Michael Baker
INTERNATIONAL

CAMBRIA EMERGENCY WATER SUPPLY PROJECT

San Luis Obispo County, California

Adaptive Management Plan

Prepared For:
Cambria Community Services District
1316 Tamson Drive, Suite 201
Cambria, California 93428
Contact: Robert C. Gresens, P.E.
805.927.6623

Prepared By:
RBF Consulting
14725 Alton Parkway
Irvine, California 92618
Contact: Thomas J. McGill, Ph.D.
909.947.4907

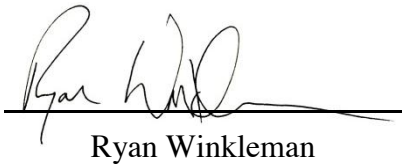
March 2015
JN: 141290

CAMBRIA EMERGENCY WATER SUPPLY PROJECT

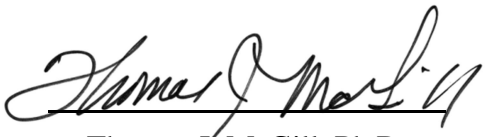
COMMUNITY OF CAMBRIA, SAN LUIS OBISPO COUNTY, CALIFORNIA

Adaptive Management Plan

The undersigned certify that the statements furnished in this report and exhibits present data and information required for this biological evaluation, and the facts, statements, and information presented is a complete and accurate account of the findings and conclusions to the best of our knowledge and beliefs.



Ryan Winkleman
Biologist
Natural Resources



Thomas J. McGill, Ph.D.
Vice President
Natural Resources

March 2015

Table of Contents

EXHIBITS

TABLES

LIST OF ACRONYMS

AMP	Adaptive Management Plan
AWTP	Advanced Water Treatment Plant
BM	Biological Monitor
C	Celsius
CCSD	Cambria Community Services District
CDFW	California Department of Fish and Wildlife
CRAM	California Rapid Assessment Method
DO	Dissolved Oxygen
F	Fahrenheit
gpm	Gallons Per Minute
PHABSIM	Physical Habitat Simulation
ppm	Parts Per Million
ppt	Parts Per Thousand
RBF	RBF Consulting
RIW	Recharge Injection Well
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WUA	Weighted Usable Area

Section 1 Background and Objectives

The Cambria Community Services District (CCSD or the District) proposes to install and operate the Cambria Emergency Water Supply Project to help alleviate an emergency water shortage in the Community of Cambria, San Luis Obispo County, California (Project). The Project would be located on previously-disturbed areas within CCSD's existing San Simeon well field and percolation pond system property. The Project proposes to both utilize existing, as well as construct and operate, the following water facilities: one extraction well (existing Well 9P7); an Advanced Water Treatment Plant (AWTP); a Recharge Injection Well (RIW); an evaporation pond (rehabilitate/modify an existing storage pond); lagoon surface discharge, proposed as mitigation to protect the San Simeon Creek and Lagoon; four monitoring wells; and four pipelines.

1.1 EMERGENCY WATER SUPPLY PROJECT

1.1.1 Project Location

The Project site is generally located east of State Route 1 (SR 1), south of the Community of San Simeon, and north of the Community of Cambria in unincorporated San Luis Obispo County, California (Exhibit 1, *Regional Vicinity Map*). The Project site is located in Sections 9, 16, and 17 of Township 27 South, Range 8 East of the Cambria quadrangle of the United States Geological Survey (USGS) 7.5-minute topographic map series (Exhibit 2, *Local Vicinity Map*). Specifically, the site is east of Van Gordon Creek Road, north of San Simeon Creek, and south of San Simeon-Monterey Creek Road. It is located adjacent to but not within Hearst San Simeon State Park (Exhibit 3, *Project Site Map*).

1.1.2 Project Background

All of Cambria's potable water is supplied by groundwater wells in the San Simeon and Santa Rosa Creek aquifers. The San Simeon and Santa Rosa Creek aquifers are relatively shallow and porous, with the groundwater levels typically recharged every year during the rainy season. Groundwater levels generally exhibit a consistent pattern of high levels during the wet season, steady decline during the dry season, and rapid rise when the wet season resumes. To minimize loss or contamination of potable groundwater at the aquifer and ocean interface, treated wastewater effluent is percolated into the San Simeon Creek aquifer downstream from its production wells. This practice also helps prevent saltwater intrusion into the freshwater water aquifer. If the groundwater level drops too far, treated effluent and seawater could migrate toward the water supply wells, deteriorating the water quality and potentially rendering the freshwater non-potable. The percolation of treated wastewater

12/2/2014 JN M:\Mdata\141290\MXD\Ex_1_Regional_Vicinity.mxd AP

Michael Baker INTERNATIONAL

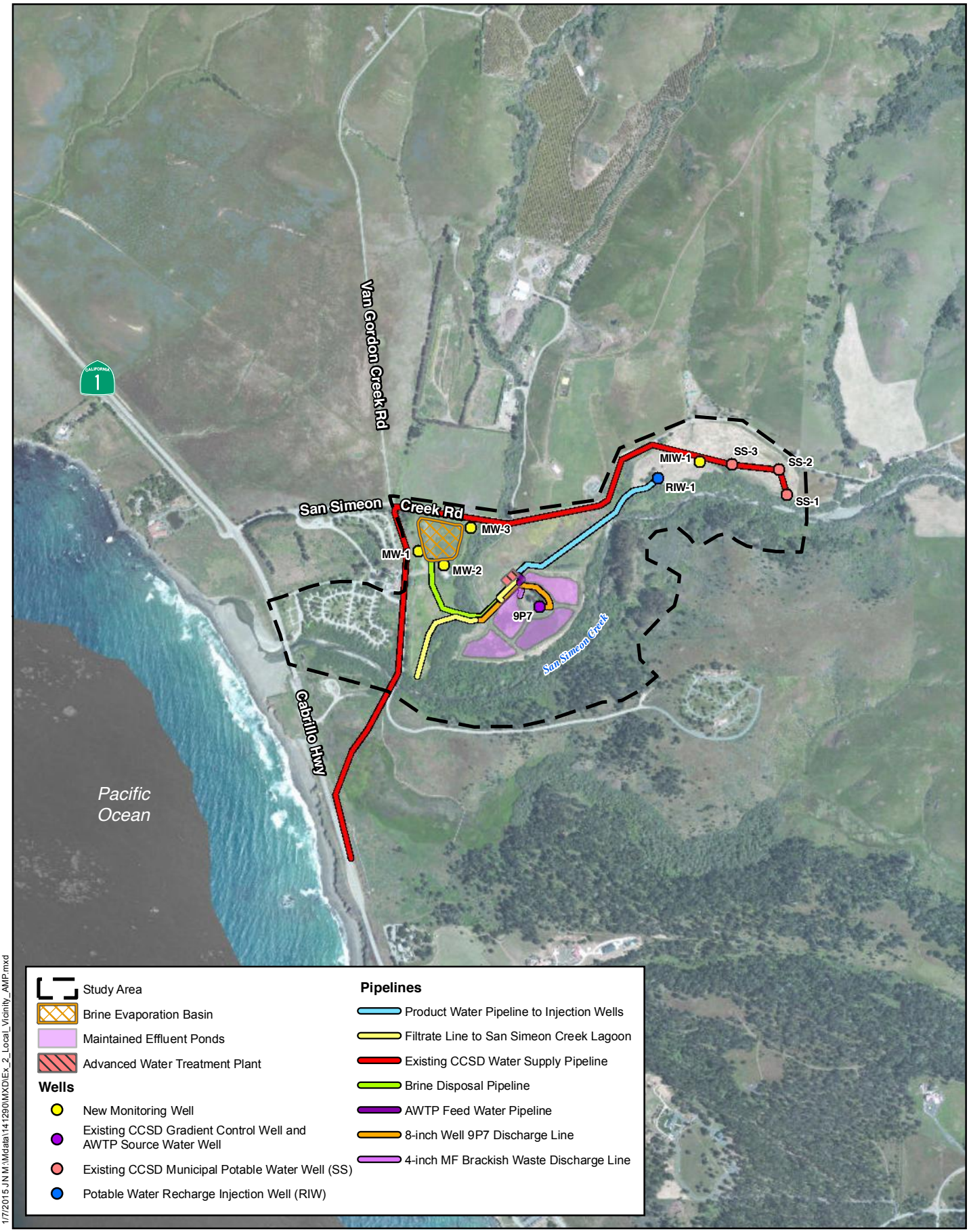
0 2.5 5 10 Miles

Source: ESRI Relief Map, National Highway Planning Network

CAMBRIA EMERGENCY WATER SUPPLY PROJECT
ADAPTIVE MANAGEMENT PLAN

Regional Vicinity Map

Exhibit 1



1/7/2015 JN M:\Mdata\141290\MXD\Ex_2_Local_Vicinity_AMP.mxd

Michael Baker INTERNATIONAL

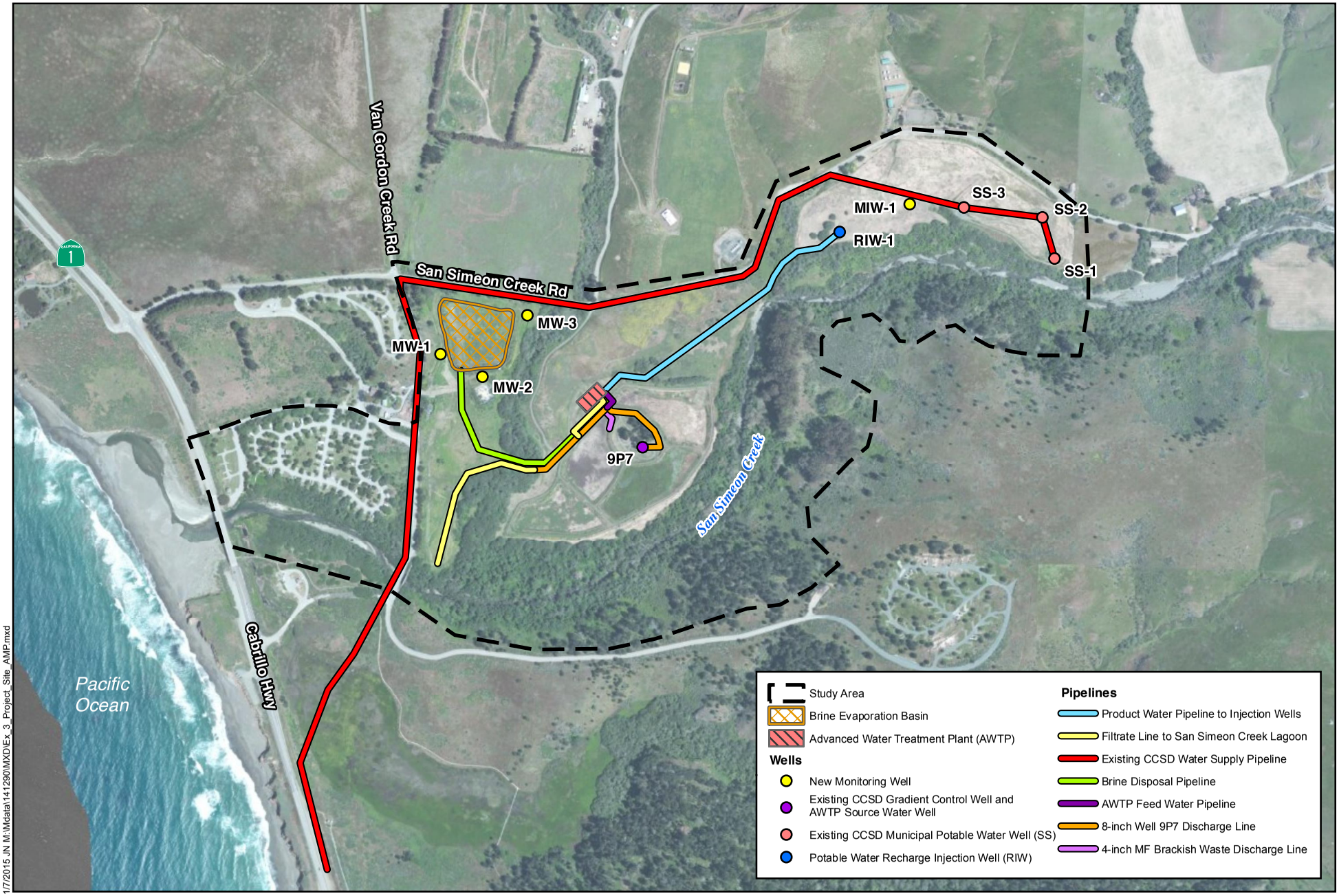
0 0.25 0.5 Miles

Source: CDM Smith, ESRI World Topographic Map

CAMBRIA EMERGENCY WATER SUPPLY PROJECT
ADAPTIVE MANAGEMENT PLAN

Local Vicinity Map

Exhibit 2



1/7/2015 JN M:\Mdata\141290\MXD\Ex_3_Project_Site_AMP.mxd

Michael Baker INTERNATIONAL

0 400 800 1,600 Feet

Source: National Hydrography Dataset, CDM Smith, ESRI World Imagery Basemap

CAMBRIA EMERGENCY WATER SUPPLY PROJECT
ADAPTIVE MANAGEMENT PLAN

Project Site Map

Exhibit 3

effluent develops groundwater mounding below the percolation basins, which forms a positive differential between the percolation pond area and the ocean that results in subsurface discharge of fresh water to the ocean. CCSD operations also monitor the groundwater mound throughout the year to maintain a positive differential from CCSD's up-gradient production wells and the down-gradient percolation ponds area. During the summer dry season, and depending upon the prior year's precipitation, the Cambria Community Services District may periodically pump groundwater from its percolation fields in order to maintain this differential. When this occurs, water is lost to the ocean as subsurface underflow and the volume of up-gradient freshwater storage is diminished.

In January 2014, the CCSD declared a Stage 3 water shortage emergency, the most stringent of three levels. In response to this emergency status, the CCSD is constructing the Cambria Emergency Water Supply Project.

1.1.3 Project Description

The Project's source water is the San Simeon Creek aquifer from existing Well 9P7, which is located in the south end of a flat park-like area in the middle of the existing percolation ponds (Refer to Exhibit 3). The extracted groundwater is transferred to an Advanced Water Treatment Plant (AWTP) that treats brackish water to produce potable water. The AWTP consists of multiple unit processes including ultrafiltration membranes, reverse osmosis membrane, advance oxidation, and post-treatment and disinfection facilities. A feed water pipeline transports the brackish water between existing Well 9P7 and the AWTP. To meet California Department of Public Health and Regional Water Quality Control Board regulations, the treated AWTP product water is re-introduced/pumped for injection into the groundwater basin so that it is available in the existing San Simeon well field. To inject the product water into the basin, a new potable water recharge injection well (RIW) is located at the existing potable water well-field, approximately 1,000 feet east of existing potable water Well SS-3. A Project water pipeline transports the product water between the AWTP and RIW well. A separate pipeline from the AWTP to the head of the San Simeon Creek lagoon area provides mitigation water.

The Project's mitigation water flows in a pipeline from the AWTP to an area on CCSD property, which is just upstream from the head of the fresh water lagoon, approximately 1,500 feet southwest of existing Well 9P7. The AWTP generated waste stream (reverse osmosis concentrate) is pumped in a pipeline from the AWTP to an existing holding basin, which has been modified to meet State Title 27 criteria. Both natural and mechanically

assisted evaporation of the waste stream occurs within the modified holding basin, which serves as the Project's evaporation pond.

The AWTP is capable of producing an average of 452 gpm of treated water for injection at the District's well field. During facility operations, a maximum of approximately 385 gpm could be extracted for use from CCSD's existing potable wells SS-1 or SS-2. The 452 gpm injection flow may be lower depending upon how much product water is required for blending with the 100 gpm of mitigation water being provided for the San Simeon Creek fresh water lagoon area to meet RWQCB quality criteria. For example, if a 50% blend is required, the 452 gpm would be reduced by 50 gpm. The amount of blending to occur with the mitigation water will be determined as part of the AWTP's commissioning and start-up testing.

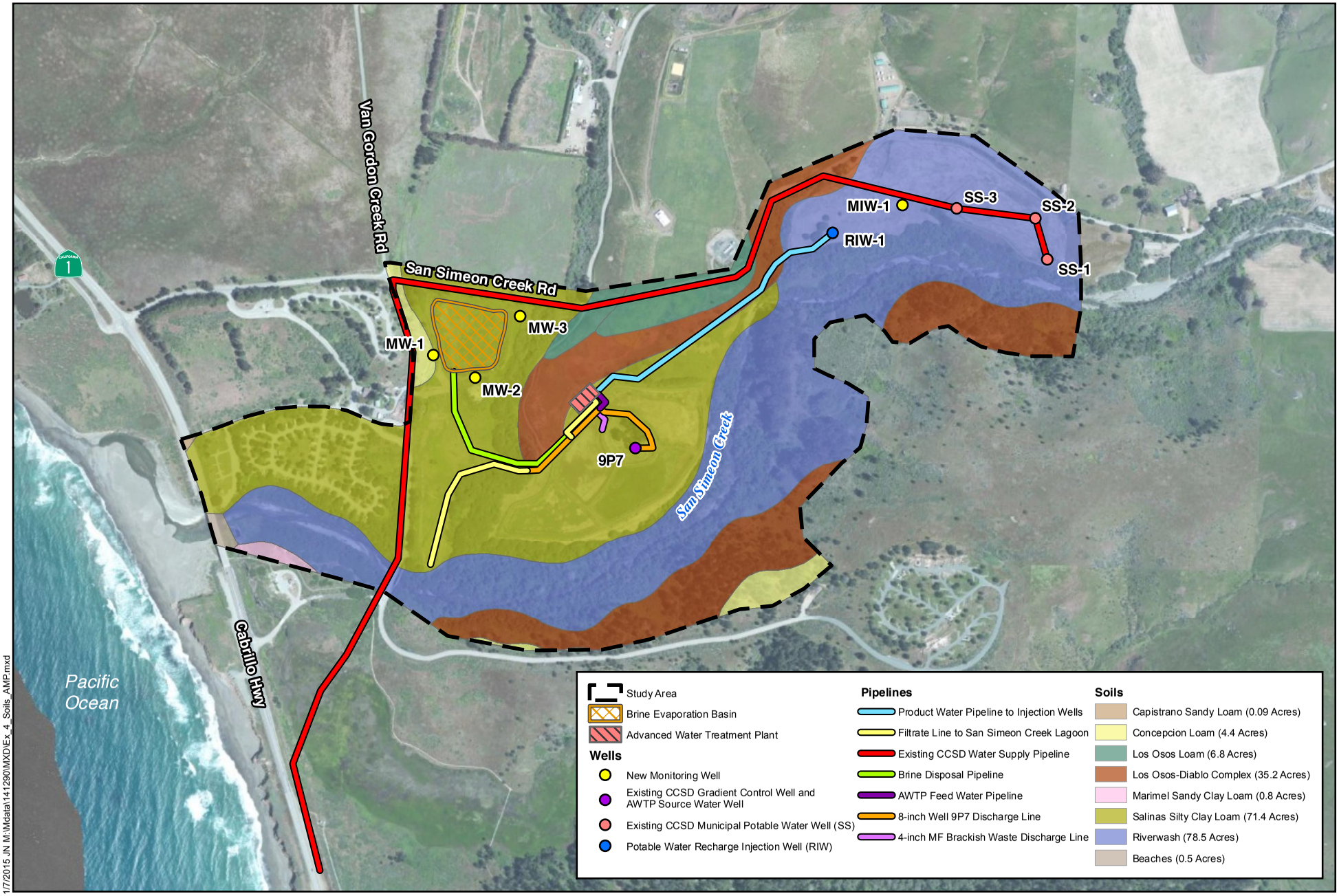
1.2 ENVIRONMENTAL SETTING

1.2.1 Soils

Based on the U.S. Department of Agriculture Soil Survey, the Project site and survey area are underlain by the following soil units (Exhibit 4, *Soils Map*): Beaches, Capistrano sandy loam (rolling), Concepcion loam (5 to 9 percent slopes), Lodo clay loam (5 to 15 percent slopes), Los Osos loam (5 to 9 percent slopes), Los Osos loam (30 to 50 percent slopes), Los Osos-Diablo complex (15 to 30 percent slopes), Marimel sandy-clay loam (occasionally flooded), Riverwash, and Salinas silty clay loam (0 to 2 percent slopes).

1.2.2 Vegetation

Eight (8) plant communities were identified within the survey area during the initial habitat assessment (Exhibit 5, *Vegetation Map*): Central Coast Arroyo Willow Riparian Forest, Monterey Pine Stand/Monterey Pine Forest, Coyote Brush Scrub, California Bulrush Marsh, Annual Grassland, Wild Oats Scrub, Upland Mustards, and Eucalyptus Stand. In addition, areas were identified that would be classified as Landscaped Campground, Percolation Pond, Lagoon/Estuary, Disturbed, and Developed. Table 1 provides the acreage of each plant community or noted feature within the survey area, as well as the percentage that each encompasses within the total survey area. The plant communities are described in further detail below.



1/7/2015 JN M:\Mdata\141290\MXD\Ex_4_Soils_AMP.mxd

CAMBRIA EMERGENCY WATER SUPPLY PROJECT
ADAPTIVE MANAGEMENT PLAN

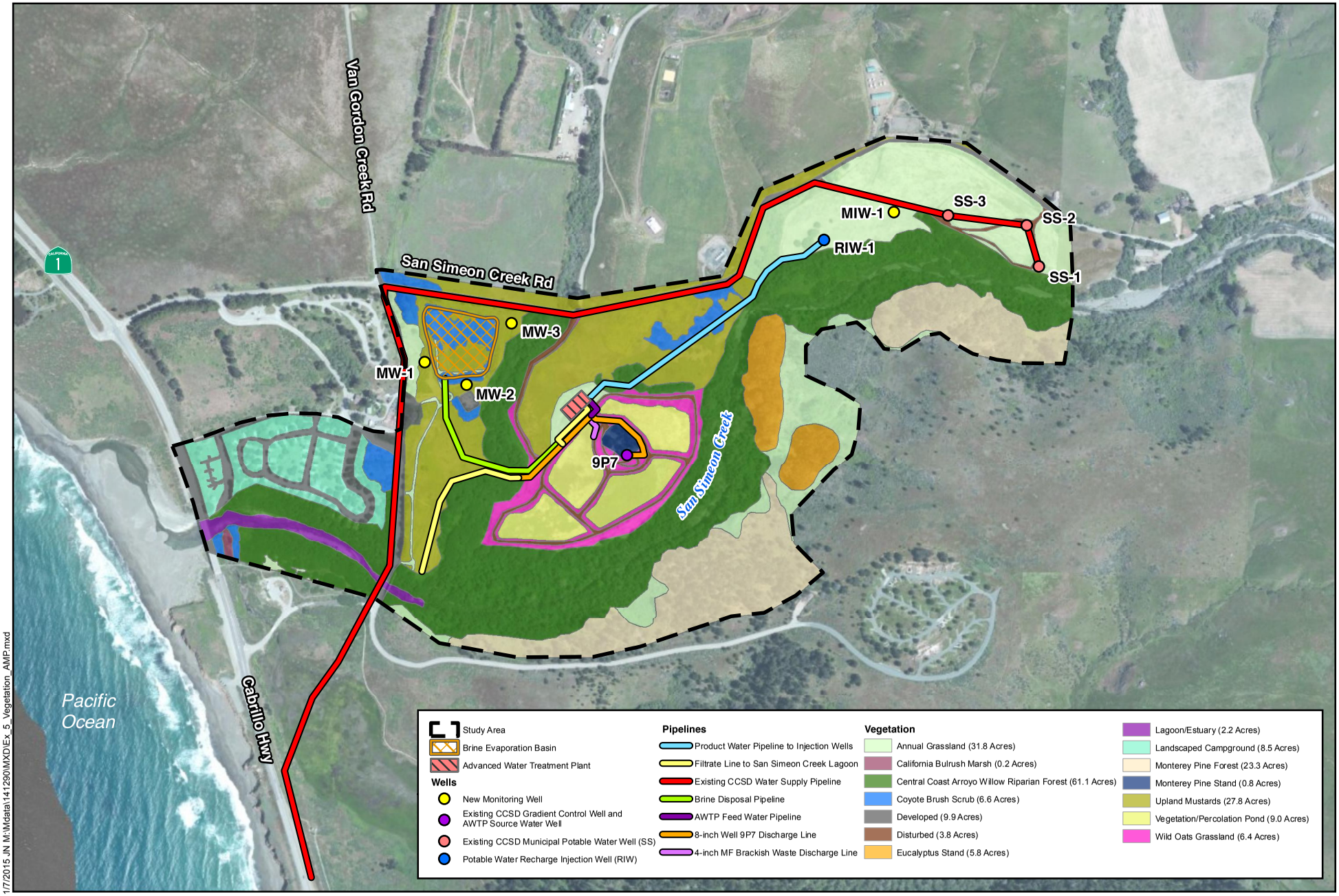
Soils Map

Michael Baker INTERNATIONAL

0 400 800 1,600 Feet

Source: NRCS Soils ca-664, CDM Smith, ESRI World Imagery Basemap

Exhibit 4



1/7/2015 JN M:\Mdata\141290\MXD\Ex_5_Vegetation_AMP.mxd

CAMBRIA EMERGENCY WATER SUPPLY PROJECT
ADAPTIVE MANAGEMENT PLAN

Vegetation Map

Michael Baker INTERNATIONAL

0 400 800 1,600 Feet

Source: CDM Smith, ESRI World Imagery Basemap

Exhibit 5

Table 1: Plant Communities

Plant Community	Acreage	Percentage
Central Coast Arroyo Willow Riparian Forest	61.1	31.0%
Monterey Pine Stand	0.8	0.4%
Monterey Pine Forest	23.3	11.8%
Coyote Brush Scrub	6.6	3.3%
California Bulrush Marsh	0.2	0.1%
Annual Grassland	31.8	16.1%
Wild Oats Grassland	6.5	3.3%
Upland Mustards	27.9	14.1%
Eucalyptus Stand	5.9	3.0%
Landscaped Campground	8.5	4.3%
Percolation Pond	9.0	4.6%
Lagoon/Estuary	2.2	1.1%
Disturbed	3.8	1.9%
Developed	9.9	5.0%
Total	**197.6**	**100%**

Central Coast Arroyo Willow Riparian Forest

The Central Coast Arroyo Willow Riparian Forest is characterized by a dense, low, closed-canopy forest dominated by arroyo willow (*Salix lasiolepis*). It typically occurs in low gradient stream reaches in areas that are moist to saturated sandy or gravelly soil, especially in areas within the coastal fog incursion zone. Other common species along the edge of San Simeon Creek include western sycamore (*Platanus racemosa*), eucalyptus (*Eucalyptus* sp.), and cape ivy (*Delairea odorata*).

Monterey Pine Stand/Monterey Pine Forest

There is one small stand of Monterey pine (*Pinus radiata*) located within the Project site. It is located in the center of the percolation ponds, with Well 9P7 located underneath the trees. The canopy cover in this area is composed entirely of Monterey pines, with the understory composed mostly of ripgut brome (*Bromus diandrus*) and wild oats (*Avena fatua*). In addition, a Monterey pine forest is located on the south side of San Simeon Creek.

Coyote Brush Scrub

Coyote brush scrub is scattered throughout the Project site, but is concentrated in patches primarily south of the vicinity of the intersection of Van Gordon Creek Road with San Simeon-Monterey Creek Road around the brine evaporation pond. It is also present north of the percolation ponds, to the east of the San Simeon Creek Campground within Hearst San Simeon State Park, and on the south side of San Simeon Creek Lagoon east of SR 1. It is dominated by coyote brush (*Baccharis pilularis*) and is intermixed with black mustard (*Brassica nigra*) and non-native grasses.

California Bulrush Marsh

California bulrush marsh is located on the western edge of the Project site, immediately east of the SR 1 crossing and on the south side of San Simeon Creek Lagoon. It consists of a narrow channel dominated by dense California bulrush (*Schoenoplectus californicus*). The upland slopes are covered in coyote brush scrub. This channel is a tributary to San Simeon Creek Lagoon.

Annual Grassland

Annual grasslands are located in the northeastern portion of the Project site between San Simeon-Monterey Creek Road and San Simeon Creek, as well as south of San Simeon Creek. This community is dominated largely by canary grass (*Phalaris aquatica*), wild oat, ripgut brome, dandelions (*Taraxacum officinale*), coyote brush, and other herbaceous vegetation.

Wild Oats Grassland

Wild oats grassland is primarily located along the upper edges of and between the percolation ponds. It is dominated almost exclusively by thick stands of wild oats, but is intermixed with light coverage of ripgut brome, shortpodded mustard (*Hirschfeldia incana*), and canary grass.

Upland Mustards

Upland mustard communities are located primarily in the center of the Project site, both east and west of Van Gordon Creek and north of the percolation ponds. This community intermixes with coyote brush scrub. It is dominated by thick, tall stands of black mustard with low-growing grasses (canary grass and bromes), milk thistle (*Silybum marianum*), dandelion, poison hemlock (*Conium maculatum*), and giant horse tail (*Equisetum telmateia* ssp. *braunii*).

Eucalyptus Stand

Some small eucalyptus stands are located on the eastern side of the Project site on the south/eastern shore of San Simeon Creek. These are predominantly characterized by tall eucalyptus trees that are bordered and surrounded by the Central Coast Arroyo Willow Riparian Forest.

Landscaped Campground

The landscaped campground (San Simeon Creek Campground) is located on the western side of the Project site, west of Van Gordon Creek Road and north of San Simeon Creek Lagoon. It is underlain by non-native ornamental grasses and contains larger trees and shrubs including cypress (*Cupressus* sp.), western sycamore, and toyon (*Heteromeles arbutifolia*).

Percolation Pond

There are four (4) percolation ponds located in the center of the Project site, northeast of the confluence of Van Gordon and San Simeon Creeks. While the upland edges of these are dominated by wild oats grasslands, the bottoms get periodically flooded for water treatment purposes and therefore undergo dynamic changes, sometimes holding dense vegetation, sometimes being bare and dry, and sometimes being inundated with water depending on the current flooding schedule.

Lagoon/Estuary

San Simeon Creek Lagoon/Estuary is located from just east of Van Gordon Creek Road to just west of SR 1. It is surrounded by the Central Coast arroyo willow riparian forest. When the sandbar is closed (typically late spring through fall or winter) this habitat is characterized as a lagoon. When it is open (typically fall or winter through early spring) it is characterized as an estuary where saltwater and freshwater merge. In some years the sandbar may not open at all, resulting in only a lagoon habitat, and in others the sandbar may be artificially breached by an excess of water, resulting in premature or untimely estuary habitat.

Disturbed

Disturbed areas within the survey area can be described as unpaved dirt roads, particularly those surrounding the percolation ponds and those passing through the eastern well field. These areas are not vegetated. It is also noted that the brine evaporation pond was previously disturbed when originally constructed to serve as a holding basin.

Developed

Developed areas within the survey area include existing wells and buildings, as well as the main access road to Well 9P7. These areas are not vegetated.

1.2.1 Wildlife

Plant communities provide food sources, along with foraging, nesting and denning sites, cover, and protection from adverse weather or predation. This section provides a discussion of those wildlife species observed, expected or not expected to occur on-site. The discussion is to be used as a general reference and is limited by the season, time of day, and weather condition in which the survey was conducted. Wildlife observations were based on calls, songs, scat, tracks, burrows and actual sightings of animals.

Amphibians

Much of the Project site and its immediate surrounding area would constitute suitable habitat for amphibians. Two amphibians were detected on-site, the common species Sierran chorus

frog (*Pseudacris sierrae*) and the federally threatened California red-legged frog (*Rana draytonii*). Other common amphibian species that could occur in San Simeon Creek or during heavy rainfall and subsequent ponding of water in the percolation ponds include western toad (*Anaxyrus boreas*), American bullfrog (*Lithobates catesbeianus*), ensatina (*Ensatina eschscholtzii*), and various species of slender salamander (*Batrachoseps* sp.). The Project site and surrounding area have the potential to support multiple special-status amphibians, including foothill yellow-legged frog (*Rana boylii*) and Coast Range newt (*Taricha torosa*).

Reptiles

The Project site has the potential to support both terrestrial and aquatic reptiles. Three reptile species were observed during surveys conducted by RBF Consulting (RBF), the common species western fence lizard (*Sceloporus occidentalis*) and coast garter snake (*Thamnophis elegans terrestris*), and the California species of special concern western pond turtle (*Emys marmorata*). The immediate Project site is primarily composed of disturbed, altered areas that are presently overgrown with vegetation. Two creeks, Van Gordon Creek and San Simeon Creek, traverse portions of the Project site. The general Project vicinity has the potential to support a number of reptilian species including gopher snakes (*Pituophis catenifer*), garter snakes (*Thamnophis* ssp.), California kingsnake *(Lampropeltis getula californiae*), northern Pacific rattlesnake (*Crotalus oreganus oreganus*), alligator lizard (*Elgaria multicarinata*), and side-blotched lizard (*Uta stansburiana*). The Project site and surrounding area also have the potential to support two-striped garter snake (*Thamnophis hammondii*).

Avian

The Project site and adjacent area support a high variety of avian species. Because of the high number of species observed, only the most numerous are mentioned here. Those that were observed in the greatest quantities included mallard (*Anas platyrhynchos*), turkey vulture (*Cathartes aura*), California gull (*Larus californicus*), Pacific-slope flycatcher (*Empidonax difficilis*), chestnut-backed chickadee (*Poecile rufescens*), bushtit (*Psaltriparus minimus*), cedar waxwing (*Bombycilla cedrorum*), song sparrow (*Melospiza melodia*), red-winged blackbird (*Agelaius phoeniceus*), and house finch (*Haemorhous mexicanus*). The Project site and surrounding area have the potential to support special-status raptors such as ferruginous hawk (*Buteo regalis*) and prairie falcon (*Falco mexicanus*).

Mammals

The plant communities within the Project site are anticipated to provide suitable habitat for a number of mammalian species acclimated to heavy disturbance. However, most mammal species are nocturnal and are difficult to observe during a diurnal field visit. Mammals observed during RBF's surveys include mule deer (*Odocoileus hemionus*), striped skunk (*Mephitis mephitis*), and feral pig (*Sus scrofa*), with additional sign from coyote (*Canis*

latrans) and woodrat (*Neotoma* sp.). Common mammalian species expected to occur on the Project site include California ground squirrel (*Otospermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), California vole (*Microtis californicus*), deer mouse (*Peromyscus maniculatus*), raccoon (*Procyon lotor*), cottontail rabbits (*Sylvilagus audubonii*), and opossum (*Didelphis virginiana*). The Project site and surrounding area have the potential to support special-status mammals, including fringed myotis (*Myotis thysanodes*) and Yuma myotis (*Myotis yumanensis*).

Fish

When wetted, San Simeon Creek, Van Gordon Creek, the San Simeon Creek Lagoon, and their tributaries would provide suitable habitat for fish. Threespine stickleback (*Gasterosteus aculeatus*) and the federally endangered tidewater goby (TWG, *Eucyclogobius newberryi*) were observed during the habitat assessment in San Simeon Creek and San Simeon Creek Lagoon. In addition to tidewater goby, the aforementioned waterways have the potential to support another special-status fish species, South-Central California Coast steelhead trout (*Oncorhynchus mykiss irideus*).

1.2.2 Wildlife Movement Corridors

The eastern portion of the Project site abuts the foothills of the Santa Lucia Mountains. This mountain range provides a natural corridor to the north and south along the Coast Ranges. However, while the Project vicinity is considered to be a north-south migratory linkage along the mountains, no formal east-west linkage has been recognized along San Simeon Creek or the other waterways by connectivity assessments such as Missing Linkages (Penrod et al. 2001) or the California Essential Habitat Connectivity Project (Spencer et al. 2010). Regardless, San Simeon Creek and the other waterways are likely to provide valuable migration habitat for birds and fish. San Simeon Creek is recognized by the California Coastal Commission and by the California Department of Fish and Wildlife (CDFW) as an essential creek for steelhead migration, and the lagoon that forms at the mouth of San Simeon Creek can host both juvenile steelhead and tidewater goby (CCC 1998). While California red-legged frog can migrate or move to upland areas during the nonbreeding season, this is decided by individual frogs and is not necessarily a feature of every frog in a population. Nevertheless, frogs that may be present in San Simeon Creek or other waterways in the Project vicinity may migrate up and down the waterways or leave the water and head to upland grasslands during seasonal migrations.

1.2.3 Surface Waters

1.2.4 Groundwater

1.3 REGULATORY REQUIREMENTS

1.3.1 California Environmental Quality Act

The California Environmental Quality Act (CEQA) provides for the protection of the environment within the State of California. If a Project is determined to be subject to CEQA, the lead agency will be required to conduct an Initial Study (IS); if the IS determines that the Project may have significant impacts on the environment, the lead agency will subsequently be required to write an Environmental Impact Report (EIR). A finding of non-significant effects will require either a Negative Declaration or a Mitigated Negative Declaration instead of an EIR. However, in certain conditions a project may be entirely exempt from the CEQA process.

In January 2014, California Governor Edmund G. "Jerry" Brown issued an emergency drought declaration and proclamation. In this emergency declaration, the Governor stated that the Department of Water Resources and the Water Board may take actions to make water immediately available, and that CEQA and all regulations adopted pursuant to CEQA "are suspended on the basis that strict compliance with them will prevent, hinder, or delay the mitigation of the effects of the emergency." The Governor's subsequent Proclamation of a Continued State of Emergency, issued on April 25, 2014, suspended the California Environmental Quality Act (Public Resources Code 21000 and following) for all actions taken by local agencies that were identified by the California Department of Public Health as vulnerable to acute drinking water shortages and that were necessary to implement solutions to such shortages if the Office of Planning and Research "concurs that local action is required." (Proclamation No. 4-25-2014, #12 & #19). On September 12, 2014, the Governor's Office of Planning and Research concurred that the Cambria Emergency Water Supply Project was subject to the Governor's April 2014 executive orders that suspended CEQA.

To abide by the conditions of the Emergency Coastal Development Pemit issued by San Lius Obispo County and support the District's Regular Coastal Development Permit application with the County, the District has commissioned the completion of an EIR, which is following construction of the Emergency Water Supply Project. This atypical completion process was necessitated by the area's extreme drought conditions and allowed for in the Governor's April 2014 Executive Orders.

1.3.2 California Coastal Act §30000 et seq.

Chapter 3 of the California Coastal Act contains policies to protect water quality and the biological productivity of coastal waters (PRC Section 30231); avoid and minimize dredging, diking, and filling sediments (PRC Section 30233); and mitigate wetland impacts (PRC Section 30607.1).

In addition, under the California Coastal Act "environmentally sensitive area means any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments" (PRC Section 30107.5).

The California Coastal Act requires that jurisdictions protect Environmentally Sensitive Habitat Areas (ESHA). Specifically, PRC Section 30240 states that:

a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on such resources shall be allowed within such areas.
b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade such areas, and shall be compatible with the continuance of such habitat areas.

The Coastal Act generally protects ESHAs where they exist and also protects "against any significant disruption of habitat values." Section 30007.5 of the Coastal Act states that where there is a conflict between policies that it:

> *…be resolved in a manner, which on balance is the most protective of significant coastal resources. In this context, the Legislature declares that broader policies which, for example, serve to concentrate development in close proximity to urban and employment centers may be more protective, overall, than specific wildlife habitat and other similar resource policies.*

The Project is located within the jurisdiction of the Coastal Zone, is adjacent to San Simeon Creek and and San Simeon Creek Lagoon, both ESHAs, and is adjacent to Hearst San Simeon State Park.

1.3.3 Local Policies

Local Coastal Program

Under Section 30500 of the California Coastal Act, each local government within the California Coastal Zone must prepare or have the Coastal Commission prepare for it a Local Coastal Program (LCP). The San Luis Obispo County LCP is a comprehensive four-part management program that is intended to assist with the management and protection of the Coastal Zone and to ensure compliance with the California Coastal Act; it was certified by the California Coastal Commission in 1987. This LCP is composed of four separate documents: *Framework for Planning*, *Coastal Plan Policies* (CPP), Area Plans, and *Coastal Zone Land Use Ordinance* (CZLUO).

a) *Framework for Planning*: San Luis Obispo County is split into 13 separate land use categories. The Framework for Planning document (SLO County 1988a) describes each of those categories in detail, including purposes and definitions ("characters"). In addition, the Framework for Planning contains Coastal Table "O," a table which lists approved uses within each land use category.
b) *Coastal Plan Policies*: The San Luis Obispo County CPP (SLO County 1988b) are intended to help the county carry out the preservation policies of the Coastal Act of 1976. As such, this document recommends policies and standards to be implemented for development within the Coastal Zone and to remain in compliance with the Coastal Zone Land Use Ordinance. Among many others, the CPP includes provisions for development that may affect riparian vegetation, terrestrial habitats, wetlands, or that may require habitat restoration. Much of the CPP works in tandem with and is implemented pursuant to the CZLUO.
c) *North Coast Area Plan*: San Luis Obispo County is divided into eight separate planning areas, four of which fall within the Coastal Zone; the Project is located within the North Coast Planning Area. The North Coast Planning Area extends from the northern San Luis Obispo County border south to Point Estero and east to the main ridge of the Santa Lucia Range, encompassing the communities of San Simeon and Cambria. The North Coast Area Plan (NCAP) (SLO County 1980) allocates land use within this planning area through the use of land use categories. Through these land use categories, the NCAP designates residential, commercial, and recreational development standards within the planning area to best protect and conserve natural resources and the overall land use plan. In addition to land use categories, there are "Combining Designations" (CDs). As defined by the NCAP, "Combining Designations are special overlay land use categories applied in areas of the county with potentially hazardous conditions or significant natural resources. In these areas more detailed project review is needed to avoid or minimize adverse environmental impacts, or effects of hazardous conditions on proposed projects." A 1998 update to

the NCAP (CCC 1998) more specifically defined ESHAs and other protected areas within the planning area.

d) *Coastal Zone Land Use Ordinance*: The CZLUO (SLO County 1986) is enacted as Title 23 of the San Luis Obispo County Code. It is the implementation portion of the LCP and regulates development and land use within the unincorporated areas of the California Coastal Zone. Chapter 7 of the CZLUO deals with CD standards, and Sections 23.07.160 to 23.07.178 pertain specifically to environmentally sensitive areas, including Sensitive Resource Areas (SRAs), ESHAs, wetlands, streams and riparian vegetation, terrestrial habitat, and marine habitat. This document works in tandem with the CPP and provides in many cases more detailed instructions and requirements for development in or adjacent to environmentally sensitive areas.

1.4 POTENTIAL IMPACTS TO SENSITIVE SPECIES

Based on habitat requirements for specific species, availability and quality of habitats needed by sensitive species, and known distribution in and around the Project site, it was determined that the following species occur or have a high potential to occur in the surrounding aquatic habitat. These species could be affected by Project implementation.

Amphibian and Reptile Species

Based on historical survey results and the results of RBF's surveys, it was determined that the habitat in and around the Project site supports or is likely to support the following sensitive amphibian and reptile species.

Western Pond Turtle

The western pond turtle is designated by the CDFW as a California species of special concern. It typically inhabits slow-moving streams, ponds, and marshes with exposed banks, logs, and other suitable locations for basking. Pond turtles mate and lay eggs in spring and summer in upland grassland habitat, and in most of their range will overwinter between October and April.

Western pond turtle has been previously documented in San Simeon Creek and San Simeon Creek Lagoon. Suitable habitat is located within these two areas, particularly in the downstream reaches of San Simeon Creek where the creek substrate gives way from rocks to sandy or muddy bottoms, which are often utilized by pond turtles for hiding during evasive movements. This species was observed by RBF biologists in San Simeon Creek Lagoon.

California Red-legged Frog

The California red-legged frog is federally listed as threatened and is designated by the CDFW as a California species of special concern. It is a year-round resident in the Project

vicinity. The life cycle of this species entails breeding between winter and early spring, followed by tadpole development and metamorphosis in summer. The California red-legged frog typically breeds between February and April in permanent or ephemeral water sources including lakes, ponds, reservoirs, slow streams, marshes, bogs, and swamps. During the non-breeding season, individuals of this species may leave and migrate elsewhere, but California red-legged frogs generally stay in one place year-round if the habitat is inundated. The California red-legged frog is primarily found near ponds in humid forests, woodlands, grasslands, coastal scrub, and streamsides with plant cover and is most common in lowlands or foothills.

In September and October 2014, RBF biologists conducted a California red-legged frog population count in San Simeon Creek Lagoon and lower San Simeon Creek consisting of two nocturnal mark-recapture surveys. No upland surveys were conducted. Surveys were spaced one week apart and an attempt was made to capture every frog. Using the Lincoln-Petersen population index and the mark-recapture data, the population of California red-legged frogs in San Simeon Creek Lagoon at the time of the surveys was estimated to be 54 frogs constituting a mixture of adults and juveniles. Overwintering tadpoles were not observed. The entire Project site is located within California red-legged frog Critical Habitat Unit SLO-2. Observed wetted habitat within San Simeon Creek during the habitat assessment was highly suitable for this species. This species was observed by RBF biologists in San Simeon Creek Lagoon.

Two-striped Garter Snake

The two-striped garter snake is designated by the CDFW as a California species of special concern. It is primarily an aquatic species and is typically found in or near permanent or semi-permanent water including creeks, pools, stockponds, and other areas. Surrounding vegetation is typically made up of chaparral, forest, woodland, and grassland, and may vary according to the season. This species is primarily active between spring and fall, and in many cases will retreat into a burrow for the winter. Breeding occurs in the spring after the snakes emerge into the active season again.

There is suitable habitat for this species in San Simeon Creek. While it is more likely to be found in the downstream sections where there is more water, it could occur throughout the creek. This species was not observed during RBF's surveys, but has been recorded in this area in the past and has a high potential to occur in San Simeon Creek, San Simeon Creek Lagoon, and Van Gordon Creek.

Fish Species

Tidewater Goby

The tidewater goby is federally listed as endangered and is designated by the CDFW as a California species of special concern. Tidewater goby is a year-round resident of San Simeon Creek Lagoon, generally only living for one year. It occurs primarily in coastal lagoons and estuaries and has only been captured in marine environments in very few instances. In their habitat, tidewater gobies are generally present in the upper estuary where the freshwater and saltwater mix, and will range upstream into pure freshwater and downstream into areas of majority salt water (up to about 75%). Though they can be present in water where salinity ranges up to 28 parts per thousand, they are predominantly found in areas where salinity is less than 12 parts per thousand, i.e. on the upper edges of tidal bays and in coastal lagoons. Tidewater gobies reproduce throughout the year but peak reproduction occurs in spring and late summer while the lagoon sandbar is closed.

There is occupied habitat for this species downstream of the Project site in San Simeon Creek Lagoon. This species was observed by RBF biologists in San Simeon Creek Lagoon, which is also tidewater goby designated Critical Habitat Unit SLO-5, during RBF's habitat assessment. A tidewater goby population estimate was also conducted in October 2014 by D.W. Alley and Associates under contract to RBF. The tidewater goby population estimate effort consisted of one survey in San Simeon Creek Lagoon using seine nets. A total of 1,002 tidewater goby were captured in San Simeon Creek Lagoon during this survey effort.

Steelhead (South/Central California Coast DPS)

Steelhead is federally listed as threatened and is designated by the CDFW as a California species of special concern. The population in the Project vicinity ranges from Santa Cruz County south to, but not including, the Santa Maria River. Typical freshwater steelhead habitat consists of gravel-bottomed, fast-flowing, well-oxygenated rivers and streams. Dissolved oxygen levels should be at least seven parts per million, and streams should have deep, low-velocity pools for wintering. The life cycle of this species is such that adult steelhead return to San Simeon Creek from the ocean in winter and early spring to spawn upstream. As the dry season returns and the creek begins to dry into isolated pools, young steelhead fry will either move into deep pools upstream or move downstream into the lagoon to mature while the sandbar is closed. When the sandbar opens again, steelhead smolt that have been summering in the lagoon will either move out to sea or remain in the lagoon and continue to grow for another year or more. Juveniles will typically spend between one and three years maturing in a freshwater or estuarine environment before migrating out to sea. After a typical span of one to four years of maturation in the ocean, the fish will return to their natal waters to spawn again.

There is suitable habitat for this species in San Simeon Creek. This species has been historically recorded over many years to occur within the creek, both in the creek and downstream in the lagoon. San Simeon Creek and Van Gordon Creek are part of the steelhead designated Critical Habitat unit that is located within the Estero Bay Hydrologic Unit. Based on local accounts, the sandbar across the mouth of the lagoon has not opened for the last couple years, preventing returning adult steelhead from spawning in San Simeon Creek and likely leading to the death of steelhead smolt that may have been maturing in the lagoon. At the time of the surveys in October 2014, no steelhead are believed to have been present in San Simeon Creek Lagoon or the lower reaches of San Simeon Creek. However, this species is expected to have a high potential for occurrence and should be assumed to be present in these water bodies under a normal rainfall year (i.e. not under drought conditions).It is noted that historically, both San Simeon Creek and Santa Rosa Creek were stocked with steelhead by the CDFW and local ranchers.

Section 2 Monitoring Program

Concern has been expressed regarding the Project's potential to lower groundwater levels and create a cone of depression that would impact surface flows in San Simeon Creek as well as riparian vegetation along the banks of San Simeon Creek.[1] This concern is also related to the potential lowering of general groundwater levels and the potential to impact up-gradient phreatophytes as the groundwater level drops. Groundwater modeling conducted by CDM Smith determined that by providing the 100 gpm of mitigation water as a design feature, the Project's proposed pumping and reinjection program would not adversely affect surface water levels in the San Simeon Creek Lagoon and that this action would have no impact upon tidewater goby, steelhead trout, or California red-legged frog. The mitigation water is intended to replenish lagoon water that is lost by seepage to the lowered groundwater table. During times when the Project is operating, there is not significant flow, since the beach berm generally isolates the system from a direct surface connection to the ocean. Due to the complexity of the San Simeon Creek system and to verify that no impact to habitat would occur, one of the mitigation measures recommended for this Project is the development and implementation of an Adaptive Management Plan (AMP) to monitor in-stream and riparian habitat associated with San Simeon Creek, San Simeon Creek Lagoon, and Van Gordon Creek. This AMP was developed to verify that the Project would not significantly adversely impact the in-stream habitat or the surrounding riparian habitat and the species that depend upon them.

This AMP has been prepared as a contingency to define available management actions by the CCSD to address unforeseeable significant adverse impacts, as well as to contribute to the long-term sustainability of the in-stream and riparian habitats in lower San Simeon Creek, San Simeon Creek Lagoon, and Van Gordon Creek. Annual reports will be prepared and will include recommendations for ongoing monitoring and any adaptive management actions required to mitigate any measured loss or prospective loss of riparian habitat that may be attributable to the Project's implementation. Using the baselines and thresholds as described in this AMP, significant adverse impacts to riparian habitat that are attributable to the Cambria Emergency Water Supply Project will be identified early and mitigated before significant adverse impacts occur.

All monitoring duties will be conducted by a biological monitor (BM) or a team of monitors. The BM(s) will be expected to participate in each of the following monitoring and reporting

[1] Concerns were expressed at an interagency meeting held on August 27, 2014 at the Santa Cruz, CA office of the California Coastal Commission. Participants included representatives from CCSD, RBF, CDM Smith, CDFW, USFWS, CA Department of Parks and Recreation, the Regional Water Quality Control Board, U.S. Army Corps of Engineers, and the California Coastal Commission.

activities, as described below. The BM(s) must be capable of correlating quantitative hydrologic modeling with stream conditions, taking stream measurements with standard electronic meters, and comparing habitat requirements of sensitive species against the on-site conditions to identify changes and determine if the noted changes have the potential to result in significant future adverse impacts. To evaluate riparian health, the BM(s) or other biological contractor(s) must be familiar with and possess demonstrable experience conducting evaluations using the California Rapid Assessment Method (CRAM). To conduct capture surveys for listed species, at least one of the BM(s) or other biological contractor(s) conducting the survey must possess current and valid Endangered Species Act Section 10(a)(1)(A) recovery permits for tidewater goby, steelhead trout, and California red-legged frog as applicable, as well as a California Department of Fish and Wildlife Scientific Collecting Permit allowing take of any or all of these species.

Confirm Baseline Assumptions

During the first year of monitoring, the focus will be to gather sufficient data at the monitoring stations to define the interaction between groundwater and surface water and how it has maintained the in-stream habitat as well as the surrounding riparian habitat. Data collection (and analysis) will include groundwater and surface water data, habitat data, and species distribution data. This information will be combined with historical data recorded by CCSD as part of its regular operations and by biological monitoring and surveys. An analysis of the combined set of data will be used to set the threshold for adverse impacts.

Collect Baseline Data

Baseline data for groundwater and surface water gathered during the first year will be collected on a monthly basis. Surface water and groundwater data will include collecting available data from existing surface water monitoring stations, as well as measuring all indications of ponding or surface discharge within a 50-foot radius of the designated groundwater wells. Depth and duration of ponding will be recorded. The water budget for CCSD operations in the San Simeon aquifer will be compiled for correlation with the monitoring program. These data will include monthly averages for:

- Pumping from wells SS1, SS2, SS3 and 9P7
- Inflow to the AWTP
- Injection into RIW-1
- Discharge of treated effluent from the Cambria POTW to the percolation ponds
- Filter backwash discharge from the AWTP to the percolation ponds
- Discharge of RO concentrate to the evaporation pond

Data loggers will be used to record diurnal variations in water levels from wells that are adjacent to riparian areas. This data will be recorded each month and correlated with the groundwater data and surface water data. As noted, it is believed, based on the existing information, that the soil moisture is maintained by a combination of groundwater and surface water. However, data collection (current and historic) and analysis will be needed to confirm this assumption.

Establishment of Thresholds

At the end of the first year, baseline conditions will be established and the interaction of groundwater levels, lagoon levels and surface flows will be better understood. This information will be used to determine specific thresholds that "trigger" additional investigation and adaptive management measures.

2.1 MONITORING GROUNDWATER LEVELS

A groundwater monitoring and management program was recommended for San Simeon Creek by the National Marine Fisheries Service in the 2013 South-Central California Coast Steelhead Recovery Plan (NMFS 2013). Monitoring stations will be established within the adjacent riparian corridor that will allow for monitoring of groundwater levels. Wherever possible, the use of existing monitoring well data, including data routinely collected by the District, will be incorporated. During the initial monitoring year, groundwater data gathered from the CDM Smith 2014 hydro-geological modeling efforts coupled with current data from a monitoring well or system of wells, will be used to establish baseline conditions against which future conditions can be compared. This information will be combined with historical groundwater data as recorded by CCSD. CCSD currently has 20 wells monitoring water levels for San Simeon Creek, 15 of which are within one mile of the proposed water extraction point (Well 9P7) vicinity. If not already present, it is recommended that each of the monitoring wells that will be used as part of the AMP be fitted with pressure transducers that record water levels once every 15 minutes. Although CCSD will continue to take regular groundwater level measurements twice per month to include on comparison charts, having groundwater data available in 15-minute increments will allow retrieval of up-to-date information as needed. Groundwater level data will be supplied to the BM on a monthly basis for evaluation and recommendations as necessary.

The average groundwater levels in San Simeon Creek production wells between 1988 and 2014, as measured bimonthly, indicate that groundwater has been at approximately 20 feet above sea level from February to May, gradually dropping each year in the late spring and summer to reach an average of only eight (8) feet above sea level by October before gradually rising again (CCSD 2014). For purposes of this AMP and during operation of the Project facilities, fluctuations in groundwater levels will be monitored monthly at all

available monitoring wells. A drop in groundwater levels outside of historical ranges will be analyzed with the District's hydrologist to determine if the drop in level is within the expected range or if further investigation is required.

2.2 MONITORING SURFACE WATER FLOW

Surface water flow is an integral component of providing suitable habitat for aquatic species. While tidewater goby and California red-legged frog require still water or minimal water flow to survive, steelhead trout requires water flow during most of its life stages, including adult migration, spawning, juvenile growth, overwintering, and juvenile migration (Smith undated). Surface water flow can be seriously depleted by water withdrawals, and as such it will be necessary to simultaneously monitor surface water levels in San Simeon Creek. It is recommended for ease, efficiency, and accuracy that stream flow be measured electronically with a flow meter, such as the Marsh McBirney Flo-Mate 2000. However, the facility may only be operated when the adjacent reaches of San Simeon and Van Gordon Creeks are already dry, as these reaches only flow seasonally and are not perennial streams. Therefore, such monitoring may be more closely related to monitoring the San Simeon Creek Lagoon area during the dry season. It is noted, little if any flow will be observed during the dry portion of the year, if the beach berm is not open. Monitoring of stage in the lagoon and the stage relative to groundwater will be assessed.

In the absence of an electronic flow meter, an alternative but less accurate method of calculating stream flow is to calculate the amount of time that it takes for a floatable object (e.g. pine cone, orange) to float down a fixed stream segment. With this method, flow can be calculated by solving the following equation:

$$\text{Flow} = ALC / T$$

Where:

- A = The average cross-sectional area of the stream (stream width multiplied by average water depth);
- L = The length of the stream reach that is being measured (typically this is 20 feet);
- C = A coefficient or correction factor (0.8 for rocky-bottom streams or 0.9 for muddy-bottom streams); and
- T = The time in seconds for the float to travel the length L.

Surface water flow should be measured at least twice each month at two-week intervals for the first year at the same time and in the same general location that the surface water level is measured (Section 2.3). It is noted, there will be tidal influences on the flow in the system, if

the beach berm is open. Measurement periods would be required to specify the point in the tidal cycle when spot measurements are taken. Measurements will be taken in Van Gordon Creek, San Simeon Creek, and San Simeon Creek Lagoon, as applicable. The information obtained during this measurement will be used to help determine habitat suitability for fish species, as described in Section 2.5. Typical flow rates will be determined over the course of the first year of monitoring in order to determine baseline flow rates for future benchmarking. Following the first year, measurements shall be taken on a quarterly basis.

2.3 MONITORING SURFACE WATER LEVELS

San Simeon Creek originates in the Santa Lucia Range and runs for approximately 8.5 miles before draining into San Simeon Creek Lagoon. Upstream of the confluence with Steiner Creek it is perennial.[2] As such, it receives significant surface flow each year, much of which dries up in the late spring and summer. Historical biological survey reports for lower San Simeon Creek and San Simeon Creek Lagoon will be used to help characterize the annual water cycles (temporally) and inundation patterns (geographically) in these water bodies. In addition, CCSD will coordinate with applicable agencies and organizations to identify key surface water monitoring stations for collection of historical data and active monitoring data.

CCSD staff gages are present in San Simeon Creek. However the San Luis Obispo County Flood Control District maintains a former USGS gaging station, which is located between the San Simeon well field and the proposed AWTP. The County data for this station is also available online via their website. Manual staff gages are used for quick visual recording of the height of surface water in water bodies. Where appropriate and as part of this AMP, and in consultation with the BM and a hydrologist, the CCSD will install additional staff gages in Van Gordon Creek, San Simeon Creek, and San Simeon Creek Lagoon for the future measurement of surface water levels. Gages will be placed at easily accessible locations to facilitate efficient and cost-effective gage checks. It is recommended that they be placed in areas where it is convenient to simultaneously measure water levels and stream flow. Surface water levels will be measured twice per month at two-week intervals for the first year of AMP implementation. Historical data will be used to establish baseline surface water levels for future monitoring. Following the first year, measurements shall be taken on a quarterly basis.

[2] Based on the USGS report of monitoring of the Palmer Flats gage, which is near the confluence, the stream is dry for about half the year.

2.4 MONITORING IN-STREAM AND RIPARIAN HABITAT EXTENT AND HEALTH

A crucial element of the long-term monitoring process will be to monitor the extent and health of the in-stream and riparian habitat associated with Van Gordon Creek, San Simeon Creek, and San Simeon Creek Lagoon. This includes the measurement of wetted width, wetted depth, water flow, and soil moisture levels in the riparian habitat. These measurements will in turn evaluate the suitability of the habitat to support listed species known to occur in the Project vicinity.

The riparian forest within the immediate vicinity of groundwater and surface water monitoring stations will be directly monitored to detect changes in soil moisture levels as well as vegetative composition. For areas that exhibit groundwater at or near the surface, groundwater is the primary source of water for the riparian vegetation at that location. Similarly, for areas with consistent surface discharge, but with lower groundwater elevations, vegetation depends mostly on surface water. Undoubtedly, some areas obtain water from both sources, and this is likely to vary within a single year and also from year to year depending on a variety of factors, making the determination of definitive baseline conditions difficult. Based on RBF's current understanding of the interaction of groundwater levels and surface flows, a combination of severe and rapid groundwater drawdown in excess of several feet, coupled with a corresponding loss of surface flows, would be required before soil moisture within the rooting zone of the riparian habitat would decrease enough to cause adverse impacts to the riparian plants and ultimately a reduction in riparian forest.

The proposal to collect groundwater, surface water, and soil moisture data will provide important information on vegetative response to changing conditions. In addition to collecting these data, it is recommended that three separate CRAM surveys be conducted of Van Gordon Creek, lower San Simeon Creek, and San Simeon Creek Lagoon. CRAM is a rapid assessment method used to monitor California's wetlands by assessing the ambient conditions within watersheds and assigning numerical scores based on physical and biotic features. CRAM surveys have previously been conducted in upper San Simeon Creek Lagoon (upstream of Van Gordon Creek Road) in 2005 and 2007. By conducting new or updated CRAM surveys of Van Gordon Creek, lower San Simeon Creek, and San Simeon Creek Lagoon, baseline physical conditions can be obtained to compare against in the future. CRAM surveys shall be conducted annually to provide long-term pictures of the potentially changing conditions within this watershed.

2.5 MONITORING AVAILABLE IN-STREAM AND FISH HABITAT

A major component of monitoring the available fish habitat in San Simeon Creek and San Simeon Creek Lagoon is establishing the connection between stream flow and habitat. The

Physical Habitat Simulation System (PHABSIM) software is used to simulate the relationship between stream flow and physical in-stream habitat for different life stages of designated fish species (Milhous and Waddle 2012). PHABSIM relies upon hydraulic simulation using defined hydraulic parameters and habitat simulation using defined habitat suitability criteria. Hydraulic simulation looks at particular stream segments that may have different combinations of depth, velocity, and channel index (e.g. substrate, cover). This information is subsequently used to calculate a habitat measure called Weighted Usable Area (WUA) for the subject stream segment from species suitability information.

By inputting tidewater goby and steelhead trout habitat requirement parameters into the PHABSIM model, it is possible to calculate the WUA for each of these species. This information will be calculated at least twice a month at two-week intervals following each period of measurements in order to determine if the simulated suitable habitat for these species has increased, decreased, or is remaining constant during Project implementation.

Available fish habitat can also be determined on a relative scale using quantitative measurements such as temperature and available dissolved oxygen. These water characteristics can be measured with oxygen and salinity meters. According to annual studies commissioned by the CCSD between 1991 and 2005, tidewater goby has been observed to be generally more tolerant of adverse ambient conditions. Tidewater goby can spawn at salinities ranging from 5 to 10 parts per thousand (ppt) and can survive in temperatures ranging from 18 up to 27° Celsius (C) and only 1 part per million (ppm) of dissolved oxygen (DO).

However, steelhead trout require more restrictive aquatic conditions in order to survive. Based on years of annual steelhead surveys funded by CCSD on San Simeon Creek, optimal conditions for steelhead trout in San Simeon Creek are believed to be salinity of less than 10 ppt, water temperatures below 22°C, and dissolved oxygen of greater than 5 ppm. While steelhead can survive at DO concentrations as low as 1-2 ppm, this is generally only for a very short period of time and typically only in the morning when temperature is low and DO is at its lowest due to overnight algal respiration. Algae conduct photosynthesis during the day when the sun is out, consuming carbon dioxide and producing high amounts of oxygen. At night the opposite trend occurs with photorespiration: algae consume and can nearly deplete oxygen while simultaneously producing high levels of carbon dioxide, thus leading to substantially lower DO levels overnight and into early morning. Steelhead ecology is such that these temporary nightly drops in DO are tolerable because the temperature is generally cooler and metabolic rate is reduced; as water temperature increases over the course of the day, fish metabolic rates increase (generally doubling with each 10°C increase in water temperature) and they require more oxygen. It is estimated that steelhead would be able to survive for only 15-30 minutes with 1-2 ppm DO and at a water

temperature of 18-20°C. Thus, steelhead cannot persist for extended periods of time with low DO and high temperatures.

Available habitat for California red-legged frog and other aquatic herpetofauna can also be determined the same way. California red-legged frog lays eggs in water that is usually less than 16°C, with a maximum salinity tolerance of 9 ppt for adults and 6 ppt for embryos (Cook 1997). Western pond turtle occurs in brackish estuaries or freshwater (Lovich undated), preferring temperatures between 15°C and 39-40°C and generally not occurring in water that is outside of this range (Jennings and Hayes 1994). By measuring the appropriate aquatic data, as described above, general suitability for monitored species can be determined.

The above habitat measurements will be measured and evaluated twice a month for the first year at two-week intervals along with all other measurements. Following the first year, habitat will be evaluated on an annual basis.

2.6 MONITORING PRESENCE OF LISTED SPECIES

Tidewater goby, steelhead trout, and California red-legged frog have been known to occur in lower San Simeon Creek and/or San Simeon Creek Lagoon since at least the early 1990s, and much earlier for steelhead due to artificial fish stocking. From 1992 to 2006, the CCSD commissioned in-house surveys for tidewater goby and steelhead in lower San Simeon Creek and San Simeon Creek Lagoon. Tidewater goby was surveyed semiannually, while steelhead was surveyed annually. CCSD has not regularly commissioned California red-legged frog surveys, but this species has instead been surveyed for on an as-needed basis for research and management requirements, particularly by biologists representing and funded by the USGS Piedras Blancas Research Station.

Historically, tidewater goby surveys have been conducted in San Simeon Creek Lagoon in early summer and early fall to measure the species' status immediately after sandbar closure and immediately before the sandbar opens again. Steelhead has been surveyed for in lower San Simeon Creek in the summer after young steelhead had hatched. To monitor the presence or absence of listed species, it is necessary to continue conducting surveys for them following Project implementation. Surveys for these two species shall continue to be conducted during these same time periods in order to capture consistent data with what has historically been evaluated and to continue building a database of fish presence in these water bodies.

As part of this AMP, visual surveys for California red-legged frog shall be conducted on a regular basis in February/March and again in August/September. It is recommended that the first surveys be conducted in early February; if breeding (e.g. observation of amplexus,

aural detection of mating calls, presence of egg masses, or presence of tadpoles) is not documented during these surveys, a second round of surveys shall be conducted three (3) weeks later.

Historically, tidewater goby surveys have been conducted in San Simeon Creek Lagoon in early summer and early fall to measure the species' status immediately after sandbar closure and immediately before the sandbar opens again. Steelhead trout have been surveyed for in lower San Simeon Creek in the summer after young steelhead had hatched. Surveys for these two species shall continue to be conducted during these same time periods, in order to capture consistent data with what has historically been evaluated and to continue building a database of fish presence in these water bodies. Two (2) rounds of visual surveys for tidewater goby and a single visual survey for steelhead trout shall be conducted.

2.7 MONITORING WATER QUALITY

CCSD's wastewater department currently monitors and analyzes water quality semiannually at Wells SS3, SS4, 9P7, 16D1, and a separate USGS well. Measurements are taken of depth to groundwater and groundwater elevation, nitrate/nitrogen, total dissolved solids, sodium, chloride, sulfate, boron, and water pH. The recent enrollment of the Project's mitigation water into the RWQCB's General NPDES permit for low threat discharges will also have additional monitoring and water quality requirements. This information will be provided to the BM for analysis and comparison with previous measurements. In addition, water quality will be evaluated based on its ability to provide suitable habitat for fish and other aquatic species.

2.8 GROUNDWATER MODEL DEVELOPMENT

Data obtained during the aforementioned monitoring actions, particularly those described in Sections 2.1 – 2.4, will be used to develop and calibrate the groundwater model that will assist in tracking condition changes in San Simeon Creek, San Simeon Creek Lagoon, and Van Gordon Creek. Baseline data obtained during the first monitoring year will be combined with historical data to determine regular and expected habitat measurements at all times of the year. These data will be used to determine thresholds at which management changes will be required while the facility is in operation.

In order to determine the point at which creek outflow may be adjusted or other management actions may be implemented to avoid impacts to listed species, it is necessary to determine the thresholds at which the potential for an adverse impact would need to be evaluated. Unless otherwise attributable to natural causes, or anthropogenic activities by riparian users upstream and apart from the CCSD-controlled property within the watershed

(e.g., an agricultural accident leading to a chemical spill), should any of the following conditions be documented during regular surveys or otherwise during creek monitoring, management actions shall be required:

- Unexplained deaths or die-offs of tidewater goby, steelhead trout, and/or California red-legged frog;
- Early closure of the San Simeon Creek Lagoon sandbar due to dropping water levels;
- Failure of California red-legged frog egg masses due to desiccation;
- Unexplained changes in population levels of these species;
- Project-related drop in groundwater levels below previous historic minimum levels causing impacts to riparian habitat;[3]
- Decrease in lagoon surface water levels below historic minimums.[4]

As part of the Project, 100 gpm of treated groundwater would be released via pipeline into San Simeon Creek Lagoon as mitigation to avoid potential adverse impacts. Using the monitoring methods provided within this AMP, if it is found that riparian vegetation, creek or lagoon water levels, and/or species population numbers surpass the thresholds established in this document or those established based on the first year of monitoring, the CCSD may increase the treated water mitigation being provided, adjust facility operations, or suspend facility operations until conditions are once again deemed acceptable.

[3] Water levels are anticipated to drop every year regardless of Project operations. Therefore, should the lowering of groundwater levels result in riparian habitat impacts, management actions may include, but not be limited to: artificially increasing the soil moisture content around riparian plants; periodically alternating which percolation basin is in operation; reducing extractions; increasing the mitigation water flow; or, some combination of these approaches (also see Section 5).

[4] It is noted, surface water flows will need to be correlated to rainfall. No flow is anticipated during the dry season.

Section 3 Reporting

This adaptive management plan is a surface water, groundwater, and biological monitoring program designed to provide adaptive management to the Cambria Emergency Water Supply Project to ensure that it will not result in significant adverse impacts to the riparian habitat in San Simeon Creek, San Simeon Creek Lagoon, and Van Gordon Creek. Integral to the effectiveness of an adaptive management program is the preparation of monthly, quarterly, and annual reports to monitor in-stream and riparian conditions within the subject area.

For the first year of monitoring, the BM will prepare and submit to the CCSD a monthly report that will discuss any notable changes in conditions. If any conditions show adverse changes, the report will suggest remedial actions to take. If the site conditions are all shown to be within an acceptable range of variation, the report will note this as such. The report will be equivalent to a memo report or a short letter report for quick analysis of monthly conditions. Following the first year, the report will be compiled on a quarterly basis.

For the first year and all subsequent years, the BM will prepare an annual report for submittal to CCSD, the CDFW, and the U.S. Fish and Wildlife Service (USFWS). The annual report will identify:

- Periods of operation of the new facility;
- Specific parameters that were monitored during the year;
- Any noted changes in the quality or extent of riparian habitat in Van Gordon Creek, San Simeon Creek, or San Simeon Creek Lagoon;
- Additional factors that could affect the long-term sustainability of surrounding riparian habitat and that should be included in the monitoring program; and
- Specific management measures that should be considered to minimize potential effects of the Cambria Emergency Water Supply Project.

Monitoring each year will occur from October 1 through September 31 of the following year. The collected monitoring data will be analyzed during the month of November and presented to an oversight committee each December for review, including preliminary interpretation of data, recommendations for hydrologic and biological monitoring in the coming year and, if necessary, adaptive management measures to correct potential adverse conditions. The annual report shall provide results of the data collection, an interpretation of results, and recommendations for changes to the monitoring program. Recommended changes to monitoring procedures and/or other adaptive management actions will be approved or denied by January 15. Table 1 provides an outline for the required elements of the annual report.

Table 1:
Annual Report Outline for the Cambria Emergency Water Supply Project
Adaptive Management Plan

Annual Report Format
Introduction Briefly mention the monitoring programs conducted that year, the type of data, and the intended use of these data. **Methods** Describe the methodology for each monitoring program conducted that year in sufficient detail to ensure repeatability. Describe the analyses used to generate the results from each set of data. **Results** The results section presents the collected data in consistent format (tabular and/or graphic). Note changes in surface flows and groundwater levels and any changes in riparian habitat at each of the monitoring sites. **Discussion** Provide an analysis of the collected data and discuss whether any observed changes and/or trends are within natural variation or indicative of unexpected and adverse effects from the loss of surface water or changes in groundwater levels. If changes in surface water and/or groundwater are determined to be outside natural variation, assess whether they are related to changes in the riparian forest in surrounding riparian habitat. **Conclusions** The conclusion should be a succinct summary of the results, interpretation of the data analysis including noted changes or identified trends, recommendations for modifications to the monitoring program, and recommendations for adaptive management actions. **References** Appendix A Groundwater Monitoring Data Appendix B Surface Water Flow Monitoring Data Appendix C Surface Water Level Monitoring Data Appendix D Riparian Vegetation Monitoring Data Appendix E In-stream and Fish Habitat Monitoring Data Appendix F Species Survey Data

Section 4 Process to Revise the AMP

The unique challenge associated with monitoring arises from the need to identify potential adverse effects in a timely manner, so that remedial measures can be implemented before significant adverse impacts (e.g., die off of areas of riparian habitat or of listed species) occur. As described in Section 2, the goal of this Plan is to determine, through monitoring of appropriate early indicators (groundwater levels, surface water flows, riparian habitat condition), that actions related to the Cambria Emergency Water Supply Project are not on a trajectory to cause harm to in-stream and riparian resources in lower San Simeon Creek, San Simeon Creek Lagoon, or Van Gordon Creek.

The annual collection of data will provide a picture of the seasonal trends and, after a number of years, longer-term trends in groundwater and surface water levels in these water bodies, as well as the associated health of the in-stream and riparian habitats based on visual observations of the extent and overall health of the in-stream habitat and riparian vegetation using aerial photographs and photo documentation. Section 2 above describes each indicator to be monitored, the expected range of measurements during the course of a single annual monitoring period, and levels of deviation from the previous monitoring period that would be considered outside natural variation, thus triggering the need for a more detailed assessment of in-stream habitat and riparian vegetation (in-stream measurements, CRAM surveys, detailed examination of aerial photographs, and ground level photo documentation).

All of the above data will be included in the annual report, including any noted change in monitoring levels. This report will also assess whether the noted change can be attributed to other causes independent of the Project, or if the change is thought to represent an adverse response to the Project's ongoing groundwater extraction activities. If a change is determined to be an adverse response to the ongoing groundwater pumping, recommendations for correcting the deviation will be included in the annual report and submitted to CCSD for their review and evaluation as part of the monitoring and annual reporting process under this AMP.

Recommendations for revisions to the monitoring and the adaptive management program, including groundwater, surface water, and biological monitoring, as well as suggested corrective measures to Project-related activities, will be evaluated and considered by CCSD during their reviews of the annual report. Linking recommendations for budgeting to the reporting process will facilitate funding of any needed changes to the monitoring program and adaptive management process.

All monitoring results, suggested revisions to the monitoring program, recommendations for corrective actions related to the groundwater extraction (adaptive management measures), and comments will be presented to the District in the annual report for future monitoring and management decisions. Following District review, suggested revisions or corrective measures will be made and noted in the AMP, including changes to the monitoring program. A final annual report will be prepared and made available to CDFW and USFWS.

Section 5 Potential Mitigation Measures

The development and implementation of this AMP will ensure that the Cambria Emergency Water Supply Project operations do not significantly adversely impact the riparian habitat of the lagoon and adjacent reaches of San Simeon Creek and Van Gordon Creek . The following potential mitigation measures are suggested for evaluation in the event that significant and adverse deviations and/or trends are noted in San Simeon Creek, San Simeon Creek Lagoon, and/or Van Gordon Creek as part of the annual monitoring program:

- **Limit operations to dry season periods when there is no surface water flow in San Simeon Creek and Van Gordon Creek.** As proposed, the facility is intended to augment water supplies during the dry season. The adjacent lower creek reaches are not perennial and typically dry up by mid-summer of each year. Under such dry conditions, steelhead and related species of concern would likely be limited to the San Simeon Creek lagoon area. The Project's mitigation water design feature is intended to protect the lagoon area during such dry season operations.

- **Adjustments to New Facility Operations.** The amount of groundwater being removed by the new facility may need to be temporarily reduced or suspended should monitoring determine potentially adverse riparian impacts were projected to occur. This measure should be considered if groundwater and/or surface water levels substantially drop to levels outside of historical ranges and significantly impact habitat. If conditions begin to improve and once again fall within the acceptable range, the amount of groundwater being pumped by the new facility at that time should be considered for subsequent pumping regime levels to avoid repetitive occurrences.

- **Changes in the quantity of treated water that is returned to San Simeon Creek Lagoon.** As proposed, CCSD will return 100 gpm of treated water to San Simeon Creek Lagoon. It may be necessary to increase the amount of water that is returned into the lagoon by increasing the mitigation water flow or adjusting operation of the new facility to pump less. This measure should be considered if surface water levels or riparian health decrease below what is considered acceptable due to operation of the new facilities. If conditions begin to improve and once again fall within the acceptable range given annual site conditions, the amount of treated water being returned to San Simeon Creek Lagoon at that time should be adjusted to avoid repetitive occurrences.

- **Increase soil moisture content for riparian plants**. Should plants along the riparian corridor exhibit stress due to a lowering of groundwater levels, irrigation to increase soil moisture content may be deployed. This adaptive measure may include the use of a water truck or above ground irrigation piping to increase soil moisture content. Additionally, the CCSD may periodically alternate which percolation basin they are using in order to place percolated water closest to plant areas showing signs of stress. The CCSD has historically needed to operate only one of its four existing percolation basins at any given time. Therefore, it has some operating flexibility on which percolation basin it places into operation.

- **Design and implementation of additional biological monitoring measures.** In the event that negative trends are not reversible with the above measures, additional monitoring measures may be required to reverse such negative trends. Such measures would be identified and described in the annual monitoring report.

Section 6 References

Cambria Community Services District (CCSD). 2014. Well Level Reports. Available online at http://www.cambriacsd.org/cm/water_wastewater/well-levels.html.

Cook, D. 1997. Biology of the California Red-legged Frog: A Synopsis. Transactions of the Western Section of the Wildlife Society 33: 79-82.

Jennings, M. and M. Hayes. 1994. Amphibian and Reptile Species of Special Concern in California. Final Report Submitted to the California Department of Fish and Game, Inland Fisheries Division. pp 98-103.

Lovich, J. Undated. Western Pond Turtle, Clemmys marmorata. United States Geological Survey, Western Ecological Research Center.

Milhous, R.T. and T.J. Waddle. 2012. Physical Habitat Simulation (PHABSIM) Software for Windows (v.1.5.1). Fort Collins, CO: USGS Fort Collins Science Center.

National Marine Fisheries Service (NMFS). 2013. South-Central California Coast Steelhead Recovery Plan. West Coast Region, California Coastal Area Office, Long Beach, California.

Smith, J.J. Undated. Winter Steelhead and Chinook and Coho Salmon Life Cycles and Habitat Requirements. Available online at http://www.swrcb.ca.gov/rwqcb3/water_issues/programs/timber_harvest/docs/steelhead/salmon_steelhead_life_cycle_requirements.pdf.