Attachment 8: Economic Analysis – Water Supply Costs and Benefits

Project Description. This project, *Stormwater Source Control in the CABY Region,* will construct green infrastructure stormwater facilities to reduce sediment, pollutants, and erosive peak flood flows, while increasing groundwater infiltration and storage in the Yuba River watershed. It will also provide a highly exportable, innovative solution for controlling downstream flood risk. The project will be constructed at two public sites in the disadvantaged communities of Nevada City and Grass Valley—the Nevada County Rood Administrative Center (Rood Center) and the Yuba River Charter School (YRCS). Green infrastructure components that will be constructed include: two rain gardens, two vegetated swales, 22,000 square-feet of pervious pavement, and two retention wetlands to capture and infiltrate stormwater runoff from 160,000 square feet of parking lot area.

These facilities mimic nature's way of cleaning and storing stormwater and provide not only economic, water quality and hydrology benefits, but also aesthetic and habitat values. In addition, the project has an innovative and robust monitoring component to quantitatively measure benefits, incorporates education and outreach activities for a range of audiences, and coordinates with other such efforts throughout the state to promote early learning and replication throughout the CABY and greater Sierra Nevada regions.

Project's Economic Costs. The project cost in 2009 dollars is $885,865. These costs would fund planning, design, labor, equipment, and materials necessary to implement the project. Ongoing operating costs are not expected to change when the project is constructed. This has been our experience at the Rood Center for Phase I: the cost to operate and maintain the green infrastructure has been the same as the cost for traditional infrastructure. Table 14 lists the estimated value of the costs, by category, in the years they would occur, and calculates their total present value.

Expected Water Supply Benefits

The Yuba River is a tributary of the Feather River in the Sacramento Valley. It is one of the Feather's most important branches, providing about a sixth of its flow. The main stem of the Yuba River is about 40 miles (64 km) long, and its headwaters are split into North, Middle and South forks. The river drains 1,339 square miles (3,470 km^2) of the western slopes of the Sierra Nevada mountain range as well as a small portion of the Sacramento Valley. The Yuba is heavily managed for water conveyance and provides water supplies to numerous communities in Nevada County and beyond. Entities such as NID, South Feather Water and Power Authority, PG&E, and individual water rights holders divert water from the Yuba River within and outside the Yuba watershed, before it reaches the Yuba County Water Agency's downstream facilities. Water from the Yuba supports a wide range of beneficial uses, including urban and agricultural uses, as well as providing water for the environment.

Analyses of green infrastructure facilities have shown that stormwater projects such as the one we propose can increase water supplies through the capture and reuse of rainwater and the increase of groundwater recharge (American Rivers, 2010). These benefits are limited for a small demonstration project; however, they would have a large impact once the project's full goal is reached and stormwater projects proliferate across the CABY IRWMP region, and eventually other watersheds of the Sierra. This demonstration project will be the first in the CABY region and one of the first in the Sierra foothills. Phase I generated substantial interest and has already educated thousands of homeowners and contractors in its first year. The next phase will greatly increase the overall project's impact, both locally and regionally.

Without-Project Conditions

Without this project, 5.9 million gallons of runoff from parking lots and roofs at the two project sites would carry sediment and pollutants into the Yuba River, contributing to erosive peak flows and increasing the danger of flood events in the lower watershed. Water that could be used on site, or that could be captured and allowed to percolate into the watershed system naturally, would instead be funneled directly into Deer Creek, a, tributary of the Yuba River. On-site stormwater management in the region lags other regions, and there are no projects that demonstrate new technologies and their multiple flood-control, water supply, and water quality benefits.

With-Project Conditions

As stated above in Attachment 7, expected population growth in Nevada County, and the resulting increase in impervious cover will result in 35,000 acre feet of additional stormwater runoff annually by 2020 (annual rainfall of 60 in/year). If 50 percent of new developments included on-site stormwater infiltration, 17,500 acre-feet of stormwater would be infiltrated and stored high in the watershed. The water savings in Nevada County from this investment in green infrastructure would supply the water needs of 35,000 households (ConSol 2010), or enough water for one-third the current household use for the people of Nevada County. For the CABY region, if 50 percent of future projects in the region adopted the green infrastructure strategies demonstrated by this project, 66,000 acre-feet of stormwater would be infiltrated per year and stored or approximately 30 percent more water than is provided annually by Englebright Reservoir on the Yuba River.

On a site-specific scale, this project will increase the available water supply for irrigation purposes and downslope of the YRCS campus through on-site infiltration and groundwater recharge. Water that would usually quickly leave the site will instead be slowed by stormwater features and used to irrigate orchards and gardens through groundwater withdrawals

Local, Regional, and Statewide Benefits

The residents of the Yuba River Watershed, the CABY region, and the Sierra Nevada will benefit from the implementation of this project. In addition, as the Sierra snowpack melts earlier and earlier in the season, it is increasingly important to slow runoff and promote alternative solutions to storing water high in the headwaters. These benefits will accrue downstream as prolonged stream flows and an extended period of peak snowmelt. Benefits will be received upon completion of the project.

Table 14- Annual Cost of Water Supply Project
(All costs should be in 2009 Dollars)
Project: ___Stormwater Source Control in the CABY Region____

	Initial Costs	Operations and Maintenance Costs (1)						Discounting Calculations	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
YEAR	Grand Total Cost From Table 6 (row (i), column(d))	Admin	Operation	Maintenance	Replacement	Other	Total Costs (a) +…+ (f)	Discount Factor	Discounted Costs(g) x (h)
2009							$0	1.000	$0
2010	$375,000						$375,000	0.943	$353,625
2011	$65,000						$65,000	0.890	$57,850
2012	$350,000						$350,000	0.840	$294,000
2013	$200,000						$200,000	0.792	$158,400
2014	$30,000						$30,000	0.747	$22,410
								…	
Project Life								…	
								Total Present Value of Discounted Costs (Sum of Column (i)) Transfer to Table 20, column (c), Exhibit F: Proposal Costs and Benefits Summaries	$886,285

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