Chapter P1

Water Supply and Demand

Introduction

This chapter presents a discussion of project impacts related to water supply and demand, including:

- project direct and indirect impacts on water supply and distribution;
- project indirect impacts to Carmel River biological resources from increased withdrawals; and
- secondary impacts related to the proposed Recycled[1] Water Project (RWP) Phase II mitigation.

The environmental setting used as the basis for evaluating these impacts is at the end of this chapter. Water data and calculations supporting this analysis are provided in Appendix G. An assessment of growth inducement impacts related to financing of the Recycled Wastewater Treatment Plant Phase II improvements is included in Chapter P6. A revised cumulative water demand analysis is included in Chapter P7.

Revisions Since Draft EIR

The key changes in analysis of water supply and demand in this document compared to the Draft EIR are as follows:

- Impact PSU-D1 has been changed from a less-than-significant to a significant impact based on assessment of impacts on existing conditions and increased withdrawals from the Carmel River and Seaside Basin aquifers. The project water demand analysis was updated to assess conditions representative of wet, average, drier than average, and very dry conditions compared to the normal and drier than normal year conditions analyzed in the Draft EIR.
- The increased withdrawals from the Carmel River aquifer are also identified as a significant impact on the biological resources of the Carmel River

[1] In the Draft EIR, "recycled" water was also termed "reclaimed" water. The terms have been used interchangeably.

including riparian vegetation, steelhead, California red-legged frog, and other sensitive plant and wildlife species.

- New mitigation measures have been added for these identified significant impacts to include funding of the RWP Phase II Improvements, operation of RWP Phase II prior to use of potable or recycled water for the Proposed Project, prohibition of potable water use for irrigation by the project, and provision of tertiary treated water to Carmel Lagoon during certain conditions or additional conservation of potable water.
- The secondary physical impacts of RWP Phase II are disclosed along with the adopted mitigation of the Pebble Beach Community Services District (PBCSD) for Forest Lake Reservoir and recommended mitigation for adoption by Carmel Area Wastewater District (CAWD) for the Salinity Management Project (SMP) at the CAWD Wastewater Treatment Plant (WWTP).
- Impacts PSU-E1 and PSU-E2 relating to infrastructure have also been revised.

This revised analysis replaces the discussion of water supply and demand and water line capacity impacts in Chapter 3.5 and supplements the assessment of impacts to Biological Resources in Chapter 3.3 of the Draft EIR (DEIR) regarding the Carmel River. The following table identifies where changes to the DEIR are specifically made:

PRDEIR Text	DEIR Text Affected by PRDEIR Text
Introduction	**New Text**
Revisions Since DEIR	**New Text**
Summary of Project Impacts	**Replaces** Lines D and E on pages 3.5-1 and 3.5-2 and adds new impacts and mitigation measures
Relevant Project Characteristics	**Expands** text on page 3.5-2, lines 3-10 and adds summary of RWP Phase II improvements
Impacts and Mitigation Measures Water Supply & Demand Impact PSU-D1 Infrastructure Capacities Impacts PSU-E1, PSU-E2 Carmel River Biological Resources Impact BIO-Carmel River-1 RWP Phase II Improvements	 **Replaces** Water Demand Impact Analysis (Section D) on pages 3.5-10 to 3.5-14, including Figure 3.5-1 **Replaces** Infrastructure Capacities Impact Analysis (Section E) on pages 3.5-15 to 3.5-16 **New Impact** is added to Biological Resources section **New Impact** discussion is added to Section D and before Section E on page 3.5-15 re: secondary impacts of planned RWP Phase II Improvements
Environmental Setting	**Replaces** Water Supply and Distribution text on pages 3.5-24 to page 3.5-29 and **Adds new text** related to the Biological Resources section regarding the Carmel River

Summary of Project Impacts

IMPACTS	GC	EC	SBI	SBE	SBR	PBL	SUB	CY	RD	HWY
Public Services and Utilities (PSU)										
Water Demand										
D1. The Proposed Project would increase demand for potable and recycled water and would result in increased withdrawals from the Carmel River and the Seaside Basin aquifers relative to the current baseline.	⦿ Applies to project as a whole									
Infrastructure Capacity										
E1. The project will increase demand for recycled water for irrigation and may result in an increased demand for potable water resulting in the need for improvement to either recycled water distribution and/or potable water distribution facilities.	⦿	⦿	—	—	⦿	—	—	—	—	—
E2. Increased demand for water line capacity. Service providers have identified adequate water and sewer line capacity for the project and cumulative development.	○ Applied to project as a whole									
Biology (BIO)										
Carmel River – 1. The project will increase withdrawals from the Carmel River resulting in a considerable contribution to cumulative adverse effects to biological resources dependent on the Carmel River including riparian vegetation, steelhead, California red-legged frogs, and other sensitive resources dependent on the river and its aquifer.	⦿ Applies to project as a whole									
RWP Phase II Mitigation – Physical Effects										
RWPP2-1. Construction and Operation of the RWPP2 Improvements could result in significant impacts to various resources.	⦿ Mitigation for Forest Lake Reservoir within the jurisdiction of PBCSD Mitigation for SMP within jurisdiction of CAWD									

● = Significant Unavoidable Impact

⦿ = Significant Impact that can be Mitigated to Less-than-Significant

○ = Less than Significant Impact

— = No Impact or Not Applicable to the development site

GC – Golf Course; **EC** – Equestrian Center; **SBI** – Inn at Spanish Bay; **SBE** – Spanish Bay Employee Housing; **SBR** – Spanish Bay Driving Range; **PBL** – The Lodge at Pebble Beach; **SUB** – Residential Subdivisions; **CY** – Corporation Yard Employee Housing; **RD** – Roadway Improvements; **HWY** – Highway 1/Highway 68/17-Mile Drive Improvement

Relevant Project Characteristics

The characteristics of the Proposed Project, cumulative development, the RWP Phase II Improvements, and potential future residential development in the Del Monte Forest that were used as the basis for the impact analysis are described below. The environmental setting relative to the impact analysis is presented after the impact analysis itself.

Proposed Project

The Proposed Project includes development that would increase demands for both potable and recycled water. The Proposed Project would result in new development at 13 sites, including: a new 18-hole Golf Course; the Spanish Bay Driving Range; 160 new visitor-serving suites at the Inn at Spanish Bay and the Lodge at Pebble Beach; relocation of the existing Equestrian Center to the Sawmill site; creation of 33 residential lots within 5 subdivisions in Areas F-2, F-3, I-2, K, and PQR; 60 employee housing units in Spanish Bay and at the Corporation Yard; internal road improvements; improvements at Highway 1/68 interchange; dedication of open space forest and other open space lands; and resource management. The Proposed Project is described further in Chapter 2 of the Draft EIR. A figure showing the location of proposed development and preservation is included in the Executive Summary of this document.

Recyled Water Plant Phase II Improvements

As discussed below in the "Environmental Setting", the existing PBCSD/CAWD RWP cannot meet all of the existing irrigation demand with recycled water due to water quality and quantity issues at the existing plant.

In 2000, the Monterey Peninsula Water Management District (MPWMD)/CAWD/PBCSD Technical Advisory Committee met to discuss actions needed to address water quality and quantity issues, including the potential use of new desalinization technology and storage facilities. The improvements identified, collectively known as the Phase II Improvements, would include restoration of the Forest Lake Reservoir to provide additional storage capacity and wastewater treatment improvements at the CAWD plant to address salinity. The goal of these improvements is to produce sufficient recycled water of an appropriate quality to meet Del Monte Forest irrigation demands for existing and proposed development.

The Phase II Improvement locations are shown on Figure P1-1. The capacity of the RWP Phase II to provide recycled water for existing users and for the Proposed Project is analyzed below in the "Impacts and Mitigation Measures" section.

Forest Lake Reservoir Improvements

The Forest Lake Reservoir Phase II Improvements include modifications to the existing embankments in order to enable the reservoir to be used as a recycled water storage facility. The improvements also include construction of a treatment plant at Forest Lake to remove algae from recycled water stored in the reservoir before it is placed back into the distribution system and construction of an emergency discharge pipeline to deliver flows directly to Sawmill Gulch.

Phase II Improvements at Forest Lake Reservoir are shown on Figure P1-2 and include the following:

- **Forest Lake Reservoir Modifications.** The California Department of Water Resource Division of Safety of Dams (DSOD) has determined that the existing reservoir embankments, in their present condition, may be unstable during a seismic event. Phase II Improvements include modifications to the existing embankments in order to enable the reservoir to be used as a recycled water storage facility. The project scope includes a lining and underdrain system, inlet and outlet structures, buried piping, gravel access roads, and tree removal. Nominal storage capacity of the reservoir for Phase II has been estimated as 420 AF.
- **Forest Lake Treatment Facility.** A treatment plant would be provided at Forest Lake to remove algae from recycled water stored in the reservoir before it is placed back into the distribution system. The treatment facility consists of a physical/chemical plant to remove algae and provide residual chlorine. Treatment processes include straining filtration, disinfection, pH and alkalinity adjustment, copper sulfate addition, and backwash water settling.
- **Sawmill Gulch Emergency Outlet Structure.** The outlet of the existing 24-inch California-American Water Company (Cal-Am) overflow/drain line currently terminates with a flap gate on a steep slope 125 feet above Sawmill Gulch just north of Congress Road. An emergency discharge pipeline would be constructed to deliver flows directly to Sawmill Gulch, which consists of a flatter gradient and adequate channel capacity to handle emergency releases. An energy dissipation structure would also be constructed at the new outlet to prevent flows from causing erosion to the Creek

The improvements proposed at Forest Lake Reservoir have been previously evaluated in the *Final Expanded Initial Study for Phase II – CAWD/PBCSD Wastewater Reclamation Project* (PBCSD 1996a), the Negative Declaration filed by PBCSD for Forest Lake Reservoir (PBCSD 1996b), the Negative Declaration filed by the County of Monterey for issuing the use permit for the expansion of: (a) Forest Lake Reservoir; and (b) design approval for the emergency outlet concrete structure under Sawmill Gulch (County of Monterey 1997); the A*ddendum to the Expanded Initial Study – Phase II CAWD/PBCSD Wastewater Reclamation Project* (PBCSD 2001a), and the Notice of Determination filed by the PBCSD on August 2, 2001 for Phase II – CAWD/PBCSD Wastewater Reclamation Project (Forest Lake Reservoir) (PBCSD 2001b). These documents are included in Appendix K (on the CDROM version), on the project website and are also available for review at the Monterey County Planning & Building Inspection Department (2620 1st Avenue at 2nd Street, in Marina at the former Ft. Ord).

PBCSD has been granted a permit from Monterey County to proceed with improvements to Forest Lake Reservoir and is in the process of seeking a funding source (Niccum, pers. comm).

CAWD Salinity Management Project

Improvements are proposed at the CAWD WWTP to provide for reduction in the salinity of the recycled water supply. This component – the Salinity Management Project (SMP) – involves construction of microfiltration (MF) and reverse osmosis (RO) facilities designed to achieve higher quality recycled water. The SMP is being designed to provide recycled water of a quality compatible with turf irrigation without the need for flushing with potable water. The total capacity of this new facility will be 1.5 million gallons per day (mgd).

Phase II Improvements at the CAWD treatment plant are shown on Figure P1-3 and include:

- construction of a new structure (equipment on slab) that will expand the existing tertiary treatment facility;
- construction of new pipelines; and
- changes to the treatment processes inside the existing facility building.

The project will include four MF units that will produce water for four RO skids. The total capacity of this new facility will be 1.5 mgd. The effluent from the secondary treatment facilities at the existing treatment plant will flow into the MF tanks as necessary to provide feed water to the RO units. Through application of high pressure, the RO units allow the recycled water to flow to a less salty state. Following blending and chemical conditioning, the water will flow through a final disinfection system and be pumped to the Forest Lake Reservoir. The existing distribution system will supply the irrigation needs of the golf courses and other recycled water users.

The CAWD SMP was evaluated in the *Preliminary Environmental Analysis of the Phase II Salinity Management Project* (CAWD 2004). This document is included in Appendix K (on the CDROM version), on the project website, and is also available at the Monterey County Planning & Building Inspection Department offices in Marina.

Potential RWP Phase II Financing Mechanism

The applicant has made a financing proposal to fund the Phase II Improvements that was approved with certain conditions in Ordinance No. 109 by the MPWMD in May 2004 (MPWMD 2004c). This proposal is to sell and convey a portion of the applicant's water entitlement to other property owners within the Del Monte Forest for residential use.

MPWMD Ordinance 109 amends the existing Fiscal Sponsorship Agreement to expand the "benefited properties" that may utilize the water entitlement in the Del Monte Forest to include residential properties owned by parties other than the applicant. Residential property owners who agree to invest in RWP Phase II will receive a portion of the applicant's entitlement. These investment proceeds will be held in escrow to fund the cost of Phase II Improvements. Construction would proceed once the escrow account contains sufficient funds to cover the cost of the improvements. Ordinance No. 109 limits the provision of back-up potable water to the recycled water users to only in the event of an "interruption" consisting of damage or destruction or inoperability of project infrastructure to deliver recycled water. Ordinance No. 109 also limits the overall amount of the applicant's entitlement that can be transferred to 175 AF (MPWMD 2004c). The proposed financing of the RWP Phase II improvements by sale and conveyance of up to 175 AF of the applicant's entitlement has the potential to induce growth and is discussed in Chapter P6, "Growth Inducement."

Impacts and Mitigation Measures

Significance Criteria

The following significance criteria were developed in accordance with CEQA, State CEQA Guidelines, Monterey County plans and policies, and agency and professional standards. These criteria are used for the analysis in this chapter.

D. Water Demand

- Result in a water demand that exceeds water supplies available to serve the project from existing entitlements and resources, and/or require that new or expanded supplies may be needed.

E. Infrastructure Capacities

Result in water demand that exceeds capacity of the water supply or infrastructure system, or would require substantial expansion of water supply, treatment or distribution facilities, the construction of which could cause significant environmental effects.

Water Supply and Demand

Direct and Indirect Demand

Impact PSU-D1: The Proposed Project would increase demand for potable and recycled water that would result in increased Cal-Am withdrawals from Carmel River over existing conditions, which currently exceed Cal-Am's legal rights and have resulted in secondary biological resource impacts. The increased demand would also result in increased Cal-Am withdrawals from the Seaside Basin, which exceeds the estimated safe yields in certain years. This is a significant impact that can be reduced to a less-than-significant level with mitigation.

The impact of project-related increases in Carmel River withdrawals on biological resources is discussed separately below.

Direct Potable Water Demand. The Proposed Project development would create an estimated direct demand for potable water of 91 acre-feet in an average year (AFY) . A summary of potable water demands is provided in Table P1-1. A more detailed estimate of potable water demand is provided in Appendix G, along with water use factors used to derive this estimate.

Table P1-1. Direct Potable Water Demand of Proposed Project

Proposed Development	Potable Demand (AFY)
Proposed Golf Course	10.8
New Equestrian Center	5.0
Inn at Spanish Bay	27.1
Spanish Bay Driving Range	0.2
Spanish Bay Employee Housing	2.4
Lodge at Pebble Beach	14.2
Residential Areas (5)	33.0
Corporation Yard Housing	9.4
Highway 1/68 Landscaping	0.7
Subtotal	*102.9*
Removed Uses	-12.0
TOTAL Average Year	**91.0**
Total - Wet Year (estimated as 95% of avg.)	*86.4*
Total - Dry Year (estimated as 105% of avg.)	*95.5*
Total - Very Dry Year (estimated as 110% of avg.)	*100.1*

NOTE: Exclusive of Potable Use Related to RWP. See Appendix G for details and assumptions

Increased Demand for Recycled Water for Irrigation. The Proposed Project would also create demand for recycled water for use in irrigating turf at the Proposed Golf Course, the Spanish Bay Driving Range, and the New Equestrian Center. Estimated irrigation demand would be 182 AFY in an average year. A summary of recycled water demand is provided in Table P1-2. A more detailed estimate of recycled water demand, along with the assumptions used to develop the estimate, is provided in Appendix G.

Table P1-2. Irrigation Water Demand of Proposed Project (AFY)

Project Element	Wet Year	Average Year	Dry Year	Very Dry Year
Proposed Golf Course	118	148	167	234
New Equestrian Center	17	21	25	25
Spanish Bay Driving Range	10	13	15	20
Other Landscaping	0	0	0	0
TOTAL	**145**	**182**	**206**	**279**

See Appendix G for Details and Assumptions.

Increased Demand for Potable Water for Irrigation. As noted in the "Environmental Setting" at the end of this chapter, the RWP cannot always meet the existing demand for irrigation water due to wastewater availability, peak demand, and recycled water quality issues. Because of these limitations, approximately 30% of the water provided by the RWP annually for irrigation is potable water. Without improvements to the RWP, project demand for recycled water for irrigation will increase the use of potable water for irrigation because of the periodic need for flushing of salts from irrigated areas and in order to meet an increased peak demand.

In order to estimate the quantity of this increased demand for potable water for irrigation, it was necessary to assess the demand of the Proposed Project along with the demand of the other users of recycled water in the Del Monte Forest. Four scenarios were evaluated for the direct impact analysis. The detailed assumptions and data used to develop these scenarios are presented in Appendix G.

Wet Year, Existing RWP (Scenario 1A). This scenario was designed to be representative of a wet year in which rainfall is greater and irrigation demand is less than that in an average year. Project irrigation demand was estimated by applying irrigation use data from representative locations within the Del Monte Forest for Water Years 1995 and 1998 to the irrigation areas within the Proposed Project. Water Years 1995 and 1998 were the relatively wettest years (rainfall of 23.7 and 47.4 inches respectively) in the last ten years and the years of lowest irrigation use of Del Monte Forest golf courses. Existing RWP use was estimated using actual use data for these years.

Average Year, Existing RWP (Scenario 1B). This scenario was designed to be representative of an average year for rainfall and irrigation demand. Project irrigation demand was estimated by applying irrigation use data from representative locations within the Del Monte Forest for Water Years[2] 1995 to 2003, excluding 1995 and 1998 (which were relatively wet years) to the irrigation areas within the Proposed Project. When excluding these two years, the rainfall average of this period (19.6 inches) is equal to the 50-year average for the Monterey Peninsula (Renard 2004). RWP use was estimated using actual use data for this same period.

Dry Year, Existing RWP (Scenario 2). This scenario was designed to be representative of a dry year in which rainfall is less and irrigation use is greater than that in an average year. The driest year in the last ten years was Water Year 2002 (15.6 inches annual rainfall), but Del Monte Forest irrigation use (1,037 AF) was only the third highest. Irrigation use is highest during the drier season of late spring, summer, and early fall (April through October). The year that was the driest during these drier seasons was Water Year 1997 (1.5 inches of rainfall), compared to 4.1 inches for Water Year 2002 and the 50-year average of 3.6 inches for the drier season. In Water Year 1997, Del Monte Forest irrigation use was highest over the last ten years (1,109 AF). Thus, project irrigation demand was estimated by applying irrigation use data from representative locations within the Del Monte Forest for Water Year 1997 to the project irrigation areas. Existing RWP use was estimated using actual use data for Water Year 1997.

Very Dry Year, Existing RWP (Scenario 5). This scenario was designed to be representative of a very dry year in which rainfall is substantially less and irrigation use is substantially greater than in an average year. Since there has not been a very dry year (< 14 inches) in the last ten years when accurate data on Del Monte Forest irrigation use is available, project irrigation demand was estimated by using a conservative use factor of 2.5 AFY/acre for turf irrigation at the Proposed Golf Course and the Spanish Bay Driving Range. The resultant estimated irrigation demand for the Proposed Golf Course is 234 AF. This amount is considered reasonably representative of the worst-case demand as it is equal to the highest single year golf course use in the Del Monte Forest identified in a review of available water use data for the last 25 years. Existing RWP use was estimated multiplying actual use data for Water Year 1997 by 120%. For all golf courses but one, the resultant estimate of very dry year demand is higher than the highest use recorded for each golf course in the available data reviewed for the last 25 years.

A summary of results of this analysis are presented in Table P1-3. As shown in the table, with the existing plant, the project is expected to result in an increase of potable water use for irrigation in an average rainfall year of 100 AFY.

[2] A water year begins on October 1 and ends September 30 of the following yar. For example, water year 1995 began October 1, 1994 and ended September 30, 1995.

Table P1-3. Increased Potable Water Demand for Irrigation with Project (AFY)

	Total Demand	Recycled Water	Potable Water
Wet Year			
Irrigation Demand - Existing Uses	747	602	144
Irrigation Demand with Project	892	670	222
Change with Project	145	68	**78**
Average Year			
Irrigation Demand - Existing Uses	1007	689	318
Irrigation Demand with Project	1190	771	419
Change with Project	182	82	**100**
Dry Year			
Irrigation Demand - Existing Uses	1109	782	327
Irrigation Demand with Project	1315	796	519
Change with Project	206	15	**192**
Very Dry Year			
Irrigation Demand - Existing Uses	1330	933	398
Irrigation Demand with Project	1609	966	643
Change with Project	279	34	**245**

Details and Assumptions in Appendix G

Summary of Project Increased Potable Use. When the direct potable water demand (Table P1-1) is added to the increased use for irrigation (Table P1-3), the overall project potable water demand can be estimated. As shown in Table P1-4, the project would increase demand by 191 AFY in an average year and up to 346 AFY in a very dry year with the existing recycled water availability.

Table P1-4. Summary of Project Water Demand (AFY)

Scenario	Total Water Demand	Recycled Water[1]	Potable Water[2]
Wet Year	*+232*	*+68*	***+164***
Average Year	*+273*	*+82*	***+191***
Dry Year	*+302*	*+15*	***+287***
Very Dry Year	*+379*	*+34*	***+346***

Details and Assumptions in Appendix G
[1] See Table P1-3
[2] Includes potable water used directly (Table P1-1) and for irrigation (see Table P1-3)

Water Supply Impact Analysis

Relative to a current baseline, the increased project demand and the project's contribution to cumulative demand would result in increased withdrawals by Cal-Am from the Carmel River aquifer and/or the Seaside Basin aquifer. Based on present patterns of use, Cal-Am obtains approximately 75% of its water supply from the Carmel River aquifer and 25% from the Seaside Basin aquifer. Using this apportionment, the project-related increases in withdrawals from these sources can be estimated, as shown in Table P1-5. In an average year, project increased withdrawals are estimated as 143 AF from the Carmel River and 48 AF from the Seaside Basin.

Table P1-5 Project Increases in Withdrawals from the Carmel River and Seaside Basin (AFY)

	Total Water Demand	Carmel River (assumed 75%)	Seaside Basin (assumed 25%)
	Wet Year		
Baseline (1)	*13,810*	*10,095*	*3,715*
Project Demand	164	123	41
	Average Year		
Baseline (2)	*16,068*	*11,378*	*4,690*
Project Demand	191	143	48
	Dry Year		
Baseline (3)	*18,335*	*12,847*	*5,488*
Project Demand	287	216	72
	Very Dry Year		
Baseline (3)	*18,335*	*12,847*	*5,488*
Project Demand	346	259	86

(1) Cal-Am Carmel River Withdrawals Water Years 1995 and 1998; All Seaside Coastal Subarea withdrawals Reporting Years 1995 and 1998

(2) Cal-Am Carmel River Withdrawals Water Years 1995 – 2003 excluding 1995 and 1998; All Seaside Coastal Subarea withdrawals Reporting Years 1996, 1997, 1999 – 2001, Water Years 2002 and 2003

(3) Cal-Am Carmel River Withdrawals Water Year 1997; All Seaside Coastal Subarea withdrawals for Reporting Year 1997.

Details, Data, and Assumptions in Appendix G

By using existing data on withdrawals from the Carmel River and the Seaside Aquifer over the last ten years and the analysis described above, the estimated demand of the project was added to the existing use over the last ten years to illustrate the character of the increased withdrawals. This is graphically shown in Figures P1-4 and P1-5. Supporting data are presented in Appendix G.4.

As shown in the figures, withdrawals would increase in all years when project demand is added. Impacts of this increased project demand were analyzed in respect to: (a) whether sufficient water can be supplied to service the Proposed Project; (b) the effect of increased withdrawals on the Carmel River water supply; (c) the effect of increased withdrawals on the Seaside Basin aquifer; and (d) the potential to require development of additional supply to meet project demand.

- **Ability to Supply.** As described below under “Environmental Setting,” the applicant has a remaining potable water entitlement of 355 AFY. Both the State Water Resources Control Board (SWRCB) and the MPWMD have previously identified that this amount is available for development on the applicant’s properties in the Del Monte Forest pursuant to the applicant’s entitlement (SWRCB 2004b; SWRCB 2001; SWRCB 1998; MPWMD 2004d). Provision of up to 355 AFY of water for the Proposed Project by Cal-Am is not constrained by the requirements of SWRCB Order WR 95-10 (see discussion of water supply and distribution in “Environmental Setting” below). The estimated increased withdrawals needed to serve project demands could range from 164 to 346 AF, depending on scenario. Even if all of this water were derived from the Carmel River, it is less than the remaining entitlement, and thus, Cal-Am would be able to supply project demand without incurring any additional risk of enforcement activity from SWRCB pursuant to Order WR 95-10.

- **Carmel River**. The estimated increased withdrawals from the Carmel River to serve project demands could range from 123 to 259 AF (if drawn proportionally from the river and the Seaside aquifer), and could range from 164 AF to 346 (if drawn entirely from the Carmel River). Existing development has already resulted in a level of withdrawal by Cal-Am from the Carmel River that exceeds Cal-Am’s legal rights and a level of withdrawal by Cal-Am and others that adversely effects biological resources in the River, such as steelhead, which is further discussed below. Currently Cal-Am’s Carmel River diversions are limited by the SWRCB to 11,285 AFY until full compliance with the Order WR 95-10 is achieved. In non-wet years, increased diversions over existing conditions would be necessary to meet project demand. During the wetter parts of wet years (November – May), Carmel River supplies are usually adequate to serve existing demand and the project-related increases would unlikely adversely affect existing supplies or result in constraints or operations. However, as discussed below under the analysis of withdrawal effects on Carmel River biological resources, additional summer withdrawal (June to October) could result in significant biological impacts, particularly to steelhead.

  This increased withdrawal would have differing impacts on the existing river supply depending on the point of increased diversion. Increased diversions upstream would lower recharge available to supply wells further downstream and could physically affect their operation, particularly in the lower part of the system. Increased groundwater withdrawals would lower the water table around the point of diversion, which could, when combined with other demands, affect the operations of nearby Cal-Am and other supply wells. In addition, increased diversions could constrain the ability of Cal-Am to supply other uses, due to restrictions on diversions and operations related to protected species such as steelhead in the Carmel River.

- **Seaside Aquifer**. The estimated increased withdrawals from the Seaside Basin to serve project demands could range from 41 to 86 AF (if drawn in proportion similar to Cal-Am overall use from its two primary sources). As noted in the "Environmental Setting" below, existing withdrawals from the aquifer have already exceeded the estimated safe yield in a number of recent years. Increased project-related withdrawals could lower the water table around the point of diversion, which could, when combined with other demands, affect the operations of nearby Cal-Am and other supply wells. In addition, increased diversions above safe yield could increase salinity intrusion into the aquifer affecting water quality, lowering available supply, and potentially affecting the ability to use existing wells. In wet years, if withdrawals for other users are well below the safe yield level, the project related increases would be nominal and unlikely to adversely affect existing supplies or result in constraints on operations.
- **Need for New Water Supplies.** Because of the effects of increased withdrawals from the Carmel River and Seaside Basin supplies and the related impacts to Carmel River biological resources (see separate discussion below), the project potable water demand will increase the existing pressure to develop alternative water supplies. Prior planning had focused on a new reservoir on the Carmel River; however due to concern about the impact of a new reservoir on Carmel River biological resources and a lack of support of local water users, this plan is not being advanced at this time. Current planning is focused on developing a new supply based on desalination using water from Monterey Bay. While the effects of a new desalination plant to serve Monterey Peninsula demands have not been evaluated in detail, it is safe to assume that it has the potential to result in significant environmental effects.

Based on the increased project demand for water and the project's considerable contribution to cumulative demands, the project would directly and indirectly result in substantial adverse effects to existing water supplies and would increase the need to develop alternative water supplies and thus the project would have a significant water supply impact.

Based on the above review, project water demand and subsequent increased withdrawals from the Carmel River and Seaside Basin would result in substantial adverse effects to existing water supplies, and thus, the project would result in a significant impact. The following mitigation measures would reduce the project's impact to a less than significant level. As described below, implementation of these mitigation measures would avoid increased withdrawals from the Carmel River and the Seaside Basin, avoid degradation of the existing river and aquifer resource, avoid any project-related curtailment of existing water system operations, and avoid any project contribution to the need for development of alternative water supplies. Implementation of these measures would also avoid any substantial adverse effects to Carmel River biological resources, as discussed separately below. Implementation of Mitigation Measures PSU-D, PSU-D2, and PSU-D3 will reduce the project impact to a less-than-significant level.

Water Supply Mitigation

Mitigation Measure PSU-D1. The applicant shall fund or arrange to fund the RWP Phase II Improvements. Potable water and recycled water shall not be used to serve any Proposed Project developments until the Phase II improvements are operational.

The characteristics of the RWP Phase II Improvements were presented above. Under this mitigation measure, the planned RWP Phase II improvements would be funded by the applicant, which could include the financing mechanism that was approved by the MPWMD. Therefore, this analysis includes the potential for an increase of residential potable water use in the Del Monte Forest as a result of a sale and conveyance of up to 175 AF of the applicant's water entitlement.

Water Demand with RWP Phase II

Four additional scenarios were developed to analyze water demand with the project and implementation of proposed mitigation measure. The detailed assumptions and data used to develop these scenarios are presented in Appendix G.

Wet Year, RWP Phase II, Without and With Project (Scenarios 3A and 3C). Scenario 3A is the same as the Scenario 1A described above, except that the Phase II improvements are assumed to be operational and the Proposed Project is excluded. Scenario 3C is the same as Scenario 3A except that project demand has been added.

Average Year, RWP Phase II Without and With Project (Scenarios 3B and 3D). Scenario 3B is the same as the Scenario 1B described above, except that the Phase II improvements are assumed to be operational. Scenario 3D is the same as Scenario 3B except that project demand has been added.

Dry Year, Phase II RWP Without and With Project (Scenarios 4A and 4B). Scenario 4A scenario is the same as Scenario 2 described above, except that the Phase II improvements are assumed to be operational. Scenario 4B is the same as Scenario 4A except that project demand has been added.

Very Dry Year, RWP Phase II Without and With Project (Scenarios 6A and 6B). Scenario 6A is the same as Scenario 5 described above, except that the Phase II improvements are assumed to be operational and the Proposed Project is excluded. Scenario 6B is the same as Scenario 6A except that project demand has been added.

Results of the analysis are summarized in Table P1-6.

Table P1-6 Project Water Use with Recycled Water Project Phase II (AFY)

Element	Total Water Use	Recycled	Potable
Wet Year			
a. Existing Del Monte Forest Irrigation Use	747	602	144
b. Project Direct Potable Water Use	86	0	86
c. RWP Phase II Improvement Investor Potable Use	166	0	166
d. Existing Plus Project Irrigation with Phase II	892	892	0
e. Total Use with Phase II (b+c+d)	1144	892	253
f. Change Compared to Existing (e – a)	*398*	*289*	***109***
Average Year			
a. Existing Del Monte Forest Irrigation Use	1007	689	318
b. Project Direct Potable Water Use	91	0	91
c. RWP Phase II Improvement Investor Potable Use	175	0	175
d. Existing Plus Project Irrigation with Phase II	1190	1190	0
e. Total Use with Phase II (b+c+d)	1456	1190	266
f. Change Compared to Existing (e – a)	*448*	*501*	***-52***
Dry Year			
a. Existing Del Monte Forest Irrigation Use	1109	782	327
b. Project Direct Potable Water Use	96	0	96
c. RWP Phase II Improvement Investor Potable Use	184	0	184
d. Existing Plus Project Irrigation with Phase II	1315	1315	0
e. Total Use with Phase II (b+c+d)	1594	1315	279
f. Change Compared to Existing (e – a)	*486*	*533*	***-48***
Very Dry Year			
a. Existing Del Monte Forest Irrigation Use	1330	933	398
b. Project Direct Potable Water Use	100	0	100
c. RWP Phase II Improvement Investor Potable Use	193	0	193
d. Existing Plus Project Irrigation with Phase II	1609	1473	136
e. Total Use with Phase II (b+c+d)	1902	1473	429
f. Change Compared to Existing (e – a)	*572*	*540*	***31***

Details and assumptions in Appendix G

The changes in estimated withdrawals with the project demand, Phase II Improvements, and the Phase II investor demand are shown in comparison to correlating Carmel River and Seaside Basin withdrawals in Table P1-7, which shows an increase in withdrawals relative to baseline for wet years, a reduction in withdrawals in average and dry years, and a small increase in withdrawals in very dry years.

Table P1-7 Project Change in Withdrawals from the Carmel River and Seaside Basin with Phase II Mitigation (AFY)

	Total Water Demand	Carmel River	Seaside Basin
	Wet Year		
Baseline (1)	*13,810*	*10,095*	*3,715*
Project Demand with Phase II*	109	81	27
	Average Year		
Baseline (2)	*16,068*	*11,378*	*4,690*
Project Demand with Phase II*	-52	-39	-13
	Dry Year		
Baseline (3)	*18,335*	*12,847*	*5,488*
Project Demand with Phase II*	-48	-36	-12
	Very Dry Year		
Baseline (3)	*18,335*	*12,847*	*5,488*
Project Demand with Phase II*	31	23	8
Assumed % for apportioning project demand		75%	25%

(1) Cal-Am Carmel River Withdrawals Water Years 1995 and 1998; All Seaside Coastal Subarea withdrawals Reporting Years 1995 and 1998

(2) Cal-Am Carmel River Withdrawals Water Years 1995 – 2003 excluding 1995 and 1998; All Seaside Coastal Subarea withdrawals Reporting Years 1996, 1997, 1999 – 2001, Water Years 2002 and 2003

(3) Cal-Am Carmel River Withdrawals Water Year 1997; All Seaside Coastal Subarea withdrawals for Reporting Year 1997.

*Includes demand of Phase II investors.

Details, Data, and Assumptions in Appendix G

In wet years with Phase II, the project combined with Phase II investor residential use could still contribute to a net increase in withdrawals relative to baseline withdrawals of about 109 AF. During the wetter portion of a wet year (November – May) supplies are usually adequate to serve existing demand, the project/residential growth-related increases would be nominal, and unlikely to adversely affect existing supplies or result in constraints on operations. However, the additional withdrawal of water during the summer (June – October) portion of wet years could still result in adverse biological effects, particularly to steelhead (see separate discussion below). As described in Appendix G, the estimated project increased withdrawals from the Carmel River between June and October would be about 30 AF under wet year conditions. Additional mitigation is proposed below to address this impact and offset this amount.

In average and dry conditions, the RWP Phase II mitigation will result in a net decrease in withdrawals from the Carmel River and/or the Seaside Basin. No potable water would be needed for project irrigation in these conditions.

Under very dry conditions, the project demand combined with potential future residential use by Phase II investors would result in a net increase (31 AF) in potable water use relative to baseline. Based on the very dry scenario without the project, existing user demand can be met by the RWP with the Phase II Improvements without using potable water for irrigation. With the project, there would be a shortfall in recycled water supply of about 136 AF due to the additional irrigation demands of the Proposed Golf Course, the Spanish Bay Driving Range, and the New Equestrian Center, which would need to be met by potable water. However, compared to existing conditions without the Phase II improvements, the project demand combined with potential Phase II investor residential use would result in a net increase of potable use of only 31 AF in a very dry year. Given that the assumptions used for this scenario presume a level of water use by existing golf courses about 13% above the highest water use recorded recently for these golf courses, use levels by the Proposed Golf Course at the upper end for golf courses in the Del Monte Forest, and do not account for any conservation savings on the part of project or Phase II investor residential users, it is possible that the scenario may overstate the potential combined demand in a very dry year.

While the project with Phase II would result in an average reduction in withdrawals, a potential for increased withdrawals of water during the drier months of a wet year or during very dry conditions would still be considered a significant water supply impact (as well as a significant biological resource impact related to the Carmel River). Further, if all of the project and Phase II investor total demand of 429 AF during very dry conditions were met by withdrawals from the Carmel River, provision of any amount above 355 AF could contribute to an exceedance of production limits in Order WR 95-10. Any provision of more than 355 AF in a year in which withdrawals for other users exceeds 11,285 AF would be beyond the discretionary exemption that SWRCB has allowed related to the applicant's entitlement.

In order to avoid any net increase in withdrawals from the Carmel River and/or Seaside Basin, related impacts or contribution to a violation of SCWRCB order WR 95-10, and related impacts to Carmel River biological resources, the following additional mitigation measures are required to mitigate project effects to a less than significant level.

Mitigation Measure PSU-D2. Potable water shall not be used to meet irrigation demand of the Proposed Golf Course, the Spanish Bay Driving

Range, or the New Equestrian Center. Under wet, average, and dry conditions, the RWP with Phase II improvements will have sufficient capacity and storage to meet the irrigation demand of existing users and the Proposed Project. However, under very dry conditions, even with the RWP Phase II Improvements, there would be a shortfall of an estimated 136 AF for irrigation of Del Monte Forest golf courses and other irrigated areas using water from the RWP. MPWMD Ordinance No. 109 restricts Del Monte Forest users of water from the RWP from using potable water for irrigation except in the event of an interruption of service at the RWP or its distribution facilities. The practical consequence of the restrictions in the ordinance and this mitigation measure is that the users of water from the RWP, including the applicant, will be forced to conserve water, close some of their facilities, and/or prioritize their irrigation demands to maximize efficient use of the limited amount of recycled water under very dry conditions.

As noted above, the net increase in potable use with the RWP Phase II under very dry conditions would be about 31 AF. This measure would lower potable use by about 136 AF. Thus, implementation of this measure and the RWP Phase II would actually result in a net decrease in potable use of about 102 AF relative to baseline conditions (e.g., very dry conditions without project and without Phase II).

Mitigation Measure PSU-D3.The applicant shall either fund the provision of 30 AF of tertiary treated water to Carmel Lagoon or reduce consumption of potable water by an additional 41 AF to offset increased withdrawals from the Carmel River between June and October of wet years. With implementation of Measures PSU-D1 and PSU-D2, the mitigated project would decrease Carmel River withdrawals under average, dry, and very dry conditions. However, these measures will not offset a net increase in withdrawals between June and October of a wet year. As discussed below under the description of impacts to Carmel River biological resources, such dry season withdrawals during a wet year are still considered a significant impact. This mitigation measure would require the applicant to either fund the assessment, CEQA evaluation, permitting, and provision of sufficient tertiary treated water to offset the project-related increases in Carmel River withdrawals between June and October of a wet year or to provide for the conservation of an additional 41 AF to offset the impact under these conditions.

For the purposes of this measure, a “wet year” shall be defined based on a water year in which annual rainfall exceeds the 50-year average by more than 25%. This mitigation measure must be implemented between June and October, and decisions about when mitigation is warranted must be made by the end of May. Thus, the trigger for this mitigation will be when water year rainfall between October and May is more than 25% of the 50-year average for these months. The 50-year annual average for the Monterey Peninsula for these months is about 19 inches and thus this mitigation would be required in any water year in which rainfall for these months exceeds 24 inches by May 31.

Tertiary Treated Water Option. The potential use of tertiary treated water to supplement water levels in the Carmel River Lagoon has been discussed by the

CAWD, the Monterey Peninsula Regional Park District, the California Coastal Conservancy, the California Department of Parks and Recreation, CDFG, USFWS, and other interested agencies and parties. However there is no current approved plan or permits to use treated water for the benefit of Carmel Lagoon resources.

The Carmel River Lagoon Enhancement and Management Plan Conceptual Design Report (PWA 1999) noted that the use of treated wastewater could enable a wide range of habitat types to be created or restored and could increase the probability of success of the restoration project that is now (2004) underway. Treated water could be released into the river or lagoon to increase water depths and reduce the effects of salinity stratification, primarily for the benefit of steelhead. Treated water could also be released to support riparian vegetation in and along the lagoon.

During wetter years, the CAWD with the Phase II Improvements will have excess capacity and storage beyond the demand of Del Monte Forest recycled water users including the Proposed Project. As noted in Appendix G, during the wet year scenario evaluated, there would still be more than 350 AF in Forest Lake Reservoir at the end of August. Thus, there would be ample availability to provide up to 30 AF to Carmel Lagoon without any effect on Del Monte Forest irrigation.

The lead agency for this potential use of tertiary treated water would likely be CAWD. The responsible agencies with probably permitting authority include SWRCB, Central Coast RWQCB, Monterey County Environmental Health, State Department of Parks and Recreation, CDFG, the USFWS, and NOAA Fisheries. Because the feasibility of discharge of tertiary treated water has not been evaluated, if this option is the adopted mitigation for this impact, the applicant shall be required to fund a feasibility assessment including working with permitting agencies to determine if this can be permitted. If determined feasible, the applicant shall fund the CEQA evaluation and the permitting.

Construction of supporting infrastructure (pipes, etc.) and discharge of tertiary treated water into Carmel Lagoon (or the Carmel River) could result in construction period effects on biological resources, air quality, noise, and traffic and operational effects on water quality, nearby groundwater wells used for drinking water, water-contact recreation in the lagoon or the river, as well as other potential environmental effects. In particular, the water quality effects of using tertiary treated water will require detailed evaluation to identify whether residual elements within the treated water would significantly affect water quality within the lagoon or river, biological resources, or users of water within the lagoon or river. The CEQA evaluation will need to evaluate all potential environmental effects and adopt feasible mitigation for any identified significant impacts. If approved and permitted, the applicant shall fund any necessary infrastructure improvements and the operational costs of providing up to 30 AF

The annual discharge of tertiary treated water or discharges under other conditions is outside the obligation of the applicant under this mitigation as would any evaluation of use of secondary treated water.

Because the feasibility and permitting of use of tertiary treated water in Carmel Lagoon remains to be completed, if this mitigation is an adopted mitigation for this project, but is later determined to be infeasible, unapprovable without significant unavoidable impacts, or unpermittable, then the applicant shall instead be responsible to provide additional conservation as described below.

Additional Conservation Option. If this option is an adopted mitigation for this impact, the applicant shall be responsible to provide an additional 41 AF of conservation of potable water to offset the project's increased withdrawal from the Carmel River between June and October of a wet year as described below. The 41 AF is the estimated total increase of project demand between June and October. Since Cal-Am uses both the Carmel River aquifer and the Seaside aquifer to provide water to the Del Monte Forest, the project would need to reduce demand by 41 AF to ensure a reduction of 30 AF in withdrawal from the Carmel River. This conservation shall be above and beyond any standard water permit conservation requirements of MPWMD for project development and any existing conservation measures.

Potential conservation measures could include installation of water saving devices such as low-flow shower heads and ultra low-flow toilets, use of drip irrigation to reduce extensive irrigation currently using potable water, provision of tertiary treated water to other users located adjacent to existed treated water lines to replace irrigation using potable water, temporary suspension of potable water using activities (such as swimming pools), or other measures.

The applicant shall submit a conservation proposal to Monterey County demonstrating a water savings of 41 AF under wet year conditions between June and October prior to issuance of any grading permit for the project. The County shall consult with the MPWMD to verify that the proposal will result in the required water savings. Once approved, the additional conservation measures shall be required to be implemented in each wet year. The applicant shall submit an annual report documenting the implementation of these measures in a wet year.

Infrastructure Capacities

Impact PSU-E1: The project will increase demand for recycled water for irrigation and may result in an increased demand for potable water resulting in the need for improvement to either recycled water distribution and/or potable water distribution facilities. This is a significant impact that can be mitigated to a less-than-significant level.

PBCSD has identified that during the peak usage summer months, the existing system for delivering potable water from Cal-Am distribution system to the recycled water storage tank can not always meet the existing water use demands and thus that there is insufficient additional capacity to meet the demands of an additional golf course. The insufficiency is related to the lack of adequate pumping capacity to pump sufficient potable water during peak water demand periods to fulfill irrigation demand.

As noted above, the project would increase demand for recycled water from the CAWD/PBCSD RWP. The project may also contribute to increased use of potable water under certain very dry conditions. Capacity of existing recycled water or potable distribution systems may be inadequate to deliver the necessary recycled or potable water for project uses.

This is a significant impact that can be mitigated to a less-than-significant level by implementation of Mitigation Measure PSU-D1 and PSU-D2 described above and the following mitigation:

Mitigation Measure PSU-E1. The applicant shall evaluate the capacity of CAWD/PBCSD distribution infrastructure and/or the Cal-Am distribution infrastructure to deliver recycled water for existing and project irrigation use and potable water needed for irrigation of project areas in the event of a RWP interruption. This mitigation shall be completed prior to irrigation of any areas associated with the Proposed Project. The applicant shall implement the following:

- The applicant shall upgrade the CAWD/PBCSD RWP distribution infrastructure (such as pumps or water lines) if necessary to address existing infrastructure constraints to deliver recycled water from the RWP Phase II to existing users and the Proposed Project.
- The applicant shall upgrade the potable water distribution infrastructure as necessary to supply potable water for irrigation either directly from Cal-Am or via the RWP Phase II to existing users or to the Proposed Golf Course, the Spanish Bay Driving Range, and the New Equestrian Center such that existing infrastructure constraints at the RWP are not exacerbated and potable water can be provided to users in the event of an interruption.

Impact PSU-E2. Increased demand for potable water line capacity. Service providers have identified adequate water and sewer line capacity for the project. This is a less-than-significant impact.

The Proposed Project would increase demand for potable water and sewer capacity. This increase in demand can be met by existing water and sewer lines and treatment facilities (Morgan, pers. comm; Niccum, pers. comm; Beretti, pers. comm). The Proposed Project would add additional lines to existing infrastructure. Impacts on an increased demand for water and sewer capacity are *less-than-significant* and no mitigation is required.

Carmel River Biological Resources

Impact BIO-Carmel River-1: The project will increase withdrawals from the Carmel River resulting in a considerable contribution to cumulative adverse effects to biological resources dependent on the Carmel River including riparian vegetation, steelhead, California red-legged frogs, and other sensitive resources dependent on the river and its aquifer. This is a significant impact that can be mitigated to a less-than-significant level through the mitigation identified for water supply and demand.

As described in the "Environmental Setting" for the Carmel River at the end of this Chapter, existing groundwater pumping (and prior surface diversions) has adversely affected the biological resources found in the Carmel River. Withdrawal of additional water from the Carmel River aquifer to meet project potable water demand (and increased amounts from cumulative demand) would lower the water table, shorten the amount and period of flow, and contribute to ongoing impacts on Carmel River resources.

In wet years, limited increases are less likely to adversely affect biological resources in the Carmel River during the wetter months due to the relative abundance of available water for both withdrawal and to support the river and its resources. Based on the analysis above, the project would result in increased withdrawals of around 168 AFY in a wet year. The wettest year in the last ten years was Water Year 1998 (> 47 inches of rain on the Monterey Peninsula); Carmel River withdrawals totaled around 10,154 AF. In such a wet year, the project would add about 1% to withdrawals. National Marine Fisheries Service (NMFS), in their study of instream flow needs for steelhead, identified that in above normal rainfall years, there could be somewhere between 13,000 and 17,000 AF available for withdrawal on an annual basis without affecting critical flows identified as necessary for steelhead in the Carmel River (NMFS 2002). Thus in wet years, the limited withdrawals associated with the project are not expected to result in adverse effects to Carmel River biological resources on an annual basis.

However, during wetter years, lower flows in the Carmel River can still occur in summer and early fall. Under current conditions (including existing withdrawals), the Carmel River can still go dry in its lower reaches (as it did in early September 1998 during the wettest year in the last 25 years) and surface flow to Carmel Lagoon can cease. NOAA Fisheries has identified that new diversions from the Carmel River should be avoided between June and October of wet years (as well as other years) to avoid further adverse effects on steelhead (NMFS 2002). By contributing to increased diversions during this period, the project could contribute to the river drying earlier affecting river resources and could contribute to lower lagoon levels and reduced water quality in Carmel Lagoon.

Given that existing average year withdrawals from the Carmel River are already in excess of 11,000 AF (and dry and very dry year withdrawals are higher) and have been identified as having adverse effects on river resources, project increases in withdrawals in average, dry, and very dry years are likely to adversely affect Carmel River biological resources as discussed below on an annual basis.

Riparian vegetation – Increased groundwater pumping could lead to local riparian vegetation mortality through stress, lack of access to water and local bank erosion. Species dependent on riparian vegetation would be indirectly affected due to the loss of forage, nesting, and rearing habitat. Bank stability could be lessened with the loss of extant riparian vegetation. Stream temperatures could rise due to a reduction of shade cover affecting steelhead and other aquatic resources sensitive to stream temperature fluctuations.

Steelhead - Existing low-flow conditions in the Carmel River during average, dry, and very dry years would be exacerbated by increased groundwater pumping. Successful migration, spawning, and rearing are dependent on appropriate flow conditions and adequate water quality.

The depletion of the aquifer in the summer by pumping can cause the first fall flows to infiltrate very quickly. This process may delay adult upstream migration or reduce duration of suitable upstream migration periods. Shallow areas within the river channel may present migration barriers to adult steelhead under low flow conditions; pumping has the potential to reduce river flows below critical thresholds for migration at these low points in the stream. Lower flows in average, dry, and very dry years could lower the available spawning areas by drying suitable locations. Juvenile steelhead are routinely stranded and isolated during summer drying of the river, leading to mortality. With increased pumping, drying would occur earlier and more often in rearing areas. In addition, reduction in flow would reduce water quality in terms of further depressed dissolved oxygen levels and increased temperatures affecting juveniles and adults. Elevated temperatures, low dissolved oxygen levels, and lack of flow constrain migration of smolts to the ocean in summer and fall; increased pumping would further limit periods of feasible migration in average, dry, and very dry years. Steelhead rearing habitat and suitable smolt holding areas in Carmel lagoon are also limited by shallower than natural water depths and salinity stratification in summer and fall due to existing withdrawals and this could be exacerbated by increased withdrawals.

CRLF – California red-legged frogs require streams or ponds that hold water for lengthy periods of time (3.5 – 7 months) for successful breeding and maturation of larvae. They utilize the Carmel River and adjacent creeks and ponds that are supported by groundwater connected to the Carmel River aquifer. Increased groundwater pumping in average, dry, and very dry years will lower the water table even further, potentially reducing successful breeding and rearing locations for California red-legged frogs. Loss of riparian vegetation described above would also affect this species, which utilize riparian areas for foraging and dispersal.

Other Resources – Fish and other aquatic resources dependent on adequate flows and water quality would be subject to similar effects described above for steelhead. Special-status birds, raptors and other species could lose breeding and foraging locations in the event of loss of riparian vegetation and areas. Special-status wildlife species, such as southwestern pond turtle, could also see a loss of habitat due to reduction of flow and lowering of water tables, particularly in summer and early fall periods of average, dry, and very dry years.

This is a significant impact that can be mitigated to a less-than-significant level by Mitigation Measures PSU-D1, PSU-D2, and PSU-D3 described above because with their implementation there would be either no net increase of Carmel River withdrawals above baseline or the net increase (in the event of drier months of a wet year) would be offset by use of tertiary treated water to supplement Carmel Lagoon or additional water conservation.

Recycled Water Plant Phase II Improvements

This section examines the direct and indirect impacts of RWP Phase II Improvements. RWP Phase II is not directly part of the Proposed Project, but would be required as mitigation for project impacts. Monterey County is not the lead CEQA agency for RWP Phase II. PBCSD has already completed the CEQA process for the Forest Lake Reservoir Improvements. CAWD will be the lead CEQA agency for the Salinity Management Project since they will be within the existing Carmel Area Wastewater District Wastewater Treatment Plant. This section is intended to disclose the secondary impacts of requiring the Phase II mitigation as a condition of approval for the Proposed Project analyzed in this document (e.g. the Pebble Beach Company's Del Monte Forest Preservation and Development Plan). Based on the analysis presented below, all identified significant impacts of RWP Phase II can be mitigated to a less than significant level by the previously adopted and recommended mitigations (or their equivalent). Thus, requiring Phase II as mitigation for the Proposed Project would not result in any secondary significant physical impacts.

The impact discussion and mitigation measures listed below are paraphrased from the February 1996 *Final Expanded Initial Study for Phase II – CAWD/PBCSD Wastewater Reclamation Project* (PBCSD 1996a) the May 2001 *Addendum to the Expanded Initial Study for Phase II – CAWD/PBCSD Wastewater Reclamation Project* (PBCSD 2001a), and the July 2004 *Preliminary Environmental Analysis of the Phase II Salinity Management Project* (CAWD 2004). The impact discussion is based on these documents which are included in Appendix K (on the CDROM version), can be found on the project website, and are available for review at the Monterey County Planning & Building Inspection Department offices in Marina.

This section analyzes the physical impacts of construction and implementing RWP Phase II. Growth inducement effects related to potential Phase II financing by sale and conveyance of a portion of the applicant's water entitlement are discussed separately in Chapter P6, "Growth Inducement."

Impact: RWP Phase II-1. Construction and operation of the RWP Phase II could result in potentially significant impacts to geology, seismicity, and

soils; biological resources; hydrology and water quality; transportation and circulation; air quality; noise; and cultural resources. With implementation by PBCSD of the previously adopted mitigation measures for the Forest Lake Reservoir Improvements and the adoption by CAWD of the recommended mitigation measures described below (or equivalent measures) for the SMP Improvements, the physical effects of Phase II can be mitigated to a less-than-significant level.

Land Use

Neither the PBCSD Forest Lake Reservoir Improvements nor the CAWD SMP would have any impact on land use, including land use compatibility or plan/policy consistency. RWP Phase II represents improvements and expansion to existing recycled water infrastructure and facilities that are appropriate for their locations and designated uses

Geology, Seismicity, and Soils

Retrofit of the Forest Lake Reservoir embankments is necessary because the California Department of Water Resources, Division of Safety of Dams (DSOD) has determined that they may be unstable if saturated during a seismic event. Both retrofit of the embankments and construction of a new emergency outflow structure would strengthen the facility and reduce the potential for failure during an earthquake. Additionally, implementation of drainage and erosion control measures as part of the National Pollution Discharge Elimination System (NPDES) permit would be included as part of the project plans and specifications at all construction sites. The design of Forest Lake Reservoir Improvements would minimize risks associated with geology, seismicity, or soils impacts to a less than significant level. No additional mitigation has been proposed by PBCSD for the Forest Lake Reservoir.

Construction of new SMP structures could result in potential structural damage and associated human safety hazards resulting from groundshaking, fault rupture, and/or liquefaction during seismic events. Ground disturbing activities could result in erosion, loss of exposed soils, and/or sedimentation of local drainage bodies. Construction in areas of expansive soils, unconsolidated fill, and/or shallow groundwater could result to damage to new structures.

CAWD has identified that the potentially significant impacts of the SMP can be mitigated to less-than-significant levels by the following mitigation measures:

> **Recommended CAWD SMP Mitigation Measures GSS-C1-1, C1-2, D1, D2, and D3:** Implement an Erosion and Sediment Control Plan, additional erosion control measure, and requirements of the California Building Code in relation to expansive soils. Dewater excavations and shore temporary cuts during construction. Implement Requirements of the California Building Code in relation to unconsolidated fill.

Biological Resources

In general, direct impacts are anticipated to be limited on the RWP Phase II sites for sensitive wildlife and vegetation resources due to the disturbed nature of the sites.

Improvements to Forest Lake Reservoir itself would not involve the removal of any native trees or vegetation as the interior of the reservoir is mostly devoid of vegetation and adequate ingress and egress are present. Associated pipeline segments, the Forest Lake Treatment facility, and the Sawmill gulch outlet structure would require removal of a limited numbers of mature native trees (~22 Monterey pines > 6 diameter-breast height (dbh) and one coast live oak > 6 inches dbh). The IS/MND in the Forest Lake project sites prepared by PBCSD does not identify removal of special-status plant species except Monterey pine and potentially a few unspecified manzanita (*Arctostaphylos spp.)*.

The Sawmill Gulch emergency outlet structure is located within an Environmentally Sensitive Habitat Area (ESHA) as delineated by the Del Monte Forest Land Use Plan (Monterey County 1987). Sawmill Gulch and its associated riparian area is a designated ESHA. However, the proposed location of the pipeline extension, discharge outlet and energy dissipator is a disturbed area along Sawmill Gulch, dominated by invasive species. Construction will require removal of about 6 Monterey pines and extant shrubs within a 30-40 foot construction zone about 125 feet long, but has been designed to avoid removal of other native trees and emergent vegetation. Upon completion of the emergency outlet structure, disturbed channel slopes above the dissipater and riprap would be revegetated with riparian and native upland species.

Removal of trees and vegetation at the Forest Lake Reservoir site would require implementation of a Forest Management Plan (FMP) to ensure limited removal for construction activities only. Native trees would be planted at each site to compensate for tree removal. Existing mature trees not designated for removal would be protected during construction by fencing.

The CAWD SMP site itself is disturbed and contains paved and turf grass areas. The project site is located near riparian, landscaped, and natural tree areas that may contain nests for special status wildlife. Raptor species with potential to occur (at least for foraging) within the project site include, but are not limited to, red-tailed hawk and red-shoulder hawk. Therefore, construction and operation at the site could potentially result in indirect impacts to these resources.

PBCSD and CAWD have identified that the potentially significant impacts of RWP Phase II could be mitigated to less-than-significant levels by the following mitigation measures:

> **Adopted PBCSD Forest Lake Reservoir Mitigation Measures No. BR-1 through 6 :** Prepare an FMP, identify specific trees to be removed or protected, provide temporary protective fencing prior to grading, propagate native trees and shrubs, utilize native grass seed mix, irrigate landscaped areas and keep them free of weeds.

Recommended CAWD SMP Mitigation Measures BIO-1 and BIO-2: Use low-level lighting; retain existing drainage patterns; protect existing vegetation during construction, use weed-free straw, revegetate disturbed areas using native species; use erosion control techniques; design irrigation to minimize runoff into adjacent areas; provide oil/grease and silt traps at storm drain outfalls to intercept residue and debris from vehicle areas; mechanically sweep paved roads and parking areas once prior to rainy season; and conduct pre-construction surveys for nesting species.

Hydrology and Water Quality

Contamination of water supply through accidental cross connections, leaks, spills, or use of recycled water could pose risks to public health; however, compliance with requirements of California Code of Regulation Title 22 for the distribution and use of recycled water would ensure that these potential risks to public health remain at less-than-significant levels.

RWP Phase II improvements at Forest Lake Reservoir would result in increased stormwater runoff due to an increase in impervious surfaces and topographic alternations. The Forest Lake Reservoir Improvements would also include grading, paving, and use of fuels and construction materials that could result in sedimentation or other contamination of stormwater runoff. Streams, ephemeral drainages, and nearby sensitive marine resources could potentially be impacted by degradation of surface and groundwater quality from construction activities. Implementation of an Erosion Control Plan (ECP) will prevent runoff from leaving construction sites. Implementation of a Stormwater Pollution Prevention Plan (SWPPP) will further minimize erosion and sedimentation, as well as proper handling of fuels, oils, lubricants, and other hazardous materials.

Sawmill Gulch provides for conveyance of stormwater, some floodwater retention, and pollutant assimilation. The new Sawmill Gulch emergency outlet structure would enable high flow emergency release of water stored in Forest Lake Reservoir. The undeveloped upper drainage is deeply incised, with a deep low flow channel and steep sidehill slopes that can accommodate this release. Sawmill Gulch has a reduced cross-sectional area and channel slope where it crosses Fairways 8 and 9 of the Monterey Peninsula Country Club golf course. Five golf cart/footpath bridges in this area are low or have small diameter drainage pipes. Flooding of these fairways during large storm events is a pre-existing condition; therefore, PBCSD determined that comparable flooding due to emergency release at the reservoir does not pose a significant new risk.

PBCSD determined that with the project controls (ECP, SWPPP, and design), the Forest Lake Reservoir Improvements would not result in significant impacts to hydrology and water quality.

The CAWD treatment plant site is within the 100-year floodplain of the Carmel River under existing channel and bank conditions. The 100-year flood elevation at the site is 20 feet. High flow velocities and dangerous movement of debris occur in the floodway, which could result in damage to CAWD treatment plant facilities following RWP Phase II.

Reject water from the RO units of the SMP will be discharged via an existing ocean outfall into Carmel Bay Area of Special Biological Significance (ASBS). The concentration of salts, expressed as total dissolved solids (TDS), in the reject water is expected to have an average value of 3,200 mg/L, which is about four times the average TDS concentration in the microfiltered secondary effluent. The TDS level in the Pacific Ocean is approximately 10 times greater than the expected reject water. The reject water will also contain other constituents and the concentration of these cannot exceed the concentration levels set in the California Ocean Plan as detail in CAWD's existing NPDES permit. CAWD's permit (Waste Discharge Requirements (WDRs)) Order No. R3-2002-0126) is available for review at the CAWD offices at 2945 Rio Road in Carmel.

Based on pilot testing in December 2003, it appears the SMP reject water will not exceed Ocean Plan limits. If further dilution modeling conducted during project design demonstrates that all parameters included for compliance in the NPDES permit are below the established limits and any other discharge changes also meet the WDRs, there would be a less than significant impact on marine water quality and marine biological resources. If modeling during design does not demonstrate this, redesign will be necessary. If no feasible redesign is possible, then subsequent CEQA analysis in the form of an EIR would be necessary to disclose a significant unavoidable impact; however at the conceptual design phase, CAWD does not consider this to appear to be a significant impact,

CAWD has identified that the potentially significant impacts of the SMP can be mitigated to less-than-significant levels by the following mitigation measures:

> **Recommended CAWD SMP Mitigation Measures No. GSS-C1-1, GSS-C1-2, HWQ-1, HWQ-B1-1, HWQ-B1-2, HWQ-C6:** Implement an Erosion and Sediment Control Plan and additional erosion control measures. Design SMP Improvements to withstand a 100-year flood and to be in accordance with County of Monterey floodplain and flood hazard regulations. Assess downstream stormwater infrastructure and implement necessary drainage improvements. Prepare and implement a final drainage plan. Obtain NPDES permit for general construction activity, if necessary.

Public Services and Utilities

The Forest Lake Reservoir and SMP Improvements would not result in a direct demand for increased fire and police services, wastewater treatment, school enrollments, recreational areas or open space nor would change emergency access, increase wildland fire hazard, or have adverse effects on infrastructure capacities.

Construction of Forest Lake Reservoir improvements would result in a positive impact to fire services from the provision of strategically located supply of emergency back-up water. The reservoir provides a readily available source of water for helicopter bucket carriers engaged in wildland fire suppression. Construction of Forest Lake Reservoir improvements could affect existing utilities; however routine construction utility locates and notification would be conducted to minimize any potential disruption.

Construction of RWP Phase II would not result in an increased potable water demand. Potable and recycled water demands with the project and RWP Phase II were discussed above in the analysis of project water supply and demand.

Although sludge is generated by existing tertiary facilities at the CAWD WWTP, the new SMP system will not increase and may actually decrease the sludge produced due to elimination of use of coagulating polymers, thus averting any increase in solid waste disposal demand. There will be no off-site construction and thus no potential to disrupt other utility lines.

Based on the factors noted above, the CAWD and PBCSD have identified that the RWP Phase II Improvements would not result in significant effects on public services and utilities.

Aesthetics

Modifications at the Forest Lake Reservoir will improve aesthetics for nearby receptors by allowing a nearly full lake level (compared to existing empty facility). Treatment of the reservoir with copper sulfate and return flow from the treatment facility would prevent the accumulation of algae at levels that would be unsightly or cause objectionable odors. Emergency nighttime lighting would be provided at the reservoir and treatment plant facilities, but would be shielded to avoid light and glare. Any aboveground outlet structures and appurtenances for recycled water distribution would be painted in dull, non-reflective neutral colors, housed in wood fencing, and/or screened by natural vegetation to avoid light and glare. PBCSD determined that the design of Forest Lake Reservoir improvements and project controls would limit any aesthetic impacts to a less than significant level.

Due its location within the existing WWTP, compatibility with existing structures, and limited exposure to off-site viewing, the CAWD identified that the SMP would have a less than significant impact on aesthetics, including scenic vistas and corridors, visual character of buildings, and light and glare.

Transportation and Circulation

Construction of RWP Phase II would result in temporary impacts to transportation and circulation systems due to construction material delivery, hauling of construction debris, and construction worker trips. A substantial amount of long-duration construction activity would occur at the PBCSD Forest Lake Reservoir, particularly trucks hauling excavated material and concrete to and from the reservoir. Truck traffic for the reservoir would be routed to Lopez

Road through a temporary construction access road to minimize traffic impacts on residential neighborhoods. Truck traffic related to the SMP would occur over the nine-month construction period up to a peak of ten truck trips and 20 employee trips on a worst-case day and could affect traffic flow on adjacent streets and intersection operations.

CAWD and PBCSD have identified that the potentially significant impacts of RWP Phase II can be mitigated to less-than-significant levels by the following mitigation measures:

Adopted PBCSD Forest Lake Reservoir Mitigation Measures No. T-1 through T-12: Limit hours of construction activities. Limit amount of excavated trench in roadway. Post feasible detours or alternative routes. Maintain at least one travel lane. Maintain access to commercial and private driveways. Notify businesses and residents when driveways will be blocked. Repave excavation areas. Notify police, fire, ambulance, and transit of street closures. Limit truck trips. Provide warning and direction to traffic. Construct temporary construction site access road. Limit trucks to predetermined routes.

Recommended CAWD SMP Mitigation Measures No. TC-1, TC-G1(C), TC-G1-2, and TC-G1-3: Design construction plans and schedule to minimize the amount of construction traffic overall, reduce construction traffic, and avoid construction vehicle trips during peak traffic volume periods. Coordinate construction traffic movements. Implement traffic control measures. Use approved construction truck traffic routes.

Air Quality

Excavation and grading activities required to reinforce the Forest Lake Reservoir embankment has the potential to result in additional air quality impacts, primarily generation of dust. Dust emissions, in the form of PM_{10} particulate matter, contribute to the North Central Coast Air Basin's excess of California Ambient Air Quality Standards (CAAQS).

The CAWD SMP would have less than significant impacts on air quality, including plan consistency, long-term emissions, construction emissions, and sensitive receptors.

PBCSD had identified that the potentially significant impacts of the Forest Lake Reservoir Phase II Improvements can be mitigated to less-than-significant levels by the following mitigation measures:

Adopted PBCSD Forest Lake Reservoir Mitigation Measures No. AQ-1 through AQ-9: Water all exposed soils. Minimize active earthwork. Water stockpiled excavated material. Use soil binders or surfactant. Install underdrain piping, Miradrain drain blanket, and hypalon liner. Wash wheels of haul trucks. Report dust complaints to MBUAQMD. Limit operation hours and truck speeds. Do not remove air emission controls. Minimize equipment idling.

Noise

Construction of RWP Phase II would cause short-term noise increases, including short-term impacts to sensitive receptors such as nearby residences. Excavation and grading activities required to reinforce the Forest Lake Reservoir embankment has the potential to result in additional construction noise impacts. The projects will comply with the Monterey County noise ordinance, which includes limiting construction noise to 85 dB at 50 feet.

The PBCSD identified project controls for Forest Lake Reservoir improvements including limiting construction to weekdays between 8:00 am and 5:00 pm, and compliance with County and state noise standards, including use of equipment mufflers. Operational pumps would be in below ground vaults, which would limit noise outside the vault. PBCSD determined that these controls would limit any noise impacts to less than significant.

CAWD has identified that the potentially significant impacts of the SMP can be mitigated to less-than-significant levels by the following mitigation measures:

> **Recommended CAWD SMP Mitigation Measures NOISE-B1-1 through B1-8:** Limit hours of construction activities. Locate equipment far from noise-sensitive receptors. Sound-control devices on combustion-powered equipment. Shield/shroud any impact tools. Shut off machinery when not in use. Use shortest practicable traveling routes. Implement a complaint response/tracking program. Implement additional mitigation measures.

Cultural Resources

Based on review of cultural resources reconnaissance surveys, previous environmental review of the sites, and the disturbed nature of the sites, there is very little potential for discovery of cultural resources at RWP Phase II sites. However, grading and excavation activities could result in disturbance of previously undiscovered archaeological resources or human remains.

CAWD and PBCSD have identified that the potentially significant impacts of RWP Phase II can be mitigated to less-than-significant levels by the following mitigation measures:

> **Adopted PBCSD Forest Lake Reservoir Mitigation Measures No. CR-1 and CR-2:** Conduct archeological monitoring and preliminary archeological testing. Stop work if archeological resources or buried remains are encountered.

Recommended CAWD SMP Mitigation No. CR-B1 and CR-C1: Stop work if buried cultural deposits are encountered. Stop work if human remains are encountered.

Hazardous Materials

All hazardous materials potentially used during construction and operation of RWP Phase II would be subject to the materials management practices contained in the SWPPP for the construction project and the facility, including provisions for the proper handling, storage, use, and disposal of these materials.

Potentially hazardous materials used at the Forest Lake Treatment Facility or the SMP would be subject to the Hazardous Material Management Plan (HMMP) requirements pursuant AB 2185. Existing hazardous waste management and safety plans that comply with County, the Occupational Health and Safety Administration (OSHA), and U.S. Environmental Protection Agency (USEPA) requirements may have to be updated for new uses.

The project sites are not located on a list of hazardous materials sites pursuant to Government Code Section 65962.5.

RWP Phase II are also subject to the same NPDES permit requirements as the existing RWP, which regulates uses of recycled water to minimize potential public health risks.

Due to the facilities proposed limited use of hazardous materials and the requirements of local, state, and federal agencies, upset and accident conditions involving release of hazardous materials into the environment is considered a less-than-significant impact by CAWD and PBCSD.

Summary Assessment of Potential Phase II Improvement Impacts

As summarized above, the construction of these improvements could result in certain impacts that can be mitigated by the adopted and recommended mitigation measures (or their equivalent). The following mitigation is recommended to ensure the implementation of these mitigation measures:

Mitigation Measure RWP-1: The applicant shall provide adequate funding to ensure that the RWP Phase II Improvements are constructed in accord with mitigation measures adopted by the PBCSD for the Forest Lake Reservoir improvements and those to be adopted by the Carmel Area Wastewater District for the SMP Project. Funding for RWP Phase II provided within Mitigation Measure PSU-D1 shall be sufficient to insure that mitigation measures are implemented. The Forest Lake Reservoir mitigations will be those outlined within the February 1996 Final Expanded Initial Study, Phase II – CAWD/PBCSD Wastewater Reclamation Project, dated February 23, 1996, the Negative Declaration adopted in PBCSD Resolution No. 96-04 adopted February 23, 1996, the Addendum to Expanded Initial Study, Phase II – CAWD/PBCSD Wastewater Reclamation Project, dated May 2001 and the Notice of Determination adopted by PBCSD Resolution No. 01-21 adopted July 21, 2001. The SMP mitigations shall be equivalent or environmentally superior to those identified in the July 2004 “Preliminary Environmental Analysis of the Phase II Salinity Management Project.”

Environmental Setting

Water Supply and Distribution

This setting describes the existing water supply sources, the history of the applicant’s water entitlement, and the operational history of the CAWD/PBCSD RWP.

Water Supply Sources

Water supply and distribution for the Proposed Project area is managed by the MPWMD and supplied by Cal-Am. sources that supply Cal-Am water, including Carmel River surface water, wells in the Carmel Valley alluvial aquifer, and the Seaside Basin Coastal Subareas (Monterey County 1995).

Cal-Am Production History

Table P1-8 and Figure P1-6 shows the history of water production by source by Cal-Am and its predecessor companies.

Carmel River

The water supply setting for the Carmel River presented below is based on the baseline conditions described in the *Monterey Peninsula Long Term Water Supply Contingency Plan, Component Screening Report (Plan B)* (CPUC 2000).

Hydrologic Setting

The Carmel River originates in the Ventana Wilderness at an elevation of approximately 5,000 feet and flows northwest for 35 miles before reaching the ocean at Carmel Bay. The Carmel River Basin is comprised of the main stem of the Carmel River plus seven major tributaries and drains an area of approximately 250 square miles (see Figure P1-7).

Table P1-8 Historic Water Withdrawals from the Carmel River and Seaside Coastal Subareas

Water Year	Seaside Coastal Subareas Ground Water	Carmel River Basin Ground Water	Carmel River Basin Surface Water	Total
Water Years 1916-2002				
Mean	1,373	2,695	5,345	9,414
Median	663	823	5,196	9,132
Minimum	0	0	98	507
Maximum	4,700	11,092	9,831	18,117
Water Years 1916-1965				
Mean	135	216	5,056	5,407
Median	0	0	4,993	4,993
Minimum	0	0	507	507
Maximum	972	2,444	9,831	12,116
Water Years 1966-1995				
Mean	2,859	5,178	6,737	14,774
Median	2,790	5,036	7,514	15,186
Minimum	1,221	931	2,118	8,528
Maximum	4,700	10,245	9,546	18,117
Water Years 1996-2002				
Mean	3,851	9,763	1,451	15,065
Median	3,910	9,688	1,385	14,589
Minimum	3,444	8,174	98	14,064
Maximum	4,319	11,092	3,527	16,872

Note: Production values for post -WY 1998 are recorded values and do not include reductions for water produced from Carmel River Basin for injection into Seaside Groundwater Basin.

Sources:
(1) Seaside basin production values for the 1955-1978 period were taken from 1997 report prepared by Fugro West, Inc. entitled Hydrogeologic Assessment, Seaside Coastal Groundwater Subareas, Phase III Update, Monterey County, California.

(2) Seaside basin production values for the 1979-2002 period were compiled by the Monterey Peninsula Water Management District from monthly production reports submitted by the California-American Water Company (Cal-Am), Monterey Division.

(3) Carmel River basin production values for the 1916-1978 period were taken from Cal-Am's Exhibit 90 from the 1992 State Water Resources Control Board hearings regarding Cal-Am's diversions from the Carmel River system.

(4) Carmel River basin production values for the 1978-2002 period were compiled by the Monterey Peninsula Water Management District from monthly production reports submitted by the Cal-Am's Monterey Division.

Flows in the river rise rapidly in response to significant rainfall and fall quickly after rains cease. Flows can peak in a matter of hours after rainfall begins, and very high flows seldom persist longer than three days.

The climate of the Carmel River Basin is generally mild, with warm, dry summers and cool, wet winters. More than 90% of the annual rainfall occurs over the watershed during the six-month period between November and April. The first significant rains of the season typically begin in November, but significant changes in instream flow resulting from these rains normally do not occur until December or January. Fall rains replenish soils that have dried out during the summer; consequently little run off occurs during this period.

The principal water-bearing geologic formation in the Carmel Valley is younger alluvium that has been deposited by the Carmel River over the last 10,000 years. The Carmel Valley aquifer is unconfined (there are no impermeable barriers between the groundwater surface and the atmosphere) and is highly permeable (laterally and vertically), recharging rapidly after extended dry periods. The aquifer is under the direct influence of the Carmel River.

Prior to development, heavy winter rains recharged the Carmel Valley aquifer. In the subsequent dry seasons, for most years, return flow from the aquifers fed the river to maintain flows throughout the year. Because of heavy reliance on the Carmel Valley aquifer as a source of water supply, the amount of water required to recharge the aquifer has increased and the return flow from the aquifers to the river has decreased. As noted in SWRCB Order WR 95-10, “During the dry season, pumping of wells has caused significant declines in the groundwater levels. The Carmel River surface flow decreases due to pump-induced infiltration, which recharges the seasonally depleted groundwater basin. During normal water years, surface flow in the lower Carmel Valley is known to become discontinuous or non-existent” (SWRCB 1995).

Surface Water Diversions

There are currently two dams on the Carmel River: San Clemente Dam and Los Padres Dam. Both are owned and operated by Cal-Am and have been used to regulate streamflow and supply water to users on the Monterey Peninsula. Diversions have been made from the San Clemente Reservoir through the Carmel Valley Filter Plant (CVFP) in the past. However, a recent order from the California Division of Safety of Dams requires San Clemente Dam to be drawn down year-round, essentially eliminating the diversion to Cal-Am’s CVFP from the reservoir (MPWMD 2004a).

Average annual diversions to CVFP, prior to recently, have been estimated as 3,155 AFY, with a maximum diversion of 933 AF per month in the months of March and April, and a minimum of no diversions throughout the year Diversions at this location were limited by the filter plant’s capacity of 32 AF/day. In addition, the CVFP typically was shut down during large storms when influent turbidity causes problems with the pressure filtration process (CPUC 2000).

Instream Flows

Unimpaired Carmel River flows at the San Clemente Reservoir site, as reconstructed by MPWMD, indicate the variable nature of the hydrology of the basin. The average annual unimpaired Carmel River flows at the San Clemente Reservoir site are approximately 69,700 AFY (MPWMD 1999). Reconstructed unimpaired annual flows ranged from as low as 2,855 AFY in 1977 to as high as 318,987 AFY in 1983. Existing reservoir operations and aquifer pumping have a great impact on the actual Carmel River flows at various reaches along the river. (CPUC 2000).

SWRCB Order WR 95-10

In 1995, the SWRCB found that Cal-Am did not have sufficient water rights for its existing water diversions from the Carmel River. SWRCB found that Cal-Am had rights to only 3,376 AFY. SWRCB ordered Cal-Am to do the following: reduce its diversion from the Carmel River to 14,106 AFY immediately; obtain appropriative permits for its diversions; obtain water from other sources to make 1:1 reductions in unlawful diversions; and/or contract with another agency having rights to divert and use water from the Carmel River. Cal-Am was also ordered to implement a water conservation plan to further reduce diversions to 11,990 AFY in 1996, and to 11,285 AFY in 1997 and subsequent years. SWRCB subsequently required Cal-Am to maintain a water conservation program with the goal of limiting annual diversions to 11,285 AFY until full compliance with the order was achieved (SWRCB 1995). Cal-Am exceeded the 11,285 AFY limit in Water Year 1997 and 2003. The Water Year 2003 exceedance of the limit was not subject to an enforcement action because some of the diversion amount was subject to exemption and the adjusted diversion amount is within the limit (SWRCB 2004b). A discretionary exemption to certain limitations of WR 95-10 related to the applicant's entitlement is discussed in the section on the history of the entitlement below.

SWRCB (in Decision D-1632, as amended in Order WR 98-04) has also determined that the Carmel River is a "fully appropriated stream" from the mouth of the river upstream to the Sleepy Hollow Gage (RM 17.2) between May 1 through December 31 and that SWRCB has permit authority in this reach. Certain existing diversions present prior to Decision D-1632 are allowed to apply for a permit to allow diversion between May and December; all other applicants must limit their diversions to between January and April.

Seaside Basin

All the major Cal-Am and other significant water wells serving the local community are located in the Coastal Subareas. The Seaside Coastal Subareas include the Northern Coastal and Southern Coastal portions of the Seaside Groundwater Basin and are shown in Figure P1-8.

The Seaside Basin is comprised of several aquifer "layers", including ancient sand dunes near the surface (Aromas Formation), a less permeable intermediate layer (Paso Robles Formation) and the deeper, more productive layer known as the Santa Margarita Sandstone. Roughly 25% of the Cal-Am municipal supply currently is extracted from the Basin (MPWMD 2004a).

Ground water levels in the coastal portion of the Seaside Basin have not been stable in recent years, in particular with respect to the deeper Santa Margarita aquifer, from which over 80 percent of the Cal-Am production in the Seaside Basin is derived. Ground water levels from several dedicated MPWMD monitor wells in the Coastal Subareas show a downward trend, even in wet years. This reflects the changed production operations in the Seaside Basin stemming from SWRCB Order 95-10. As noted above, the 1995 Order limited Cal-Am diversion from the Carmel River Basin, and required Cal-Am to maximize its production from the Seaside Basin within the long-term yield of the basin to meet community needs. The Order has resulted in much higher Cal-Am withdrawals after the Order as compared to before the Order. The Seaside Basin has not been allowed to recharge ("rest") in wet years as was done in the past. The increased reliance on production from Cal-Am's major production wells in Seaside has contributed to lowered water levels in the Santa Margarita aquifer, and to a lesser extent in the overlying Paso Robles aquifer. Seasonal recoveries associated with short-term reduced production in winter have not been sufficient to reverse this trend. Another factor is new and expanded use of non-Cal-Am wells in the Basin due to change in ownership and control of properties on the former Fort Ord (MPWMD 2004a).

The MPWMD has conducted a series of hydrogeologic investigations to estimate the reliable long-term yield of the Basin, and set production targets to protect the basin from overpumping and/or seawater intrusion, which has plagued nearby communities dependent on the Salinas and Pajaro Basins. At one time, the estimated reliable yield for the Coastal Subareas was 4,500 AFA; the current reliable yield estimate is 4,375 AFA based on updated hydrogeologic investigations that more accurately estimated yield based on the practical rate of withdrawal (MPWMD 2004a).

As shown in Table P1-9, water production from the Seaside Coastal Subareas has exceeded safe yield in five of the past nine years (MPWMD 2004a). In addition to the eight active Cal-Am production wells in the coastal portion of the basin, two active production wells serve approximately 800 municipal connections within the City of Seaside water distribution system. Several private water wells tap into the coastal portion of the basin to supply water primarily for golf course and landscape irrigation.

Table P1-9 Seaside Coastal Basin Water Production

Year	Cal-Am	Other	Total
Reporting Year 1995	2800	479	3279
Reporting Year 1996	4429	636	5065
Reporting Year 1997	4651	797	5448
Reporting Year 1998	3563	588	4151
Reporting Year 1999	3578	659	4237
Reporting Year 2000	4013	1011	5024
Reporting Year 2001	3307	979	4286
Water Year 2002	3522	903	4425
Water Year 2003	3507	959	4466

Source: MPWMD 2004a and 2004b

History of Pebble Beach Company's Water Entitlement

Following is a history of the water entitlement relative to the applicant's properties within the Del Monte Forest.

In 1989 the MPWMD adopted Ordinance 39, which offered to provide a permanent dedication of potable water to users who guaranteed financing of the CAWD/PBCSD RWP, which would reclaim wastewater for irrigation use on golf courses and other uses in the Del Monte Forest. The intent of the RWP was to lower use of potable water for irrigation by an average of 800 acre-feet per year by provision of recycled water to irrigation users.

A Fiscal Sponsorship Agreement was signed by MPWMD, in which the applicant guaranteed financing for the RWP to be operated by CAWD and PBCSD. In return, the applicant would be granted a dedicated water entitlement of 365 AFY of potable water for specific "benefited" properties in the Del Monte Forest. An additional 15 AFY entitlement would be granted to two other property owners on Areas S and W in the Del Monte Forest who also participated in the agreement. The total entitlement to be granted was for a total of 380 AFY of potable water. The right to the remaining water savings would be held by MPWMD.

The Agreement identifies this entitlement as a vested property right and allows the applicant the right to reallocate the water entitlement among the benefited properties, provided that the annual water usage among all benefited properties does not exceed the aggregate water entitlement held by the applicant.

1n 1994, the RWP and the distribution and storage system were constructed and began operations. The applicant received the entitlement of 365 AFY for its properties at the closing of the sale of bonds that funded the project. The applicant also has the right to revert its water entitlement to Cal-Am on an annual basis if it appears the water will not be used. The RWP is discussed in greater detail below.

As noted above, in 1995, the SWRCB found that Cal-Am did not have sufficient water rights for its existing water diversions from the Carmel River. MPWMD has specifically identified that Order WR 95-10 does not preclude service by Cal-Am to the Del Monte Forest property under the 380 AFY entitlement granted by MPWMD (MPWMD 2004d). SWRCB has identified that it will not use its enforcement discretion to penalize Cal-Am for excess diversion from the Carmel River as long as their diversion does not exceed 11,285 AFY, plus the quantity of potable water provided to the applicant (or other sponsors) under the entitlement for use on the entitlement lands. SWRCB has identified that it will exercise its discretion as long as the RWP continues to produce as much as, or more than, the quantity of potable water delivered to the Del Monte Forest property. In addition, the recycled wastewater must be utilized on lands within the Cal-Am service area (SWRCB 2004a).

CAWD/PBCSD Recycled Water Plant

The CAWD/PBCSD RWP is a cooperative effort involving the CAWD, PBCSD, MPWMD and the Pebble Beach Company.

The Project involved the construction of a new tertiary treatment plant located on the site of the existing CAWD secondary wastewater treatment plant, the construction of a new distribution system and storage tank used to distribute the recycled water to the receptor sites in Pebble Beach, and irrigation system improvements. The tertiary treatment plant produces water, which meets Title 22 standards specified by the California Department of Health Services, which is a quality acceptable for human contact.

Certificates of Participation finance the Project which were executed and delivered at the direction of the MPWMD in December, 1992 in the amount of $33,900,000. The MPWMD agreed to provide the funds necessary to construct and operate the Project and own the recycled water for the purpose of resale of such water. The Pebble Beach Company has guaranteed payment of construction costs of the Project as well as any operating deficiencies. Construction of the Project began in January, 1993 and was completed in October, 1994.

The RWP began supplying treated water in 1994. Between 1994 and 2001, the RWP supplied between 550 and 780 AFY for irrigation of eight golf courses, athletic fields and other landscaped areas in the Del Monte Forest. Irrigation was supplemented with potable water usage of approximately 130 to 380 AFY. Use is highest in summer and lowest in winter. Summaries of water supplied from the plant and used by specific golf courses are presented in Appendix G. Historic Golf course use of recycled and potable water is shown in Figure P1-9.

The RWP has had to use supplemental potable water for three reasons: wastewater availability, peak demand, and recycled water quality.

The plant is designed to produce up to a maximum capacity of 1.8 mgd, and requires about 2.0 mgd inflow to produce 1.8 mgd of recycled water (due to certain losses within the reclamation process). However, wastewater flows to the plant are traditionally lowest during the summer months when irrigation usage is highest for the Golf Courses, and flows are highest during the winter months when irrigation demand is at its lowest (MPWMD/CAWD/PBCSD Technical Advisory Committee 2000). The RWP currently lacks sufficient storage facilities to retain excess wastewater and runoff in the winter, when plant flows are highest. When inflows are less than 2.0 mgd, the plant operates under capacity and is not able to produce the design level of 1.8 mgd.

During peak irrigation demand, the plant's capacity is sometimes insufficient to produce sufficient recycled water. Based on CAWD/PBCSD records, peak demand in summer months can sometimes exceed 1.8 mgd. In June 2001, average daily demand for recycled water from the plant was about 2.1 mgd (potable daily use was about 0.7 mgd during that month). Periodically, due to maintenance or system repairs, the plant has also not been able to provide recycled water to meet demands.

The primary issue concerning continued use of potable water by the plant concerns the quality of the recycled water. The level of TDS primarily sodium (salt), remaining in the water after treatment has impacted water quality. Sodium levels have been as high as 150 parts per million (ppm), approximately 75 ppm higher than the tolerance level for *Poa annua*, the grass species commonly used on golf courses. High sodium levels can result in increased browning, thinning, and disease of the greens as well as poor soil drainage. The Recycled Water Sales Agreements between the water users and MPWMD allow the use of potable water if recycled water quality levels fall below certain levels. The use of potable water helps flush salts from the root zones and the soil (MPWMD/CAWD/PBCSD Technical Advisory Committee 2000).

Table P1-10 provides a summary of RWP production between 1995 and 2003.

Table P1-10. CAWD/PBCSD RWP, Water Production Annual Average, Water Years 1995–2003

Month	Percent	Recycled (AF)	Potable (AF)	Total Use (AF)	Amount Recycled (%)	Rainfall avg. (1995-2003) (inches)	Rainfall avg. (1951-2003) (inches)
October	9.1%	71.3	15.0	86.3	82.7%	0.8	0.8
November	2.2%	11.4	9.5	20.9	54.7%	2.6	2.3
December	1.2%	6.9	4.3	11.2	61.4%	3.6	3.1
January	0.8%	4.6	2.6	7.2	64.1%	5.9	4.2
February	0.6%	4.4	0.9	5.3	83.4%	4.8	3.2
March	3.3%	28.4	3.2	31.6	89.8%	2.9	3.1
April	8.2%	56.0	21.8	77.8	71.9%	1.7	1.6
May	14.3%	84.9	50.5	135.4	62.7%	0.8	0.5
June	16.4%	97.7	57.8	155.5	62.9%	0.3	0.2
July	16.0%	111.7	40.3	152.0	73.5%	0.0	0.1
August	15.1%	102.0	41.1	143.1	71.3%	0.1	0.1
September	13.0%	90.5	32.6	123.1	73.5%	0.1	0.3
TOTAL	100.0%	669.9	279.6	949.5	70.6%	23.6	19.6

Rainfall Data from: Renard 2004 (National Weather Service Climatological Station Monterey, California 93940 (elevation 385'), accessed via web at: www.weather.nps.navy.mil/renard_wx)

Source for recycled water use: PBCSD 2003.

Water Year is October through September (i.e. 2002 Water Year is October 2001 through September 2002)

Carmel River Biological Resources Setting

Introduction

The Carmel River and its watershed is shown on Figure P1-7.

Existing diversions from the Carmel River have had an adverse effect on

- the riparian corridor along the river below San Clemente Reservoir (River Mile (RM) 18.5 - river miles represent distances measured upstream of the mouth of the Carmel River);
- steelhead and other fish that inhabit the river; and
- the wildlife which depend on riparian and riverine habitat (SWRCB 1995)

The focus of this setting is on the same resources, in particular, riparian vegetation, steelhead, and the California red-legged frog. These resources are the most obvious indicators of the river's biological health. Riparian (streamside) vegetation often defines a stream's presence to the human eye and provides habitat to a broad array of vertebrate and invertebrate species. The steelhead trout that occupy the river are the largest aquatic species in the system and are sought after by both fishermen and vertebrate predators. The riparian vegetation and the steelhead are also excellent indicators of water quality and flow conditions in the river. Past water supply project impact analyses on the Carmel River have identified potential significant effects on riparian vegetation and the steelhead trout (MPWMD 1990, 1994) and the red-legged frog (MPWMD 1998). The California Department of Fish and Game considers riparian vegetation a sensitive plant community because of its long-term loss to agriculture and development, and because of the species diversity it supports. The steelhead trout and the red-legged frog are the focus of analyses because the federal Endangered Species Act (ESA) protects them as threatened species.

The biological resources setting related to water supply impacts focuses on these three resources. Other biological resources dependent on the Carmel River are noted below as well.

Riparian Vegetation

Vegetation Composition

Vegetation along the portion of the Carmel Valley generally consists of the same species, however the relative species abundance and canopy structure differs between the Upper, Middle, and Lower Carmel Valley.

The Upper Carmel Valley, upstream of San Clemente Dam (RM 18.6), consists mostly of narrow canyons with a narrow strip of riparian forest generally conforming to Holland's (1986) Central Coast Cottonwood-Sycamore Riparian Forest. Dominant species include western sycamore (*Platanus racemosa*), black cottonwood (*Populus balsamifera ssp. trichocarpa*), white alder (*Alnus rhombifolia*), coast live oak (*Quercus agrifolia*), California bay (*Umbellularia californica*), California buckeye (*Aesculus californicus*), and willows (*Salix species*). Understory species typically include poison oak (*Toxicodendron diversilobum*), coffeeberry (*Rhamnus californica*), blackberries (*Rubus species*), and others. Marshy vegetation occurs along slower reaches of the river (MPWMD 1994).

Riparian vegetation in the Middle Carmel Valley, (San Clemente Dam to The Narrows (RM 9.5), and in the Lower Carmel Valley, (the Narrows to the river mouth), conforms generally to Holland's (1986) Central Coast Arroyo Willow Riparian Forest. It is dominated by arroyo willow (*S. lasiolepis*), with red willow (*S. laevigata*), shining willow (*S. lucida ssp. lasiandra*), and narrow-leaved willow (*S. exigua*), with black cottonwood as an important component of the overstory and with sycamore, box elder (*Acer negundo*) the other species listed above. In the drier outer floodplains of this region, coast live oak may dominate and the riparian vegetation conforms generally to Central Coast Live Oak Riparian Forest (Holland 1986). The Middle Carmel Valley has a steeper gradient, and a more braided, less stable channel than the Lower Carmel Valley (Curry and Kondolf 1983). The vegetation in the Middle Carmel Valley tends to be more discontinuous than in the Lower Carmel Valley, where a more continuous riparian woodland or forest has developed (McNiesh 1989).

McNiesh's (1989) mapping of the riparian corridor downstream from San Clemente Dam based on 1986 aerial photographs, showed that the riparian zone was on average 271 feet wide, 86 feet being channel and 185 feet being riparian vegetation. The total area of riparian vegetation was 410 acres, 299 acres was made up of riparian woodlands and 111 acres was non-continuous cover.

Riparian Vegetation along the Carmel River

Riparian vegetation along the Carmel River has been affected by a number of important natural and human-induced events.

The most important natural events that have affected riparian vegetation include floods and droughts. Major floods occurred in 1862, 1911, 1914, 1995, and 1998 (Kondolf and Curry 1986, Mussetter Engineering Inc. 2002). Major floods cause bank erosion and loss of riparian vegetation, but perhaps more importantly may also affect channel form and depth.

Droughts have probably had a substantial effect on riparian vegetation; however, the effect of droughts cannot be separated fully from human activities. For example, the 1976-1977 drought led to extremely heavy groundwater pumping and unprecedented drawdown in the lower Carmel Valley (McNiesh 1989). To what extent the drawdown was the result of pumping or of the natural effects of drought cannot be determined. However, an analysis of simulated unimpaired flows for 1977 using the MPWMD's Carmel Valley Simulation Model (CVSIM) model shows that the river would have been dry at the USGS "Near Carmel" gauge site (RM 3.6) without the presence of dams and pumping wells. McNiesh (1989) points out that droughts by themselves cannot be blamed for vegetation decline in the Carmel Valley, because vegetation decline occurred prior to the 1970's drought and continued after the water table recovery that followed the drought.

The major human-induced changes that have affected the riparian vegetation include encroachment on the riparian vegetation as the result of farming, housing development, and golf course construction, construction of San Clemente (1921) and Los Padres (1948) Dams, and groundwater pumping (McNiesh 1989). In addition, installation of bank protection has reduced lateral movement of the river (Mussetter Engineering Inc. 2002). The dams have relatively small reservoirs that have relatively little effect on flood peaks. Diversions and groundwater pumping have caused the once perennial river to become characteristically dry in late summer. However, reservoir releases also periodically cause increased flows in reaches below the dams that otherwise would have been dry. The dams also trap sediment which have led to downstream channel incision (Curry and Kondolf 1983). Groundwater pumping by Cal-Am and others has been identified as a major impact on riparian vegetation (McNiesh 1986, 1989).

McNiesh (1986, 1989) and others (Zinke 1971, Groeneveld and Griepentrog 1985) have demonstrated that groundwater pumping has led to local riparian vegetation mortality. This mortality has been associated with local bank erosion. McNiesh (1986) has shown that not only total drawdown, but also the rate of drawdown is critical for survival of riparian trees. The precise amount of drawdown that can be tolerated by vegetation cannot be defined, because it is dependent on a large number of interrelated factors (McNiesh 1989). But, a general model was outlined by McNiesh (1986) that can be used to predict thresholds of damage to vegetation. Mild stress of riparian trees occurs if drawdown is between 4 and 8 feet in a season or between 1 and 2 feet per week. Severe stress occurs when seasonal drawdown is greater than 8 feet, or drawdown in a week exceeds 2 feet. These are drawdown rates in excess of the normal seasonal fluctuation in groundwater levels.

Steelhead

NMFS has listed steelhead trout in the Carmel River Basin as a threatened species. NMFS considers these fish to be part of a broader population designated as the south-central California Coast Evolutionary Significant Unit (ESU).

Life History

Steelhead are anadromous (sea-run) rainbow trout that spawn in freshwater, spend the first year (or years) of life in freshwater, and then migrate to the ocean where they continue to grow and mature before returning to spawn.

Following upstream migration, the female establishes a territory and digs a redd (gravel nest) with her tail, usually in areas where there is sufficient subsurface flow to sustain eggs and alevins (yolk-sac fry) through the incubation period (usually the lower ends of pools or heads of riffles). She then lays the eggs in the redd where they are fertilized by one or more males. Eggs buried in redds hatch in 3-4 weeks (at 10-15 Celsius) and fry emerge from the gravel 2-3 weeks later. The fry initially live in quiet waters close to shore and soon establish feeding territories that they defend against other juveniles. As they grow during spring and summer, juvenile steelhead move to faster, deeper water in riffles, runs, and pools. They typically maintain positions near swift currents that carry drifting aquatic and terrestrial insects on which they feed. Some juveniles may move downstream to the lower reaches of streams or lagoons during the summer and fall to complete their freshwater rearing phase.

After one year of stream residence, most juveniles become smolts (juveniles adapted to seawater) and migrate downstream to the ocean in late winter and spring. Some juveniles remain in fresh water 1-2 more years before they enter the ocean. Because juvenile steelhead rear for a year or more in freshwater, juveniles of different age groups are usually present year-round in California coastal streams.

Most steelhead spend 1-3 years in the ocean before returning to spawn. Some adults return to the ocean after spawning (kelts) and return to spawn again. Occasionally, juvenile steelhead mature in freshwater and spawn without migrating to the ocean. This occurs most frequently during droughts when juveniles are trapped in the river and cannot migrate to the ocean.

Steelhead Within the Carmel River

The upstream migration of adults in the lower Carmel River primarily occurs from mid-December through mid-April in response to flows of sufficient magnitude and duration to stimulate movement of adults, permit passage of adults past critical riffles in the lower river, and keep the river mouth open between storms. Although suitable migration conditions may occur earlier, adults typically do not begin arriving at San Clemente Dam until late December or January. Depending on migration opportunities later in the season, the migration of adults may continue into April.

The primary spawning season for steelhead in the Carmel River is February through March but spawning may continue through mid-April. Downstream of San Clemente Dam, the highest concentration of redds generally occurs upstream of the Narrows but redds have been observed as far downstream as RM 5.5.

In the Carmel River, most steelhead fry emerge from the gravel in April-June and rear for at least one year in the river before migrating to the ocean as smolts. Juveniles may migrate downstream to lower reaches of the Carmel River in late spring or early summer of their first year of life (young-of-the-year or age 0+ juveniles) or in late fall and early winter of their first, second, or third years (as yearling and older juveniles). Juveniles of all age classes may migrate as far downstream as the lagoon in years when flows to the lagoon are sustained through the summer and fall. Substantial downstream movement of juveniles in late fall and early winter appears to be associated with the initial storms of the season that result in spill and increased flows downstream of San Clemente Dam.

Many juvenile steelhead in the Carmel River become smolts and enter the ocean in late winter and spring after one year in the river. A small number remains for two to three years before emigrating.

The steelhead run in the Carmel River at the time of the Spanish explorers was believed to be upwards of 12,000 fish (SWRCB 1995). The river was overfished during the mid-to-late 1800s, and the runs subsequently declined. Snider (1983) reported annual runs of 1,200 adult steelhead at the San Clemente Dam fishway during the mid-1970s. During droughts in 1976-77 and the late 1980s, no steelhead passed San Clemente Dam. The Lagoon never opened during the four years from 1987 to 1990. Density of rearing juvenile steelhead reached very low levels by 1989 but have increased in subsequent years. After lows of zero returning adult steelhead in 1989-90, one fish in 1991, and 15 in 1992, the run has increased to an average of a few hundred fish. Viable steelhead populations in the Carmel River depend on sufficient attraction flows, passage flows for adults and smolts, suitable spawning and egg-incubation conditions, and good rearing conditions (CPUC 2000).

California Red-Legged Frog

The California red-legged frog (CRLF) is listed as threatened under the federal Endangered Species Act. It has been extirpated from 70% of its former range and now is found primarily in coastal drainages of central California, from Marin County, California, south to northern Baja California, Mexico. CRLF has been reported from several relatively isolated, although widely distributed locations, along the Carmel River. This Carmel River population has been identified by the U.S. Fish and Wildlife Service as a core population, targeted for development and implementation of a management plan. (U.S. Fish and Wildlife Service 2002).

California Red-Legged Frogs Within the Carmel River

Information on CRLF occurrences in the lower Carmel River floodplain, between approximately RM 28 (above Los Padres Dam reservoir) and the Carmel River Lagoon, was taken primarily from information provided in the Draft Interim Biological Assessment for the Carmel River Dam and Reservoir Project (EcoSystems West Consulting Group 2001), although other sources such as Mullen (1996) and the Recovery Plan for the California red-legged frog (U.S. Fish and Wildlife Service 2002) were also reviewed.

The U.S. Fish and Wildlife Service designated critical habitat for the CRLF on March 13, 2001 (FR 69:14626). Most of the Carmel River watershed was included in critical habitat unit 18 (FR69:14626). However, this critical habitat designation was withdrawn in 2002 due to Court order requiring preparation of a new economic analysis and publishing of a new critical habitat proposal. Critical habitat in the Carmel River was reproposed by USFWS in April 2004 (USFWS 2004). Only a few localities in California have been identified with more than 350 adults; one of these is Rancho San Carlos, a private ranch on the upper portion of the Carmel River Valley (USFWS 2002).

As part of their efforts to characterize habitat for CRLF, EcoSystems West Consulting Group (2001) identified a total of 100 potential reproductive sites along the Carmel River floodplain. Twenty-two of these occurred in the main stem of the river and 78 occurred in off-channel sites. Numerous additional non-reproductive habitats were also identified. Incidental observations of CRLF in the Carmel River floodplain made during the habitat characterization and critical habitat mapping efforts included observations of adults at 69 sites, sub-adults at 22 sites, young of the year at 15 sites, and tadpoles at 13 sites (EcoSystems West Consulting Group 2001). The majority of potential reproductive sites tend to cluster in two general locations: behind the two existing reservoirs and below RM 1 in the Carmel River lagoon. Surveys conducted by Mullen (1996) indicate that CRLF populations occur in several tributaries of the Carmel River in addition to those identified in the main stem and its floodplain.

Other Biological Resources

The fish community in the Carmel River is diverse relative to other Central Coast streams. Twenty species have been identified within the river and lagoon, including 12 native and 8 introduced species. Sculpin (*Leptocottus armatus*), brown trout (*Salmo trutta*), hitch (*Lavinia exilicauda*), stickleback (*Gasterosteus aculeatus*), and steelhead are the most abundant species. Species composition in the lower river and lagoon may change as a function of the connectivity of the mouth of the river with the ocean (CPUC 2000).

While other biological resources of interest (such as birds, benthic invertebrates, amphibians) are also dependent on the overall health of the river system, impacts to these groups can be assessed with some reliability by considering impacts to flow on riparian vegetation, steelhead, and California red-legged frogs. Riparian vegetation provides habitat for numerous wildlife species including neotropical song birds and raptors. Special-status birds that may occur in the area and nest and forage in riparian habitat along the river include the federal and state endangered least Bell's vireo (*Vireo bellii*), the yellow warbler (*Dendroica petechia brewsteri*, and the yellow-breasted chat *(Icteria virens*) (CPUC 2000). Special-status raptors that may utilize riparian vegetation in the Carmel Valley include sharp-shinned hawks (*Accipiter striatus*), and Cooper's hawk *(Accipiter cooperi)* (CPUC 2000). Other sensitive amphibian and reptile species that could be affected by increased diversions include the southwestern pond turtle (*Clemmys marmorata pallida*) and possibly the foothill yellow-legged frog (*Rana boylii*) (MPWMD 1998).

Recycled Water Project, Phase II Setting

Forest Lake Reservoir

Forest Lake is an existing man-made reservoir formed by excavation and embankments (levees) on the northeast and southwest sides. Forest Lake has been used as a potable water supply for the Monterey Peninsula for more than 75 years. Its use as a potable water storage reservoir was recently discontinued by Cal-Am and replaced by two existing and one proposed and approved 5 MG steel storage tanks located just northwest of Forest Lake. The reservoir has a maximum design capacity of 438 AF and a surface area of 18.4 acres at maximum storage (PBCSD 1996a).

Environmental setting information was incorporated in the summary of impacts presented above. More detailed setting information is presented in the Expanded

Initial Study (PBCSD 1996a) and Addendum (PBCSD 2001a) for Forest Lake Reservoir improvements in Appendix K (on the CDROM version, on the project web site, and in hard copy at the Monterey County Planning and Building Inspection Department in Marina).

Carmel Area Wastewater District Wastewater Treatment Plant

The existing WWTP is developed with wastewater treatment facilities, pavement and landscaped turf grass. The site of the SMP improvements is surrounded to the south by dense rows of eucalyptus trees, to the west by the laboratory facilities, and to the north and east by existing wastewater treatment facilities. Detailed environmental setting information pertaining to various resources in the surrounding areas can be found in the Final EIR for the Carmel Sanitary District Wastewater Reclamation Project (June 1989) that is available for review at the CAWD offices at 2945 Rio Road in Carmel (CAWD 2004).

SB610 Applicability

The County reviewed this project to determine if it meets the threshold for requiring a water assessment as required by the state water code (SB610). As outlined in Water Code §10912(a)(7) all projects which "...would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project" must be assessed. Following consultation with the water provider (Cal-Am), the County has identified that the threshold for application of SB 610 for this project should be based on the average water usage figure for residences within the Del Monte Forest area, which is about 0.80 AFY. This average is based on Cal-Am records for years 1986, 1987, 1993, and 1994 (non-rationing years) (as cited in WWD 2001). Multiplying 500 units times this factor results in a threshold of 400 AFY. The amount of water estimated to be utilized by this project was calculated for each component of the project utilizing specific water usage factors as outlined in this Chapter and in Appendix G. This calculation determined that the total project water usage in an average year would be 191 AFY (before mitigation), which is less than the threshold. Taking into account the proposed RWP Phase II Mitigation and the potential demands of Phase II investors, the combined demand in an average year would be 266 AF, which is also less than the threshold.