Attachment 8

Stormwater Flood Management Grant Proposal
City of Palmdale
Water Supply Costs and Benefits

Attachment 8 consists of the following items:

- ✓ **Water Supply Costs and Benefits.** Attachment 8 presents water supply costs and benefits estimates for the proposed Amargosa project.

Introduction

This attachment provides information regarding the water supply benefits that will be derived from the Amargosa Project. Narrative descriptions of the expected water supply benefits of the project are presented in this attachment. Where possible, each benefit was quantified and presented in economic terms. Where quantitative analysis was not feasible, a qualitative analysis was provided.

Project Costs

The total estimated budget for the proposed project is $13,483,322 (see Attachment 4). Administration, operations and maintenance costs are anticipated throughout the project lifetime in order to maintain the proposed project. Table 8-1 shows the breakdown of the project costs and its net present value in 2009 dollars. For the detailed breakdown of the annual costs over the 50-year life of the project see Table 8-7 at the end of this attachment.

Table 8-1: Total Project Costs

Phase	Cost
Capital Costs	$13,483,322
O&M and Replacement Costs	$12,455,000
Total project costs	$25,938,322
Total present value of discounted costs ($2009)	$14,463,689

Water Supply Benefits

The Amargosa Project will provide several water supply benefits. These benefits are described in detail below and are summarized in Table 8-2.

Reduced Groundwater Overdraft

The Amargosa Project would help replenish valuable groundwater resources in the Amargosa Creek watershed by providing an additional 25,000 AFY of stormwater and imported water to the local aquifer. Recharge of the underlying aquifer will help lower pumping costs, provide more head to existing groundwater wells to increase their yield, and help mitigate the risk of subsidence. The “upper aquifer” being recharged by this project is known as the Lancaster subunit. This is the principal aquifer supporting Palmdale, Lancaster, Quartz Hill, Antelope Acres, and other surrounding communities.

Groundwater in the Antelope Valley is under stress. Withdrawals are being made at a rate faster than the rate for natural recharge of the aquifers. According to the U.S. Geological Survey (USGS), groundwater

pumping in the Antelope Valley has exceeded recharge every year since the early 1920's (AVIRWMP, 2005). The current amount of overdraft in the Antelope Valley is approximately 50,000 AFY[1]. This approach to groundwater pumping will change in the future, as an adjudication process for establishing groundwater rights in the Antelope Valley Region is currently in progress and will impact how the resource is managed in the future.

Persistent over pumping of an aquifer causes the water table to drop, resulting in subsidence or localized depressions. Potential damages associated with subsidence are known to include loss of storage capacity in the aquifer, contamination of groundwater supplies as a result of fissuring, and structural damage (especially to long, linear structures such as roads, railroad tracks, water lines, and sewer lines)[2]. The USGS estimated that between 1950 and 1993, subsidence in the Antelope Valley, which occurred as a result of the aquifer, exceeded six feet in some areas[3].

The Amargosa Project will help abate these conditions by reducing the groundwater pumping amounts that exceed recharge rates, at least in the short-term until participating agencies request their "banked" supplies be extracted to meet demands. The long-term contribution of the project to stabilizing groundwater levels will depend on the extent to which the local water agencies participate in the banking program and the timing of that use.

If the Amargosa Project is not implemented, the approximately 25,000 AFY of additional stormwater and imported water will not be added to the underlying aquifer (1.25M AF over the 50-year lifespan of the project), and the benefits of temporary overdraft relief and prevention of land subsidence and its associated damage to structures will not be realized.

Avoided Dry-Year Reserve Water Costs

The Amargosa Project will provide a water supply cost savings because it will enable the storage of surplus imported SWP water during the winter and spring when the demand and environmental impacts in the Bay-Delta region are lower. A surplus of water is often available from the Bay-Delta region during the winter months. When there is insufficient storage capacity locally for this water, it is released into the ocean from the Bay-Delta instead of being dedicated to beneficial uses. By storing this less expensive off-peak water, the Amargosa Project would reduce peak summertime and dry-year demand on the region's imported water system and would provide an associated cost savings.

Availability of Article 21 Water

To estimate the avoided water costs from storing surplus imported water, this analysis uses the rate charged by the SWP for wet year Article 21 water and compares it to the likely rate to purchase imported water in a dry year. The DWR *2009 SWP Delivery Reliability Report* indicates that approximately 85,000 AF of Article 21 water is available to contract agencies in an average delivery year, up to a maximum of 850,000 AF for extremely wet years. For 2029 conditions, approximately 60,000 AF of Article 21 water is expected to be available for average years, up to 540,000 AF in wet years.[4]

[1] According to the USGS, groundwater pumping in the Antelope Valley has exceeded recharge every year since the early 1920s, the basin has continued to be in a state of overdraft. Groundwater pumping rates vary from year to year and there is no general consensus on the average annual pumping rate for the Antelope Valley. The rate of agricultural pumping is the largest unknown in assessing pumping rates. Annual natural recharge rate estimates also vary substantially. Although exact groundwater extractions for the entire Region are not available, they can be approximated using assumptions from the 2007 Antelope Valley Integrated Regional Water Management Plan (IRWM Plan). Given the total 2005 water demand of 239,350 AFY identified in the IRWM Plan and subtracting out all other sources of supply (112,193 AFY not including groundwater), the 2005 groundwater pumping rate was 127,157 AFY. Comparing this to the natural recharge range identified in the IRWM Plan (30,300 AFY to 81,400 AFY), yields a potential range for overdraft between 24,350 AFY to 75,466 AFY. Therefore, the average rate of overdraft is used for purposes of this analysis is approximately 50,000 AFY.
[2] Antelope Valley Integrated Regional Water Management Plan, 2007
[3] Antelope Valley Integrated Regional Water Management Plan, 2007
[4] *The State Water Project Delivery Reliability Report 2009*, Department of Water Resources, August 2010

Costs for Wet/Normal Year Article 21 Water

The basic rate for Article 21 water is based on the SWP variable transmission rate which is generally between $10 and $20 per AF delivered. This amount can fluctuate depending on the distance to move the water from the Delta to where it is to be used and the conditions of the California energy market. This analysis assumes the rate is $20 per AF in 2009 and that the cost will increase according to the escalation rates discussed below.

Costs for Dry Year Imported Water

The dry year cost for imported water is based on the Antelope Valley-East Kern Water Agency (AVEK) wholesale water rates that are used for delivery of treated water to Municipal and Industrial (M&I) users. AVEK is the largest of three SWP contractors in the Antelope Valley Region. The 2011 rate is $304/AF for winter months and $374/AF for summer months. The winter season is defined as October-May, and the summer season is defined as June-September. The weighted unit value for 2011 was calculated as such: ((8 x $304) + (4 x $374))/12 = $327/AF.

Avoided Unit Cost Calculations

Using the assumed costs for dry year imported and wet/normal year Article 21 water from above, the avoided cost is calculated as the difference between the wet and dry year imported water costs, minus the cost of pumping the stored water from the aquifer. The average cost to pump groundwater (GW) in the vicinity of the project is estimated at $115/AF in 2009 dollars.[5]

Avoided Unit Costs = (Wet/Normal Year Unit Cost) – (Article 21 Unit Cost) – (Unit Cost to Pump GW)

Escalation of Costs

The costs of the imported water supplies (both wet/normal year and Article 21) are expected to escalate. To estimate the escalation rate for SWP water, projections from the largest SWP contractor in the state, the Metropolitan Water District (MWD), are used. The costs of these supplies are expected to escalate by 6.4 percent in 2012, 6 percent from 2013 to 2020, and 3 percent from 2021 onward[6]. Costs for pumping are escalated using an assumed inflation rate of 3 percent per year.

Groundwater Withdrawal Assumptions

The Antelope Valley IRWM Plan identifies the reserves required to meet a single dry-year regional demand to be 50,600 AFY to 57,450 AFY. This analysis conservatively assumes that water banked in the Amargosa Project can meet approximately half of the reserve need, so the single dry year water withdrawn is assumed to be approximately 25,000 AF.[7] Based on the likely amount of water that is available for recharge from SWP supplies, the likely amount of local Amargosa Creek storm flows available, and projected realistic percolation rates for the project, there is more than enough storage capacity to support 25,000 AF of withdrawals to meet a single dry year supply once per decade.

Total Avoided Water Supply Costs

This analysis assumes that banked water will be used to meet drought needs once per decade over the life of the project. Assuming the first use of dry year reserve is in 2015, the savings in cost of water used as dry-year reserve would be approximately $6.9 million in that year (25,000 AF x $277 per AF). The present value total benefit over the lifetime of the project is $15.7 million. For a detailed breakdown of the calculations over the life of the project see Table 8-8 at the end of this attachment.

[5] *Palmdale Water District Strategic Water Resources Plan*, Evaluation Criteria and Cost Assumptions Guidelines, July 2009.
[6] Metropolitan Water District Water Rate Forecast, 2010
[7] Note that the project is expected to recharge approximately 25,000 AFY of combined imported water and local stormwater. Over the 50-year lifespan of the project, this is approximately 1.25 million AF of additional groundwater supply. Only a portion is assumed to be recovered for supply in this analysis.

If the Amargosa Project is not implemented, the cost savings of $15.7 million over the life of the project will not be realized.

Table 8-2: Water Supply Benefits Summary

Type of Benefit	Assessment Level	Beneficiaries
Reduced groundwater overdraft	Qualitative	Local , Regional
Avoided dry-year reserve water costs	Monetized	Local, Regional

Summary Distribution of Project Benefits and Identification of Beneficiaries

Table 8-3 summarizes the Project's beneficiaries. Local residents and water customers will benefit from flood protection, increased local supplies, more sustainable management of water supplies, protected quality of groundwater in drinking supplies, enhanced and protected native habitat, increased recreational space, and improved educational opportunities provided in the Nature Park kiosks and signage.

Though the City of Palmdale is not an urban water supplier, the City supports this project as beneficial to the Antelope Valley Region. The regional beneficiaries include other municipalities, communities, water districts, and mutual water companies in the general area. These entities will benefit from reduced groundwater overdraft, avoided dry-year reserve water costs, avoided decline of drinking water supply quality due to arsenic contamination from the lower aquifer, enhanced and protected riparian habitat, and increased education opportunities.

The State of California will benefit from reduced stress on the Bay-Delta during dry years.

Table 8-3: Project Beneficiaries Summary

Benefits	Local*	Regional**	Statewide***
Protection of Buried Utilities from Erosion	✓		
Protection of Streets and Roadways from Flooding	✓		
Protection of Public Safety	✓		
Reduced Groundwater Overdraft	✓	✓	
Avoided Dry-Year Reserve Water Costs	✓	✓	
Avoided Decline of Drinking Water Supply Quality due to Arsenic	✓	✓	
Riparian Habitat Protection and Enhancement	✓	✓	
Increased Water Conservation Education with New Nature Park	✓	✓	
Reduced Stress on Bay-Delta During Dry Years/Seasons			✓

* Includes: City of Palmdale
** Includes: Los Angeles County Water Works District #40, City of Lancaster, Quartz Hill, Rosamond, Antelope Acres, and other surrounding communities
*** Includes: State of California

Project Benefits Timeline Description

The Amargosa Project will provide benefits over an assumed 50-year project lifetime. Benefits from the project will begin accruing as soon as the recharge facilities are constructed in 2013. For additional detail on the timeline for project benefits, see Attachment 5.

Qualitative Benefits Summary

The project will result in significant benefits that have been qualitatively assessed. Table 8-4 shows each benefit along with a qualitative indicator of the likely effect of that benefit on net benefits for the Amargosa Project.

Table 8-4: Qualitative Benefits Summary

Benefit	Qualitative Indicator
Reduced Groundwater Overdraft	+

Uncertainty of Benefits

Uncertainties relating to the flood reduction benefits of this project are summarized below in Table 8-5. Uncertainties include the inherent unpredictability of rainfall patterns, fluctuations in the availability of imported water, variability in repair frequency for erosion damages, and uncertainty in the regulatory process.

Table 8-5: Uncertainty of Benefits

Benefit or cost category	Likely impact on net benefits	Comment
Avoided dry-year reserve water costs	+/-	The uncertainty inherent in this project could have a net positive or negative impact on the benefits. Rainfall/SWP availability could be more or less than predicted. Erosion damages could occur more or less frequently than predicted. Regulatory requirements could evolve in such manner as to be more difficult or more streamlined.

**Direction and magnitude of effects on net benefits

+	Likely to increase net benefits relative to quantified estimates
++	Likely to increase net benefits significantly
"-"	Likely to decrease net benefits
"--"	Likely to decrease net benefits significantly
+/-	Uncertain

Potential Adverse Effects from the Project

Any potential short-term impacts, such as potential harmful effects of removing land from the floodplain, associated with project construction will be mitigated as described in the EIR, in Appendix B. No long-term adverse effects are expected as a result of the proposed project.

Project Benefit Costs Comparison

The total present value of the costs for the project, along with monetized and qualitative benefits, is provided in Table 8-6.

Table 8-6: Benefit-Cost Analysis Overview

	Present Value ($2009)
Costs – Total Capital and O&M	$13,483,322
Monetizable Benefits *Avoided dry-year reserve water costs*	$15,725,436
Total Benefits	**$15,725,436**
Qualitative Benefits *Reduced groundwater overdraft* **Total Benefits**	**Qualitative Indicator*** + $0

**Direction and magnitude of effects on net benefits

+	Likely to increase net benefits relative to quantified estimates
++	Likely to increase net benefits significantly
"-"	Likely to decrease net benefits
"--"	Likely to decrease net benefits significantly
+/-	Uncertain

Economic Benefit Tables

Capital costs for the project amount to $14,463,689 in present value terms, as shown in Table 8-7. This includes initial spending starting in 2011 and continuing through 2060. The project lifetime is expected to be 50 years, and annual maintenance costs of $265,000 per year are anticipated once the project is completed, beginning in 2014 to conduct routine maintenance and cleaning operations. The net present value of the water supply benefits is $15,725,436, as shown in Tables 8-8 and 8-9.

Table 8-7: Amargosa Project Annual Costs

Upper Amargosa Creek Flood Control, Recharge, and Habitat Restoration Project

Year	Initial Costs	Operations and Maintenance Costs						Discounting Calculations	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
	Grand Total Cost	Admin.	Ops.	Maint.	Repl.	Other	Total Costs (a) +…+ (f)	Disc. Factor	Discounted Costs (g) x (h)
2009	$0	$0	$0	$0	-	-	$0	1.00	$0
2010	$0	$0	$0	$0	-	-	$0	0.94	$0
2011	$1,747,708	$0	$0	$0	-	-	$1,747,708	0.89	$1,555,454
2012	$7,160,723	$0	$0	$0	-	-	$7,160,723	0.84	$6,012,281
2013	$4,574,891	$0	$0	$0	-	-	$4,574,891	0.79	$3,623,742
2014	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.75	$198,023
2015	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.70	$186,815
2016	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.67	$176,240
2017	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.63	$166,264
2018	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.59	$156,853
2019	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.56	$147,975
2020	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.53	$139,599
2021	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.50	$131,697
2022	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.47	$124,242
2023	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.44	$117,210
2024	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.42	$110,575

Table 8-7: Amargosa Project Annual Costs

Upper Amargosa Creek Flood Control, Recharge, and Habitat Restoration Project

Year	Initial Costs	Operations and Maintenance Costs						Discounting Calculations	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
	Grand Total Cost	Admin.	Ops.	Maint.	Repl.	Other	Total Costs (a) +…+ (f)	Disc. Factor	Discounted Costs (g) x (h)
2025	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.39	$104,316
2026	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.37	$98,412
2027	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.35	$92,841
2028	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.33	$87,586
2029	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.31	$82,628
2030	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.29	$77,951
2031	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.28	$73,539
2032	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.26	$69,376
2033	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.25	$65,449
2034	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.23	$61,745
2035	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.22	$58,250
2036	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.21	$54,953
2037	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.20	$51,842
2038	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.18	$48,908
2039	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.17	$46,139
2040	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.16	$43,528
2041	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.15	$41,064
2042	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.15	$38,739
2043	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.14	$36,547
2044	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.13	$34,478
2045	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.12	$32,526
2046	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.12	$30,685
2047	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.11	$28,948
2048	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.10	$27,310
2049	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.10	$25,764
2050	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.09	$24,306
2051	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.09	$22,930
2052	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.08	$21,632
2053	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.08	$20,407
2054	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.07	$19,252
2055	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.07	$18,163
2056	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.06	$17,134
2057	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.06	$16,165
2058	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.06	$15,250
2059	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.05	$14,386
2060	$0	$53,000	$106,000	$106,000	-	-	$265,000	0.05	$13,572
Totals	**$13,483,322**	**$2,491,000**	**$4,982,000**	**$4,982,000**	**-**	**-**	**$25,938,322**	**-**	**$14,463,689**

Table 8-7: Amargosa Project Annual Costs

Upper Amargosa Creek Flood Control, Recharge, and Habitat Restoration Project

Year	Initial Costs	Operations and Maintenance Costs						Discounting Calculations	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
	Grand Total Cost	Admin.	Ops.	Maint.	Repl.	Other	Total Costs (a) +…+ (f)	Disc. Factor	Discounted Costs (g) x (h)
Total Present Value of Discounted Costs (Sum of Column (i)) Transfer to Table 20, column (c), Exhibit F: Proposal Costs and Benefits Summaries									$14,463,689
Comments: All costs are in 2009 dollars.									

Table 8-8: Annual Water Supply Benefits

Upper Amargosa Creek Flood Control, Recharge, and Habitat Restoration Project

(a) Year	(b) Type of Benefit: Avoided dry year reserve water costs							Discounting Calculations for Economic Benefits		
	(c) Measure of Benefits [Unit]: Acre Feet									
	(d)	(e)	(f)	(g1)	(g2)	(g)	(h)	(h)	(i)	(j)
	W. out Project	W. Project	Change resulting from project [e-d]	Unit value of imported water savings (escalated using MWD projections)	Unit pumping costs (escalated at 3% inflation)	Unit $ value [(g1)-(g2)]	Annual $ value [f x g]	Total annual benefits ($)	Disc. value	Discounted Benefits [h x i]
2009	-	-	0	$256	$115	$141	$0	$0	1.000	$0
2010	-	-	0	$280	$118	$162	$0	$0	0.943	$0
2011	-	-	0	$307	$122	$185	$0	$0	0.890	$0
2012	-	-	0	$327	$126	$201	$0	$0	0.840	$0
2013	-	-	0	$347	$129	$217	$0	$0	0.792	$0
2014	0	0	0	$367	$133	$234	$0	$0	0.747	$0
2015	0	25000	25000	$389	$137	$252	$6,303,629	$6,303,629	0.705	$4,444,059
2016	0	0	0	$413	$141	$271	$0	$0	0.665	$0
2017	0	0	0	$438	$146	$292	$0	$0	0.627	$0
2018	0	0	0	$464	$150	$314	$0	$0	0.592	$0
2019	0	0	0	$492	$155	$337	$0	$0	0.558	$0
2020	0	0	0	$521	$159	$362	$0	$0	0.527	$0
2021	0	0	0	$537	$164	$373	$0	$0	0.497	$0
2022	0	0	0	$553	$169	$384	$0	$0	0.469	$0
2023	0	0	0	$570	$174	$396	$0	**$0**	**0.442**	**$0**
2024	0	0	0	$587	$179	$407	$0	**$0**	**0.417**	**$0**
2025	0	25000	25000	$604	$185	$420	$10,491,431	**$10,491,431**	**0.390**	**$4,091,658**
2026	0	0	0	$622	$190	$432	$0	**$0**	**0.371**	**$0**
2027	0	0	0	$641	$196	$445	$0	**$0**	**0.350**	**$0**
2028	0	0	0	$660	$202	$459	$0	**$0**	**0.331**	**$0**

(a) Year	(b) Type of Benefit: Avoided dry year reserve water costs (c) Measure of Benefits [Unit]: Acre Feet							Discounting Calculations for Economic Benefits		
	(d)	(e)	(f)	(g1)	(g2)	(g)	(h)	(h)	(i)	(j)
	W. out Project	W. Project	Change resulting from project [e-d]	Unit value of imported water savings (escalated using MWD projections)	Unit pumping costs (escalated at 3% inflation)	Unit $ value [(g1)-(g2)]	Annual $ value [f x g]	Total annual benefits ($)	Disc. value	Discounted Benefits [h x i]
2029	0	0	0	$680	$208	$472	$0	**$0**	**0.312**	**$0**
2030	0	0	0	$700	$214	$486	$0	**$0**	**0.294**	**$0**
2031	0	0	0	$721	$220	$501	$0	**$0**	**0.278**	**$0**
2032	0	0	0	$743	$227	$516	$0	**$0**	**0.262**	**$0**
2033	0	0	0	$765	$234	$532	$0	**$0**	**0.247**	**$0**
2034	0	0	0	$788	$241	$548	$0	**$0**	**0.233**	**$0**
2035	0	25,000	25,000	$812	$248	$564	$14,099,606	**$14,099,606**	**0.220**	**$3,101,913**
2036	0	0	0	$836	$255	$581	$0	**$0**	**0.207**	**$0**
2037	0	0	0	$861	$263	$598	$0	**$0**	**0.196**	**$0**
2038	0	0	0	$887	$271	$616	$0	**$0**	**0.185**	**$0**
2039	0	0	0	$914	$279	$635	$0	**$0**	**0.174**	**$0**
2040	0	0	0	$941	$288	$654	$0	**$0**	**0.164**	**$0**
2041	0	0	0	$970	$296	$673	$0	**$0**	**0.155**	**$0**
2042	0	0	0	$999	$305	$694	$0	**$0**	**0.146**	**$0**
2043	0	0	0	$1,029	$314	$714	$0	**$0**	**0.138**	**$0**
2044	0	0	0	$1,059	$324	$736	$0	**$0**	**0.130**	**$0**
2045	0	25,000	25,000	$1,091	$333	$758	$18,948,691	**$18,948,691**	**0.123**	**$2,330,689**
2046	0	0	0	$1,124	$343	$781	$0	**$0**	**0.116**	**$0**
2047	0	0	0	$1,158	$354	$804	$0	**$0**	**0.109**	**$0**
2048	0	0	0	$1,192	$364	$828	$0	**$0**	**0.103**	**$0**
2049	0	0	0	$1,228	$375	$853	$0	**$0**	**0.097**	**$0**
2050	0	0	0	$1,265	$386	$879	$0	**$0**	**0.092**	**$0**
2051	0	0	0	$1,303	$398	$905	$0	**$0**	**0.087**	**$0**
2052	0	0	0	$1,342	$410	$932	$0	**$0**	**0.082**	**$0**
2053	0	0	0	$1,382	$422	$960	$0	**$0**	**0.077**	**$0**
2054	0	0	0	$1,424	$435	$989	$0	**$0**	**0.073**	**$0**
2055	0	25,000	25,000	$1,467	$448	$1,019	$25,465,457	**$25,465,457**	**0.069**	**$1,757,117**
2056	0	0	0	$1,511	$461	$1,049	$0	**$0**	**0.065**	**$0**
2057	0	0	0	$1,556	$475	$1,081	$0	**$0**	**0.061**	**$0**
2058	0	0	0	$1,603	$489	$1,113	$0	**$0**	**0.058**	**$0**
2059	0	0	0	$1,651	$504	$1,146	$0	**$0**	**0.054**	**$0**
2060	0	0	0	$1,700	$519	$1,181	$0	**$0**	**0.051**	**$0**
Total		**$125,000**	**$125,000**	**$45,078**	**$13,995**	**$31,083**	**$75,308,815**	**$75,308,815**		**15,725,436**
Total Present Value of Discounted Benefits over Project Life (Monetized Benefits):										**$15,725,436**
Project Allocation:										**100%**
Total Present Value of Discounted Benefits (Monetized Benefits):										**$15,725,436**

Comments:

(1) Table was modified for the Amargosa Project from DWR Table 15 of the PSP SWFM Guidelines

(2) All values are in 2009 dollars

Table 8-9: Present Value of Water Supply Benefits from Amargosa Project

Upper Amargosa Creek Flood Control, Recharge, and Habitat Restoration Project

(a)	Present value of water supply benefits	$15,725,436
(e)	**Total**	**$15,725,436**

Comments:
(1) Table was modified for the Amargosa Project from DWR Table 18 of the PSP SWFM Guidelines
(2) All values are in 2009 dollars.
(3) 6% discount rate