

### 3.1.2 Hydrology and Water Quality

This section assesses general surface water hydrology and water quality conditions in unincorporated San Diego County (County) and identifies potential hydrology and water quality impacts that could result from implementation of the proposed project. The information used in this analysis is general in nature and is derived from the most readily available information in applicable resource and planning documents.

The general surface water hydrology and water quality conditions of the project area were based on review of the *Water Quality Control Plan for the San Diego Basin (9)* (Basin Plan) (RWQCB 1994), applicable general plans, and the City and County of San Diego online geographic database (SanGIS 2008).

#### 3.1.2.1 Existing Conditions

A wind turbine or Meteorological Testing (MET) facility may be located in various hydrologic subareas within the various hydrologic units throughout the unincorporated areas of the County. Natural areas within the County may include marshes, lakes, ponds, streams, sloughs, and seasonal wetlands. Artificially created/developed areas within the County may include stormwater detention basins and other facilities or structures, flood control channels, street drains and gutters, roadside ditches, and road ruts. Figure 3.1.2-1 illustrates the locations of these various surface waters. The overall geographic setting of the San Diego Region results in a number of physiographic and environmental characteristics. A discussion of these major elements is provided as follows.

#### Physiography

The San Diego Region occurs within the Peninsula Range Physiographic Province of California. The San Diego Region is divided into a coastal plain, a central mountain-valley area, and an eastern mountain valley area (RWQCB 1994). Urbanized areas within the County are located mainly within the coastal plain and, to a lesser extent, the central mountain-valley area. The coastal plain, which extends approximately 10 miles inland from the sea, has been deeply dissected by streams draining to the sea.

#### Soil Erosion and Sedimentation

Soils and sediment are composed of small pieces of decomposed rock material such as sand, gravel, loam, clay, or silt that also contain varying amounts of organic materials. Soils within the County are classified by the Natural Resources Conservation Service into four hydrologic soil groups (A, B, C, and D) based on the soil's runoff potential. Group A generally has the least

runoff potential and group D the greatest. Future wind turbines and MET facilities would be located within any one, or a combination of, these soil types.

Erosion is a natural process caused by water, wind, mechanical, or chemical forces acting on exposed natural land. The process removes soil, sediment, and rock from exposed areas and transports the resulting topsoil and sediment. The rate of erosion is dependent on three factors: the type of material that is eroded, the type and amount of erosive forces, and the shape of the landform involved. Increased sedimentation, over and above the amount that enters the water system by natural erosion, can cause many adverse impacts on aquatic organisms, water supply, and wetlands. Sedimentation can decrease transmission of light, which affects plant production and leads to loss of food and cover for aquatic organisms. It can change behavioral activities (nesting, feeding, mating), and adversely affect respiration, digestion, and reproduction. Contaminants and toxic substances can also be transported in sediments. Sediments can damage water treatment equipment, increasing treatment costs. They can reduce reservoir volume and flood storage and increase peak discharges.

The U.S. Department of Agriculture's Soil Survey for the San Diego Area conducted in 1973 rated and classified each soil's level of erodibility typical of that class. A rating of slight, moderate, or severe was applied to each classification based on four criteria: surface layer texture, grade of structure in the surface layer, depth of material that restricts permeability, and slope. Note that climate, plant cover, and physiographic features are not a part of the rating system for erodibility since these factors vary independently of the soil classification type. Based on the 1973 soil survey, approximately 74% (325,464 acres) of the project area contains soils that are considered to be susceptible to erosion while only 26% (115,318 acres) are considered non-erodible.

### Groundwater Hydrology

San Diego County overlies a complex groundwater resource that varies greatly throughout the region. The western portion of the County is mostly supplied with imported water from member agencies and the San Diego County Water Authority. The remaining portion of the County is completely dependent on groundwater resources. The County contains three types of groundwater aquifers: fractured rock, alluvial/sedimentary, and Desert basin aquifers. The County is located in the jurisdiction of the Regional Water Quality Control Board (RWQCB) San Diego Basin, Region 9, and the Colorado River Basin, Region 7. The San Diego Basin encompasses approximately 3,900 square miles, including most of San Diego County and portions of southwestern Riverside and Orange Counties. A portion of the County is located in the Colorado River Basin, which forms the water divide with the San Diego Basin and drains toward the east. The San Diego Region is divided into 11 hydrologic units as designated in the 1994 RWQCB Basin Plan. The Colorado River Region is divided into 28 hydrologic units (5 are

located in the County) as designated in the *Water Quality Control Plan for the Colorado River Basin* (RWQCB 1993). The hydrologic units in the County are listed in Table 3.1.2-1.

### Groundwater Quality

Groundwater obtained from San Diego County aquifers has traditionally been very high quality. However, naturally occurring and more recently man-made sources of contamination have caused the quality of groundwater to be adversely affected in localized areas. The most common man-made sources of groundwater contamination include leaking underground fuel tanks, sewer and septic systems, agricultural applications, and facilities producing animal wastes. The most common contaminants in groundwater within San Diego County include elevated nitrate, naturally occurring radionuclides, total dissolved solids (TDS), and bacteria.

### Floodplain

Flooding is a general or temporary condition of partial or complete inundation of normally dry land areas. Flooding is commonly associated with the overflow of natural rivers or streams, but can also occur near stormwater diversion facilities or in low-lying areas not designed to carry water at any time (County of San Diego 2007). Average precipitation across the County is highly variable; the western coastal regions range between 6 to 8 inches per year and the central mountains range between 15 to 35 inches per year. Palomar Mountain and Cuyamaca Peak experience the highest precipitation in the County, while desert areas have reportedly less than 1 inch of rainfall in extremely dry years.

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps identify flood zones and areas that are susceptible to 100- and 500-year floods. Flood risk information is based on historic, meteorological, hydrologic, and hydraulic data, in addition to open space conditions, flood control works, and existing development. Flood zones, as depicted on Figure 3.1.2-2, are used to require protection of development within the 100-year flood zone.

### Surface Water Hydrology

The County includes many surface waterbodies, such as estuaries, lagoons, bays, lakes, reservoirs, rivers, and creeks. These waterbodies often support natural habitat and recreational areas in addition to acting as storage reservoirs for the County's water supply.

The Basin Plan identifies water quality objectives in order to protect the designated beneficial uses of the waterbodies. Section 303(d) of the federal Clean Water Act (CWA) (33 U.S.C. 1251 et seq.) requires states to identify waters that do not meet water quality standards after applying certain required technology-based effluent limits. These are referred to as "impaired" waterbodies. States are required to compile this information in a list and submit the list to the

U.S. Environmental Protection Agency (EPA) for review and approval. Within the project area, the following waterbodies are listed on the EPA's 2006 303(d) list as having impaired status for one or more contaminants: Buena Creek, Cloverdale Creek, De Luz Creek, Escondido Creek, Pine Valley Creek (Upper), Rainbow Creek, Reidy Canyon Creek, San Luis Rey River, Santa Margarita River (Upper), and Temecula Creek. Several of the reservoirs (lakes) in the County are also on the current list as well, including Otay Reservoir and Lake Morena (RWQCB 2006).

### Typical Contaminants

**Metals** can impact surface water quality by accumulating in sediments and fish tissues. This poses risks of toxicity such as lowering the reproductive rates and life spans of aquatic animals and animals up in the food chain. Metals can also alter photosynthesis in aquatic plants and form deposits in pipes. Metals in urban runoff can result from automobile use, industrial activities, water supply infrastructure corrosion, mining, or pesticide application. Atmospheric deposition can also contribute metals to waterbodies.

**Petroleum products** such as oil and grease are characterized as high-molecular-weight organic compounds. Primary sources of oil and grease are petroleum hydrocarbon products, motor products from leaking vehicles, esters, oils, fats, waxes, and high-molecular-weight fatty acids. Introduction of these pollutants to waterbodies is typical due to the widespread use and application of these products in municipal, residential, commercial, industrial, and construction areas. Elevated oil and grease content can decrease the aesthetic value of a waterbody, as well as its water quality. Although methyl tertiary butyl ether (MTBE) is currently outlawed, previous uses of petroleum products can be a source of contamination. Current use regulations for volatile organic compounds (VOCs) ensure these chemicals are not used in any amounts that would impact groundwater. Similarly, residual concentrations from petroleum products are a concern for water quality.

Increased amounts of **sediments**, over and above the amount that enters the water system by natural erosion, can cause many adverse impacts on aquatic organisms, water supply, and wetlands. Sedimentation can decrease transmission of light, which affects plant production and leads to loss of food and cover for aquatic organisms. It can change behavioral activities (nesting, feeding, mating), and adversely affect respiration, digestion, and reproduction. Contaminants and toxic substances can also be transported in sediments. Sediments can damage water treatment equipment, increasing treatment costs. They can reduce reservoir volume and flood storage and increase peak discharges.

**Total dissolved solids (TDS)** refer to the total concentration of all minerals, salts, metals, or cations/anions (positive/negative charged ions) that are dissolved in water. TDS is composed of inorganic salts (principally calcium, magnesium, potassium, sodium, bicarbonate, carbonate,

chloride, and sulfate), and some small amounts of organic matter that are dissolved in water. The primary source of TDS in groundwater is the natural dissolution of rocks and minerals, but septic tanks, agricultural runoff, and stormwater runoff also contribute. Increased salts in regional freshwater resources from mining, urban runoff, and construction can create stressful environments and even destroy habitat and food sources for wetland animals in aquatic and wetland habitats, as well as favoring salt-tolerant species, reducing the quality of drinking water, and potentially causing skin or eye irritations in people. It is important to note that much of the water that is imported to the San Diego region is relatively high in TDS content.

### Groundwater Hydrology

The American Geological Institute defines a groundwater basin as a hydrogeologic unit containing one large aquifer as well as several connected and interrelated aquifers that has reasonably well-defined boundaries and more or less definite areas of recharge and discharge (AGI 1977). The County has three general categories of aquifers: rock aquifers, alluvial and sedimentary aquifers, and desert basin aquifers (County of San Diego 2011). Figure 3.1.2-3 depicts the three categories of aquifers located in the County. Characteristics of each aquifer are described as follows:

#### Fractured Rock Aquifers

Approximately 73% of the County is underlain with fractured rock. Fractured rock aquifers are present in the foothills and mountain regions of the County where precipitation levels are higher. Therefore, recharge rates to these types of aquifers are relatively greater than in lower elevation areas. Due to low storage rate capacity, recharge to rock aquifers may cause fast rises in the water table, which may conversely lead to relatively fast declines in the water table from groundwater pumping during years that do not experience significant rainfall and recharge. As a result, pumping from wells completed by fractured rock aquifers typically produces a greater decline than wells located in alluvium or sedimentary aquifers. In many cases, fractured rock aquifers are overlain by a layer of alluvium, which may provide additional storage if the water table extends into these areas. In turn, the additional storage may enhance the usability of groundwater resources in these areas (County of San Diego 2011).

#### Alluvial and Sedimentary Aquifers

Alluvial and sedimentary aquifers are present in approximately 13% of the County and are typically found in river and stream valleys, around lagoons, near the coast, and in the intermountain valleys. Sediments mostly consist of consolidated (sedimentary rock) or unconsolidated (alluvium or colluvium) gravel, sand, silt, and clay. These aquifers typically have high hydraulic conductivity, porosity, and storage, and generally would be considered good

aquifers. However, these types of aquifers found within the County have relatively thin saturated thickness and limited storage. Sometimes underlain by fractured rock, these aquifers may have increased storage. Since alluvial aquifers mostly occur in low-lying areas of a watershed, surface water runoff may accumulate in surface depressions within alluvial basins and provide additional recharge source to these basins (County of San Diego 2011).

### Desert Basin Aquifers

Located in the extreme eastern areas, desert basin aquifers make up the remaining 14% of aquifers in the County. These aquifers are generally characterized by limited groundwater recharge due to low levels of precipitation, but have high storage capacity. Runoff and stream flow from the highlands typically recharge the margins of the basins.

#### 3.1.2.2 Regulatory Setting

##### Federal Regulations

##### Federal Water Pollution Control Act (Clean Water Act)

Increasing public awareness and concern for controlling water pollution led to enactment of the Federal Water Pollution Control Act Amendments of 1972. As amended in 1977, this law became commonly known as the CWA. The CWA established basic guidelines for regulating discharges of pollutants into the waters of the United States. The CWA requires that states adopt water quality standards to protect public health, enhance the quality of water resources, and ensure implementation of the CWA (33 U.S.C. 1251 et seq.) in the following ways:

- **Section 401.** Section 401 requires an application for a federal permit, such as for the construction or operation of a facility that may result in the discharge of a pollutant, to obtain certification of those activities from the state in which the discharge originates. This process is known as water quality certification. For projects in the County, the RWQCB issues Section 401 permits.
- **Section 402.** Section 402 established the National Pollutant Discharge Elimination System (NPDES) to control water pollution by regulating point sources that discharge pollutants into waters of the United States. In the State of California, the EPA has authorized the State Water Resources Control Board (SWRCB) permitting authority to implement the NPDES program. In general, the SWRCB issues two baseline general permits: one for industrial discharges and one for construction activities. The Phase II Rule that became final on December 8, 1999, expanded the existing NPDES program to address stormwater discharges from construction sites that disturb land equal to or greater than 1 acre.

- **Section 404.** Section 404 established a permitting program to regulate the discharge of dredged or filled material into waters of the United States. The definition of waters of the United States includes wetlands adjacent to national waters. This permitting program is administered by the U.S. Army Corps of Engineers and is enforced by the EPA.
- **Section 303(d).** Under Section 303(d), the SWRCB is required to develop a list of water quality limited segments for jurisdictional waters of the United States. The RWQCBs are responsible for establishing priority rankings and developing action plans, referred to as total maximum daily loads (TMDLs), to improve water quality of waterbodies included in the 303(d) list. The most recent 303(d) list approved by the EPA is from 2006. The list includes pollutants causing impairment to receiving waters or, in some cases, the condition leading to impairment.

### Federal Maximum Contaminant Levels

To protect public health related to known contaminants in drinking water supplies, the EPA sets the highest level of a contaminant or Maximum Contaminant Levels (MCLs) for a range of contaminants, including microorganisms, disinfectants and disinfection byproducts, and chemicals, among others. There are two tiers: primary and secondary standards. National Primary Drinking Water Regulations (primary standards) are enforceable standards. National Secondary Drinking Water Regulations (secondary standards) are guidelines related to contaminants that could cause aesthetic (such as taste, odor, or color) or cosmetic effects (such as skin or tooth discoloration).

### National Pollutant Discharge Elimination System

In 1990, the EPA promulgated rules establishing Phase I of the NPDES stormwater program for categories of stormwater discharge, including “medium” and “large” municipal separate storm sewer systems (MS4s), which generally serve populations of 100,000 or more. In 1999, EPA promulgated rules establishing Phase II of the NPDES stormwater program for categories of stormwater discharge not covered by Phase I including “small” MS4s, such as small communities.

The RWQCB issued the municipal stormwater NPDES permit (Municipal Permit) (Order No. R9-2007-0001, NPDES No. CAS0108758) to the County, the City of San Diego, the Port of San Diego, the County Regional Airport Authority, and 17 other cities (called copermitees or dischargers by owning or operating an MS4) on January 24, 2007. The Municipal Permit requires each copermitee to adopt its own local Standard Urban Stormwater Mitigation Plan (SUSMP) and ordinances consistent with the RWQCB-approved Model SUSMP. The SUSMP requires the development and implementation of best management practices (BMPs) in development planning and construction of private and public development projects. Development projects are also required to include BMPs to reduce pollutant discharges from

project sites in the permanent designs. BMPs associated with the final design are described in the Model SUSMP. As part of Phase II of the Municipal Permit, the SWRCB adopted Order No. 2003-0005-DWR (General Permit No. CAS000004) for small MS4s, which requires these MS4s to develop and implement a Stormwater Management Plan (SWMP) to reduce the discharge of pollutants to the maximum extent possible. The SWMP describes potential construction and post-construction pollutants and identifies BMPs to protect water resources. The RWQCB requires the owners or operators of these MS4s in watersheds subject to TMDLs to submit Notices of Intent to comply with this order.

### National Flood Insurance Act

The National Flood Insurance Act of 1968 established the National Flood Insurance Program (NFIP) to provide flood insurance within communities that were willing to adopt floodplain management programs to mitigate future flood losses. The Act also required the identification of all floodplain areas within the United States and the establishment of flood-risk zones within those areas. The Federal Emergency Management Agency (FEMA) is the primary agency responsible for administering programs and coordinating with communities to establish effective floodplain management standards. FEMA is responsible for preparing Federal Insurance Rate Maps (FIRMs) that delineate the areas of known special flood hazards and their risk applicable to the community.

### National Flood Insurance Reform Act

The National Flood Insurance Reform Act of 1994 resulted in major changes in the NFIP. The Act, which amended the Flood Disaster Protection Act of 1973, provided tools to make NFIP more effective in achieving its goals of reducing the risk of flood damage to properties and reducing federal expenditures for uninsured properties that are damaged by flood. The Act requires mitigation insurance and establishes a grant program for state and community flood mitigation planning projects.

### Cobey-Alquist Floodplain Management

Under this Act, local governments are encouraged to plan, adopt, and enforce land use regulations for floodplain management to protect people and property from flooding hazards. This Act also identifies requirements that jurisdictions must meet to receive state financial assistance for flood control. The County has used the guidelines established by this legislation to produce ordinances, such as the Flood Damage Prevention Ordinance, which promote public health, safety, and general welfare, and minimize public and private losses due to flood conditions in specific areas throughout the County. Furthermore, the Act has influenced the



direction of Board of Supervisors (BOS) policy decisions, such as defining watercourses in the County of San Diego subject to flood control.

### State

#### State Maximum Contaminant Levels

As part of the California Safe Drinking Water Act, the State Department of Health Services (DHS) sets primary and secondary standards for drinking water supplies. MCLs set by DHS are either as stringent or more stringent than federal MCLs.

#### Section 303(d) List of Water Quality Limited Segments

The 2006 CWA 303(d) List of Water Quality Limited Segments (RWQCB 2006) classifies the impaired waterbodies located in the County. The complete 2006 EPA-approved list for the San Diego Region is available from the San Diego RWQCB at the following web address: [http://www.swrcb.ca.gov/rwqcb9/water\\_issues/programs/303d\\_list/index.shtml](http://www.swrcb.ca.gov/rwqcb9/water_issues/programs/303d_list/index.shtml).

#### Total Maximum Daily Loads

The purpose of a TMDL is to attain water quality objectives (WQOs) and restore beneficial uses for impaired waterbodies under Section 303(d) of the CWA. TMDLs represent a strategy for meeting WQOs by allocating quantitative limits for point and non-point pollution sources. A TMDL is the maximum amount of pollutant of concern that the waterbody can receive and still attain WQOs.

#### Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (California Water Code, Section 13000 et seq.) is directed primarily toward the control of water quality. The act establishes the SWRCB and its nine RWQCBs as the principal state agencies responsible for control of water quality. Therefore, each RWQCB is required to formulate and adopt a water quality control plan that designates beneficial uses and establishes WQOs to protect these beneficial uses.

#### Streambed Alteration Agreement

Sections 1601–1603 of the California Fish and Game Code require an agreement between CDFG and a public agency proposing to substantially divert or obstruct the natural flow or affect changes to the bed, channel, or bank of any river, stream, or lake. The agreement is designed to protect the fish and wildlife values of a river, lake, or stream.

Local

## San Diego Regional Water Quality Control Board's Basin Plan

The SWRCB's Basin Plan was approved by the SWRCB in 1994 and was subsequently revised in 1998 and 2004. In addition, the Basin Plan has been amended by the RWQCB. The RWQCB designates beneficial uses in the Basin Plan under California Water Code, Section 13240. Beneficial uses are defined as the uses of water necessary for the survival or wellbeing of man, plants, and wildlife. Designated beneficial uses in inland surface waters, coastal waters, and groundwaters in the County are defined in Table 3.1.2-2.

## County of San Diego Code of Regulatory Ordinances Sections 67.801–67.814, Watershed Protection, Stormwater Management, and Discharge Control Ordinance

The County's Watershed Protection, Stormwater Management, and Discharge Control Ordinance (WPO) was adopted in March 2008 and revised in January 2010. The purpose of the WPO is to protect water resources and improve water quality by controlling the non-stormwater conveyance system and receiving waters, to cause the use of management practices by the County and its citizens that will reduce the adverse effects of polluted run-off discharges on waters of the state, to secure benefits from the use of stormwater as a resource, and to ensure the County is compliant with state and federal law. The WPO establishes standards and requirements that are legally enforceable by the County within the County's jurisdiction. Projects that require a permit (i.e., Administrative Permit, Major Use Permit, Grading Permit, etc.) are required to demonstrate compliance with the WPO. Section 67.804, for example, specifically addresses waste discharge and prohibits the discharge of pollutants to the stormwater system unless they are permitted through the NPDES program.

As part of the revised ordinance, Priority Development Projects are required to incorporate low-impact development (LID) techniques. Adopted in 2008, the LID Handbook was provided to compliment the WPO by providing guidance regarding LID techniques and practices. LID design considerations for proposed private projects may include the following: (1) draining runoff from impervious areas into pervious areas based on the capacity to treat/hold runoff; (2) designing pervious areas to receive and treat runoff by using swales, detention, and/or bioretention, and using amended soils to increase infiltration; (3) using porous pavements where appropriate; (4) conserving natural areas, trees, vegetation, and soils; (5) constructing streets, sidewalks, and parking areas to the minimum widths necessary for public safety, thereby retaining pervious areas; (6) minimizing the impervious footprint of the project and disconnecting impervious surfaces; (7) minimizing soil compaction (under planned green/open areas); and (8) minimizing disturbance to natural drainages.

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### San Diego County Code of Regulatory Ordinances Sections 67.701-67.703, 67.710-67.711, 67.720-67.722, Groundwater Ordinance

The County currently manages anticipated future groundwater demand through the Groundwater Ordinance. This ordinance does not limit the number of wells or the amount of groundwater extraction from existing landowners. However, the ordinance does identify specific measures to mitigate potential groundwater impacts of projects requiring specified discretionary permits. Existing land uses are not subject to the ordinance unless a listed discretionary permit is required.

### County Code and Zoning Ordinance related to Flood Hazard Areas and Flood Protection

The County Code Title 8, Division 7, Grading, Clearing and Watercourses, echoes protections at the federal level by prohibiting any actions or development that would impede water flows, and addresses grading and clearing near watercourses. This section of the County Code exists to protect persons and property against flood hazards by prohibiting the alteration of the surface of land so as to reduce the capacity of a watercourse and prohibit any action that impairs the flow of water in a watercourse. Enforcement occurs at the time that grading plans or improvement plans are reviewed during the Grading Permit process. Lands within close proximity to major rivers and streams, as well as reservoirs and dams, are within a 100-year floodplain. A review of the flood hazards areas indicate that the flood zones for the project area are primarily located along major surface waters, including the Sweetwater River in the south, the San Diego River and San Dieguito River in the central area, and the San Luis Rey River in the north. However, there are also flood hazard areas along minor streams and rivers throughout the project area. In addition to the 100-year flood hazard areas, the terms “floodplain,” “floodway,” and “floodplain fringe” are used to describe low-lying areas near rivers and other watercourses that could be affected by occasional flooding. Although agricultural uses are allowed, regulations are in place to minimize hazards to people and structures from flood events.

For example, Sections 5307(b) and (c) of the Sensitive Resource Area Regulations in the County’s Zoning Ordinance prohibit permanent, occupied structures in the floodway and floodplain fringe and require any structures to be constructed to withstand periodic flooding. These properties are designated with an “F” Flood Plain Special Area Regulation. In acknowledgement that certain areas are subject to periodic inundation, the County’s Flood Damage Prevention Ordinance contained in Section 811.101 of the County Code exists to minimize the risk associated with flood events. This ordinance applies to all areas of special flood hazards and areas of flood-related erosion hazards. It seeks to control the alteration of natural flood plains, stream channels, and natural protective barriers, which help accommodate or channel flood waters.

### County of San Diego Code of Regulatory Ordinances Sections 86.601-86.608, Resource Protection Ordinance (RPO)

The RPO prohibits development of permanent structures for human habitation or as a place of work in a floodway. Uses permitted in a floodway pursuant to Section 86.604(c) of this ordinance include agricultural, recreational, and other such low-intensity uses, provided, however, that no use shall be permitted that will substantially harm the environmental values of a particular floodway area. Modifications to the floodway must meet design criteria, and concrete or riprap flood control channels are allowed only when specific findings are made. Additionally, Section 86.604(d) of the RPO allows uses permitted by zoning and those that are allowable in the floodway in the floodplain fringe when the specific criteria are met.

### County of San Diego Grading Ordinance

The purpose of the ordinance is to combine regulations affecting the grading and clearing of land and activities affecting watercourses within the unincorporated parts of the County. Chapter 6 (Section 87.601–87.608) of the ordinance covers watercourses and is intended to protect persons and property against flood hazards by identifying prohibited acts in watercourses and acts prohibited unless a permit is obtained. The Grading Ordinance requires that projects involving more than 200 cubic yards of grading, clearing, and/or removal of natural vegetation obtain a Grading Permit (see Section 1.5.1, Matrix of Project Approvals/Permits). Grading Permits are discretionary and require compliance with the California Environmental Quality Act (CEQA).

### San Diego County BOS Policy I-45, Definition of Watercourses in the Subject of Flood Control

The purpose of this policy is to define those watercourses in the County of San Diego that are subject to flood control so that appropriate responsibility can be determined. The policy was developed because consideration of flood control methods is essential in the land-use decision-making process and the failure of flood control systems may result in property damage and loss of life. The policy provides for maps that specifically designate the watercourses that are subject to flood control, thus eliminating uncertainty and providing a clear and easily accessible record of the district's areas of concern.

### San Diego County BOS Policy I-68, Proposed Projects in Floodplains with Defined Floodways

This policy was developed to identify procedures to be used when proposed projects impact floodways as defined on County floodplain maps. The policy defines procedures to be implemented for the following types of proposals: (1) major construction that would change the floodplain or

floodway, (2) relocation of a floodway, (3) partial filling of the floodplain fringe, (4) erosion and sedimentation in a floodplain, (5) increased flood flows, and (6) concrete or rip rap facilities.

### 3.1.2.3 Analysis of Project Effects and Determination as to Significance

The proposed project consists of amendments to the Zoning Ordinance related to wind turbines and temporary Meteorological Testing (MET) facilities. Under the proposed project, large turbines will continue to require approval of a Major Use Permit while a small wind turbine or MET facility meeting the height designator of the zone in which it is located would be allowed without discretionary review. The impact analysis that follows has been separated into “Small Turbine(s)/MET Facilities” and “Large Turbine(s)” to reflect the distinction in the level of review required for the establishment of each use (discretionary vs. non-discretionary).

#### 3.1.2.3.1 Water Quality Standards and Requirements

##### Guidelines for Determination of Significance

For the purpose of this EIR, the County’s *Guidelines for Determining Significance: Hydrology* (County of San Diego 2007) applies to the direct and indirect impact analysis, as well as the cumulative impact analysis. A significant impact would result if:

- The project violates any waste discharge requirements or water quality objectives

##### Analysis

The proposed Zoning Ordinance amendment applies to the entire unincorporated County with regard to small turbines and to a significant portion of the unincorporated County with regard to large turbines (see Project Description Section 1.2); therefore, it includes all the various hydrologic subareas and hydrologic units in the County. The proposed project would allow development of wind turbines and MET facilities that could adversely affect water quality or result in substantial pollutant runoff or waste discharge through activities such as demolition, clearing and grading.

##### Small Turbine(s)/MET Facilities

The proposed project would allow small wind turbines or MET facilities without discretionary review if they meet the zoning verification requirements in the amended ordinance.

Under the proposed ordinance, a small turbine or MET facility may be located near natural areas, such as marshes, lakes, ponds, streams, sloughs, or seasonal wetlands. No environmental review would be required prior to development of these types of projects, so there is a potential that an individual project would drain to a waterbody listed on the CWA Section 303(d) list. However,

these future small turbines and MET facilities would still require a building permit and, therefore, would be subject to preparation of a Minor SWMP, which includes requirements for construction BMPs, LIDs, and post-construction BMPs. There is also a potential that an individual project's contaminants could drain to a tributary of a drinking water reservoir. However, small wind turbines and temporary MET facilities would not introduce an additional amount of pollutants than would normally run off under natural conditions and would not result in a significant impact to water quality. Small wind turbines and MET facilities are not anticipated to result in substantial pollutant runoff or waste discharge, such as sediments, pesticides, fertilizers, oils, metals, or bacteria. The operation of small wind turbines and MET facilities does not use water to generate electricity and does not create waste byproducts. Pursuant to Table 6 in Appendix C of the County's SUSMP, land uses characterizing small wind turbines and MET facilities are not listed as having anticipated and potential pollutants. No substantial adverse effects to water quality would be anticipated for these types of projects, and impacts would be **less than significant**.

### Large Turbine(s)

The proposed project amends certain provisions of the County's Zoning Ordinance related to large turbines. These updates are necessary to address advancements in technology that have obviated many of the current provisions. The proposed amendments related to large wind turbines consist of updated definitions and requirements related to setbacks, noise, height, and locations where large turbines are permissible. All future large turbine projects will be subject to discretionary review and required to obtain a Major Use Permit. As part of the County's discretionary review process, all future projects would be evaluated under CEQA and would be required to implement measures to minimize impacts to water quality, as necessary. CEQA requires proposed projects to provide detailed information about the potentially significant environmental effects they are likely to have, list ways in which the significant environmental effects would be minimized, and identify alternatives that would reduce or avoid the significant impacts identified for the project.

A Major Use Permit is subject to the Grading Ordinance and WPO, which requires that hydrology be evaluated as part of the County's discretionary environmental review process. Additionally, in order to comply with the CWA, the state Water Code, and the above-mentioned County Ordinances, the County requires that property owners complete an SWMP prior to issuance of any permit. The purpose of an SWMP is to document BMPs that will be implemented to prevent pollutants from entering stormwater conveyances and receiving waters. Construction projects with a disturbed area of greater than 1 acre must also prepare a Stormwater Pollution Prevention Plan (SWPPP) to receive a construction permit. In a typical project, an SWPPP is a document consisting of narrative and a separate sheet within the construction document set, usually in the Civil Engineering or Landscape series, that outlines both a plan to control stormwater pollution during construction (temporary controls) and after construction is

completed (the permanent constructed stormwater pollution prevention elements). The permanent controls are usually found on the sheet within the construction documents. Because all future large turbines are required to comply with the Grading Ordinance, WPO, LID requirements, and Major Use Permit process prior to approval, the proposed project **would not result in significant impacts** to water quality with respect to large turbines.

### 3.1.2.3.2 *Groundwater Supplies and Recharge*

#### Guidelines for Determination of Significance

For the purpose of this EIR, the County's *Guidelines for Determining Significance: Hydrology* (County of San Diego 2007) applies to the direct and indirect impact analysis, as well as the cumulative impact analysis. A significant impact would result if:

- The project would substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted).

#### Analysis

The County prepared a Groundwater Study, dated April 2010, as part of the General Plan Update. The study defined the four areas as having the potential for localized groundwater resource issues due to pumping large amounts of groundwater: Ballena Valley, Guatay, Julian Town Center, and Morena Village. The proposed project could potentially locate wind turbines or MET facilities within these areas or other areas that may be susceptible to localized groundwater problems. Therefore, the proposed project could result in an impact to groundwater supply.

#### Small Wind Turbine(s)/MET Facilities

The proposed project would allow small wind turbines or MET facilities without discretionary review. However, these facilities are not expected to use groundwater for purposes of irrigation, domestic, or commercial demands. In addition, future small wind turbines would not involve operations that would interfere substantially with groundwater recharge, including but not limited to regional diversion of water to another groundwater basin, or diversion or channelization of a stream course or waterway with impervious layers, such as concrete lining or culverts, for substantial distances (e.g., .25 mile). Some projects may use small amounts of groundwater for cleaning the equipment, such as wind turbine rotor blades, on the site. The purpose of blade cleaning is to eliminate dust and insect buildup, which otherwise deforms the shape of the airfoil and degrades performance. As illustrated in Table 3.1.2-3, the American Wind Energy Association

estimates water consumption for a wind turbine is approximately 0.001 gallon/kilowatt-hour (kWh).<sup>1</sup> These small amounts of water usage project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. Therefore, impacts to groundwater resources would **be less than significant**.

### Large Turbine(s)

The proposed project amends certain provisions of the County's Zoning Ordinance related to large turbines. These updates are necessary to address advancements in technology that have obviated many of the current provisions. The proposed amendments related to large wind turbines consist of updated definitions and requirements related to setbacks, noise, height, and locations where large turbines are permissible. All future large turbine projects will be subject to discretionary review and required to obtain a Major Use Permit. As part of the County's discretionary review process, all future projects would be evaluated under CEQA and would be required to implement measures to minimize impacts to water quality, as necessary. CEQA requires proposed projects to provide detailed information about the potentially significant environmental effects they are likely to have, list ways in which the significant environmental effects would be minimized, and identify alternatives that would reduce or avoid the significant impacts identified for the project.

Additionally, a Major Use Permit is subject to the Groundwater Ordinance and WPO. Large projects require in-depth analysis and have stringent requirements pursuant to the WPO. Projects that propose the use of groundwater must demonstrate a viable water supply that meets state standards. Because all future large turbines are required to comply with the Groundwater Ordinance, WPO, and Major Use Permit process prior to approval, the proposed project **would not result in significant impacts** to groundwater resources with respect to large turbines.

#### 3.1.2.3.3 *Erosion/Siltation*

##### Guidelines for Determination of Significance

A significant impact would result if:

- The project would substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on or off site.

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<sup>1</sup> The American Wind Energy Association estimate assumes a 250 kW turbine operating at .25 capacity factor, with blades washed four times annually (AWEA 2010).



### Analysis

The natural process of erosion removes soil, sediment, and rock from exposed areas and transports the resulting sediment. The rate of erosion is dependent on the type of material that is eroded, the type and amount of erosive forces, and the shape of the landform involved. Land-disturbing activities associated with the construction of future wind turbines or MET facilities may potentially result in the alteration of drainage patterns that could potentially result in substantial erosion or siltation on or off site.

#### Small Turbine(s)/MET Facilities

The proposed project would allow small wind turbines or MET facilities without discretionary review if they meet the zoning verification requirements in the amended ordinance. If a small wind turbine project required substantial earthwork (over 200 cubic yards of material), a grading permit would be required. The Grading Permit process would ensure that applicants demonstrate compliance with regulations established in Title 8, Division 7 (Grading, Clearing, and Watercourses), Chapter 6 (Watercourses), that prohibit, in part, any land-disturbance activities that reduce the capacity of a watercourse and prohibit any action that impairs the flow of water in a watercourse.

Future small turbines and MET facilities that do not require discretionary review would still require a building permit and, therefore, would be subject to preparation of a Minor SWMP, which includes requirements for construction BMPs, LIDs, and post-construction BMPs. Conformance with these requirements ensures that projects would implement necessary erosion control measures. Some small wind turbines would be roof-mounted and would not result in any ground disturbance and, therefore, would not result in any impacts related to erosion or siltation. Impacts related to substantial erosion or siltation from future small turbine and MET facilities would be **less than significant**.

#### Large Turbine(s)

The proposed project amends certain provisions of the County's Zoning Ordinance related to large turbines. These updates are necessary to address advancements in technology that have obviated many of the current provisions. The proposed amendments related to large wind turbines consist of updated definitions and requirements related to setbacks, noise, height, and locations where large turbines are permissible. All future large turbine projects will be subject to discretionary review and required to obtain a Major Use Permit. As part of the County's discretionary review process, all future projects would be evaluated under CEQA and would be required to implement measures to minimize impacts resulting from erosion or siltation, as necessary. CEQA requires proposed projects to provide detailed information about the

potentially significant environmental effects they are likely to have, list ways in which the significant environmental effects would be minimized, and identify alternatives that would reduce or avoid the significant impacts identified for the project.

A Major Use Permit is subject to the Grading Ordinance and WPO, which requires that hydrology be evaluated as part of the County's discretionary environmental review process. This includes the provision of BMPs to effectively reduce substantial erosion or siltation, as appropriate. Priority Development Projects (including projects that proposed non-residential development greater than 1 acre, hillside development greater than 5,000 square feet, or any new paved surface in excess of 5,000 square feet used for transportation) are subject to the preparation of a Major SWMP and hydromodification control requirements. Hydromodification is defined as changes to the frequency, duration, and magnitude of surface runoff that, when unmitigated, cause an increase in erosion of the receiving waterbody. Hydromodification occurs when urbanization replaces areas of vegetated, uncompacted soil with impermeable surfaces such as buildings, roads, and compacted fill. The reduction in permeability results in increased volumes of runoff and faster, more concentrated delivery of this water to receiving waters. These changes have the potential to cause creeks to erode faster than before development. The County's Hydromodification Management Plan ensures that Priority Development Projects are designed so that runoff rates and durations are controlled to maintain or reduce pre-project downstream erosion conditions and protect stream habitat.

Because all future large turbines are required to comply with the Grading Ordinance, WPO, and Major Use Permit process prior to approval, the proposed project **would not result in significant impacts** related to substantial erosion or siltation with respect to large turbines.

#### **3.1.2.3.4 Flooding**

##### Guidelines for Determination of Significance

A significant impact would result if:

- The project would substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site.

##### Analysis

Grading or other modifications, including directly altering the course of a stream or river by excavation or embankment, can increase velocities of floodwaters, which increases the potential for flooding downstream of the modification. A reduction in the capacity of the watercourse can increase the potential for flooding at the site of the modification as well as upstream from the

activity. Land disturbing activities associated with the construction of future wind turbines or MET facilities may potentially result in the alteration of drainage patterns or an increase in the rate or amount of surface runoff.

#### Small Turbine(s)/MET Facilities

The proposed project would allow small wind turbines or MET facilities without discretionary review if they meet the zoning verification requirements in the amended ordinance. Future small turbines and MET facilities would still require a building permit and therefore would be subject to the preparation of a Minor SWMP and site-specific BMPs and LID techniques to maintain existing drainage patterns and runoff levels to the greatest extent possible. Additionally, properties designated with an “F” Flood Plain Special Area Regulation are subject to periodic inundation. The County’s Flood Damage Prevention Ordinance contained in Section 811.101 of the County Code exists to minimize the risk associated with flood events. This ordinance applies to all areas of special flood hazards and areas of flood-related erosion hazards. It seeks to control the alteration of natural flood plains, stream channels, and natural protective barriers, which help accommodate or channel flood waters. Some small wind turbines would be roof mounted and would not result in any ground disturbance and therefore would not result in any impacts related to the alteration of drainage patterns. Conformance to the WPO and the Flood Damage Prevention Ordinance requirements ensures that future small wind turbines and MET facilities would not substantially alter the existing drainage patterns or contribute runoff water that would potentially result in flooding; therefore, impacts would be **less than significant**.

#### Large Turbine(s)

The proposed project amends certain provisions of the County’s Zoning Ordinance related to large turbines. These updates are necessary in order to address advancements in technology that have obviated many of the current provisions. The proposed amendments related to large wind turbines consist of updated definitions and requirements related to setbacks, noise, height and locations where large turbines are permissible. All future large turbine projects will be subject to discretionary review and required to obtain a Major Use Permit. As part of the County’s discretionary review process all future projects would be evaluated under CEQA and would be required to implement measures to minimize alterations to existing drainage patterns, as necessary. CEQA requires proposed projects to provide detailed information on the potentially significant environmental effects they are likely to have, list ways in which the significant environmental effects would be minimized, and identify alternatives that would reduce or avoid the significant impacts identified for the project.

The Major Use Permit discretionary review process requires the submittal of pre and post construction drainage information to ensure that projects do not substantially alter drainage

patterns and increase runoff. The County may also require the preparation of a Drainage Report in accordance with the *San Diego County Hydrology Manual*; the manual provides uniform procedures for flood and stormwater analysis (County of San Diego 2003). Flood management hydrology deals with estimating flow peaks, volumes and time distributions of storm runoff to assist in the design of stormwater management facilities in order to reduce the occurrence of flooding. As described in Section 3.1.2.3.3, Priority Development Projects are also subject to the County's Hydromodification Management Plan. While focused on erosion protection, hydromodification control measures also assist in the management of runoff volumes and rates. Additionally, properties designated with an "F" Flood Plain Special Area Regulation are subject to the County's Flood Damage Prevention Ordinance contained in Section 811.101 of the County Code, which minimizes the risk associated with flood events.

Because all future large turbines are required to comply with the Grading Ordinance, WPO, Flood Damage Prevention Ordinance and Major Use Permit process prior to approval, the proposed project **would not result in significant impacts** related to flooding with respect to large turbines.

#### *3.1.2.3.5 Exceed Capacity of Stormwater Systems*

##### Guidelines for Determination of Significance

A significant impact would result if:

- The project would create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems.

##### Analysis

Construction of impervious surfaces such as roads and driveways reduces the amount of rainfall that can infiltrate the ground surface and move to the subsurface. As a result, the volume of surface water runoff increases within a watershed; subsequently, artificial conveyances such as gutters, storm pipes and natural channel improvements to accommodate additional volume accelerate the rate of flow of water in the watershed. This faster moving, higher volume of surface water runoff within a watershed results in a higher probability and increased severity of flooding within a watershed, if facilities are not adequately maintained or constructed to carry peak flow capacity. Wind turbines and MET facilities may result in the development of impervious surfaces, such as access roads, that could affect existing or planned stormwater drainage systems.

### Small Turbine(s)/ MET Facilities

The proposed project would allow small wind turbines or MET facilities without discretionary review if they meet the zoning verification requirements in the amended ordinance. Future small turbines and MET facilities would still require a building permit and therefore would be subject to the preparation of a Minor SWMP and site-specific BMPs and LID techniques to maintain existing drainage patterns and runoff levels to the greatest extent possible. Some small wind turbines would be roof mounted and would not result in any ground disturbance and therefore would not result in any impacts related to the alteration of drainage patterns. Conformance to the WPO and other local requirements ensures that future small wind turbines and MET facilities would not substantially alter the existing drainage patterns or contribute runoff water that would potentially exceed the capacity of existing or planned stormwater drainage systems; therefore, impacts would be **less than significant**.

### Large Turbine(s)

The proposed project amends certain provisions of the County's Zoning Ordinance related to large turbines. These updates are necessary in order to address advancements in technology that have obviated many of the current provisions. The proposed amendments related to large wind turbines consist of updated definitions and requirements related to setbacks, noise, height and locations where large turbines are permissible. All future large turbine projects will be subject to discretionary review and required to obtain a Major Use Permit. As part of the County's discretionary review process all future projects would be evaluated under CEQA and would be required to implement measures to minimize alterations to existing drainage patterns, as necessary. CEQA requires proposed projects to provide detailed information on the potentially significant environmental effects they are likely to have, list ways in which the significant environmental effects would be minimized, and identify alternatives that would reduce or avoid the significant impacts identified for the project.

The Major Use Permit discretionary review process requires the submittal of pre and post construction drainage information to ensure that projects do not substantially alter drainage patterns and increase runoff. The County may also require the preparation of a Drainage Report in accordance with the *San Diego County Hydrology Manual*; the manual provides uniform procedures for stormwater analysis (County of San Diego 2003). As described in Section 3.1.2.3.3, Priority Development Projects are also subject to the County's Hydromodification Management Plan. While focused on erosion protection, hydromodification control measures also assist in the management of runoff volumes and rates. These local regulations ensure that projects are designed to meet the capacity of existing stormwater systems, or are required to retrofit stormwater drainage systems so that they would not cause flooding.

Because all future large turbines are required to comply with the Grading Ordinance, WPO and Major Use Permit process prior to approval, the proposed project **would not result in significant impacts** related to exceeding the capacity of stormwater systems with respect to large turbines.

#### *3.1.2.3.6 Housing within a 100-year Flood Hazard Area*

##### Guidelines for Determination of Significance

A significant impact would result if:

- The project would place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.

##### Analysis

The proposed project does not involve construction of housing, habitable structures, or unanchored impediments to flow; therefore, no impacts associated with the placement of housing within a 100-year-flood zone would occur.

##### Small Turbine(s)/MET Facilities

The proposed project would allow small wind turbines or MET facilities to be developed as an accessory use to properties throughout the County within the County's jurisdiction. The project does not involve the development of housing or habitable structures and therefore **no impacts** would result from placing housing in a 100-year flood hazard area.

##### Large Turbine(s)

The proposed project would allow large wind turbines to be developed in reliable wind resource areas throughout the County within the County's jurisdiction. The project does not involve the development of housing or habitable structures and therefore **no impacts** would result from placing housing in a 100-year flood hazard area.

### 3.1.2.3.7 *Impeding or Redirecting Flood Flows*

#### Guidelines for Determination of Significance

A significant impact would result if:

- The project would place within a 100-year flood hazard area structures which would impede or redirect flood flows.

The proposed Zoning Ordinance amendment applies to the entire unincorporated County with regards to small turbines and to a significant portion of the unincorporated County with regard to large turbines (see Project Description Section 1.2); therefore, it includes 100-year flood hazard areas in the County.

#### Small Turbine(s)/MET Facilities

The proposed project would allow small wind turbines or MET facilities to be developed in 100-year flood hazards areas. Flood prone areas are delineated in the County and have been mapped accordingly; see Figure 3.1.2-2. These areas are designed with an “F” Flood Plain Special Area Regulation and are subject to the County’s Flood Damage Prevention Ordinance contained in Section 811.101 of the County Code, which minimizes the risk associated with flood events. Small wind turbines and MET facilities do not include the development of structures that would significantly impede or redirect flows, such as houses or buildings. Some small wind turbines would be roof mounted and therefore would not result in any impacts related to drainage patterns. The other two types of supporting structures for small turbines and MET facilities are guyed towers or monopole structures. Guyed towers are not allowed as part of the zoning verification. Monopole structures would allow the flow of water to pass and would not create a substantial blockade. Due to the type of structures affiliated with the proposed project, as well as conformance to the WPO and the Flood Damage Prevention Ordinance requirements, future small wind turbines and MET facilities would not substantially alter existing drainage patterns, nor would future projects develop structures that would impede flood flows; therefore, impacts would be **less than significant**.

#### Large Turbine(s)

The proposed project amends certain provisions of the County’s Zoning Ordinance related to large turbines. These updates are necessary in order to address advancements in technology that have obviated many of the current provisions. The proposed amendments related to large wind turbines consist of updated definitions and requirements related to setbacks, noise, height and locations where large turbines are permissible. All future large turbine projects will be subject to discretionary review and required to obtain a Major Use Permit. As part of the County’s

discretionary review process all future projects would be evaluated under CEQA and would be required to implement measures to minimize alterations to existing drainage patterns and flood flows, as necessary. CEQA requires proposed projects to provide detailed information on the potentially significant environmental effects they are likely to have, list ways in which the significant environmental effects would be minimized, and identify alternatives that would reduce or avoid the significant impacts identified for the project.

The Major Use Permit discretionary review process requires the submittal of pre and post construction drainage information to ensure that projects do not substantially alter drainage patterns and increase runoff. The County may also require the preparation of a Drainage Report in accordance with the *San Diego County Hydrology Manual*; the manual provides uniform procedures for flood and stormwater analysis (County of San Diego 2003). Flood management hydrology deals with estimating flow peaks, volumes and time distributions of storm runoff to assist in the design of stormwater management facilities in order to reduce the occurrence of flooding. As described in Section 3.1.2.3.3, Priority Development Projects are also subject to the County's Hydromodification Management Plan. While focused on erosion protection, hydromodification control measures also assist in the management of runoff volumes and rates. Additionally, properties designated with an "F" Flood Plain Special Area Regulation are subject to the County's Flood Damage Prevention Ordinance contained in Section 811.101 of the County Code, which minimizes the risk associated with flood events.

Other federal, state, and local regulations include, but are not limited to, the following: National Flood Insurance Act, which establishes flood-risk zones within floodplain areas; National Flood Insurance Reform Act, which reduces the risk of flood damage to properties; BOS Policy I-45, which identifies procedures to use when proposed projects impact floodways; the County Grading, Clearing and Watercourses Ordinance, which requires the lowest floor of structures to be elevated to or above the level of the 100-year flood; County Subdivision Ordinance, which requires mapping and drainage easements to avoid certain drainages; and RPO, which prohibits development of permanent structures for human habitation in a floodway. As a result of these regulations, development within floodplains and development that would have the potential to adversely affect flooding hazards are highly regulated and addressed at all levels of the County's development review process.

Because all future large turbines are required to comply with the National Flood Insurance Act, National Flood Insurance Reform Act, Grading Ordinance, WPO, Flood Damage Prevention Ordinance and Major Use Permit process prior to approval, the proposed project **would not result in significant impacts** related to placing structures within a 100-year flood hazard area that would impede or redirect flood flows.



### 3.1.2.3.8 *Dam Inundation and Flood Hazards*

#### Guidelines for Determination of Significance

A significant impact would result if:

- The project would expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.

#### Analysis

Certain land uses have a higher risk of exposing people or structures to flooding hazards associated with the failure of a levee or dam because they allow for higher-density development. These include village residential, village core mixed use, neighborhood commercial, general commercial, limited impact industrial, medium impact industrial, and high impact industrial development (County of San Diego 2011). To present a hazard, these land uses must also be located in an area subject to flooding or levee/dam inundation. Within the unincorporated County there are approximately 31 dams that pose inundation risk in the event of a breach or failure. The proposed project does not propose uses or involve construction of housing, habitable structures, or unanchored impediments to flow that would expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.

#### Small Turbine(s)/MET Facilities

The proposed project would allow small wind turbines or MET facilities to be developed as an accessory use to properties throughout the County within the County's jurisdiction. The project does not involve the development of land uses, such as residential, or the placement of habitable structures in a flood hazard area. Therefore, **no impacts** would result from exposure of people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.

#### Large Turbine(s)

The proposed project amends certain provisions of the County's Zoning Ordinance related to large turbines. These updates are necessary to address advancements in technology that have obviated many of the current provisions. The proposed amendments related to large wind turbines consist of updated definitions and requirements related to setbacks, noise, height, and locations where large turbines are permissible. All future large turbine projects will be subject to discretionary review and required to obtain a Major Use Permit. As part of the County's discretionary review process, all future projects would be evaluated under CEQA and would be required to implement measures

to minimize any impacts related to dam inundation and flood hazards, as necessary. CEQA requires proposed projects to provide detailed information about the potentially significant environmental effects they are likely to have, list ways in which the significant environmental effects would be minimized, and identify alternatives that would reduce or avoid the significant impacts identified for the project.

The project does not involve the development of land uses, such as residential, or the placement of habitable structures in a flood hazard area. Additionally, the regulations that apply to flooding as discussed in Section 3.1.2.3.7, would also apply to protect people from a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam. Therefore, **no impacts** would result from exposure of people or structures to a significant risk involving flooding.

#### ***3.1.2.3.9 Seiche, Tsunami, and Mudflow Hazards***

##### **Guidelines for Determination of Significance**

A significant impact would result if:

- The project would expose people or structures to a significant risk or loss, injury, or death involving inundation by seiche, tsunami, or mudflow.

##### **Analysis**

A seiche is a standing wave in a completely or partially enclosed body of water. Areas located along the shoreline of a lake or reservoir are susceptible to inundation by a seiche. High winds, seismic activity, or changes in atmospheric pressure are typical causes of seiches. The size of a seiche and the affected inundation area is dependent on different factors, including size and depth of the waterbody, elevation, source, and if human made, the structural condition of the body of water in which the seiche occurs. In the unincorporated County's semi-arid climate, naturally occurring enclosed waterbodies are not common (County of San Diego 2011). Instead, most enclosed waterbodies are reservoirs built by local municipalities and water districts to provide water service to local residents and businesses. Typically, all land around the reservoirs' shorelines are in public holdings, such as the City of San Diego or Helix Water District, which restrict private land development and minimize risk of inundation from seiches (County of San Diego 2011). Moreover, the public land holdings are not within the jurisdiction of the unincorporated County (County of San Diego 2011). Therefore, the impact from a seiche on the proposed project would be considered less than significant.

A tsunami is a very large ocean wave caused by an underwater earthquake or volcanic eruption. Tsunamis can cause flooding to coastlines and inland areas less than 50 feet above sea level and

within 1 mile of the shoreline. The majority of unincorporated County is located more than 1 mile inland and is, therefore, not susceptible to inundation or flooding due to a tsunami (County of San Diego 2011). Pendleton/De Luz is the only portion of the unincorporated County that is located on the coast of the Pacific Ocean and, therefore, susceptible to inundation or flooding from a tsunami. However, the County does not have jurisdiction over land uses and development in the western portion of Pendleton/De Luz, which would potentially be affected by a tsunami (County of San Diego 2011). Additionally, tsunamis have historically been infrequent and low in height in the vicinity of the County. Four tsunamis have been reported since 1952, none more than 5 feet in height (County of San Diego 2011). Therefore, due to the location of the unincorporated County, mostly inland from the ocean, and the fact that past historical tsunami events have been slight, potential impacts to the proposed project from a tsunami would not be considered significant.

Mudflows, also known as debris flows, are shallow water-saturated landslides that travel rapidly down slopes, carrying rocks, brush, and other debris. Mudflows are the most common disaster in San Diego. A mudflow occurs naturally as a result of heavy rainfall on a slope that contains loose soil or debris. The unincorporated County contains many areas with steep slopes, or mountainous areas, that would be subject to mudflows in the event of large amounts of precipitation. Additionally, much of the unincorporated County has recently been burned by wildland fires and is particularly susceptible to flash floods and debris flows during rainstorms. The proposed project, however, would not change existing land use designations or place habitable structures in mudflow-prone areas. Therefore, potential impacts to the proposed project from mudflows would not be considered significant.

#### Small Turbine(s)/MET Facilities

The proposed project would allow small wind turbines or MET facilities to be developed as an accessory use to properties throughout the County within the County's jurisdiction. Implementation of the proposed project would not result in land uses or development within areas subject to inundation from a seiche. The proposed project would not place people or habitable structures in areas subject to impacts from mudflows. Additionally, due to the location of the unincorporated County, mostly inland from the ocean, and the fact that past historical tsunami events have been slight, potential impacts to the proposed project from a tsunami would be **less than significant**.

#### Large Turbine(s)

The proposed project would allow large wind turbines to be developed in reliable wind resource areas throughout the County within the County's jurisdiction. Implementation of the proposed project would not result in land uses or development within areas subject to inundation from a

seiche. The proposed project would not place people or habitable structures in areas subject to impacts from mudflows. Additionally, due to the location of the unincorporated County, mostly inland from the ocean, and the fact that past historical tsunami events have been slight, potential impacts to the proposed project from a tsunami would be **less than significant**.

#### 3.1.2.4 Cumulative Impact Analysis

The geographic scope of cumulative impact analysis for hydrology and water quality includes the County, including both incorporated and unincorporated areas and surrounding counties.

##### 3.1.2.4.1 *Water Quality Standards and Requirements*

Construction and development associated with cumulative regional land use projects, such as those identified in adjacent city and county general plans and regional transportation plans, would contribute both point and non-point source pollutants to downstream receiving waters that have the potential to violate water quality standards. However, development and construction proposed under most cumulative projects would be subject to regulations that require compliance with water quality standards, including the CWA, Porter-Cologne Water Quality Control Act, NPDES, applicable basin plans, and local regulations. The exception to this would be projects proposed in Mexico, which are not subject to water quality discharge requirements and would result in water quality violations in shared WMAs, such as the Tijuana WMA and Anza-Borrego WMA. Therefore, even though required regulations would minimize the cumulative impact of projects in the United States, watersheds or receiving waters that receive runoff from projects in Mexico, which would not be protected by the same requirements, would result in a potentially cumulatively considerable impact to water quality standards and requirements.

##### Small Wind Turbine(s)/MET Facilities

As described in Section 3.1.2.3.1, no substantial adverse effects to water quality would be anticipated from the development of future small wind turbines and MET facilities. Therefore, the development of small wind turbines and MET facilities under the proposed project **would not contribute to a cumulatively considerable impact**.

##### Large Turbine(s)

As described in Section 3.1.2.3.1, future large wind turbines projects would be required to comply with the Grading Ordinance, WPO, LID requirements, and Major Use Permit process prior to approval. Therefore, the development of large wind turbines under the proposed project **would not contribute to a cumulatively considerable impact**.

#### 3.1.2.4.2 *Groundwater Supplies and Recharge*

Groundwater basins typically serve localized areas; therefore, any cumulative impacts would generally be localized. The area of cumulative analysis for groundwater supplies and recharge includes the groundwater dependent areas of the unincorporated County and the immediately adjacent jurisdictional areas that share groundwater basins with County areas. Due to the rural nature of land uses proposed adjacent to Riverside and Imperial Counties, potential groundwater impacts would be less than significant. This is also true for the majority of proposed land use designations adjacent to state and federal lands, and those adjacent to most Native American reservations. The Campo and Los Coyotes Indian Reservations are two exceptions that are located near higher-density areas. Potential cumulative impacts to supplies and recharge would not be considerable.

#### Small Wind Turbine(s)/MET Facilities

As described in Section 3.1.2.3.2, future small wind turbines and MET facilities would not result in impacts to groundwater resources. Therefore, the development of small wind turbines and MET facilities under the proposed project **would not contribute to a cumulatively considerable impact.**

#### Large Turbine(s)

As described in Section 3.1.2.3.2, future large wind turbines projects would be required to comply with the Groundwater Ordinance, WPO, and Major Use Permit process prior to approval, and would not result in large amounts of water usage. Therefore, the development of large wind turbines under the proposed project **would not contribute to a cumulatively considerable impact.**

#### 3.1.2.4.3 *Erosion/Siltation*

Cumulative projects may result in multiple developments that would potentially alter existing drainage patterns in a manner that would result in substantial erosion or siltation. Cumulative projects such as regional transportation projects, development consistent with general plans, and tribal developments would be expected to increase impervious surfaces within the region and, therefore, increase the potential for runoff to occur that would lead to erosion and siltation impacts. While cumulative projects would be expected to follow regulations, such as NPDES or others as applicable, when combined, they would still have the potential to result in a significant cumulative erosion and siltation impact, especially in watersheds that extend into Mexico, where U.S. hydrology and water quality regulations do not apply. Therefore, a cumulatively considerable impact to erosion or siltation would occur from proposed cumulative projects.

### Small Turbine(s)/MET Facilities

As described in Section 3.1.2.3.3, future small wind turbines and MET facilities would not result in impacts related to substantial erosion. Therefore, the development of small wind turbines and MET facilities under the proposed project **would not contribute to a cumulatively considerable impact.**

### Large Turbine(s)

As described in Section 3.1.2.3.3, future large wind turbines projects would be required to comply with the Grading Ordinance, WPO, and Major Use Permit process prior to approval, and would not result in impacts due to substantial erosion. Therefore, the development of large wind turbines under the proposed project **would not contribute to a cumulatively considerable impact.**

#### **3.1.2.4.4 Flooding**

Cumulative projects would result in land uses and development that would convert permeable surfaces to impermeable surfaces, such as through the construction of buildings, parking lots, and roadways. New development would have the potential to alter existing drainage patterns, increase the amount of runoff and potentially increase flooding in the San Diego region. Many cumulative projects in the United States would be subject to regulations that reduce the potential for existing drainages to be altered in a way that would result in flooding on or off site. However, projects proposed in Mexico are not subject to the same drainage requirements and have the potential to alter drainage patterns that would increase flooding in watersheds that extend to both Mexico and the San Diego region. Therefore, even though required regulations would minimize the cumulative impact of projects in the United States, watersheds that are located in Mexico and the United States would not be protected by the same requirements, and a potentially cumulatively considerable impact to flooding would occur, especially in unincorporated County areas bordering Mexico.

### Small Turbine(s)/MET Facilities

As described in Section 3.1.2.3.4, future small wind turbines and MET facilities would not result in impacts related to flooding. Therefore, the development of small wind turbines and MET facilities under the proposed project **would not contribute to a cumulatively considerable impact.**

### Large Turbine(s)

As described in Section 3.1.2.3.4, future large wind turbines projects would be required to comply with the Grading Ordinance, WPO, Flood Damage Prevention Ordinance, and Major Use Permit process prior to approval, and would not result in impacts due to flooding. Therefore, the

development of large wind turbines under the proposed project **would not contribute to a cumulatively considerable impact.**

#### *3.1.2.4.5 Exceed Capacity of Stormwater Systems*

Many of the cumulative projects are proposed to accommodate the expected population growth within the region. Impermeable surfaces, constructed under implementation of these cumulative projects, would have the potential to contribute substantial quantities of runoff that would exceed the capacity of existing stormwater drainage systems, while contributing to substantial additional sources of polluted runoff. However, a cumulative project that would exceed the capacity of a stormwater system would be unlikely to contribute to a cumulative impact because the area of exposure would be limited to the immediate surrounding area. Additionally, the majority of cumulative projects would be subject to CEQA and/or NEPA review, and local regulations that require development to construct or retrofit stormwater drainage systems so that they would not cause flooding. A cumulatively considerable impact would not occur.

#### Small Turbine(s)/MET Facilities

As described in Section 3.1.2.3.5, future small wind turbines and MET facilities would not substantially alter the existing drainage patterns or contribute runoff water that would potentially exceed the capacity of existing or planned stormwater drainage systems. Therefore, the development of small wind turbines and MET facilities under the proposed project **would not contribute to a cumulatively considerable impact.**

#### Large Turbine(s)

As described in Section 3.1.2.3.5, future large wind turbines projects would be required to comply with the Grading Ordinance, WPO, and Major Use Permit process prior to approval. These regulations ensure that projects are designed to meet the capacity of existing stormwater systems, or are required to retrofit stormwater drainage systems so that they would not cause flooding. Therefore, the development of large wind turbines under the proposed project **would not contribute to a cumulatively considerable impact.**

#### *3.1.2.4.6 Housing within a 100-year Flood Hazard Area*

Cumulative projects, such as those proposed in adjacent city and county general plans, would potentially place housing within a 100-year flood hazard area. However, most cumulative projects in California would be required to conform to applicable regulations, such as National Flood Insurance Act, National Flood Insurance Reform Act, and Cobey-Alquist Floodplain Management Act, which prohibit housing from being placed in floodways. Therefore, due to existing regulations, a cumulative impact would not occur.

### Small Turbine(s)/MET Facilities

As described in Section 3.1.2.3.6, the proposed project does not involve construction of housing, habitable structures, or unanchored impediments to flow. Therefore, the development of small wind turbines and MET facilities under the proposed project **would not contribute to a cumulatively considerable impact.**

### Large Turbine(s)

As described in Section 3.1.2.3.6, the proposed project does not involve construction of housing, habitable structures, or unanchored impediments to flow. Therefore, the development of large wind turbines under the proposed project **would not contribute to a cumulatively considerable impact.**

#### *3.1.2.4.7 Impeding or Redirecting Flood Flows*

Cumulative projects included in this analysis have the potential to place residential land uses, commercial land uses, industrial land uses, and various other land uses, with the potential to contain structures, within a 100-year flood plain. Placing structures within a 100-year flood plain would impede or redirect flood flows, thereby causing a significant impact. However, it is expected that most cumulative projects in California would be required to comply with applicable regulations that would prevent the construction of structures in floodways, such as the National Flood Insurance Act, National Flood Insurance Reform Act, Cobey-Alquist Floodplain Management. Therefore, it is expected that through regulation, a cumulative impact would not occur.

### Small Turbine(s)/MET Facilities

As described in Section 3.1.2.3.7, future small wind turbines and MET facilities would not substantially alter existing drainage patterns, nor would future projects develop structures that would impede flood flows. Therefore, the development of small wind turbines and MET facilities under the proposed project **would not contribute to a cumulatively considerable impact.**

### Large Turbine(s)

As described in Section 3.1.2.3.7, all future large turbines are required to comply with the National Flood Insurance Act, National Flood Insurance Reform Act, Grading Ordinance, WPO, Flood Damage Prevention Ordinance, and Major Use Permit process prior to approval. Therefore, the development of large wind turbines under the proposed project **would not contribute to a cumulatively considerable impact.**



#### 3.1.2.4.8 *Dam Inundation and Flood Hazards*

It is reasonably foreseeable that cumulative projects would place housing or structures within dam inundation areas, thereby increasing the potential for a significant risk of loss, injury, or death involving flooding. However, multiple regulations exist, such as the National Flood Insurance Act, National Flood Insurance Reform Act, Cobey-Alquist Floodplain Management Act, and local regulations, that would be expected to mitigate any potential impacts to below a level of significance. A cumulative impact would not occur.

#### Small Turbine(s)/MET Facilities

As described in Section 3.1.2.3.8, future small wind turbines and MET facilities would not result in impacts from exposure of people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam. Therefore, the development of small wind turbines and MET facilities under the proposed project **would not contribute to a cumulatively considerable impact.**

#### Large Turbine(s)

As described in Section 3.1.2.3.7, future large turbine projects do not involve the development of land uses, such as residential, or the placement of habitable structures in a flood hazard area. Additionally, the regulations that apply to flooding as discussed in Section 3.1.2.3.7, would also apply to protect people from a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam. Therefore, the development of large wind turbines under the proposed project **would not contribute to a cumulatively considerable impact.**

#### 3.1.2.4.9 *Seiche, Tsunami, and Mudflow Hazards*

Cumulative projects on the coast have the potential to expose people or structures to loss, injury, or death involving inundation of a tsunami, due to the inherent risk involved with coastal development. Additionally, cumulative projects would be located in the vicinity of natural waterbodies that have the potential to be affected by a seiche, thereby exposing people and structures to flooding from this natural disaster. Mudflows would also potentially affect cumulative projects, especially in surrounding jurisdictions that have been affected by the extreme wildfire events in the recent past. However, the majority of cumulative projects would be subject to CEQA and/or NEPA review, in addition to compliance with applicable regulations such as the National Flood Insurance Act, National Flood Insurance Reform Act, Cobey-Alquist Floodplain Management Act, and local regulations, and impacts would be reduced to a level below significant. A cumulative impact would not occur.

### Small Turbine(s)/MET Facilities

As described in Section 3.1.2.3.8, future small wind turbines and MET facilities would not result in impacts related to seiche, tsunami or mudflows. Therefore, the development of small wind turbines and MET facilities under the proposed project **would not contribute to a cumulatively considerable impact**.

### Large Turbine(s)

As described in Section 3.1.2.3.8, future large wind turbines would not result in impacts related to seiche, tsunami, or mudflows. Additionally, all future large turbines are required to comply with the National Flood Insurance Act, National Flood Insurance Reform Act, Grading Ordinance, WPO, Flood Damage Prevention Ordinance, and Major Use Permit process prior to approval. Therefore, the development of large wind turbines under the proposed project **would not contribute to a cumulatively considerable impact**.

#### 3.1.2.5 Significance of Impacts Prior to Mitigation

The proposed project would not result in any significant hydrology or water quality impacts.

#### 3.1.2.6 Mitigation Measures

The proposed project would not result in any significant hydrology or water quality impacts, and no mitigation measures are required.

#### 3.1.2.7 Conclusion

The following discussion provides a synopsis of the conclusion reached in each of the above impact analyses and the level of impact that would occur after mitigation measures are implemented.

##### *Water Quality Standards and Requirements*

The proposed project would not violate any waste discharge requirements or water quality objectives.

##### *Groundwater Supplies and Recharge*

The proposed project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of preexisting, nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted).

*Erosion/Siltation*

The proposed project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on or off site.

*Flooding*

The proposed project not would substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off site.

*Exceed Capacity of Stormwater Systems*

The proposed project would not create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems.

*Housing within a 100-year Flood Hazard Area*

The proposed project would not place housing within a 100-year flood hazard area, thereby causing a significant impact.

*Impeding or Redirecting Flood Flows*

The proposed project would not place structures within a 100-year flood hazard area that would significantly impede or redirect flood flows, thereby causing a significant impact.

*Dam Inundation and Flood Hazards*

The proposed project would not increase the potential for a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.

*Seiche, Tsunami and Mudflow Hazards*

The proposed project would not expose people or structures to a significant risk or loss, injury, or death involving inundation by seiche, tsunami, or mudflow.

**Table 3.1.2-1  
Hydrologic Units of the San Diego and Colorado River Regions**

Basin #	Hydrologic Unit	County	Size (square miles)
901.00	San Juan	Northern San Diego, Riverside, and Orange	500
902.00	Santa Margarita	Northern San Diego and Southwestern Riverside	750
903.00	San Luis Rey	Northern San Diego	565
904.00	Carlsbad	Western San Diego	210
905.00	San Dieguito	Central San Diego	350
906.00	Peñasquitos	San Diego	170
907.00	San Diego River	San Diego	440
908.00	Pueblo San Diego	San Diego	60
909.00	Sweetwater	Southern San Diego	230
910.00	Otay	Southern San Diego	160
911.00	Tijuana	Southern San Diego and Mexico	1,750 (470 in U.S.)
719.00	Whitewater	Riverside and Eastern San Diego	1,854
720.00	Clark	Riverside and Eastern San Diego	145
721.00	West Salton	Imperial, Riverside, and Eastern San Diego	188
722.00	Anza Borrego	Imperial and Eastern San Diego	1,000
723.00	Imperial	Imperial and Eastern San Diego	2,271

Source: RWQCB 1993, 1994.

**Table 3.1.2-2  
State Water Resources Control Board's List of Beneficial Uses**

<b>MUN – Municipal and Domestic Supply</b>	Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.
<b>AGR – Agricultural Supply</b>	Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.
<b>IND – Industrial Services Supply</b>	Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well repressurization.
<b>PROC – Industrial Process Supply</b>	Uses of water for industrial activities that depend primarily on water quality.
<b>FRSH – Freshwater Replenishment</b>	Uses of water for natural or artificial maintenance of surface water quantity or quality (e.g., salinity).
<b>GWR – Groundwater Recharge</b>	Uses of water for artificial recharge of groundwater for purpose of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.
<b>REC I – Contact Water Recreation</b>	Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water skiing, skin and scuba diving, surfing, whitewater activities, fishing, and use of natural hot springs.
<b>REC II – Non-Contact Water Recreation</b>	Uses of water for recreational activities involving proximity to water, but not normally involving contact with water where ingestion is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.
<b>WARM – Warm Freshwater Habitat</b>	Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish or wildlife, including invertebrates.

**Table 3.1.2-2  
State Water Resources Control Board's List of Beneficial Uses**

<b>COLD – Cold Freshwater Habitat</b>	Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
<b>WILD – Wildlife Habitat</b>	Uses of water that support terrestrial ecosystems including, but not limited to, the preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.
<b>RARE – Threatened or Endangered Species</b>	Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered.
<b>NAV – Navigation</b>	Uses of water for shipping, travel, or other transportation by private, military, or commercial vessels.
<b>COMM – Commercial and Sport Fishing</b>	Uses of water for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to, uses involving organisms intended to human consumption or bait process.
<b>BIOL – Preservation of Biological Habitats of Special Significance</b>	Uses of water that support designated areas or habitats, such as established refuges, parks, sanctuaries, ecological reserves, or Areas of Special Biological Significance (ASBS), where the preservation or enhancement of natural resources requires special protection.
<b>EST – Estuarine Habitat</b>	Uses of water that support estuarine habitat ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds).
<b>MAR – Marine Habitat</b>	Uses of water that support marine ecosystems including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish, or wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates or wildlife water and food sources).
<b>AQUA – Aquaculture</b>	Uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption and bait.
<b>MIGR – Migration of Aquatic Organisms</b>	Uses of water that support habitats necessary for migration, acclimatization between fresh and salt water.
<b>SPWN – Spawning, Reproduction, and/or Early Development</b>	Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish. This use is applicable only for the protection of anadromous fish.
<b>SHELL – Shellfish Harvesting</b>	Uses of water that support habitats suitable for collection of filter-feeding shellfish (e.g., clams, oysters and mussels) for human consumption, commercial, or sport purposes.

Source: County of San Diego 2007.

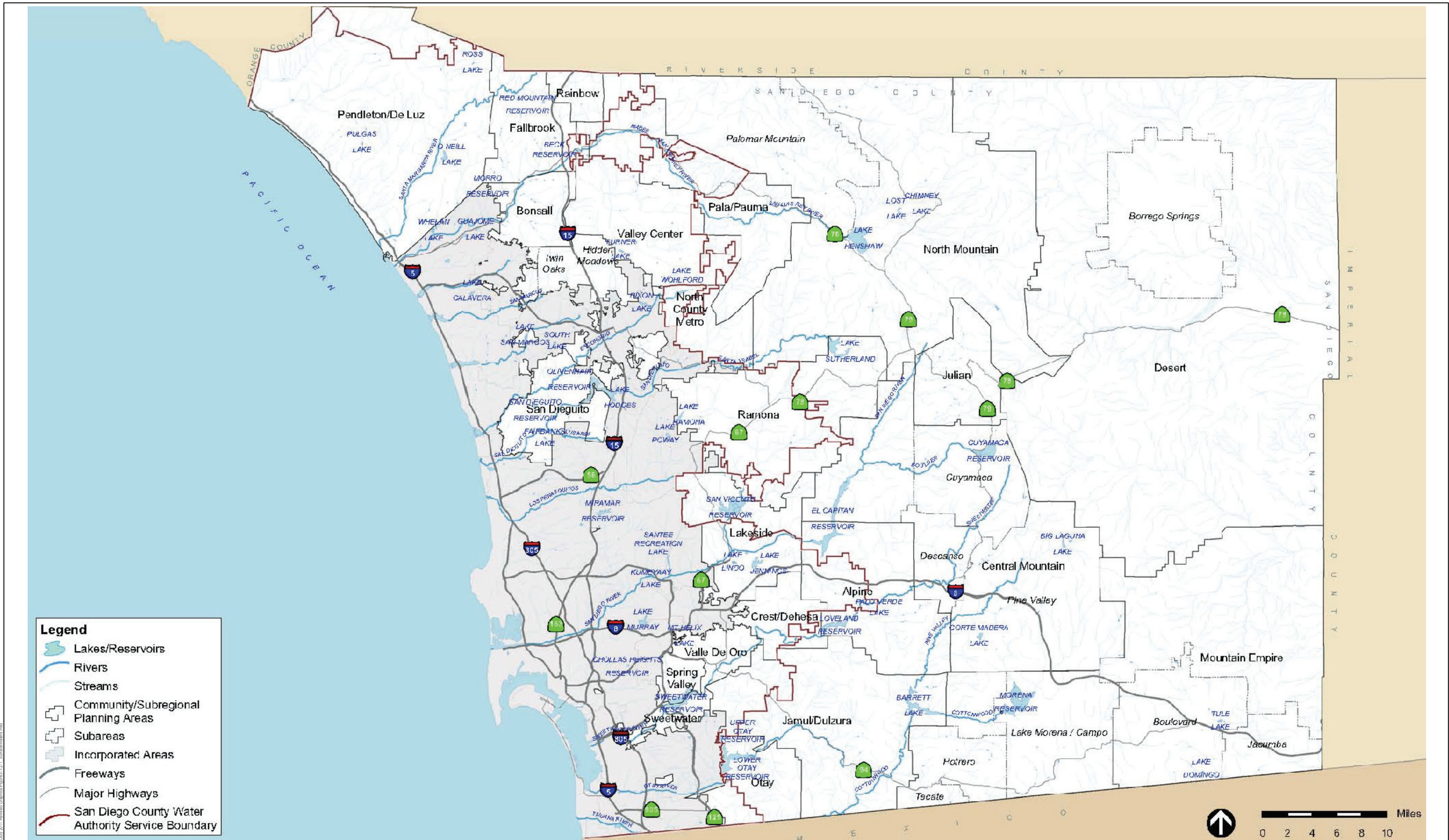
**Table 3.1.2-3  
Comparative Water Consumption of Wind and Conventional Power Plants**

Technology	Gallons/kWh	Liters/kWh
Nuclear	0.62	2.30
Coal	0.49	1.90
Oil	0.43	1.60
Combined Cycle Gas	0.25	0.95
Wind <sup>1</sup>	0.001	0.004

Note: <sup>1</sup> American Wind Energy Association estimate assumes 250-kW turbine operating at .25 capacity factor, with blades washed four times annually.

Source: AWEA 2010.

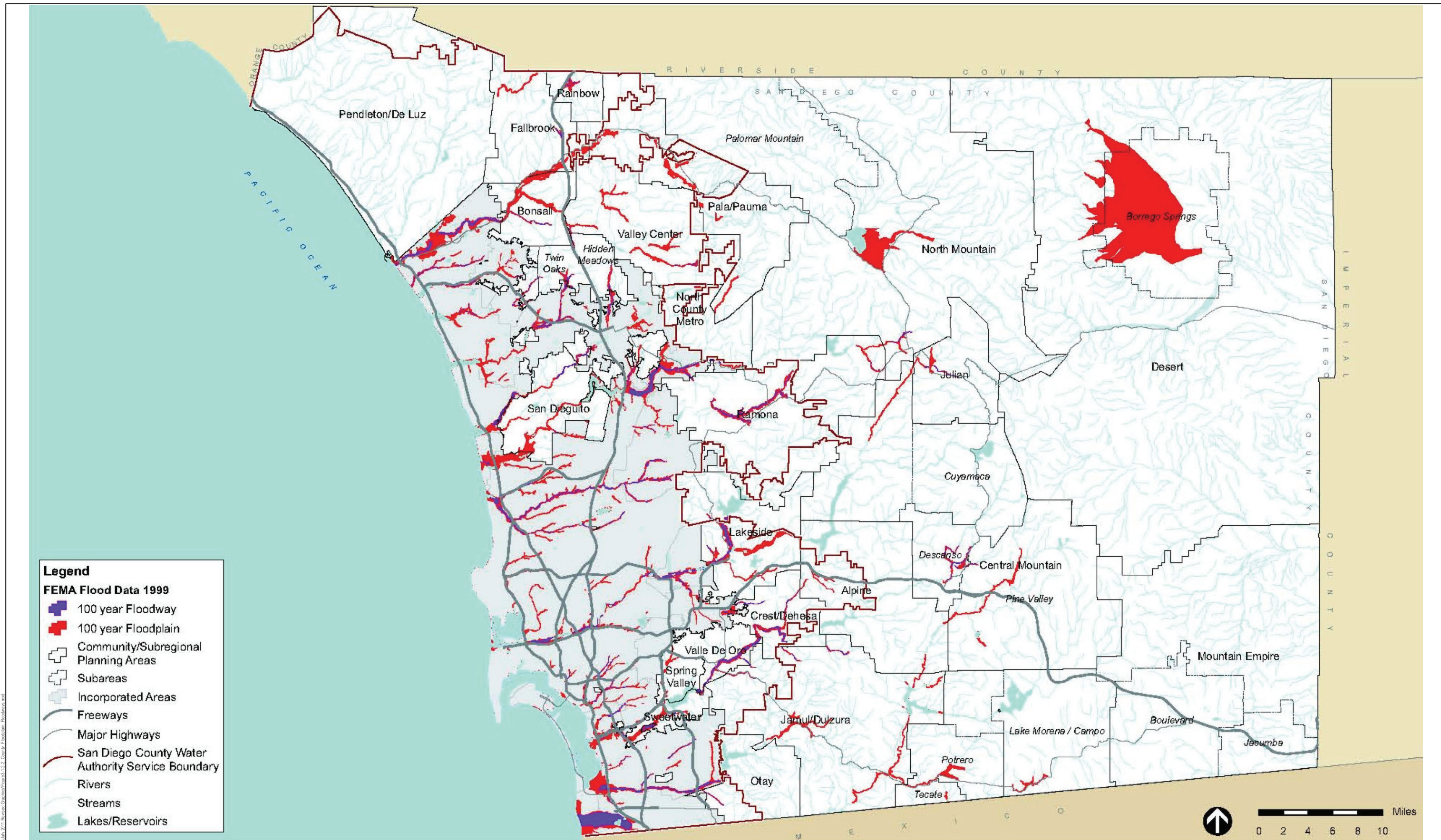
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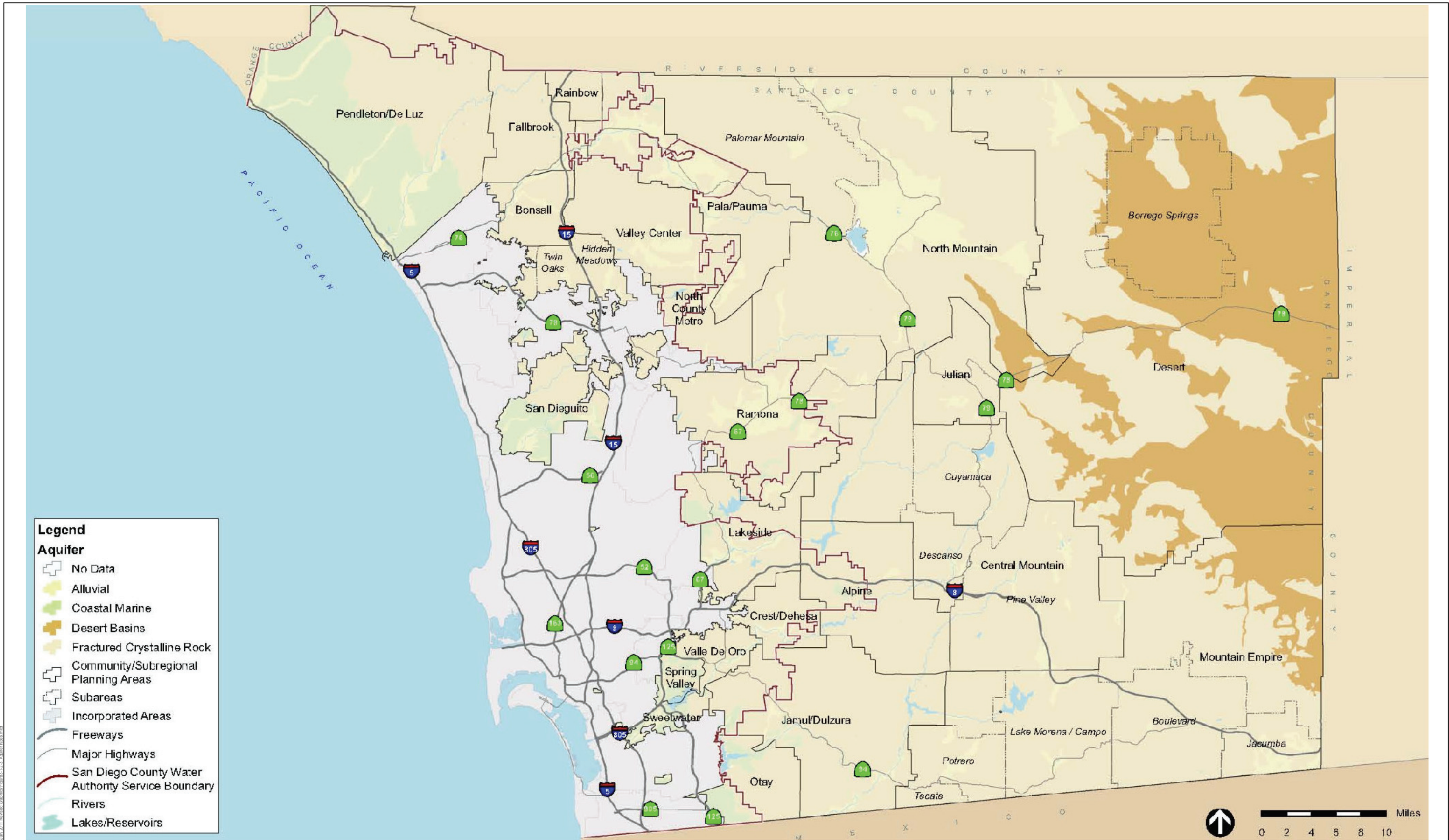
**FIGURE 3.1.2-1**  
**Surface Waters**

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**Legend**

**Aquifer**

- No Data
- Alluvial
- Coastal Marine
- Desert Basins
- Fractured Crystalline Rock
- Community/Subregional Planning Areas
- Subareas
- Incorporated Areas
- Freeways
- Major Highways
- San Diego County Water Authority Service Boundary
- Rivers
- Lakes/Reservoirs



FIGURE 3.1.2-3  
Aquifer Types

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