APPENDIX G – GROUNDWATER BASIN DESCRIPTIONS

The description of each groundwater basin and sub-basin contained within this appendix is a compilation of many works from prior studies and reports. In many cases, the best available information is used with a careful understanding of the approximate nature of the information and the need to update the data to a more current understanding under controlled conditions.

In some cases, storage, yield, and other basin measurables are not provided. See the Master Water Report (2012) for the latest comprehensive basin analysis. Additionally, for basins subject to SGMA, visit the County of San Luis Obispo's SGMA website. This includes the Paso Robles, Atascadero, Santa Maria, Los Osos, San Luis Obispo and Cuyama Valley Groundwater Basins:

http://www.slocounty.ca.gov/Departments/Public-Works/Committees-Programs/Sustainable-Groundwater-Management-Act-(SGMA).aspx

This Appendix is organized by Water Planning Area (WPA), Groundwater Basin and Sub-Basin. See **Figure 3-2** (attached at the end of this Appendix for reference) for the locations of these groundwater basins in the IRWM Planning Region. See **Section 3 – Region Description** for additional information regarding Water Planning Areas, Watersheds, etc.

G.1 WPA 1 – SAN SIMEON / CAMBRIA AREA

G.1.1 San Carpoforo Valley Groundwater Basin

The San Carpoforo Valley Groundwater Basin is located in WPA 1 of the North Coast Sub-Region and is identified in California's Groundwater Bulletin 118 as Groundwater Basin Number 3-33 (DWR 2003). The basin underlies the San Carpoforo Valley, is 200 acres (0.3 square miles) in size and is bounded by the Pacific Ocean and impermeable rocks. Recharge to the basin comes primarily from seepage of surface flows in San Carpoforo Creek and to a lesser extent percolation of precipitation and irrigation return flows. There are no current estimates of actual groundwater in terms of in-storage volumes. The volume of in-storage groundwater likely fluctuates widely in response to seasonal variations in rainfall and pumping extractions. There are no municipal or public water purveyors in the basin. All pumping in the basin is for agricultural purposes and by overlying users. There are neither estimates of basin yield, nor is their information available describing water quality in the basin. The primary constraints on water availability in the basin include physical limitations in storage volume and recharge and potential water quality issues, including salinity intrusion from the Pacific Ocean.

As discussed above, groundwater levels in this basin are typically highest during the wet season, steadily decline from these levels during the dry season, and recover again to higher levels during the next wet season. Published hydrogeologic information for this basin is compiled from older reports and may not be representative of current conditions. If the District requires more current or detailed information for this basin, new studies are recommended. Information currently compiled by County departments (such as well logs for private wells or

water quality for shared well systems) would be useful to these studies. Additional information may be available from CDWR and other private sources.

G.1.2 Arroyo De La Cruz Valley Groundwater Basin

The Arroyo De La Cruz Valley Groundwater Basin is located in WPA 1 of the North Coast Sub-Region and is identified in California's Groundwater Bulletin 118 as Groundwater Basin Number 3-34 (DWR 2003). The basin is 750 acres (1.2 square miles) in size and is bounded by the Pacific Ocean and impermeable rocks. Recharge to the basin comes primarily from percolation of surface flows in Arroyo de la Cruz, deep percolation of precipitation, and agricultural irrigation return flows. The volume of groundwater basin storage likely fluctuates widely in response to seasonal variations in rainfall and pumping extractions for agriculture during the irrigation season. There are no municipal or public water purveyors in the basin. All pumping in the basin is for agricultural purposes and by overlying private pumpers for rural uses. The safe yield of the basin is estimated to be 1,244 AFY (Envicom, 1982). Groundwater samples taken from four wells from 1957 to 1985 show total dissolved solids concentration ranging from 211 to 381 mg/L.

The primary constraints on water availability in the basin include physical limitations and potential water quality issues from applied fertilizers and pesticides, small ranch properties and salinity intrusion. Groundwater levels in the basin are likely highest during the wet season, steadily declining from these levels during the dry season, and recover again to higher levels during the next wet season.

Published hydrogeologic information for this basin is compiled from older reports and may not be representative of current conditions. If the District requires more current or detailed information, new studies are recommended. Information currently compiled by County departments (such as well logs for private wells or water quality for shared well systems) would be useful to these studies. Additional information may be available from CDWR and private well sources.

G.1.3 San Simeon Valley Groundwater Basin

The San Simeon Valley Groundwater Basin is located in the WPA 1 of the North Coast Sub-Region and is identified in California's Groundwater Bulletin 118 as Groundwater Basin Number 3-35 (DWR 2003). The basin underlies San Simeon Valley and is 620 acres (approx. 1 square mile) in size, and is bounded by the Pacific Ocean, the Santa Lucia Range, and impermeable rocks. Recharge to the basin comes primarily from seepage of surface flows in San Simeon and Van Gordon creeks, deep percolation of precipitation, and agricultural irrigation return flows.

Groundwater is found in alluvial deposits underlying San Simeon Creek (DWR 2003). The alluvium's thickness varies from about 100 feet beneath the center of the valley to more than 120 feet at the coast (Yates and Van Konyenburg, 1998). The groundwater storage capacity is estimated as 4,000 AF; however the actual amount in groundwater storage is unknown (DWR

2003). The volume of groundwater in storage likely fluctuates widely in response to seasonal variations in rainfall and pumping extractions.

Water users in the basin include the Cambria Community Services District (Cambria CSD) and overlying users. The safe yield of the basin was estimated to be 1,040 AFY (Cambria County Water District, 1976). Groundwater samples from 31 wells collected from 1955 to 1994 show total dissolved solids (TDS) concentration ranging from 46 to 2,210 mg/L (DWR 2003). Samples from three public supply wells show a TDS concentration range of 400 to 420 mg/L with an average concentration of 413 mg/L. Manganese concentrations in the downstream regions of the basin have exceeded the MCL, with a range of 0.002 to 1.6 mg/L (Yates and Van Konyenburg, 1998).

The primary constraints on water availability in the basin include physical limitations and potential water quality issues. In general, groundwater levels in the basin are typically highest during the wet season, steadily decline from these levels during the dry season, and recover again to higher levels during the next wet season. Cambria CSD is constantly challenged to meet demands through water conservation, proper well location, and groundwater treatment. New growth is constrained due to the lack of sustainability in water supplies.

G.1.4 Santa Rosa Valley Groundwater Basin

The Santa Rosa Valley Groundwater Basin is located in WPA 1 of the North Coast Sub-Region and is identified in California's Groundwater Bulletin 118 as Groundwater Basin Number 3-36 (DWR 2003). The basin underlies the Santa Rosa Valley, is 4,480 acres (7 square miles) in size, and is bounded by the Pacific Ocean and impermeable rocks. Recharge to the basin comes primarily from seepage of surface flows in Santa Rosa Creek and tributaries, deep percolation of precipitation, and residential/agricultural return flows.

According to Bulletin 118, the main water-bearing unit in the basin is unconfined alluvium (DWR 2003). The groundwater storage capacity of the basin has been estimated as 24,700 AF (DWR 1975). The volume of groundwater in storage likely fluctuates widely in response to seasonal variations in rainfall and pumping extractions. The actual amount of groundwater in storage is unknown.

Water users in the basin include the Cambria CSD and overlying users. The safe yield of the basin has been estimated to be 2,260 AFY (Cambria County Water District, 1976). Groundwater sampled from one public supply well had a total dissolved solids concentration of 680 mg/L. Increases in measured groundwater chloride concentration suggest the possibility of seawater intrusion into the basin (DWR 1975). From 1955 to 1975, measured chloride concentration increased from 80 mg/L to 933 mg/L (DWR 1975), where background chloride concentration typically range from 30 to 270 mg/L (Yates and Van Konyenburg, 1998).

The primary constraints on water availability in the basin include physical limitations and potential water quality issues. In general, groundwater levels in the basin are typically highest during the wet season, steadily decline from these levels during the dry season, and recover

again to higher levels during the next wet season. Cambria CSD is constantly challenged to meet demands through water conservation, proper well location, and groundwater treatment. New growth is constrained due to the lack of sustainability in water supplies.

G.1.5 Villa Valley Groundwater Basin

The Villa Valley Groundwater Basin is located in WPA 1 in the North Coast Sub-Region and encompasses approximately 980 acres (approx. 1.5 square miles). The basin is bounded by the Pacific Ocean and by relatively impermeable rocks. This basin has been designated by the DWR as Basin 3-37 (DWR 2003). Recharge to the basin comes primarily from seepage of surface flows in Villa Creek, deep percolation of precipitation, and residential/agricultural return flows.

The aquifer consists of alluvial deposits that are up to approximately 50 feet thick. There are no municipal or public water purveyors in the basin. All pumping in the basin is for agricultural and residential purposes by overlying users. The projected safe seasonal yield of the Villa Valley Groundwater Basin was historically estimated at 1,000 AFY (DWR 1958). There has been no subsequent basin study to confirm or update this estimate.

Seawater intrusion has been reported historically in the lower portion of the basin (DWR 1975). Upstream of sea water influence, the TDS concentration averaged 500 mg/L in samples collected from three wells between 1965 and 1970 (based on data extracted from STORET Legacy Database).

Constraints on water availability in this basin include both physical limitations and water quality issues. Shallow alluvial deposits are typically more susceptible to drought impacts. For the upper Villa Valley, water level and well capacity declines during drought limit the availability of the resource, while in the lower valley area; sea water intrusion is the primary constraint.

Published hydrogeologic information for this basin is compiled from older reports and may not be representative of current conditions. If the District requires more current or detailed information for the Villa Valley Groundwater Basin, new studies are recommended. Information currently compiled by County departments (such as well logs for private wells or water quality for shared well systems) would be useful for these studies. Additional information may be available from the DWR and private well user sources.

G.2 WPA 2 – Cayucos / Morro Bay / Los Osos

G.2.1 Cayucos Valley Groundwater Basin

The Cayucos Valley Groundwater Basin is located in WPA 2 in the North Coast Sub-Region and encompasses approximately 580 acres (approx. 0.9 square miles). The basin is bounded by the Pacific Ocean and by relatively non-water bearing rock units (Cleath, T. S., 1988). This basin has been designated by the DWR as Basin 3-38. Recharge to the basin comes primarily from seepage of surface flows in Cayucos Creek, deep percolation of precipitation, and residential/agricultural return flows.

Basin groundwater users include a small public water system (mobile home park) and overlying residential and agricultural users. The Morro Rock Mutual Water Company and Paso Robles Beach Water Association service areas overlie a portion of the basin; however, these purveyors do not pump from the Cayucos Valley basin.

The water supply aquifer is within the alluvial deposits of Cayucos Creek, which are comprised of gravel, sand, silt and clay. These alluvial deposits extend up to an estimated 80 feet thick, and are at least 68 feet thick at a distance of one mile inland from the coast (Cleath, T. S., 1988). The projected safe seasonal yield of the Cayucos Valley Groundwater Basin was historically estimated at 600 AFY (DWR 1958). There has been no subsequent basin-wide studies to confirm or update this estimate. Estimated production from the basin was 350 AFY in 1987 (Cleath, T. S., 1988).

There is evidence of sea water intrusion in the basin extending to the mobile home park wells and ranch wells immediately upstream of Highway 1. The TDS concentration of groundwater upstream of the sea water influence is close to 500 mg/L (Cleath, T. S., 1988).

Constraints on water availability in this basin include both physical limitations and water quality issues. Water level and well capacity declines during drought limit the availability of the resource, while in the lower valley area; sea water intrusion is the primary constraint.

Some of the published hydrogeologic information for the Cayucos Valley Groundwater Basin is over 20 years old and may not be representative of current conditions. If the District requires more current or detailed information for this basin, new studies are recommended. Information currently compiled by County departments (such as well logs for private wells or water quality for shared well systems) would be useful to these studies. Additional information may be available from the DWR and private well sources.

G.2.2 Old Valley Groundwater Basin

The Old Valley Groundwater Basin is in WPA 2 and encompasses approximately 750 acres (approx. 1.2 square miles). The basin is bounded by the Pacific Ocean and by relatively impermeable rocks. This basin, which includes Whale Rock Reservoir, was designated by the DWR as Basin 3-39. Basin recharge upstream of the reservoir comes primarily from deep percolation of precipitation and seepage from surface flows in Cottontail Creek and Old Creek. Below the dam, recharge includes dam underflow and seepage from reservoir releases.

Basin groundwater users downstream of Whale Rock reservoir include members of the Cayucos Area Water Organization (CAWO), which include Morro Rock Mutual Water Company (Morro Rock MWC), Paso Robles Beach Water Association (PRBWA), County Service Area 10A (CSA 10A), the Cayucos Cemetery District (CCD), and two landowners.

CAWO agencies receive water directly from the reservoir via the treatment plant and transmission pipeline. Mainini Ranch and Ogle also receive entitlements to 64 AFY of Whale Rock Reservoir. Upstream of the reservoir are residential and agricultural overlying users.

Whale Rock Reservoir water users, including the City of San Luis Obispo, Cal Poly, and the California Men's Colony, are discussed later in this section.

The water supply aquifer is within the alluvial deposits of Old Creek and upstream tributary valleys. These alluvial deposits extend up to an estimated 72 feet thick (Cleath & Associates, 1993, 1995). Production from wells in the lower Old Valley Groundwater Basin (below the reservoir) ranged from 389 to 603 AFY, with an average of 505 AFY between 1981 and 1992. The lower basin was estimated to have a yield capable of providing the entire 600 AFY CAWO allocation, although releases from the reservoir were necessary to protect against sea water intrusion (Cleath & Associates 1993, 1995). With direct deliveries of CAWO downstream entitlements to a water treatment plant beginning in 1997, re-evaluation of the yield in this part of the basin has not been a high priority. The TDS concentration of the groundwater below the reservoir averaged 440 mg/L in 2008 (CSA 10/10A, 2008).

Constraints on water availability in this basin include physical limitations, water rights, and environmental considerations. Shallow alluvial deposits upstream of the reservoir are susceptible to drought impacts, having limited groundwater in storage. For the area below the reservoir, dam underflow may provide a source of recharge. Water agreements limit the amount of groundwater available to the members of CAWO and downstream landowners in Old Valley.

G.2.3 Toro Valley Groundwater Basin

The Toro Valley Groundwater Basin is in WPA 2 and encompasses approximately 510 acres (approx. 0.8 square miles). The basin is bounded by the Pacific Ocean and by generally non-water bearing rocks. This basin is designated by the DWR as Basin 3-40 (Cleath, T. S., 1988; DWR 2003). Basin recharge comes primarily from seepage of surface flows in Toro Creek, deep percolation of precipitation, and residential/agricultural return flows.

Basin water users include Chevron (with agricultural tenants), and overlying residential and agricultural users. The water supply aquifer is within the alluvial deposits drained by Toro Creek. These alluvial deposits extend up to an estimated 80 feet thick, and average approximately 50 feet thick in the lower portion of the basin (McClelland Engineers, 1988). The projected safe seasonal yield of the Toro Valley Groundwater Basin was historically estimated at 500 AFY (DWR 1958). Estimates of hydrologic budget items for 1987 conditions included 591 AFY of percolation of precipitation and 532 AFY of basin groundwater production. Given the shallow nature of alluvial deposits and limited groundwater basin storage, the safe yield estimate is limited to the documented historical production that has not resulted in water supply problems, which to date has been up to 532 AFY.

Water quality data for a well approximately 0.7 miles inland of the coast between 1954 and 1987 indicates mild sea water intrusion at this location in the basin, with chloride concentrations up to 129 mg/L. The TDS concentration typically ranges between 400 and 700 mg/L (STORET Legacy Database and DWR 2003). In the lower basin area near Highway 1,

petroleum hydrocarbon contamination associated with the Chevron marine terminal has been detected in groundwater and remedial activities are ongoing (GeoTracker Database).

Constraints on water availability in this basin include both physical limitations and water quality issues. Shallow alluvial deposits are typically more susceptible to drought impacts than deeper formation aquifers, having less groundwater in storage and consequently less capacity for resource utilization and banking. For the upper basin, water level and well capacity declines during drought limit water availability, while in the lower valley area, sea water intrusion and petroleum hydrocarbon contamination are the primary constraints.

Some of the published hydrogeologic information for this groundwater basin is over 20 years old and may not be representative of current conditions. If the District requires more current or detailed information for this basin, new studies are recommended. Information currently compiled by County departments (such as well logs for private wells or water quality for shared well systems) would be useful to these studies. Additional information may be available from the DWR and private well sources.

G.2.4 Morro Valley Groundwater Basin

The Morro Valley Groundwater Basin is in WPA 2 and encompasses approximately 1,200 acres (1.9 square miles). The basin is bounded by the Pacific Ocean, the Morro Bat estuary, and by impermeable rock units. The basin is designated by the DWR as Basin 3-41. Most of the basin area is within unincorporated San Luis Obispo County, with the City of Morro Bay overlying the basin area southwest of the narrows near Highway 1 (DWR 2003). Recharge to the basin comes primarily from seepage of surface flows in Morro Creek and Little Morro Creek, deep percolation of precipitation, and residential/agricultural return flows. The water supply aquifers are predominantly within alluvial deposits drained by Morro Creek, which are comprised of gravel, sand, silt and clay. The alluvial deposits are typically up to 80 feet thick (Cleath & Associates, 2007).

Basin groundwater users include the City of Morro Bay, Morro Bay power plant, a cement plant, a small public water system (mobile home park), and residential and agricultural overlying users. The City of Morro Bay pumps sea water and Morro Creek underflow from the basin for use as recycled water.

Groundwater modeling performed to evaluate the impacts of sea water well operation on the basin indicated that concurrent operation of the City of Morro Bay's sea water and fresh water supply wells could interfere during drought conditions such that the fresh water wells would be subject to sea water intrusion (Cleath & Associates, 1993a; 1993b).

Sea water intrusion and nitrates are the predominant concerns for water quality in this basin. In the mid-1980's TDS concentrations in groundwater downstream of the narrows near Highway 1 began to exceed 1,000 mg/L seasonally due to sea water intrusion and tidal influences. More recently, basin TDS concentrations (measured in 2007) were typically between 400 and 800 mg/L and increasing toward the coast, except for an area beneath agricultural fields in the

lower valley where TDS concentrations reached 1000 mg/L, and nitrate concentrations reached 220 mg/L as nitrate (Cleath & Associates 1993a; 2007). Primary constraints on water availability in this basin include physical limitations, water quality issues, and water rights. Shallow alluvial deposits are typically more susceptible to drought impacts. For the upper Morro Valley, water level and well capacity declines during drought would limit the availability of the resource, while in the lower valley area, sea water intrusion would be the primary constraint. Elevated nitrates are a constraint for drinking water availability at the City of Morro Bay well field, where appropriative water right permits from the State Board also limit production.

G.2.5 Chorro Valley Groundwater Basin

The Chorro Valley Groundwater Basin is in WPA 2 and encompasses approximately 3,200 acres (5 square miles), although the effective extent of saturated basin deposits covers an estimated 1,900 acres (approx. 3 square miles). The basin is bounded by the Morro Bay estuary and elsewhere by impermeable rock units (Cleath-Harris Geologists, 2009). This basin is designated by the DWR as Basin 3-42. Most of the basin area is within unincorporated San Luis Obispo County, with the City of Morro Bay overlying the basin area near the Morro Bay estuary. Recharge to the basin comes primarily from seepage of surface flows in Chorro Creek and tributaries (including wastewater treatment plant discharges and releases from Chorro Reservoir), deep percolation of precipitation, and residential/agricultural return flows. The water supply aquifers are alluvial deposits drained by Chorro Creek, which are comprised of gravel, sand, silt, and clay. These alluvial deposits are 50-70 feet thick downstream of Canet Road (Cleath-Harris Geologists, 2009).

Basin groundwater users include the City of Morro Bay, San Luis Obispo County, California State Parks, California State Polytechnic University, California National Guard, California Men's Colony, and residential and agricultural overlying users.

The perennial yield of the Chorro Valley basin is estimated for planning purposes at 2,210 AFY (Cleath & Associates, 1993a; DWR 1958). Nitrate concentrations are a concern for water quality in the lower portion of this basin. Sea water intrusion has been documented historically and is a potential future concern in the Chorro Flats area, should pumping patterns change significantly. Recent basin TDS concentrations (measured in 2008) are typically between 500 and 700 mg/L (DWR 1975; Cleath-Harris Geologists, 2009).

Constraints on groundwater availability in this basin include physical limitations, water quality issues, environmental demand, and water rights. In the Chorro Valley upstream of the Chorro Creek discharge point for the California Men's Colony wastewater treatment plant, water level and well capacity declines during drought continue to limit the availability of the resource. The wastewater plant discharges enter the basin as imported water sources, and therefore provide additional available water for basin wells and environmental demand below the discharge point. In the lower valley area, sea water intrusion is the primary constraint, especially during drought conditions. The elevated nitrates are a constraint for drinking water availability at the City of Morro Bay well field where production is also limited by appropriative water right permits from the State Board. These permits for underflow production by the City of Morro Bay

have also been conditioned to require minimum surface flows in Chorro Creek for Steelhead habitat protection.

G.2.6 Los Osos Groundwater Basin

The Los Osos Valley Groundwater Basin encompasses approximately 6,400 acres (10 square miles), of which 3.3 square miles underlie the Morro Bay estuary and sandspits (i.e., sandy deposits built into landforms), and 6.7 square miles underlie the communities of Los Osos, Baywood Park, and the Los Osos Creek Valley. The basin is bounded by the Pacific Ocean, and elsewhere by relatively impermeable rocks. The southern basin boundary also runs parallel to the main strand of the Los Osos fault. This basin is designated by the DWR as Basin 3-8 (DWR, 2003; Cleath & Associates, 2005).

Basin groundwater users in the Los Osos Valley basin include Golden State Water Company, S&T Mutual, the Los Osos Community Services District, and overlying private well users. The three local water purveyors, along with the County of San Luis Obispo, are currently under a court-approved Interlocutory Stipulated Judgment (ISJ Working Group). This group has developed a Basin Management Plan with identified management actions to be implemented.

For the latest information, including annual reports, visit the Los Osos Basin website: https://www.slocounty.ca.gov/Departments/Public-Works/Committees-Programs/Sustainable-Groundwater-Management-Act-(SGMA)/Los-Osos-Valley-Groundwater-Basin.aspx

G.3 WPA 3 – San Luis Obispo / South County

G.3.1 San Luis Obispo Valley Groundwater Basin

The San Luis Obispo Valley Groundwater Basin is part of WPA 3 and encompasses approximately 13,800 acres (approx. 21.6 square miles). The basin underlies the San Luis and Edna Valleys and is bounded by the Santa Lucia Range, the San Luis Range and the Los Osos and Edna faults. The San Luis Valley Basin (approximately 8,000 acres) includes both unincorporated County and the City of San Luis Obispo.

With a Groundwater Sustainability Plan (GSP) under development, this plan defers to the latest information, modelling and actions being taken by the GSA partners.

For the latest information, visit the San Luis Obispo Valley Basin website: http://www.slocounty.ca.gov/Departments/Public-Works/Committees-Programs/Sustainable-Groundwater-Management-Act-(SGMA)/San-Luis-Obispo-Valley-Groundwater-Basin.aspx

G.3.2 Santa Maria Valley Groundwater Basin

The Santa Maria Valley Groundwater Basin is part of WPA 3. The Santa Maria Valley Groundwater Basin (DWR boundary, including sub-basins) encompasses approximately 184,000 acres (288 square miles), of which approximately 61,220 acres (95.7 square miles) are part of

WPA 3. This groundwater basin underlies the Santa Maria Valley in the coastal portion of northern Santa Barbara and southern San Luis Obispo Counties. The basin also underlies Nipomo and Tri-Cities Mesas, Arroyo Grande Plain, with sub-basins in the Nipomo, Arroyo Grande and Pismo Creek Valleys. The basin is bounded on the north by the San Luis and Santa Lucia Ranges, on the east by the San Rafael Mountains, on the south by the Solomon Hills and the San Antonio Creek Valley Groundwater Basin, on the southwest by the Casmalia Hills, and on the west by the Pacific Ocean. In addition, three sub-basins have been identified in San Luis Obispo County that are separated from the main basin by the Wilmar Avenue fault. These are the Pismo Creek Valley (1,220 acres), Arroyo Grande Valley (3,860 acres), and Nipomo Valley (6,230 acres) Sub-basins. The Santa Maria River Valley Groundwater Basin is designated by the DWR as Basin 3-12 (DWR 2002, 2003).

The Santa Maria Valley Groundwater Basin has been adjudicated. In 2005, the Superior Court of California entered a Judgment for a basin-wide groundwater litigation case that defined three basin management areas. These management areas are the Northern Cities Management Area (NCMA), the Nipomo Mesa Management Area (NMMA), and the Santa Maria Valley Management Area (SMVMA), which are used herein for planning by the County of San Luis Obispo. The Judgment incorporated a Stipulated Settlement which was made binding by the Court on the signatories, with a declaratory judgment and physical solution adjudged and decreed in the Judgment after Trial, dated January 25, 2008. The three DWR sub-basins included herein as separate basin components are outside of the adjudicated area.

The San Luis Obispo County portion of the SMVMA and the NMMA are in unincorporated County. The NCMA includes unincorporated County areas and the Cities of Pismo Beach, Arroyo Grande and Grover Beach. The City of Arroyo Grande also overlies a portion of the Arroyo Grande Sub-basin, and the City of Pismo Beach overlies a portion of the Pismo Creek Valley Sub-Basin.

For the latest information on the Santa Maria Valley Groundwater Basin, visit: http://www.slocounty.ca.gov/Departments/Public-Works/Committees-Programs/Sustainable-Groundwater-Management-Act-(SGMA)/Santa-Maria-River-Valley-Groundwater-Basin.aspx

G.3.3 Santa Maria Valley- Arroyo Grande Sub-Basin

The Arroyo Grande Sub-basin is part of the Santa Maria Valley Groundwater Basin as defined by the DWR but outside of the adjudicated basin area. Water supply aquifers are within alluvial deposits in Arroyo Grande Valley, which is drained by the Arroyo Grande Creek. The alluvial deposits reach approximately 100 feet thick (DWR 2002). Recharge to the sub-basin comes primarily from seepage from Arroyo Grande Creek (including Lopez Reservoir releases) and tributaries, deep percolation of precipitation, and residential/agricultural return flows.

Sub-basin groundwater users include small public water systems (residential, commercial, and County park), and agricultural and residential overlying users. There is no estimated safe yield or existing developed yield value reported for this sub-basin. Groundwater levels in the Arroyo

Grande Creek alluvium downstream of Lopez Dam are controlled by releases from Lopez reservoir, and have been fairly stable since 1969 (DWR 2002).

The primary constraints on water availability in the Arroyo Grande Valley Sub-basin are water quality issues, environmental demand, and water rights. Although shallow alluvial deposits are typically more susceptible to drought impacts, releases from Lopez Reservoir provide greater dry period recharge than would otherwise exist. Groundwater quality in the lower sub-basin is marginal to poor, and steelhead habitat is present in the Arroyo Grande Creek. The legal framework for Lopez Reservoir releases, downstream monitoring, and surface water allocations could also limit groundwater availability.

G.4 WPA 4 – Cuyama River

G.4.1 Huasna Valley Groundwater Basin

The Huasna Valley Groundwater basin is part of WPA 4 and encompasses approximately 4,700 acres (approx. 7.3 square miles). The basin underlies valleys drained by two branches of Huasna Creek, which flow to Twitchell reservoir. Huasna Valley has been designated as Basin 3-45 and is entirely within unincorporated San Luis Obispo County (DWR 2003). Recharge to the basin comes primarily from seepage from Huasna River and tributaries, deep percolation of precipitation, residential/agricultural return flows, and from Twitchell reservoir seepage when the reservoir fills the lower valley. The basin aquifer consists of alluvial deposits drained by Huasna Creek and Huasna River (DWR 2003).

Basin water users are residential and agricultural overlying users. There is no existing estimate of basin safe yield or hydrologic budget items. No historical water quality data for the alluvial basin has been published in public documents or is available through the STORET Legacy Database.

Constraints on water availability in the Huasna Valley Groundwater Basin include physical limitations. Shallow alluvial deposits are typically more susceptible to drought impacts than deeper formation aquifers. Water availability in the sandstone and fractured reservoirs can be highly variable, depending on the local structure, available storage capacity, and access to source of recharge.

There is limited hydrogeologic information published for this basin. If the District requires more current or detailed information for this basin, new studies would be necessary. Information currently compiled by County departments (such as well logs for private wells or water quality for shared well systems) would be useful to these studies. Additional information may be available from the DWR and private sources.

G.4.2 Cuyama Valley Groundwater Basin

The Cuyama Valley Groundwater Basin is part of WPA 4 and encompasses approximately 147,200 acres (230 square miles), of which approximately 32,600 acres (51 square miles) are

within San Luis Obispo County. The basin underlies the valley drained by the Cuyama River and is bounded on the north by the Caliente range and on the Southwest by the Sierra Madre Mountains. Cuyama Valley has been designated as Basin 3-13 and includes portions within unincorporated San Luis Obispo County, Santa Barbara County, Kern County, and Ventura County (DWR 2003). Recharge to the basin comes primarily from seepage from Cuyama River, deep percolation of precipitation, and residential/agricultural return flows.

The Cuyama Basin is subject to SGMA and more information can be found here: http://cuyamabasin.org/

G.5 WPA 5 - North County

G.5.1 Big Spring Area Groundwater Basin

The Big Spring Area Groundwater Basin is located in WPA 5 and is identified in California's Groundwater Bulletin 118 as Groundwater Basin Number 3-47 (DWR 2003). The basin is 7,320 acres (approx. 11.4 square miles) in size and underlies a valley that is drained by a tributary to San Juan Creek. According to Bulletin 118, the main water-bearing unit in the basin is Quaternary age alluvium (DWR 2003). No additional information is available describing the basin hydrogeology.

There are no municipal or public water purveyors in the basin. All pumping in the basin is for agricultural purposes and by overlying users. No information is available describing basin yield or water quality.

Constraints on water availability in this basin are primarily based on physical limitations. Shallow alluvial deposits are typically limited by available storage capacity and are therefore susceptible to drought impacts. In the Big Spring area, the alluvial aquifer also overlies and recharges the underlying consolidated rock formations. Water availability in the consolidated rock reservoirs is highly variable, depending on the local structure, available storage capacity, and access to source of recharge. Published hydrogeologic information for this basin is very limited. If the District requires more current or detailed information for this basin, new studies would be necessary.

G.5.2 Rafael Valley Groundwater Basin

The Rafael Valley Groundwater Basin is located in WPA 5 and is identified in California's Groundwater Bulletin 118 as Groundwater Basin Number 3-46 (DWR 2003). The basin underlies the Rafael Valley and is 2,990 acres (approx. 3.6 square miles) in size. The Rafael Valley is drained by the Rafael and San Juan creeks.

According to Bulletin 118, the main water-bearing unit in the basin is an alluvial aquifer (DWR 2003). There are no municipal or public water purveyors in the basin. All pumping in the basin is for agricultural purposes and by overlying users. No information is available describing basin yield or water quality for this basin.

Constraints on water availability in the Rafael Valley Groundwater Basin are primarily based on physical limitations. Shallow alluvial deposits are typically limited by available storage capacity and are therefore susceptible to drought impacts. In the Rafael Valley, the alluvial aquifer also overlies and recharges the underlying consolidated rock formations. Water availability in the consolidated rock reservoirs is highly variable, depending on the local structure, available storage capacity, and access to source of recharge.

Published hydrogeologic information for this basin is very limited. If the District requires more current or detailed information for this basin, new studies would be necessary.

G.5.3 Pozo Valley Groundwater Basin

The Pozo Valley Groundwater Basin is located in WPA 5 and is identified in California's Groundwater Bulletin 118 as Groundwater Basin Number 3-44 (DWR 2003). The basin is 6,840 acres (approx. 10.7 square miles) in size and is bounded on all sides by low permeability rocks. The basin is drained by Pozo Creek and the Salinas River, both of which flow into Santa Margarita Lake.

According to Bulletin 118, alluvium is the main water-bearing unit in the basin (DWR 2003). The alluvium is up to 30 feet thick. Basin recharge occurs as percolation of stream flow, percolation of precipitation, and irrigation return flows.

There are some small public water systems in the basin. All other pumping is for residential and agricultural purposes by overlying users. The safe yield in the basin has been reported to be 1,000 AFY (DWR 1958). According to Bulletin 118, groundwater samples from 5 wells in the basin taken from 1951 to 1988 indicate TDS concentrations ranging from 287 to 676 mg/L (DWR 2003).

Constraints on water availability in this basin are physical limitations. Shallow alluvial deposits are typically limited by available storage capacity and are therefore susceptible to drought impacts. In the Pozo Valley, the alluvial aquifer also overlies and recharges the underlying rock formations. Water availability in the consolidated rock reservoirs is generally limited and highly variable, depending on the local structure, available storage capacity, and access to source of recharge.

Published hydrogeologic information for this basin is compiled from older reports and may not be representative of current conditions. If the District requires more current or detailed information for this basin, new studies would be necessary.

G.5.4 Rinconada Valley Groundwater Basin

The Rinconada Valley Groundwater Basin is located in WPA 5 and is identified in California's Groundwater Bulletin 118 as Groundwater Basin Number 3-43 (DWR 2003). The basin underlies the Rinconada Valley and is 2,580 acres (approx. 4 square miles) in size. The valley is drained by Rinconada Creek, which is tributary to the Salinas River.

There are no municipal or public water purveyors in the basin. All pumping in the basin is for agricultural purposes and by overlying users. No information is available describing basin yield or water quality in the basin. There is very limited information available for this basin. If the District requires more current or detailed information for this basin, new studies would be necessary.

Constraints on water availability in the Rinconada Valley basin are primarily based on physical limitations. Shallow alluvial deposits are typically limited by available storage capacity and are therefore susceptible to drought impacts. In the Rinconada Valley, the alluvial aquifer also overlies and recharges the underlying rock formations. Water availability in the consolidated rock formations is generally limited and highly variable, depending on the local structure, available storage capacity, and access to source of recharge.

G.5.5 Salinas Valley - Paso Robles Area Groundwater Basin

The Salinas Valley - Paso Robles Area Groundwater Basin is part of WPA 5. According to California's Groundwater Bulletin 118, the entire Salinas Valley - Paso Robles Groundwater Basin is located within the greater Salinas Valley Groundwater Basin and is identified as Groundwater Basin Number 3-4.06. The Salinas Valley - Paso Robles Area Groundwater Basin is located in both Monterey and San Luis Obispo counties and is 505,000 acres (approx. 790 square miles) in size. Roughly one-third of the areal extent of the Paso Robles Groundwater Basin extends into Monterey County. The basin ranges from the Garden Farms area south of Atascadero to San Ardo in Monterey County, and from the Highway 101 corridor east to Shandon.

In general, the Salinas River, Estrella Creek, San Juan Creek, Huer Huero Creek, and numerous other smaller channels that are tributary to these major rivers and creeks drain the basin. Groundwater in the basin is found in alluvium and in the Paso Robles Formation. In general, the alluvium is mostly unconfined and is characterized by relatively high permeability. The Salinas River is a significant source of groundwater to several municipalities located adjacent to and along its reach as well as a number of overlying users with appropriative or riparian rights. Groundwater in the alluvium is a principal source of recharge to the underlying Paso Robles Formation. The Paso Robles Formation is the most significant source of groundwater in the basin. Recharge to the basin derives from stream percolation of the alluvium underflow, infiltration of precipitation, and deep percolation of applied irrigation and wastewater discharge.

Water users in the basin include municipalities, communities, rural domestic residences, and agricultural users. The major municipal water purveyors include the City of Paso Robles, CSA 16-1 (Shandon), and San Miguel Community Services District (San Miguel CSD). The San Luis Obispo County Environmental Health Department also identified 36 small commercial and community water systems that extract groundwater from the basin. Overlying users include rural domestic residences and agricultural users.

In response to SGMA, the County of San Luis Obispo, City of Paso Robles, Shandon-San Juan Water District and San Miguel Community Services District have formed GSA's and developed a GSP. To view the GSP, and the latest information and modelling, visit the Paso Robles Basin website:
https://www.slocounty.ca.gov/Departments/Public-Works/Committees-Programs/Sustainable-Groundwater-Management-Act-(SGMA)/Paso-Robles-Groundwater-Basin.aspx

G.5.6 Salinas Valley - Atascadero Area Groundwater Sub-Basin

The Salinas Valley - Atascadero Area Groundwater Sub-basin is located in WPA 5 and is a sub-basin within the Paso Robles Groundwater Basin. The northern boundary of the sub-basin is approximately the southern end of the City of Paso Robles and the southern sub-basin boundary is located just south of the community of Garden Farms. The eastern boundary of the sub-basin is the Rinconada fault. Because the fault displaces the Paso Robles Formation, the hydraulic connection between the aquifer across the Rinconada fault is sufficiently restricted to warrant the classification of this area as a distinct sub-basin. Therefore, the Salinas Valley - Atascadero Area Groundwater Sub-basin of the Paso Robles Groundwater Basin is defined as that portion of the basin west of the Rinconada fault.

The Salinas Valley - Atascadero Area Groundwater Sub-basin includes the City of Atascadero and the communities of Templeton and Garden Farms. The Salinas River is the major hydrologic feature in the sub-basin. Outflow (primarily surface flow and Salinas River underflow) occurs in the northern direction from the sub-basin into the Estrella subarea of the Paso Robles Groundwater Basin.

Though identified by DWR as "low priority", basin partners are utilizing grant funds to proactively develop a GSP. For the latest information and GSP updates, visit the Atascadero Groundwater Sub-Basin website:
http://www.slocounty.ca.gov/Departments/Public-Works/Committees-Programs/Sustainable-Groundwater-Management-Act-(SGMA)/Atascadero-Groundwater-Basin.aspx

G.5.7 Cholame Valley Groundwater Basin

The Cholame Valley Groundwater Basin is located in the Inland Sub-Region and is identified in California's Groundwater Bulletin 118 as Groundwater Basin Number 3-5 (DWR 2003). The basin is located in both Monterey and San Luis Obispo counties and is 39,800 acres (approx. 62.2 square miles) in size. The basin is comprised of alluvium and is bounded in the southwest by the Paso Robles Formation. The valley is drained by Cholame Creek. The depths of the wells in this area ranged from 100 to 665 feet. Most wells were located on the fringe of the basin in the upper canyon areas and are used primarily for domestic water supply.

There are some small public water systems in the San Luis Obispo County portion of the basin. All other pumping is for residential and agricultural purposes by overlying users. No information is available describing basin yield. Very limited groundwater quality information has been published or described. Water quality data from non-specific sites indicate generally

high concentrations of TDS, chlorides, sulfates, and boron (Chipping, et al., 1993). Constraints on water availability in this basin include physical limitations and water quality.

Published hydrogeologic information for this basin is limited. If the District requires more current or detailed information for this basin, new studies would be necessary.

G.6 WPA 6 – Carrizo Plain

G.6.1 Carrizo Plain Groundwater Basin

The Carrizo Plain Groundwater Basin is located in WPA 10 and is identified in California's Groundwater Bulletin 118 as Groundwater Basin Number 3-19 (DWR 2003). The basin is 173,000 acres (approx. 270 square miles) in size and is situated between the Temblor Range to the east and the Caliente Range and San Juan Hills to the west. The basin has internal drainage to Soda Lake.

Groundwater in the basin is found in alluvium, the Paso Robles Formation, and the Morales Formation (DWR 2003). The upper alluvium and Paso Robles Formation deposits are more than 3,000 feet thick in the eastern portion of the basin and decrease in thickness to the west. Recharge to the basin is predominantly from percolation of stream flow and infiltration of precipitation.

There is one small public water system serving the local school (part of the Atascadero Unified School District). All other pumping in the basin is for agricultural and residential purposes by overlying users. There are two proposed solar farms that will located within this WPA (Topaz Farms 550-MW; SunPower 250-MW).

The safe yield of the basin is estimated to be 600 AFY (DWR 1958). The Kemnitzer safe yield was estimated at 59,000 AFY (based on 1967 inflow/outflow analysis). Taking into consideration the methodologies used in previous studies, current and historical groundwater levels, and water quality, the solar project EIRs' water analyses conclude that a more reasonable safe yield on which to base planning decisions is between 8,000 to 11,000 AFY.

Groundwater samples from 79 wells collected from 1957 to 1985 show total dissolved solids concentration ranging from 161 to 94,750 mg/L (DWR 2003). Groundwater in the lower alluvium and upper Paso Robles Formation that both underlie Soda Lake are highly mineralized. Groundwater deeper in the confined Paso Robles Formation is of higher quality. Groundwater in the Morales Formation is likely brackish.

Constraints on water availability in the basin include physical limitations and water quality issues. The low safe yield estimate of this basin relative to its large size, and the high TDS concentrations in areas (e.g., Soda Lake) suggest that water availability in the region is limited. Other than water quality issues associated with the internal drainage structure of the basin, other constraints are not well defined.

Published hydrogeologic information for this basin is compiled from older reports and may not be representative of current conditions. If the District requires more current or detailed information for this basin, new studies would be necessary. Information currently compiled by County departments (such as well logs for private wells or water quality for shared well systems) would be useful to these studies. Additional information may be available from the DWR and private sources.