

the District should consider drilling small irrigation wells in AQ3 and AQ4 instead of purchasing treated or untreated Cal-Am water. The water would be filtered to avoid clogged drip emitters. The District could secure an area along the river to establish a cottonwood and willow nursery for the projects. Alternatively, existing commercial nurseries could be contracted to provide a certain number of plants each year. Several seasonal river maintenance staff would be hired to assist the program manager. In areas where vegetation has encroached on the active channel bottom, vegetation would be selectively removed to reduce the risk of bank erosion, as well as water loss due to evapotranspiration.

Frequency of Use

This program would likely begin in the second or third year, after completion of the Riparian Corridor Management Plan. This program would be carried out annually until a new water supply project that provides improved streamflow conditions is developed.

Monitoring and Reporting

An annual report would be prepared on activities under the Riparian Corridor Management Plan, in accordance with the recommendations in the Allocation EIR. Parameters include number of plantings, nursery activities, survival rates, acreage irrigated, irrigation water applied, inspection results and vegetation removal data.

Permits Required

Permits from several agencies, including Monterey County, CDFG and/or USACE, may be required for some aspects of the program.

Preliminary Cost Estimates

No capital costs would be incurred for this mitigation. Annual O&M, including funds for seasonal river maintenance workers, overhead, vehicles, irrigation water and irrigation maintenance is estimated at \$60,000 per year. These annual costs are anticipated to begin in the second or third year. This estimate includes \$10,000 per year for irrigation water, an amount that could be reduced if wells are drilled. If it becomes necessary to acquire land or easements for the program, additional costs could be significant. The combined cost of existing and new programs would total \$347,000 per year.

RIPARIAN MITIGATION #4:

**EXPAND MONITORING PROGRAMS FOR SOIL
MOISTURE AND VEGETATIVE STRESS**

Existing District Program

The District has installed permanent access tubes to monitor soil moisture profiles in selected areas in lower Carmel Valley. The District regularly monitors water levels, riparian plant stress and soil moisture. These activities cost about \$5,000 per year and entail one staffmember working intermittently.

Description and Purpose

This mitigation entails an expanded monitoring program with additional locations for neutron probe access tubes, pressure bombing sites and canopy rating sites. This will allow the District to better assess the impact of prolonged depression or rapid drawdown of the water table. Conversely, the beneficial impacts of the mitigation programs described above could be documented.

Implementation and Facilities

The expanded monitoring program would entail analysis of data already collected and identification of new sites for continuous baseline data collection. In addition to measurements of soil moisture and vegetative moisture stress, the expanded program would include data analysis, weather monitoring and irrigation scheduling for drip lines already in place in the riparian corridor.

Frequency of Use

Once the new sites are located, monitoring and data analysis would be an ongoing program. The frequency and location of monitoring would be determined in the Riparian Corridor Management Plan.

Monitoring and Reporting; Permits Required

An annual report on the results and findings of this monitoring program would be prepared and made available to interested agencies or members of the public. No permits would be required for this program.

Preliminary Cost Estimates

An estimated capital cost of \$10,000 would be needed for new monitoring sites, equipment and calibration, and infrared photographs. Annual costs are expected to increase from \$5,000 to \$6,000 per year for the monitoring program. Additional personnel are not expected to be needed for this mitigation measure.

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**FINAL FIVE-YEAR MITIGATION PROGRAM FOR LAGOON VEGETATION
AND WILDLIFE -- OPTION V**

SUMMARY: The Water Allocation Program Final EIR found that all water supply options would have potentially significant impacts on lagoon vegetation and dependent wildlife, even though a reduced impact is recognized for 16,700 AF production (Option V). Discussion of the mitigation program for lagoon vegetation is found on page IV-54 and IV-55 of the document. It should be noted that Option V would result in less than significant impacts to lagoon hydrology. The following mitigations for vegetation and wildlife were recommended by the consultant:

1. Reduce production from the MPWRS by providing additional supplies of water, thus allowing additional surface inflow into the lagoon. Pump water from the aquifers for release into the lagoon during the dry seasons. Additional volume into the lagoon should be recorded and should equal conservation savings.
2. An extensive monitoring program is described that entails vegetation mapping, ordinary high water mark, and soil salinity measurements. Monitoring would be performed every two years to compare status to the baseline. If more than 10% increases in vegetation type or coverage occurred, additional measures would occur (see #3-5). If these measures are not successful, implement a wetland restoration project with a goal of 110% of baseline acreage.
3. Increase reinvestment of conserved water to the lagoon.
4. Injection wells to recharge AQ4.
5. Grout curtain near lagoon to create a coastal barrier.

The consultant could not determine whether the above mitigations would lessen impacts to a less than significant level. The consultant concluded that the impacts would remain as potentially significant with mitigations.

Existing District Programs: Ongoing District programs already address the environmental impacts of existing water supply practices on the Carmel River lagoon. MPWMD activities include:

1. Provides \$25,000 to co-fund Carmel River Lagoon Enhancement Plan, which is in progress. The plan entails detailed mapping of vegetation, soils and survey data, lagoon history and compares alternative enhancement activities. Cosponsors include County Flood Control, State Parks, and California Coastal Conservancy.

2. Conducts regular monitoring of lagoon water quality parameters and other data.
3. Actively seeks major new water supply that would provide year-round river flow to the lagoon in most years.
4. Implements comprehensive long-term water conservation program, which would reduce overall demand on the water resource system.

As shown in Exhibit 5, the existing lagoon programs are modest in terms of cost. About \$1,200 is expended annually for lagoon monitoring, primarily by two District staff on an intermittent basis. In addition to the monitoring activities, the District has contributed \$25,000 to the Carmel River Lagoon Enhancement Plan (\$15,000 cash and \$10,000 as in-kind services), and \$1,000 towards monitoring. Thus, capital costs expended to date total \$26,000.

Amendments to Consultant's Lagoon Mitigation Program:

District staff evaluated the consultant's proposals for technical merit and feasibility. Staff concluded (and the Board agreed) that the recommended mitigations should be amended or deleted as follows:

The consultant's mitigation #1 entails pumping water from the lower Carmel Valley aquifers into the lagoon during dry seasons to maintain freshwater levels. District staff notes that this mitigation may exacerbate impacts to riparian vegetation and is not consistent with riparian mitigations. It also entails "reducing production in the MPWRS by providing additional supplies of water," which makes sense only if importation or desalination are water sources. The District has pursued importation and desalination as water supply alternatives, but they have not proven to be institutionally feasible to date. For these reasons, the District will not pursue this mitigation concept.

The consultant's mitigation #2 entails monitoring every two years. Due to the significant fluctuations in year-to-year weather patterns and streamflow, the baseline survey will be repeated during the next normal year and every five years thereafter.

The consultant's mitigation #3 entails increased reinvestment of conserved water to the lagoon if monitoring shows significant changes. This assumes that conservation savings would equal a specific volume of water to the lagoon, which would not be true. Instead, the District will determine the amount of water needed to maintain an adequate habitat for fish and wildlife, and explore alternative means to transport it to the lagoon. Preliminary studies indicate that the amount would be relatively small.

The consultant's mitigation #4 entails injection wells to recharge AQ4. A reliable source of injection water was not identified by the consultant. Unless a reliable source can be identified, the effectiveness of this mitigation is questionable. It should be

noted that reclaimed wastewater could be an injection source if institutional constraints did not exist.

The consultant's mitigation #5 entails a grout curtain near the lagoon to create a coastal barrier. This would be a very expensive solution to the problem and has attendant technical concerns. A comprehensive engineering assessment would be needed prior to implementation of this measure. A more reasonable alternative would be to determine how to bring in the small amount of water that the lagoon needs to provide adequate habitat.

Elements of Lagoon Mitigation Program: The above alterations and deletions to the consultant's lagoon mitigation concepts by the District staff and Board result in the following specific measures that would be carried out in addition to existing District programs:

1. Assist with lagoon enhancement plan investigations.
2. Expand long-term monitoring program.
3. Identify feasible alternatives to maintain adequate lagoon volume.

The following pages include a brief description of the mitigation measure and its purpose, implementation and facilities needed, frequency of use with Option V, monitoring and reporting, permits required and a preliminary cost estimate. New programs resulting from the Allocation EIR would total \$25,000 in capital costs and \$2,000 in annual costs. The total estimated capital cost of the Board-approved program would be \$25,000. Annual costs would be \$3,200 per year. No additional staff would be needed to implement these mitigations. This information is summarized in Exhibit 5.

The three Board-approved mitigations, in addition to the existing lagoon programs, would reduce the impacts of Supply Option V, but it is unknown whether impacts would be reduced to a less than significant level. Thus, the District program would result in potentially significant impacts to lagoon vegetation and wildlife.

Exhibit 5

**COST ESTIMATES FOR FINAL LAGOON MITIGATION PROGRAM -- OPTION V
November 1990**

(Values are fully funded by MPWMD for five years)

	<u>MITIGATION PROGRAM</u>	<u>CAPITAL COST</u>			<u>ANNUAL COSTS</u>		
		<u>Existing</u>	<u>New</u>	<u>Total</u>	<u>Existing</u>	<u>New</u>	<u>Total</u>
1.	Assist with Lagoon enhancement plan investigations	\$ 25,000 ⁽¹⁾	0	25,000	\$ 0	0	0
2.	Expand long-term monitoring program	\$ 1,000	20,000	21,000	\$ 1,200	2,000	3,200
3.	Identify feasible alternatives to maintain lagoon volume	<u>\$ 0</u>	<u>5,000</u>	<u>5,000</u>	<u>\$ 0</u>	<u>0</u>	<u>0</u>
	TOTAL COST	\$ 26,000	25,000	51,000	\$ 1,200	2,000	3,200
	ESTIMATED TOTAL COST WITH BOARD-APPROVED PROGRAM		\$ 25,000			\$ 3,200	

NOTE 1: The District has contributed a one-time amount of \$25,000 for the completion of the Lagoon Enhancement Plan.

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LAGOON MITIGATION #1:

ASSIST WITH LAGOON ENHANCEMENT PLAN INVESTIGATIONS

Existing District Program

The District, County Flood Control, State Parks and the Coastal Conservancy presently co-fund the Carmel River Lagoon Enhancement Plan. The District will contribute \$25,000 to this effort by the completion of the plan (\$15,000 in cash and \$10,000 as in-kind lagoon water quality monitoring services). The Plan, which is in preparation, is being written by Phillip Williams and Associates. District staff participate on a plan review committee, which meets on an as-needed basis.

Description and Purpose

A key aspect of the Lagoon Enhancement Plan is to identify alternative means to restore and enhance the lagoon environment. As part of the lagoon mitigation program, the District would continue to contribute staff expertise for enhancement plan investigations, and assistance in developing a final plan.

Implementation and Facilities

PWA is scheduled to complete a final Lagoon Enhancement Plan in 1991. The document would entail extensive review and input by District and other agency staff, as well as the public. Once a final plan of action is selected, the District could contribute staff expertise to implement the plan.

Frequency of Use

Completion of the Plan and implementation of projects would occur once, though other enhancement activities could be spread over a series of years.

Monitoring and Reporting; Permits Required

This mitigation would not entail monitoring. No permits would be required.

Preliminary Cost Estimates

No capital or annual costs are anticipated for this mitigation.

LAGOON MITIGATION #2:

EXPAND LONG-TERM MONITORING PROGRAM

Existing District Program

The District has an existing program to monitor water quality, streamflow, sediment transport and changes in bedrock geometry in the lagoon on a monthly basis when the Carmel River flows into the lagoon. Water quality measurements (dissolved oxygen, carbon dioxide, specific conductance and temperature) are taken on a quarterly basis when there is no flow into the lagoon. This has been the case in the past three drought years. The annual cost in these years has been about \$1,200 in staff time.

Description and Purpose

The lagoon habitat would be monitored as described in the Allocation EIR (mitigation #2) to quantify its existing status and the long-term response to ground water pumping. Major studies such as vegetative mapping and soil surveys would occur every five years. The purpose of the monitoring is to determine if specific changes in plant species distribution, diversity, acreage etc occur over time, and to implement additional mitigations if vegetative changes begin to occur.

Implementation and Facilities

Monitoring performed by District staff would be continued and expanded. Consultants would be retained to perform the detailed mapping and surveys similar to those being performed for the Lagoon Enhancement Plan.

Frequency of Use

Monitoring would be performed on a regular basis. Major mapping and survey studies would be performed every five years after an initial survey during the next normal water year.

Monitoring and Reporting; Permits Required

Annual reports with the findings of the monitoring program would be provided to interested agencies and members of the public.

Preliminary Cost Estimate

The cost for consultant mapping and surveys would be \$20,000 every five years. Annual costs for monitoring by District staff would be increased by \$2,000 per year from \$1,200 to \$3,200 annually.

LAGOON MITIGATION #3:

**IDENTIFY FEASIBLE ALTERNATIVES TO
MAINTAIN ADEQUATE LAGOON VOLUME**

Existing District Program

There is no existing program to calculate adequate lagoon volume.

Description and Purpose

In conjunction with mitigation #2 above, the volume required to keep the lagoon in a stable situation that can adequately support plants and wildlife would be identified. Alternative means to achieve and maintain the desired volume would be compared, and the most cost-effective means selected.

Implementation and Facilities

Identification of the needed volume would be done in conjunction with the monitoring studies noted above and the findings of the Lagoon Enhancement Plan. Development of alternative means to provide adequate volume would be coordinated with the implementation of the selected alternative in the final Lagoon Enhancement Plan. It should be noted that construction of a large surface reservoir would provide inflow to maintain adequate lagoon volume in most years. The District is pursuing construction of a dam as soon as possible.

Frequency of Use

This study would not begin until the end of 1992, or whenever a final lagoon enhancement program is determined.

Monitoring and Reporting; Permits Required

No monitoring or permits are associated with this mitigation.

Preliminary Cost Estimates

The one-time capital costs within the first five years to assess the volume of water needed to maintain adequate habitat in the lagoon would be \$5,000. No annual costs are anticipated.

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FINAL FIVE-YEAR MITIGATION PROGRAM FOR AESTHETICS -- OPTION V

SUMMARY: The Water Allocation Program EIR found that all water supply options, including 16,700 AF Cal-Am production (Option V) would have significant impacts to aesthetics associated with riparian vegetation. According to the consultant, Option V would have potentially significant impacts due to the "brown lawn effect" if water supplies were limited. Discussion of this issue is found on page IV-107. The following mitigations were recommended:

1. For aesthetic impacts related to riparian vegetation, implement the riparian mitigations described previously.
2. For the brown lawn effect, plant drought-resistant landscaping and vegetation.

The consultant determined that, with these mitigations, there would still be potentially significant aesthetic impacts associated with riparian vegetation. Aesthetics associated with the brown lawn effect would be reduced to a less than significant level.

Existing District Programs: Ongoing District riparian programs are described in the riparian vegetation section. Programs relating to landscaping aesthetics include:

As part of the District's comprehensive water conservation program, seminars, educational materials and resource lists are provided to the public about drought-tolerant plants and water conserving irrigation techniques (e.g., drip, cisterns). This program costs about \$6,000 annually.

Amendments to Consultant's Aesthetics Mitigation Program: District staff evaluated the consultant's recommendations for technical accuracy and feasibility, and found that mitigation #2 entails reasoning that is unclear. A reduction in the amount of water available for growth would result in fewer instances of brown lawn in droughts because fewer people will be using the water supply. The brown lawn danger would occur only if all conservation savings went to new growth, thus increasing drought vulnerability. The EIR recommends that this not occur, and the District Board has adopted policies to preclude such action. Thus, this mitigation concept will not formally be part of the Board-approved mitigation program. It should be noted, however, that this mitigation is actually being performed as part of the District's ongoing conservation program.

Elements of District's Aesthetics Mitigation Program: The following Board-approved mitigations will be carried out by the District to mitigate aesthetic impacts of Option V:

1. Implement riparian mitigation programs discussed above.

The costs for this program are described in the riparian mitigation section. They would reduce aesthetic impacts relating to riparian vegetation from significant to a potentially significant level.

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