SAN GORGONIO PASS WATER AGENCY
1210 Beaumont Avenue, Beaumont, CA
Board of Directors Engineering Workshop
Agenda
November 10, 2014 at 1:30 p.m.

1. **Call to Order, Flag Salute and Roll Call**

2. **Public Comment**
   Members of the public may address the Board at this time concerning items relating to any matter within the Agency's jurisdiction. To comment on specific agenda items, please complete a speaker's request form and hand it to the board secretary.

3. **Review and Discussion of Draft 2013 Water Conditions Report* (Page 2)**

4. **Discussion of 2015 Urban Water Management Plan Issues**

5. **Announcements**
   A. The office will be closed **Tuesday**, November 11, 2014 in observance of Veterans Day
   B. Regular Board Meeting, November 17, 2014 at 1:30 p.m.
   C. Finance and Budget Workshop, November 24, 2014 at 1:30 p.m.
   D. The office will be closed November 27th & 28th, in observance of the Thanksgiving Holiday

6. **Adjournment**

*Information included in Agenda Packet

(1) Materials related to an item on this Agenda submitted to the Board of Directors after distribution of the agenda packet are available for Public inspection in the Agency's office at 1210 Beaumont Avenue, Beaumont during normal business hours. (2) Pursuant to Government Code section 54957.5, non-exempt public records that relate to open session agenda items and are distributed to a majority of the Board less than seventy-two (72) hours prior to the meeting will be available for public inspection at the Agency's office, located at 1210 Beaumont Avenue, Beaumont, California 92223, during regular business hours. When practical, these public records will also be made available on the Agency's Internet Web site, accessible at http://www.sgpwa.com." (3) Any person with a disability who requires accommodation in order to participate in this meeting should telephone the Agency (951 845-2577) at least 48 hours prior to the meeting in order to make a request for a disability-related modification or accommodation.

1.0 Background

The San Gorgonio Pass Water Agency is a State Water Contractor and wholesale water agency that provides imported water to retail water purveyors within its service area, which extends from Calimesa on the west to Cabazon on the east. Its service area covers approximately 228 square miles, most of which is in Riverside County but which includes two small areas in San Bernardino County. One of these is unpopulated and the other includes three residences owned by the Beaumont Cherry Valley Water District. The service area is depicted on **Figure 1.**

The Agency was created by the San Gorgonio Pass Water Agency Act, passed by the California Legislature in 1961 and signed by Governor Pat Brown on July 12, 1961. The first Board of Directors, appointed by the Riverside County Board of Supervisors, held its initial formal meeting on October 10 of that year. It had previously met briefly on September 22 to elect Ted Silverwood as the first President of the Agency. The area had a population of approximately 21,000 at the time (today it is closer to 85,000, an increase of 400%).

The San Gorgonio Pass is an elevated, relatively narrow land mass between the San Bernardino Mountains on the north and the San Jacinto Mountains on the south, connecting the San Bernardino Valley on the west to the Coachella Valley on the east. Both of these valleys are at much lower elevations than the Pass region. The region straddles two large watersheds. The western half of the service area is drained primarily by Little San Gorgonio Creek and Noble Creek, which are tributary to San Timoteo Creek and the Santa Ana River. The eastern half of the service area is drained by the San Gorgonio River, which is tributary to the Whitewater River and is part of the Colorado River Basin. A small portion of the region drains to the San Jacinto River which drains to Lake Elsinore. **Figure 2** depicts the drainage basins and principal streams in the region.

This report, published annually by the Agency in some form for over two decades, is intended to help monitor and make available to the public the quantity and quality of water in local groundwater basins. It is based on the Agency's extensive database as well as data from other sources. It includes data from 2013 as well as historical data, which provide a basis to put the most recent data into historical context.

Tables 1, 2, and 3 are extraction (production) summaries of groundwater pumping within the Agency's service area, hereinafter referred to as the region. These tables summarize annual production for the past 13 years, and represent the heart of this report. These data were obtained from the State Water Resources Control Board, Division of Water Rights (State Board); local sources; or in some cases estimated by the Agency. The Agency does not independently verify the data. The State Board does not require reporting for well owners who extract less than 25 acre feet per year (about eight million gallons). Also, it is possible that some well owners do not file as required. The data in these tables represent the Agency's best estimate of actual pumping, based on both actual data and production estimates. Most wells are not metered and therefore data from these wells must be estimated by various means.

The report also includes water quality data from the State Water Project's sampling station at Devil Canyon in San Bernardino. Devil Canyon is the closest sampling station to the Agency and is representative of the water that the Agency receives from the State Water Project. The data, summarized in **Table 5,** reflect that the water quality varies from year to year and from month to month. It is primarily a function of water quality conditions in the Sacramento/San Joaquin Delta and of runoff in watersheds tributary to the Delta. That water quality in turn is largely a function of hydrology. In wet years and during wet periods within dry and average years, fresh water from upland rivers drains to the Delta and improves overall water quality.

The water quality constituent of most interest to the Agency and other local water agencies is TDS, or total dissolved solids (also known as salinity or salts). Salinity is becoming more heavily regulated by Regional Water Quality Control Boards throughout the State, especially as water agencies around the state construct recycled water systems. In order to maintain reasonable TDS levels in the lower reaches of the Santa Ana watershed (primarily Orange County), the Santa Ana Regional Board must set standards for TDS at relatively low concentrations in the upper reaches of the watershed, where the western portion of the Agency's service area is located. Salinity is less of an issue in the eastern portion of the region, which is part of the Colorado River watershed and is more sparsely populated. This watershed already has among the highest levels of TDS in the State. Sewage treatment plant effluent from Beaumont, Yucaipa, and Calimesa is discharged into tributaries to the Santa Ana River and is regulated by the Santa Ana Regional Board; effluent from Banning is currently regulated by the Colorado River Regional Board though it is likely that the Santa Ana Regional Board may at some time regulate this discharge or portions thereof. This is due to the fact that the City of Banning has plans for a recycled water system, parts of which will overlie a portion of the Santa Ana watershed.

State legislation passed in 2009 requires more extensive groundwater elevation monitoring in basins throughout the State similar to what the Agency has performed for over a decade. The California Department of Water Resources has set up CASGEM (the California Statewide Groundwater Elevation Monitoring system). The Agency has been accepted as the regional monitoring entity for the region. This represents a legislative mandate to perform the groundwater level monitoring that the Agency has been performing on its own for many years. The data uploaded by the Agency to the CASGEM system represent a relatively small subset of the Agency's overall groundwater database.

2.0 Water Supply Conditions

There are three principal sources of water within the region—groundwater, which begins as precipitation in the form of rain and snow in the local mountains; imported water from the State Water Project; and recycled wastewater. A fourth source—local runoff of surface water—accounts for a small portion of local water resources, primarily in Edgar and Banning Canyons. Even this runoff is typically recharged into local groundwater basins where it becomes part of the groundwater supply. Recycled water is not in use as of this writing; however three retail water agencies, including the Beaumont Cherry Valley Water District, Yucaipa Valley Water District, and the City of Banning, have plans to implement recycled water systems in the next few years and have begun planning, designing, and constructing the needed infrastructure for these systems. The Yucaipa Valley Water District is working on obtaining a permit to serve desalted recycled wastewater for non-potable uses and is likely to have this recycled water source available before other local water purveyors.

2.1 Precipitation

Annual precipitation in the Beaumont area since 1888 is shown on **Figure 4.** The long-term mean annual precipitation in Beaumont is approximately 17.5 inches. This figure depicts the variable nature of precipitation. Of the approximately 125 years of records, the precipitation in 50 years has exceeded the average, while 75 years have been relatively dry as compared to the average. The figure shows several periods—1897-1904, 1948-1952, 1960-1965, 1986-1992, 1999-2002, and 2005-2009—with multiple consecutive dry years. The figure shows that 2007, 2009, and 2013 were among the driest on record in Beaumont (and in fact in all of Southern California), while 2010 was one of the wettest and 2011 and 2012 were below normal. The figure indicates that, since 1999, there have been only three years that met or exceeded the long-term average rainfall. Data presented are for Beaumont because the National Weather Service's official weather station in the region is located in Beaumont.

Precipitation is highly variable, both spatially and temporally. The National Weather Service's official station is at an elevation of about 2600 feet. It is highly likely that higher elevations receive more precipitation, including snow, and lower elevations receive relatively less precipitation. In addition, storms, particularly summer storms, can be highly concentrated and impact one area, while another area a mile or two away may get little or no rain. Thus, while the long-term average rainfall may be approximately 17.5 inches in one part of the region, it could easily be an inch or two more or less at other locations in the same region.

Groundwater basins are able to capture naturally and store much, but not all, of the precipitation in wet years. During and after a rainfall event, runoff drains to streams where it runs into creeks and rivers. Some of this will recharge the local groundwater basins. During large storm events, much of the runoff will flow downstream. In this case, it will either flow from San Timoteo Creek into the Santa Ana River in Redlands, or it will flow from the San Gorgonio River into the Whitewater River in the Coachella Valley. A small portion of runoff from the region flows to the San Jacinto River in Hemet. Cities and water agencies in the region have begun planning

how to capture additional stormwater that currently runs down the Santa Ana River to Prado Dam and eventually to the Pacific Ocean.

Stormwater capture represents a potential new source of water to the region. While additional sources of local water are always good for a region, stormwater capture requires a lot of land, and thus has been found to be too expensive for large-scale development in many areas. Large areas of land are required in order to construct ponds to settle out the particulate matter that accompanies storm flows. Since large storms are not abundant every year, land acquired for large scale stormwater capture would not be used on a consistent basis, and therefore represents a large investment that does not reap benefits every year.

2.2 State Water Project

The San Gorgonio Pass Water Agency Act was signed by Governor Pat Brown in 1961, and the Board of Directors, appointed by the Riverside County Board of Supervisors, held its first meeting in September of that year. Within another year, the Agency had signed a contract with the State of California for 15,000 acre feet of water from what at the time was known as the Feather River Project. A year later, the Agency increased its contract amount, or Table A amount, to 17,300 acre feet, an increase of 15%. The Agency's Board of Directors fought hard to get this amount, and made financial sacrifices to do so. The additional water increased the annual amount of debt service owed by the Agency, and the expenditure of these additional funds precluded the ability to begin construction on a pipeline to San Bernardino to take delivery of the water at that time

The Agency began importing State Water Project water into the region in 2003, when Phase 1 of the East Branch Extension of the California Aqueduct was completed. Since that time, deliveries of State Water Project water within the region have increased nearly every year. **Table 4** summarizes these deliveries. This table shows that the Agency delivered nearly 11,000 acre-feet in 2011 and 2012, dropping to less than 10,000 acre-feet in 2013. The 80% allocation of Table A water in 2011 was the highest since 2006, and enabled the Agency to deliver water that not only met local water demands, but that added to local banked groundwater as well. Even though the 35% allocation of water in 2012 was considerably less, the Agency was able to deliver virtually the same amount as in 2011 due to its ability to carry over water from the previous year. This number dropped in 2013 as the Agency had less carryover water to deliver.

The Table A allocation is a function of hydraulic conditions in the Sacramento/San Joaquin delta as well as northern California hydrology. The average long-term reliability of the State Water Project is approximately 60%. For the Agency, this represents a long-term supply of approximately 10,400 acre-feet, nearly 7,000 acre-feet less than its contracted amount. And, this reliability is expected to decrease over time for a number of reasons. This points out the importance of being able to store water in those years when the Table A allocation is greater than 60%. The ability to import and store more water locally in the future is a key to the sustainability of the region and to minimizing the amount of additional supplemental water that must be procured to meet projected future water demands.

Currently, the Agency can import a maximum of approximately 12,000 acre feet per year with existing infrastructure. When Phase 2 of the East Branch Extension is completed in 2016, the

Agency will be able to import its entire Table A allocation when it is available, plus additional supplies. Completion of this $200 million project is a high priority for the Agency and the San Bernardino Valley Municipal Water District (Valley District) and the California Department of Water Resources, the Agency's partners in this project.

Phase 2 of the project (named EBX 2) consists of a pipeline under the Santa Ana River near Highland, a reservoir and pump station in Mentone, and a pipeline from this pump station to the existing Crafton Hills Pump Station in Mentone. The project also includes new pumps in the Crafton Hills Pump Station and the Cherry Valley Pump Station. The new pipeline, which will be 72-inches and 66-inches in diameter, will replace an existing 48-inch diameter line that was constructed in the 1980's. In addition, the Agency and Valley District are constructing improvements to the existing EBX that will make it more reliable and able to deliver water in the event Crafton Hills Reservoir is out of service. These improvements include an expansion of Crafton Hills Reservoir from approximately 90 acre-feet to approximately 135 acre-feet, and a bypass line around the reservoir that can be used to deliver water when the reservoir is out of service for any reason.

The ability to import and store more water in the region will depend on these projects, additional connection capacity to the East Branch Extension, and additional regional recharge and storage capacity. As of 2013, the total turnout capacity of the pipeline is approximately 25 cfs. The current pipeline capacity is 16 cfs. When EBX 2 goes online in 2015, the total pipeline capacity will be 32 cfs, expandable to 64 cfs. However, unless additional infrastructure is constructed to be able to convey this additional water out of the pipeline to new or existing recharge facilities, the project will not add appreciably to the region's water resources.

The Agency is currently planning such infrastructure. The Beaumont Avenue Recharge Facility includes a new connection to the EBX, a new recharge facility, and a short pipeline connecting the two. The Agency is moving forward on this project and plans to have it on-line by 2016, when EBX 2 is expected to be completed. The facility will enable the region to import additional water in wet years and store it for dry years. This "conjunctive use" of water is a very popular and effective water management tool that is used throughout the West, and whose use is increasing.

2.3 Wastewater

Three public agencies discharge treated wastewater in the region—the cities of Beaumont and Banning, and the Yucaipa Valley Water District. In addition, the Morongo Band of Mission Indians operates a sewage treatment plant in the Cabazon area. The annual discharges since 1987 for the three public sewage treatment entities are shown on **Figure 5.** Figures for the Morongo plant are not included. Unlike precipitation and the State Water Project, which are highly variable from year to year, wastewater discharges from the region have consistently increased over time, as the region has developed. They have been relatively constant over the past five years. Wastewater treatment plant discharges are a function of indoor water use, not hydrology or exterior water use. Hence they are considered to be relatively more reliable and stable than imported water or local runoff.

Thus, treated wastewater, or recycled water, is an important asset to the region, because it can be a reliable, non-potable water source in the future. All three of the public agencies mentioned

above are in various stages of implementing recycled and/or non-potable water systems for irrigation, golf courses, parks, medians, etc., or to recharge it into local groundwater basins. The Yucaipa Valley Water District is expected to begin implementing its recycled water system in 2014.

As mentioned in Section 1.0, salinity is a growing concern in California, and recycled water is high in dissolved solids or salinity. While recycled water is a huge potential benefit to the region, its use as a water supply will at some point in the future require desalting. Desalting is an expensive operation that requires brine disposal, a costly process. The Yucaipa Valley Water District is constructing a desalination plant and brine disposal pipeline. Once this is complete, it will be able to utilize recycled water in lieu of groundwater or imported water for non-potable uses, primarily irrigation and construction water.

The City of Banning is moving towards a recycled water system, and the City of Beaumont, which owns a sewage treatment plan, and the Beaumont Cherry Valley Water District, which is the water purveyor in the City and surrounding areas, are in talks to distribute the City's treated effluent as part of a recycled water system owned by BCVWD.

Use of recycled water either for direct non-potable use or for recharge requires a permit from the Santa Ana Regional Water Quality Control Board. Such permits will be granted only when the Regional Board is convinced that the permit holder will take all required steps to meet its standards for salinity based on the current Basin Plan.

3.0 Groundwater Conditions

Figure 3 shows the principal groundwater basins, sometimes referred to as storage units, in the region. The boundaries of these basins are as defined by the United States Geological Survey. The Beaumont Basin is the largest and most productive of these basins, and serves a large majority of the population in the region.

The region is characterized by numerous faults, which make for complex geology. The Beaumont Basin is characterized by a number of smaller sub-basins, but can be viewed as one continuous basin, or storage unit, and has been modeled in that manner. East of the Beaumont Basin is the Banning Basin, and east of that is the Cabazon Basin. The Agency is in the process of expanding its model of the Beaumont Basin (developed by the United States Geologic Survey) eastward to include both the Banning and Cabazon basins, or storage units. This work should be completed and peer-reviewed by late 2014.

The existing model is a tool that can be used to predict how various recharge scenarios will impact water levels in the Beaumont Basin.

3.1 Groundwater Extractions (Production)

Table 1 summarizes groundwater production from the eleven basins in the region. **Table 2** summarizes reported production from each individual producer, whether public or private. **Table 3** provides a detailed breakdown of extractions by each reporting producer (including some based in San Bernardino County) for each basin for the thirteen most recent years of available data. Surface diversions from the Whitewater River are not included, as the Agency is not convinced the available data are reliable enough to report. These diversions serve the Banning Bench and parts of the City of Banning. Surface diversions from Edgar Canyon are included.

Figure 6 illustrates the long-term trend in reported groundwater production in the region since 1947. **Figure 7** summarizes the same data since 1997, about the time significant growth started. Both figures show a distinct increasing trend in groundwater extractions both over the long term and over the past 16 years, though there is variability within that trend, especially over the past seven years. The results of these recent years show a sharp reduction in local extractions from 2008 to 2010, followed by gradual increases over the past three years, in contrast to decades of increases prior to 2008.

Figure 6 indicates that extractions remained relatively constant from the early 1960's to the mid 1980's. Extractions increased gradually from that point until the mid-1990's, when they started to increase significantly. **Figure 7** shows a significant increase from 1998 to 2006 (from less than 25,000 AF to over 35,000 AF, an increase of over 40%), and a significant decrease since that time, from over 35,000 AF to approximately 30,000 AF (a decrease of about 15%).

Figure 8 illustrates the percentage share for each basin's total extraction within the region in 2013. This is somewhat different from the 2012 percentages. In the previous year, the Beaumont Basin represented only 48% of all extractions, compared to 54% in 2013. This increase was primarily at the expense of the Banning Canyon Basin (decreased from 14% to 11%), the Cabazon Basin (decreased from 4% to 2%), and Edgar Canyon (reduced from 11% to 9%). The Beaumont Basin is still the largest basin by far, with just over half of all extractions. The Banning Canyon and Edgar Canyon basins are next. Each of these is fed primarily by surface water runoff, the former through adjudicated inter-basin diversions from the Whitewater River.

Table 1 indicates that total production in the region increased about 2.5% from 2012 to 2013, from 29,575 to 30,292 acre-feet. Compared to the peak year of 2007, when total production totaled 35,474 acre-feet, this represents a 15% reduction in groundwater production over the past five years, and the third slight increase in the past three years (an increase from 28,313 AF in 2010 to 30,474 in 2013, or about 7.5% over those three years).

In the Beaumont Basin, the region's largest, production increased about 13%, from 14,302 to 16,236 acre-feet. This represents a relatively larger increase than has occurred over the past three years. As can be seen from Table 3, most of this increase can be attributed to higher extractions from three retail water purveyors, Beaumont Cherry Valley Water District (an increase of nearly 1000 acre-feet), the City of Banning (another increase of nearly 1000 acre-feet), and the Yucaipa Valley Water District (an increase of about 300 acre-feet). Overall, this represents a 15% reduction in the Beaumont basin from 2007. Much of this decrease can be explained by the 2008-2011 recession and the ongoing slow recovery. From 2008 to 2010, some homes were vacant and therefore had no water demand, while other families and businesses presumably cut back on water use to help make ends meet. Very few new homes have been built over the past several years, meaning that use of construction water has also been reduced. The increase in extractions over the past three years is an indication that the recovery is ongoing and picking up steam.

The Cabazon Basin presents an interesting data set. According to the data submitted to the Agency, extractions from this basin decreased by approximately 55% from 2007 to 2012, yet increased by over 80 in 2013. These numbers lead to a question of whether the data are correct every year, especially in 2012, when the data showed extractions of 654 acre-feet, compared to 900 acre-feet in 2011 and 1226 acre-feet in 2013.

As noted above, the use of construction water for grading and to control dust, so prevalent in the 2000-2008 period, virtually disappeared for several years, accounting for some of the reduction in water demand. The increased extractions over the past three years are an indication that some of this may have resumed.

Table 2 summarizes overall production by owner, regardless of basin. In reviewing the production by the major water agencies and overliers, the data are relatively consistent. Beaumont Cherry Valley Water District increased its extractions by 676 acre-feet, an increase of 5.5%. Banning increased its extractions by nearly 200 acre-feet, an increase of about 2%. At the same time, South Mesa Water Company decreased its extractions by 20%, from 2376 to 1889

acre-feet. The Morongo Band of Mission Indians, which owns the Tukwet Canyon golf course, increased extractions by about 200 acre-feet, an increase of 12%. This is likely due to 2013 being a drier year than 2012, thus requiring more irrigation water for the golf course. The same could be said for increases in the Beaumont Basin. The Cabazon Water District had the greatest increase in extractions, increasing them from 269 to 854 acre-feet, an increase of over 300%. This is further evidence that perhaps the 2012 data are incorrect. There is no known reason for extractions to increase this much in one year, even though the Cabazon Water District took over deliveries to the two outlet malls in Cabazon. This is not enough to account for this high an increase.

An examination of the groundwater production data demonstrates that economic conditions and annual precipitation and temperature likely play large roles in determining water demand in any given year. The gradual increase in water production in the region over the past three years can be explained in large measure by a gradually recovering economy, which causes higher water use. Per capita reductions in water use in homes over the previous three years could be explained either by cutbacks due to economic conditions during that time, reduced usage due to higher water rates, or water conservation efforts on the part of local residents. A detailed study would have to be performed to determine the specific impacts of these issues on the reduction in water demand over the past three years. In the case of the Cabazon Water District, an aggressive effort to fix leaks in its distribution system led to a large reduction in extractions from 2010 to 2012.

The reduction in production due to decreased water demand from 2008 to 2010 points out a major issue within the water industry. As water demand falls, water sales revenues fall, making it difficult for public water agencies (and private ones, for that matter) to meet financial obligations. Most of their costs (primarily labor) are fixed and do not decrease when water demand falls. These agencies have to make up for these lost revenues in other ways, either by changing their rate structures, by increasing water rates, by reducing their costs, or by drawing from reserves.

As noted above, while overall extractions increased only 2.5% in 2013, extractions from the Beaumont Basin increased 13%. Three large retail water agencies have numerous wells in the Beaumont Basin, and their production increased significantly, as mentioned previously. This is likely explained by two factors. The first is the gradually improving economy. The second is the fact that 2013 was an extremely dry year locally, and some groundwater basins did not have high yields. This is particularly true of Banning Canyon and Edgar Canyon, which depend largely on local runoff. With these sources greatly reduced in 2013, the City of Banning and the Beaumont Cherry Valley Water District pumped more from their wells in the Beaumont Basin, where they had been storing imported water for years. Thus, local hydrologic conditions, while not having a significant impact on overall extractions, did impact which basins were used to meet local water demands.

3.2 State of Overdraft

Overdraft of a groundwater basin refers to the amount of water pumped out in excess of its safe yield. Safe yield is the average annual replenishment of a basin through natural sources such as rainfall, runoff, snowmelt, and underflows from other groundwater basins. Safe yield is difficult

to establish and represents only an average. In a given year, natural replenishment of a groundwater basin could be more or less than the average safe yield, depending on local hydrology

The Agency has been closely monitoring overdraft of the Beaumont Basin since at least 1988, when the Agency's first engineering investigation of the basin indicated that pumping significantly exceeded the basin's probable safe yield. Studies by the Agency have pointed to an estimated long-term average safe yield of about 5,000 to 6,100 acre feet per year for the Beaumont Basin (Boyle Engineering, 1995; Boyle Engineering, 2002). This is smaller than the safe yield of 8,650 acre feet defined in the Beaumont Basin Stipulated Judgment, a number which represents the sum of overlier water rights. Overlier water rights refer to rights based on historical production for water used on the land.

Thus, current and future pumping from the Beaumont Basin, even if in accordance with the Judgment, could exceed the long-term average safe yield of the basin as identified in Boyle. The Judgment includes a clause enabling a party to challenge the determinations of the Judgment ("seek judicial relief') if that party demonstrates harm from the consequences of the Judgment (if pumping activities of others "constitute an unreasonable interference with the complaining party's ability to extract groundwater").

The Judgment also requires the Beaumont Basin Watermaster to "redetermine" the safe yield of the basin at least once every ten years, beginning ten years after the date of entry of the Judgment (no later than February 2014). If the redetermined safe yield were to be different from the 8,650 acre feet per year identified in the Judgment, it would change the amount of overdraft on an annual basis. Depending on the redetermined safe yield, this could be more or less than the current overdraft.

According to the Judgment, the basin must be in balance after 2014. That is, the total amount pumped out cannot exceed the average safe yield as identified by the Watermaster unless it is drawn out of storage accounts already in place at that time, or replenished from additional sources, including State Water Project water, recycled water, stormwater, or some other source.

Total production in 2013 from the basin, as reported, was 16,236 acre feet. Therefore, the Beaumont Basin experienced an apparent overdraft of about 10,136 acre feet, assuming an average safe yield of 6,100 acre feet. This was partially offset by importing 9,695 acre-feet of supplemental water. This is the first time in three years that the volume pumped out of the basin exceeded the sum of average natural recharge plus imported water. Even so, this difference was a very small amount (441 acre-feet).

Selecting 1997 as a base year (the year when significant increases in production began in the region), the cumulative overdraft in the Beaumont Basin since that time (assuming a safe yield of 6,100 acre feet) would be 147,861 acre feet, an average of approximately 9,000 acre feet per year over the past 16 years, without importation of State Water Project water. **Figure 9a** depicts this graphically. Through 2013, the Agency has imported nearly 63,000 acre-feet of supplemental water. This offsets the cumulative overdraft and reduces it to less than 85,000 acre-feet over the same time period. This is depicted in **Figure 9b.** The difference in these two figures shows the immense impact that the State Water Project has had on the region in the last decade.

Although other local groundwater basins are at similar risk of overdraft, the state of the overdraft of the Beaumont Basin is far more apparent (in part because it has been studied more) and, due to the large population served by the basin, more critical to the region. Since the safe yields of other basins in the region have not yet been defined, it is impossible to determine whether or not they are in overdraft at this time. However, monitoring of water levels in these basins shows that levels are decreasing in at least some of the eleven basins in the region.

The Agency is continuing studies of the Cabazon Basin and at some point in the next few years will likely define an average safe yield for this basin. It is estimated that this is the second largest basin in the region based on storage volume. Other basins will require additional studies over time to better understand their geology and hydrology. It is believed that most of them have storage volumes and safe yields far smaller than the Beaumont and Cabazon basins.

3.3 Groundwater Levels

The Agency monitors water levels in a large monitoring well network. Currently there are approximately 110 wells in the system, each of which is monitored for groundwater elevation twice a year, typically in May and November. The monitoring network is depicted in **Figure 10.**

Between Fall 2012 and Fall 2013, 76 of the wells had water level changes. Of these, eight wells recorded a water level increase of more than five feet, and 13 wells recorded a decline of more than five feet. The rest showed increases or declines of less than five feet. Of the eight wells showing a large increase in water levels, seven are in the Beaumont Basin or right on the boundary of the Beaumont Basin, while one is in the San Timoteo Basin. Three are relatively close downstream of the Beaumont Cherry Valley recharge facility, and are likely influenced by the imported water recharged at that facility. Two are near the boundary with the Banning Basin. Of the 13 wells showing declines of more than five feet, eight of them are in Banning Canyon. This is not surprising, given that this basin is very shallow and 2013 was a very dry year. Four of these are in the Beaumont Basin, including two on the western edge of the basin, and one is in the South Beaumont Basin. These are depicted on **Figure 11**.

As of 2011, the Agency is part of the California State Groundwater Elevation Monitoring (CASGEM) system. This is a new, formal statewide groundwater monitoring system initiated through 2009 legislation. The Agency is a formal monitoring entity for two basins—the San Timoteo sub-basin and the San Gorgonio sub-basin—which roughly correspond to the Agency's boundaries. The state uses different basin names because it views the statewide geology and hydrology on a larger scale, and aggregates smaller basins into larger ones. What is known in the CASGEM system as the San Timoteo sub-basin is essentially the Beaumont Basin, and what CASGEM labels the San Gorgonio sub-basin is essentially the Cabazon Basin. While the boundaries are not exact, they are similar. The Agency files water level data for selected wells through the Department of Water Resources into the CASGEM database. These data are available on the CASGEM web site.

Figures 12 through 17 show time-series groundwater elevations (hydrographs) for selected wells in five different basins within the Agency service area. These same wells have been depicted in this report for the past several years.

The two wells shown in **Figure 12** are Banning production wells in the Banning Basin. Each shows great variability in groundwater elevation from 2002 to 2006. Since that time, both wells appear to be higher in elevation. Both of these wells show a long-term trend of lower groundwater levels. However, both appear to be relatively stable over the past few years. The well depicted in **Figure 12a** appears to be holding at a water level between 325 and 400 feet below ground surface. The well in **Figure 12b** is down about 75 feet since 1998, but appears to be stable at approximately 350 feet below ground surface.

The five wells depicted in **Figures 13-15** are in the Beaumont Basin. The wells in **Figures 13b and 15b** are in the same location, approximately 1000 feet east of Beaumont Avenue and 50 feet south of Cherry Valley Boulevard in Cherry Valley. This location is likely influenced by the past recharge at Little San Gorgonio Creek, and possibly by the recharge at Noble Creek. The upturn in water levels over the past four years indicate that this is quite likely the case. The wells in **Figures 14 and 15a** are on Calimesa Boulevard near the western fringe of the Beaumont Basin. These wells show continually falling water levels over the past decade. That portion of the Beaumont Basin would appear to not be influenced as yet by the ongoing recharge efforts and reduced production. While it is clear that ongoing recharge and reduced extractions have had an impact on at least some of the wells in the Beaumont Basin, water levels at other wells are still falling.

The two wells in **Figure 16** are both in the Cabazon Basin. They are both production wells—one for the Mission Springs Water District and the other for the Cabazon Water District. Both show severe drops in water surface elevation over the past several years. The well in **Figure 16a** shows a drop of nearly 30 feet over the past ten years. However there does appear to be some stabilizing of the water level recently. It remains to be seen if this will become a trend. The well in **Figure 16b** is changed from previous reports. Previously this report depicted the Cabazon Water District's Well Number 1. However, this well has become difficult if not impossible to monitor; thus it is replaced with Well Number 2. This well shows a drop of approximately 15 feet over the past five years, though the most recent data might indicate some moderation of this drop, or perhaps even a stabilizing of the water level. These data, along with previous data from the Cabazon Water District Well Number 1, would seem to indicate that, even though the wells are several miles away from each other, that water levels in the Cabazon Basin are dropping and have been for a number of years. This is somewhat surprising, given the decline in extractions from this basin over the past several years. This could mean that inflows to the basin have also declined over the same period of time. It could mean that any impact of reduced extractions just requires a longer period of time before the impact is seen in wells. It certainly means that there are other factors at work in this basin that impact water surface elevations that are beyond the scope of this report. This is one reason that the Agency has worked with the United States Geological Survey to extend its model of the Beaumont Basin to the Cabazon Basin. The Agency wishes to learn more about the Cabazon Basin and how it reacts to various hydrologic events.

The wells depicted in **Figure 17** are in the Calimesa and Banning Canyon Basins. The data in **Figure 17b** show clearly that the Banning Canyon Basin is a shallow basin, and that water levels fluctuate more in such basins. The year 2006 was a wet one locally, and the figure shows that groundwater levels in the basin came up nearly 15 feet that year. The next three years, on the

other hand, were dry ones, and the water level dropped nearly seven feet in that time. The data for the well in the Calimesa Basin show that groundwater levels increased in 2006 and have remained relatively constant since. This could have to do with the Yucaipa Valley Water District's filtration plant, which came online in 2006. This event reduced extractions from the Calimesa Basin and most likely contributed to the stabilization of the water level.

These figures represent only a small portion of all groundwater elevation data available in the region. These data indicate that, in general, groundwater elevations continue to decline except in certain areas where recharge of imported water or the switch to surface water is apparently stabilizing or even raising the water levels. Reductions in extractions over the past six years have in many cases slowed the rate of decline. It remains to be seen if the gradual increase in extractions over the past three years will contribute to a long-term trend in downward water levels.

The implications of lower water levels are great. As water levels decline throughout the local basins, every well will have to pump water from a lower elevation, thus increasing power costs for well owners and rate payers. Some overliers' wells may be quite shallow, and as water levels decline further some of these wells may be in danger of going dry. This would necessitate a large expense to the overlier—either a new well, a deeper well, or connection to one of the water purveyors' systems.

In general, continually decreasing water levels can also lead to land subsidence (sinking) and the drying up of traditional wetlands or streambeds. In the region, most of these wet areas dried up many years ago. The Beaumont Basin Watermaster is charged with monitoring land elevations to determine if subsidence is taking place in the Beaumont Basin. As of this time, the Watermaster has not reported any appreciable land subsidence over the basin.