>Will the proposal</b>	
10	<b>Improve the overall, long-term management of California groundwater resources?</b>	NO
	Examples are not limited to, but may include: <ul style="list-style-type: none"> <li>- Reduce extraction of non-renewable groundwater?</li> <li>- Promote aquifer storage or recharge?</li> </ul>	
11	<b>Reduce demand for net diversions for the regions from the Delta?</b>	NO
12	<b>Provide a long-term solution in place of a short-term one?</b>	YES
	<b>The replacement of all three tanks will provide a greater benefit to the community versus structrually retrofitting the existing tanks.</b>	
13	<b>Promote energy savings or replace fossil fuel based energy sources with renewable energy and resources?</b>	YES
	<b>Remote monitoring of the pump stations will reduce O&amp;M costs and the District's fuel consumption.</b>	
	Examples are not limited to, but may include: <ul style="list-style-type: none"> <li>- Reduce net energy use on a permanent basis?</li> <li>- Increase renewable energy production?</li> <li>- Include new buildings or modify buildings to include certified LEED features?</li> <li>- Provide a net increase in recycling or reuse of materials?</li> <li>- Replace unsustainable land or water management practices with recognized sustainable practices?</li> </ul>	
14	<b>Improve water supply reliability in ways not quantified in Attachment 7?</b>	YES
	<b>The completion of the project will bring all the water tank structures and foundations to current seismic code.</b>	
	Examples are not limited to, but may include: <ul style="list-style-type: none"> <li>- Provide a more flexible mix of water sources?</li> <li>- Reduce likelihood of catastrophic supply outages?</li> <li>- Reduce supply uncertainty?</li> <li>- Reduce supply variability?</li> </ul>	
15	<b>Other (If the above listed categories do not apply, provide non-monetized benefit description)?</b>	N/A

**ATTACHMENT 8 - BENEFITS AND COST ANALYSIS**

**Table 16 – Annual Costs of Avoided Projects**

(All avoided costs should be in 2012 dollars)

Project: Water Tank Replacement Project

(a)	Costs				Discounting Calculations	
	(b)	(c)	(d)	(e)	(f)	(g)
Year	Alternative (Avoided Project Name): Emergency Temporary Water Storage or pump rental				Discount Factor	Discounted Costs (e) x (f)
	Avoided Project Description: In the event of catastrophic failure of two Water Tank(s) and pump(s) failure, the District would need to provide temporary water storage/pumping capabilities to ensure the water distribution system runs properly and provide for adequate fire protection.					
	Avoided Capital Costs	Avoided Replacement Costs	Avoided Operations and Maintenance Costs	Total Cost Avoided for Individual Alternatives (b) + (c) + (d)		
2012	1,500,000	20,000	60000	1580000	1.000	\$1,580,000
2013	1,000,000	0	60000	1060000	0.943	\$999,580
2014	0	0	60000	60000	0.899	\$53,940
2015	0	0	60000	60000	0.840	\$50,400
2016	0	0	60000	60000	0.792	\$47,520
2017	0	0	60000	60000	0.747	\$44,820
2018	0	0	60000	60000	0.705	\$42,300
2019	0	0	60000	60000	0.665	\$39,900
2020	0	0	60000	60000	0.627	\$37,620
2021	0	0	60000	60000	0.592	\$35,520
2022	0	20,000	60000	80000	0.558	\$44,640
2023	0	0	60000	60000	0.527	\$31,620
2024	0	0	60000	60000	0.497	\$29,820
2025	0	0	60000	60000	0.469	\$28,140
2026	0	0	60000	60000	0.442	\$26,520
2027	0	0	60000	60000	0.417	\$25,020
2028	0	0	60000	60000	0.394	\$23,640
2029	0	0	60000	60000	0.371	\$22,260
2030	0	0	60000	60000	0.350	\$21,000
2031	0	0	60000	60000	0.331	\$19,860
2032	500,000	20,000	60000	580000	0.312	\$180,960
2033	0	20,000	60000	80000	0.558	\$44,640
2034	0	0	60000	60000	0.527	\$31,620
2035	0	0	60000	60000	0.497	\$29,820
2036	0	0	60000	60000	0.469	\$28,140
2037	0	0	60000	60000	0.442	\$26,520
2038	0	0	60000	60000	0.417	\$25,020
2039	0	0	60000	60000	0.394	\$23,640
2040	0	0	60000	60000	0.371	\$22,260
2041	0	0	60000	60000	0.350	\$21,000
2042	0	0	60000	60000	0.331	\$19,860
Total Present Value of Discounted Costs (Sum of Column (g))						<b>\$3,657,600</b>
(%) Avoided Cost Claimed by Project						<b>100%</b>
Total Present Value of Discounted Avoided Project Costs Claimed by Alternative Project (Total Present Value of Discounted Costs x % Avoided Cost Claimed by Project)						<b>\$3,657,600</b>

Comments: Column B assumes mitigation costs associated with tank failure and the purchase of a temporary water storage tanks. Column C represents the purchase of a 1-new pump and motor.

**ATTACHMENT 8 - BENEFITS AND COST ANALYSIS**

**Table 19 – Annual Costs of Project**  
(All costs should be in 2012 Dollars)

Project: Water Tank Replacement Project

Year	Initial Costs Grand Total Cost from Table 7 (row (i), column (e))	Adjusted Grant Total Cost <sup>(1)</sup>	Annual Costs <sup>(2)</sup>					Discounting Calculations		
			Admin	Operation	Maintenance	Replacement	Other	Total Costs (a) +...+ (g)	Discount Factor	Discounted Project Costs (h) x (i)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
2012	0	0	20000	25000	25000	0	0	70000	1.000	\$70,000.00
2013	0	0	20000	25000	25000	0	0	70000	0.943	\$66,010.00
2014	1485000	0	20000	20000	20000	0	0	1545000	0.890	\$1,375,050.00
2015	0	0	20000	20000	20000	0	0	60000	0.840	\$50,400.00
2016	0	0	20000	20000	20000	0	0	60000	0.792	\$47,520.00
2017	0	0	20000	20000	20000	0	0	60000	0.747	\$44,820.00
2018	0	0	20000	20000	20000	0	0	60000	0.705	\$42,300.00
2019	0	0	20000	20000	20000	0	0	60000	0.665	\$39,900.00
2020	0	0	20000	20000	20000	0	0	60000	0.627	\$37,620.00
2021	0	0	20000	20000	20000	0	0	60000	0.592	\$35,520.00
2022	0	0	20000	20000	20000	0	0	60000	0.558	\$33,480.00
2023	0	0	20000	20000	20000	0	0	60000	0.527	\$31,620.00
2024	0	0	20000	20000	20000	0	0	60000	0.497	\$29,820.00
2025	0	0	20000	20000	20000	0	0	60000	0.469	\$28,140.00
2026	0	0	20000	20000	20000	0	0	60000	0.442	\$26,520.00
2027	0	0	20000	20000	20000	0	0	60000	0.417	\$25,020.00
2028	0	0	20000	20000	20000	0	0	60000	0.394	\$23,640.00
2029	0	0	20000	20000	20000	0	0	60000	0.371	\$22,260.00
2030	0	0	20000	20000	20000	0	0	60000	0.350	\$21,000.00
2031	0	0	20000	20000	20000	0	0	60000	0.331	\$19,860.00
2032	0	0	20000	20000	20000	15000	0	75000	0.312	\$23,400.00
2033	0	0	20000	20000	20000	0	0	60000	0.294	\$17,640.00
2034	0	0	20000	20000	20000	0	0	60000	0.278	\$16,680.00
2035	0	0	20000	20000	20000	0	0	60000	0.262	\$15,720.00
2036	0	0	20000	20000	20000	0	0	60000	0.247	\$14,820.00
2037	0	0	20000	20000	20000	0	0	60000	0.233	\$13,980.00
2038	0	0	20000	20000	20000	0	0	60000	0.220	\$13,200.00
2039	0	0	20000	20000	20000	0	0	60000	0.207	\$12,420.00
2040	0	0	20000	20000	20000	0	0	60000	0.196	\$11,760.00
2041	0	0	20000	20000	20000	0	0	60000	0.185	\$11,100.00
2042	0	0	20000	20000	20000	15000	0	75000	0.174	\$13,050.00
Total Present Value of Discounted Costs (Sum of column (j))										<b>\$2,234,270.00</b>
Transfer to Table 20, column (c), Proposal Benefits and Costs Summaries										

Comments: Column C = Staff Time \* 10% for water distribution tasks; Column D and E are based on 2013 6 month actuals and assumes a reduction of 20% upon project completion; Column F = Assumes 30-year life expectancy for tank and 10-year for pump and motors. (Supplemental information can be provided upon request).

(1) If any, based on opportunity costs, sunk costs and associated costs  
(2) The incremental change in O&M costs attributable to the project

**ATTACHMENT 8 - BENEFITS AND COST ANALYSIS**

**Table 20 – Proposal Benefits and Costs Summary**

Proposal: Westside IRWMP

Agency: Lake Berryessa Resort Improvement District

Project	Project Proponent	Total Present Value Project Costs <sup>(1)</sup>	Total Present Value Project Benefits			From Section D1 – Cost-Effectiveness Analysis, Cost Savings <sup>(5)</sup>	From Section D2 – Briefly describe the main Non-monetized benefits
			From Section D3 – Monetized <sup>(2)</sup>	From Section D4 – Flood Damage Reduction <sup>(3)</sup>	Total		
(a)	(b)	(c)	(d)	(e)	(f) = (d) + (e)	(g)	(h)
<b>Water Tank Replacement Project</b>	Lake Berryessa Resort Improvement District	\$2,234,270	See Note 4.			\$1,423,330	(1) Project will bring water tank structures and foundations to current seismic code; (2) Address a critical water quality and reliability issue for a DAC.

(1) From Table 19, or RWMG method

(2) From Table 15 or RWMG method

(3) From Table 18 or RWMG method

(4) Avoided Project Costs used in analysis

(5) Represents difference in total costs of Table 16 versus Table 19.