ENGINEER'S REPORT ON WATER SUPPLY AND REPLENISHMENT ASSESSMENT

East Whitewater River Subbasin Area of Benefit

2014-2015

Prepared for

COACHELLA VALLEY WATER DISTRICT

April 2014

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COACHELLA VALLEY WATER DISTRICT

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Prepared by
Environmental Services Department
and
Engineering Department
April 2014

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INTRODUCTION

This is the eleventh annual Engineer's Report on Water Supply and Replenishment Assessment for the East Whitewater River Subbasin Area of Benefit (formerly known as the Lower Whitewater River Subbasin Area of Benefit) managed by the Coachella Valley Water District (CVWD). This program began in the 2004-2005 fiscal year and has replenished the east portion of the Whitewater River Subbasin with a cumulative total of approximately 197,997 acre-feet (AF) of supplemental water.

CVWD serves an area of approximately 1,000 square miles in the Coachella Valley (Valley) within the counties of Riverside, Imperial and San Diego. The Valley is situated in the northwesterly portion of California's Colorado Desert. The Valley is bordered on the west and north by high mountains, which provide an effective barrier against coastal storms, and which greatly reduce the contribution of direct precipitation to replenish the Valley's groundwater basin. The bulk of natural groundwater replenishment comes from runoff from the adjacent mountains.

The need to enhance the Valley's water supply has been recognized for many years. The formation of CVWD in 1918 was a direct result of the concern of residents over a plan to export water from the Whitewater River to Imperial Valley. The early residents of the Valley also recognized that action was needed to stem the decline of the water table, which was occurring as a result of their pumpage. This caused CVWD to enter into an agreement for construction of the Coachella Branch of the All American Canal (Coachella Canal or Canal) to bring Colorado River water to the Valley. Since 1949, the Coachella Canal has been providing water for irrigation use in an area generally from Indio and La Quinta southerly to the Salton Sea.

After providing supplemental water in the southeastern part of the Valley and with the onset of recreational development, the need for supplemental water in the northwestern part of the Valley was recognized. As a result, CVWD and the Desert Water Agency (DWA) entered into separate contracts with the State of California (State) to ensure that water from the State Water Project (SWP) would be available. A direct connection from the SWP to the Valley does not currently exist. Therefore, CVWD and DWA entered into an agreement with the Metropolitan Water District of Southern California (MWD) to obtain water from the MWD Colorado River Aqueduct, which crosses the western portion of the Valley near Whitewater, in exchange for CVWD and DWA SWP water. Since 1973, CVWD and DWA have been releasing Colorado River water near Whitewater to replenish groundwater in the western portion of the Whitewater River Subbasin of the Valley.

As of December 2002, CVWD and DWA also began replenishment activities at the Mission Creek Replenishment Facility overlying the Mission Creek Subbasin.

In addition, CVWD recognized the need to identify alternative sources of water and entered the water reclamation field in 1967. Today CVWD operates six water reclamation plants (WRPs) in the Valley. Recycled water from three of these facilities (WRP 7, 9 and 10) has been used for golf course and greenbelt irrigation for many years, thereby reducing demand on the groundwater basin. An alternate water source allows groundwater to remain in storage and helps to reduce overdraft. Currently CVWD is planning to expand recycled water use throughout the mid-valley.

In the east portion of the Whitewater River Subbasin, groundwater levels had been declining since 1980. In response to this, CVWD implemented a Groundwater Replenishment Program (GRP) to replenish the Subbasin at two sites in the eastern Valley. The combined cumulative total replenishment at these two sites was 197,997 AF at the end of 2013. Groundwater replenishment began in 1997 using pilot groundwater replenishment facilities. The pilot project at the Dike 4 site became the fully operational *Thomas E. Levy Groundwater Replenishment Facility* (TEL Replenishment Facility) in June 2009. The full-scale capacity of this replenishment facility could reach 40,000 AF/year. The Martinez Canyon pilot project began in 2004 to determine if water conditions at this site are beneficial for groundwater replenishment.

In 2002 the CVWD Board of Directors adopted the Coachella Valley Water Management Plan. The Plan was updated in 2010 (2010 CVWMP Update). The goal of the 2010 CVWMP Update is to reliably meet current and future water demands in a cost effective and sustainable manner through water conservation, increased surface water supplies, substitution of surface water supplies for groundwater (source substitution), groundwater replenishment, and monitoring. The 2010 CVWMP Update can be found on CVWD's website at www.cvwd.org.

The State Water Code requires completion of an Engineer's Report regarding the GRP before CVWD can levy and collect groundwater replenishment assessment charges (RACs). The report shall include the condition of groundwater supplies, the need for groundwater replenishment, the Area of Benefit, water production within said area, and RACs to be levied upon said water production. It shall also contain recommendations regarding the GRP including the source and amount of replenishment water and related costs. The first Engineer's Report for the East Whitewater River Subbasin Area of Benefit was completed in April 2004.

The purpose of this report is to update the groundwater supply conditions and current GRP and to establish a RAC for the East Whitewater River Subbasin Area of Benefit for the upcoming fiscal year.

GROUNDWATER BASIN DESCRIPTIONS

Geology

The Coachella Valley Groundwater Basin, as described by the California Department of Water Resources (DWR), is bounded on the north and east by non-water bearing crystalline rocks of the San Bernardino and Little San Bernardino Mountains and on the south and west by the crystalline rocks of the Santa Rosa and San Jacinto Mountains. At the west end of the San Gorgonia Pass, between Beaumont and Banning, the basin boundary is defined by a surface drainage divide separating the Coachella Valley Groundwater Basin from the Beaumont Groundwater Basin of the Upper Santa Ana drainage area.

The southern boundary is formed primarily by the watershed of the Mecca Hills and by the northwest shoreline of the Salton Sea running between the Santa Rosa Mountains and Mortmar. Between the Salton Sea and Travertine Rock, at the base of the Santa Rosa Mountains, the southern boundary roughly coincides with the Riverside/Imperial County Line.

Southerly of the southern boundary, at Mortmar and at Travertine Rock, the subsurface materials are predominantly fine grained and low in permeability; although groundwater is present, it is not readily extractable. A zone of transition exists at these boundaries; to the north, the subsurface materials are coarser and more readily yield groundwater.

Although there is interflow of groundwater throughout the groundwater basin, fault barriers, constrictions in the basin profile and areas of low permeability limit and control movement of groundwater. Based on these factors, the groundwater basin has been divided into Subbasins and Subareas as described by DWR in 1964 and the United States Geological Survey (USGS) in 1971.

The Subbasins present in the Valley are Mission Creek, Desert Hot Springs, Garnet Hill, and Whitewater River (also known as Indio). The Subbasins, with their groundwater storage reservoirs, are defined without regard to water quantity or quality. They delineate areas underlain by formations which readily yield the stored water through water wells and offer natural reservoirs for the regulation of water supplies.

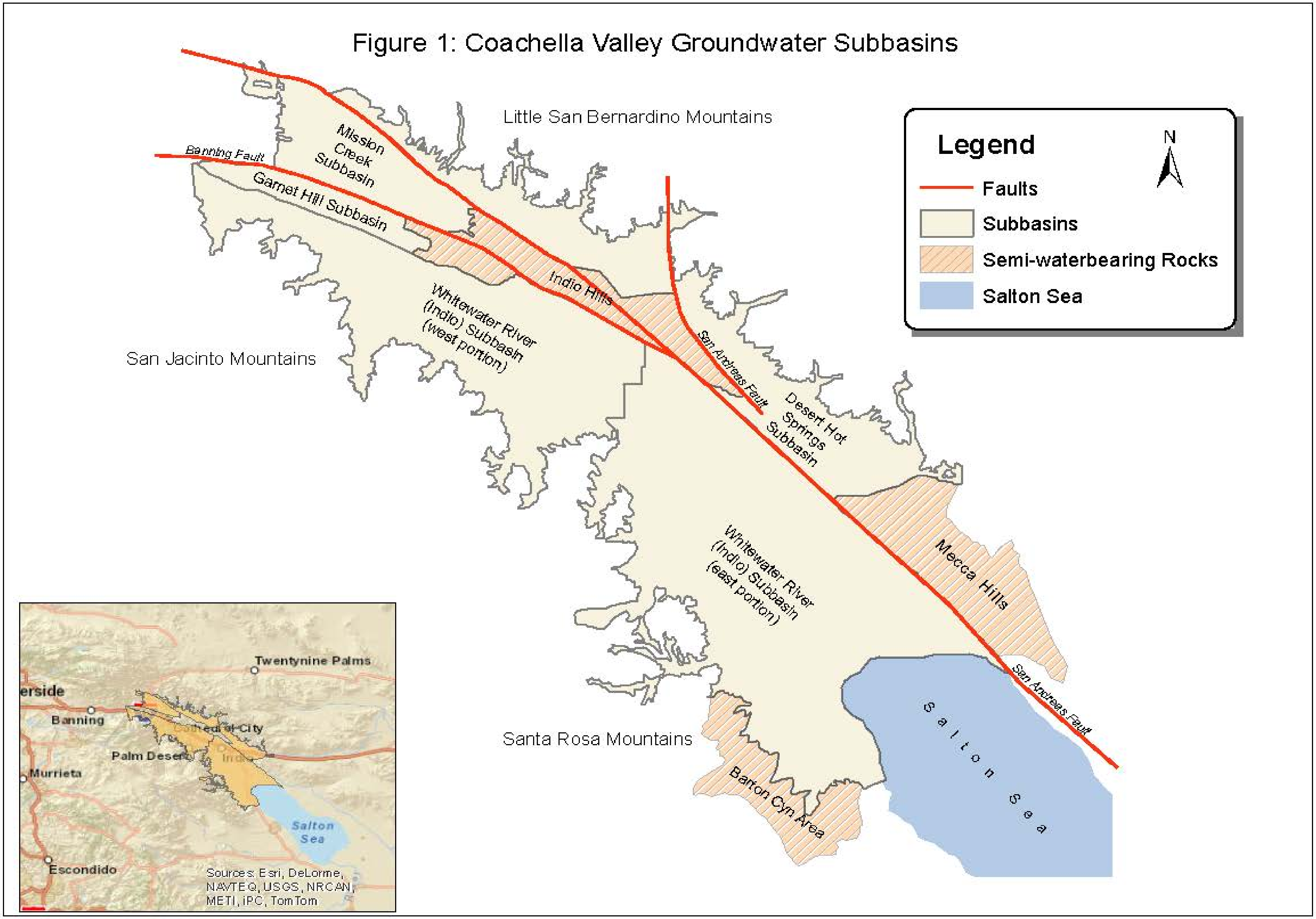
The boundaries between Subbasins within the groundwater basin are generally based upon faults that are effective barriers to the lateral movement of groundwater. Minor Subareas have also been delineated, based on one or more of the following geologic or hydrologic characteristics: type of water bearing formations, water quality, areas of confined groundwater, forebay areas, groundwater divides and surface drainage divides.

The following is a list of the Subbasins and associated Subareas, based on the DWR and USGS designations:

- Mission Creek Subbasin
- Desert Hot Springs Subbasin
- Garnet Hill Subbasin
- Whitewater River (Indio) Subbasin
    - Palm Springs Subarea
    - Thermal Subarea
    - Thousand Palms Subarea
    - Oasis Subarea

Figure 1 shows the locations of these Subbasins. This report presents brief descriptions of the Mission Creek Subbasin, Desert Hot Springs Subbasin, and Garnet Hill Subbasin as they are located outside the area of interest for this report. A more detailed description of the Whitewater River (Indio) Subbasin is provided in this report.

Figure 1 Coachella Valley Groundwater Subbasins



The following are areas within the Valley where a supply of potable groundwater is not readily available:

- Indio Hills area
- Mecca Hills area
- Barton Canyon area
- Bombay Beach area
- Salton City area

Mission Creek Subbasin

Water-bearing materials underlying the Mission Creek upland comprise the Mission Creek Subbasin. This subbasin is designated number 7-21.02 in DWR's Bulletin 118 (2003). The subbasin is bounded on the south by the Banning fault and on the north and east by the Mission Creek fault. The subbasin is bordered on the west by non-waterbearing rocks of the San Bernardino Mountains. To the southeast of the subbasin are the Indio Hills, which consist of the semiwater-bearing Palm Springs Formation. The area within this boundary reflects the estimated geographic limit of effective storage within the subbasin. This subbasin relies on the same imported State Water Project Exchange water source for replenishment as does the Whitewater River Subbasin.

CVWD, Desert Water Agency (DWA), and Mission Springs Water District jointly manage this subbasin under the terms of the 2004 Mission Creek Settlement Agreement. This agreement and the 2003 Mission Creek Groundwater Replenishment Agreement between the District and DWA specify that the available State Water Project water will be allocated between the Mission Creek and Whitewater River Subbasins in proportion to the amount of water produced or diverted from each subbasin during the preceding year.

Desert Hot Springs Subbasin

The Desert Hot Springs Subbasin is bounded on the north by the Little San Bernardino Mountains and to the southeast by the Mission Creek and San Andreas faults. The San Andreas fault separates the Desert Hot Springs Subbasin from the Whitewater River Subbasin and serves as an effective barrier to groundwater flow. The subbasin has been divided into three subareas: Miracle Hill, Sky Valley and Fargo Canyon. This subbasin is designated number 7-21.03 in DWR's Bulletin 118 (2003).

The Desert Hot Springs Subbasin is not extensively developed except in the area of Desert Hot Springs. Relatively poor groundwater quality has limited the use of this subbasin for groundwater supply. The Miracle Hill subarea underlies portions of the City of Desert Hot Springs and is characterized by hot mineralized groundwater, which supplies a number of spas in that area. The Fargo Canyon subarea underlies a portion of the planning area along Dillon Road north of Interstate 10. This area is characterized by coarse alluvial fans and stream channels flowing out of Joshua Tree National Park. Based on limited groundwater data for this area, flow is generally to the southeast. Water quality is relatively poor with salinities in the range of 700 to over 1,000 mg/L.

Garnet Hill Subbasin

The area between the Garnet Hill fault and the Banning fault, named the Garnet Hill Subarea by DWR (1964), is considered a distinct subbasin by the USGS because of the effectiveness of the Banning and Garnet Hill faults as barriers to groundwater movement. This is illustrated by a difference of 170 feet in groundwater level elevation in a horizontal distance of 3,200 feet across the Garnet Hill fault, as measured in the spring of 1961. The fault does not reach the surface and is probably effective as a barrier to groundwater movement only below a depth of about 100 feet.

The 2013 Mission Creek and Garnet Hill Water Management Plan states groundwater production is low in the Garnet Hill Subbasin and is not expected to increase significantly in the future due to relatively low well yields compared to those in the Mission Creek Subbasin. Water levels in the western and central portion of the subbasin show response to replenishment from the Whitewater River Replenishment Facility while levels are relatively flat in the eastern portion of the subbasin. The lack of wells in the subbasin limits the geologic understanding of how this subbasin operates relative to the Mission Creek and Whitewater River Subbasins.

Although some natural replenishment to this subbasin may come from Mission Creek and other streams that pass through during periods of high flood flows, the chemical character of the groundwater plus its direction of movement indicate that the main source of replenishment to the subbasin comes from the Whitewater River through the permeable deposits which underlie Whitewater Hill. This subbasin is considered part of the Whitewater River (Indio) Subbasin in DWR's Bulletin 118 (2003).

Whitewater River (Indio) Subbasin

The Whitewater River Subbasin, designated the Indio Subbasin (Basin No. 7-21.01) in DWR Bulletin No. 118 (2003), underlies the major portion of the Valley floor and encompasses approximately 400 square miles. Beginning approximately one mile west of the junction of State Highway 111 and Interstate Highway 10, the Whitewater River Subbasin extends southeast approximately 70 miles to the Salton Sea. The Subbasin is bordered on the southwest by the Santa Rosa and San Jacinto Mountains and is separated from Garnet Hill, Mission Creek and Desert Hot Springs Subbasins to the north and east by the Garnet Hill and San Andreas faults (DWR 1964). The Garnet Hill fault, which extends southeastward from the north side of San Gorgonio Pass to the Indio Hills, is a relatively effective barrier to groundwater movement from the Garnet Hill Subbasin into the Whitewater River Subbasin, with some portions in the shallower zones more permeable. The San Andreas fault, extending southeastward from the junction of the Mission Creek and Banning faults in the Indio Hills and continuing out of the basin on the east flank of the Salton Sea, is also an effective barrier to groundwater movement from the northeast. The subbasin underlies the cities of Palm Springs, Cathedral City, Rancho Mirage, Palm Desert, Indian Wells, La Quinta, Indio and Coachella, and the unincorporated communities of Thousand Palms, Thermal, Bermuda Dunes, Oasis and Mecca. From about Indio southeasterly to the Salton Sea, the subbasin contains increasingly thick layers of silt and clay, especially in the shallower portions of the subbasin. These silt and clay layers, which are remnants of ancient lake beds, impede the percolation of water applied for irrigation and limit groundwater replenishment opportunities to the westerly fringe of the subbasin.

In 1964, DWR estimated that the five subbasins that make up the Coachella Valley groundwater basin contained a total of approximately 39.2 million acre-feet (AF) of water in the first 1,000 feet below the ground surface; much of this water originated as runoff from the adjacent mountains. Of this amount, approximately 28.8 million AF of water was stored in the Whitewater River Subbasin. However, the amount of water in the Whitewater River Subbasin has decreased over the years due to pumping to serve urban, rural and agricultural development in the Coachella Valley has withdrawn water at a rate faster than its rate of replenishment.

The Whitewater River Subbasin is not adjudicated. From a management perspective, the subbasin is divided into two management areas designated the West Whitewater River Subbasin Area of Benefit (AOB) and the East Whitewater River Subbasin AOB. The dividing line between these two areas is an irregular trending northeast to southwest between the Indio Hills north of the City of Indio and Point Happy in La Quinta. The West Whitewater River Subbaisn AOB is jointly managed by CVWD and DWA under the terms of the 1976 Water Management Agreement. The East Whitewater River Subbasin AOB is managed by CVWD.

The Whitewater River Subbasin is divided into four subareas: Palm Springs, Thermal, Thousand Palms, and Oasis. The Palm Springs Subarea is the forebay or main area of replenishment to the Subbasin and the Thermal Subarea comprises the pressure or confined area within the basin. The other two subareas are peripheral areas having unconfined groundwater conditions.

Palm Springs Subarea

The triangular area between the Garnet Hill Fault and the east slope of the San Jacinto Mountains southeast to Cathedral City is designated the Palm Springs Subarea, and is an area in which groundwater is unconfined. The Valley fill materials within the Palm Springs Subarea are essentially heterogeneous alluvial fan deposits with little sorting and little fine grained material content. The thickness of these water bearing materials is not known; however, it exceeds 1,000 feet. Although no lithologic distinction is apparent from well drillers' logs, the probable thickness of recent deposits suggests that Ocotillo conglomerate underlies Recent fanglomerate in the Subarea at depths ranging from 300 to 400 feet.

Natural replenishment to the aquifers in the Whitewater River and Garnet Hill subbasins occurs primarily in the Palm Springs Subarea. The major natural sources include infiltration of stream runoff from the San Jacinto Mountains and the Whitewater River, and subsurface inflow from the San Gorgonio Pass and Mission Creek Subbasins. Deep percolation of direct precipitation on the Palm Springs Subarea is considered negligible as it is consumed by evapotranspiration.

Thermal Subarea

Groundwater of the Palm Springs Subarea moves southeastward into the interbedded sands, silts, and clays underlying the central portion of the Valley. The division between the Palm Springs Subarea and the Thermal Subarea is near Cathedral City. The permeabilities parallel to the bedding of the deposits in the Thermal Subarea are several times the permeabilities normal to the bedding and, therefore, movement of groundwater parallel to the bedding predominates. Confined or semi-confined groundwater conditions are present in the major portion of the Thermal Subarea. Movement of groundwater under these conditions is present in the major portion of the Thermal Subarea and is caused by differences in piezometric (pressure) level or head. Unconfined or free water conditions are present in the alluvial fans at the base of the Santa Rosa Mountains, as in the fans at the mouth of Deep Canyon and in the La Quinta area.

Sand and gravel lenses underlying this Subarea are discontinuous and clay beds are not extensive. However, two aquifer zones separated by a zone of finer-grained materials were identified from well logs. The fine grained materials within the intervening horizontal plane are not tight enough or persistent enough to restrict completely the vertical interflow of water, or to assign the term “aquiclude” to it. Therefore, the term “aquitard” is used for this zone of less permeable material that separates the upper and lower aquifer zones in the southeastern part of the valley. Capping the upper aquifer at the surface are tight clays and silts with minor amounts of sands. Semi-perched groundwater occurs in this capping zone, which is up to 100 feet thick.

The lower aquifer zone, composed of part of the Ocotillo conglomerate, consists of silty sands and gravels with interbeds of silt and clay. It is the most important source of groundwater in the Coachella Valley Groundwater Basin but serves only that portion of the valley easterly of Washington Street. The top of the lower aquifer zone is present at a depth ranging from 300 to 600 feet below the surface. The thickness of the zone is undetermined, as the deepest wells present in the Valley have not penetrated it in its entirety. The available data indicate that the zone is at least 500 feet thick and may be in excess of 1,000 feet thick.

The aquitard overlying the lower aquifer zone is generally 100 to 200 feet thick, although in small areas on the periphery of the Salton Sea it is in excess of 500 feet in thickness. North and west of Indio, in an arcuate zone approximately one mile wide, the aquitard is apparently lacking and no distinction is made between the upper and lower aquifer zones.

Capping the upper aquifer zone in the Thermal Subarea is a shallow fine-grained zone in which semi-perched groundwater is present. This zone consists of recent silts, clays, and fine sands and is relatively persistent southeast of Indio. It ranges from zero to 100 feet thick and is generally an effective barrier to deep percolation. However, north and west of Indio, the zone is composed mainly of clayey sands and silts and its effect in retarding deep percolation is limited. The low permeability of the materials southeast of Indio has contributed to the irrigation drainage problems of the area. Semi-perched groundwater has been maintained by irrigation water applied to agricultural lands south of Point Happy necessitating the construction of an extensive subsurface tile drain system.

The Thermal Subarea contains the division between the west and east portions of the Whitewater River (Indio) Subbasin and their respective groundwater tables. Primarily due to the application of imported water from the Coachella Canal, and an attendant reduction in groundwater pumpage, the water table in the area southerly from Point Happy (in La Quinta) rose until the early 1970's, while the water table in the area northerly from Point Happy was dropping. This division forms the southern boundary of the management area of the Management Agreement between CVWD and DWA. Water table measurements have shown no distinction between the Palm Springs Subarea and the Thermal Subarea. The distinction has been is that in the Thermal Subarea at Point Happy the groundwater levels until recently were stabilized, neither rising nor falling significantly. This is changing as increased pumpage is again lowering the groundwater levels in the east portion of the Whitewater River (Indio) Subbasin. CVWD recently completed a study to evaluate the entire groundwater basin. This led to the development and adoption of the 2010 CVWMP Update. Using state of the art technology, the District developed and calibrated a peer-reviewed, three-dimensional groundwater model (Fogg 2000) that is based on over 2,500 wells, and includes an extensive database of well chemistry reports, well completion reports, electric logs, and specific capacity tests. This model improved on previous groundwater models and incorporates the latest hydrological evaluations from previous studies conducted by DWR and USGS to gain a better understanding of the hydrogeology in this subbasin and the benefits of water management practices identified in the plan.

Thousand Palms Subarea

The small area along the southwest flank of the Indio Hills is named the Thousand Palms Subarea. The southwest boundary of the Subarea was determined by tracing the limit of distinctive groundwater chemical characteristics. Whereas a calcium bicarbonate water is characteristic of the major aquifers of the Whitewater River (Indio) Subbasin, water in the Thousand Palms Subarea is sodium sulfate in character.

The quality differences suggest that replenishment to the Thousand Palms Subarea comes primarily from the Indio Hills and is limited in supply. The relatively sharp boundary between chemical characteristics of water derived from the Indio Hills and groundwater in the Thermal Subarea suggests there is little intermixing of the two waters.

The configuration of the water table north of the community of Thousand Palms is such that the generally uniform, southeast gradient in the Palm Springs Subarea diverges and steepens to the east along the base of Edom Hill. This steepened gradient suggests a barrier to the movement of groundwater, or a reduction in permeability of the water-bearing materials. A southeast extension of the Garnet Hill Fault would also coincide with this anomaly. However, there is no surface expression of such a fault, and the gravity measurements taken during the 1964 DWR investigation do not suggest a subsurface fault. The residual gravity profile across this area supports these observations. The sharp increase in gradient is therefore attributed to lower permeability of the materials to the east. Most of the Thousand Palms Subarea is located within the west portion of the Whitewater River (Indio) Subbasin. Groundwater levels in this area show similar patterns to those of the adjacent Thermal Subarea, suggesting a hydraulic connectivity.

Oasis Subarea

Another peripheral zone of unconfined groundwater that is different in chemical characteristics from water in the major aquifers of the Whitewater River (Indio) Subbasin is found underlying the Oasis Piedmont slope. This zone, named the Oasis Subarea, extends along the base of the Santa Rosa Mountains. Water bearing materials underlying the Subarea consist of highly permeable fan deposits. Although groundwater data suggest that the boundary between the Oasis and Thermal Subareas may be a buried fault extending from Travertine Rock to the community of Oasis, the remainder of the boundary is a lithologic change from the coarse fan deposits of the Oasis Subarea to the interbedded sands, gravel and silts of the Thermal Subarea. Little information is available as to the thickness of waterbearing materials, but it is estimated to be in excess of 1,000 feet. Groundwater levels in the Oasis Subarea have exhibited similar declines as elsewhere in the Subbasin due to increased groundwater pumping to meet agricultural demands on the Oasis slope.

Summary

The Whitewater River (Indio) Subbasin consists of four Subareas: the Palm Springs, Thermal, Thousand Palms and Oasis Subareas. The Palm Springs Subarea is the forebay or main area of replenishment to the Subbasin, and the Thermal Subarea comprises the pressure or confined area within the basin. The Thousand Palms and Oasis Subareas are peripheral areas having unconfined groundwater conditions, which would support groundwater replenishment. From a management perspective, the Whitewater River (Indio) Subbasin is commonly divided into a west and east portion, with the dividing line extending from Point Happy in La Quinta to the northeast, terminating at the San Andreas Fault and the Indio Hills at Jefferson Street.

For the purpose of this report, the east portion of the Whitewater River (Indio) Subbasin is defined generally as that portion of the Thermal Subarea east of this line, and the Oasis Subarea.

WATER SUPPLY

Groundwater Storage

In 1964, DWR estimated that the Subbasins in the Coachella Valley Groundwater Basin contained, in the first 1,000 feet below the ground surface, approximately 39,200,000 AF of water. The capacities of the Subbasins are shown in Table 1.

Table 1 Estimated Groundwater Storage Capacity of the Coachella Valley Groundwater Basin		
Area		**Storage[1] (AF)**
San Gorgonio Pass Subbasin		2,700,000
Mission Creek Subbasin		2,600,000
Desert Hot Springs Subbasin		4,100,000
Garnet Hill Subbasin		1,000,000
	Subtotal	10,400,000
Whitewater River (Indio) Subbasin		
Palm Springs Subarea		4,600,000
Thousand Palms Subarea		1,800,000
Oasis Subarea		3,000,000
Thermal Subarea		19,400,000
	Subtotal Whitewater River (Indio) Subbasin	28,800,000
	Total all Subbasins	**39,200,000**

(1) First 1,000 feet below ground surface. CA Dept. of Water Resources estimate (DWR, 1964).

Currently, the Whitewater River (Indio) Subbasin is developed to the point where significant groundwater production occurs. Imported State Water Project water allocations are replenished in the West Whitewater River Basin to replace consumptive uses created by the resort-recreation economy and permanent resident population. The imported Colorado River supply through the Coachella Canal is used mainly for irrigation. Annual deliveries of Colorado River water through the Coachella Canal of approximately 300,000 AF are a significant component of southeastern valley hydrology.

Precipitation and Streamflow

Average annual precipitation in the Coachella Valley varies from 4 inches on the valley floor to more than 30 inches in the surrounding mountains (DWR 1964). Precipitation predominantly occurs December through March, with occasional intense precipitation events during the summer months resulting from subtropical thunderstorms. The precipitation that occurs within the tributary watersheds either evaporates, is consumed by native vegetation, percolates into underlying alluvium and fractured rock or becomes runoff. A portion of the flow percolating into the mountain watersheds eventually becomes subsurface inflow to the subbasins.

Precipitation in the surrounding mountains is included in the natural inflow estimates found in the water balance calculated in Table 3 of this report. The natural inflow estimates are based on long-term average rates provided in USGS Report 91-4142, Evaluation of a Ground-water Flow and Transport Model of the Upper Coachella Valley, California, 1994, and the 2010 CVWMP Update.

Recycled Water and Source Substitution

CVWD recognized the need to identify alternative sources of water and entered the water reclamation field in 1967. Recycled water is a significant potential local resource that can be used to help reduce overdraft. Wastewater that has been highly treated and disinfected can be reused for landscape irrigation and other purposes; however, treated wastewater is not suitable for direct potable use. Recycled wastewater has historically been used for irrigation of golf courses and municipal landscaping in the Coachella Valley.

CVWD operates six water reclamation plants (WRPs) in the Valley. Recycled water from two of these facilities (WRP 9 and WRP 10) has been used for golf course and greenbelt irrigation in the Palm Desert area for many years, thereby reducing demand on the groundwater basin. A third facility (WRP 7), located north of Indio, began providing recycled water for golf course and greenbelt irrigation in 1997. CVWD is currently planning to expand non-potable water (imported water and recycled water) use throughout the mid-valley.

CVWD continues to work with groundwater users such as farmers, golf courses and others to encourage the use of non-potable water. Urban irrigation will use non-potable water as development progresses within this subbasin. These programs are being developed and will be implemented over the next thirty years.

Groundwater Levels

Historical water level declines and conditions producing those declines have been extensively described by the USGS and DWR and are documented in the 2010 CVWMP Update.

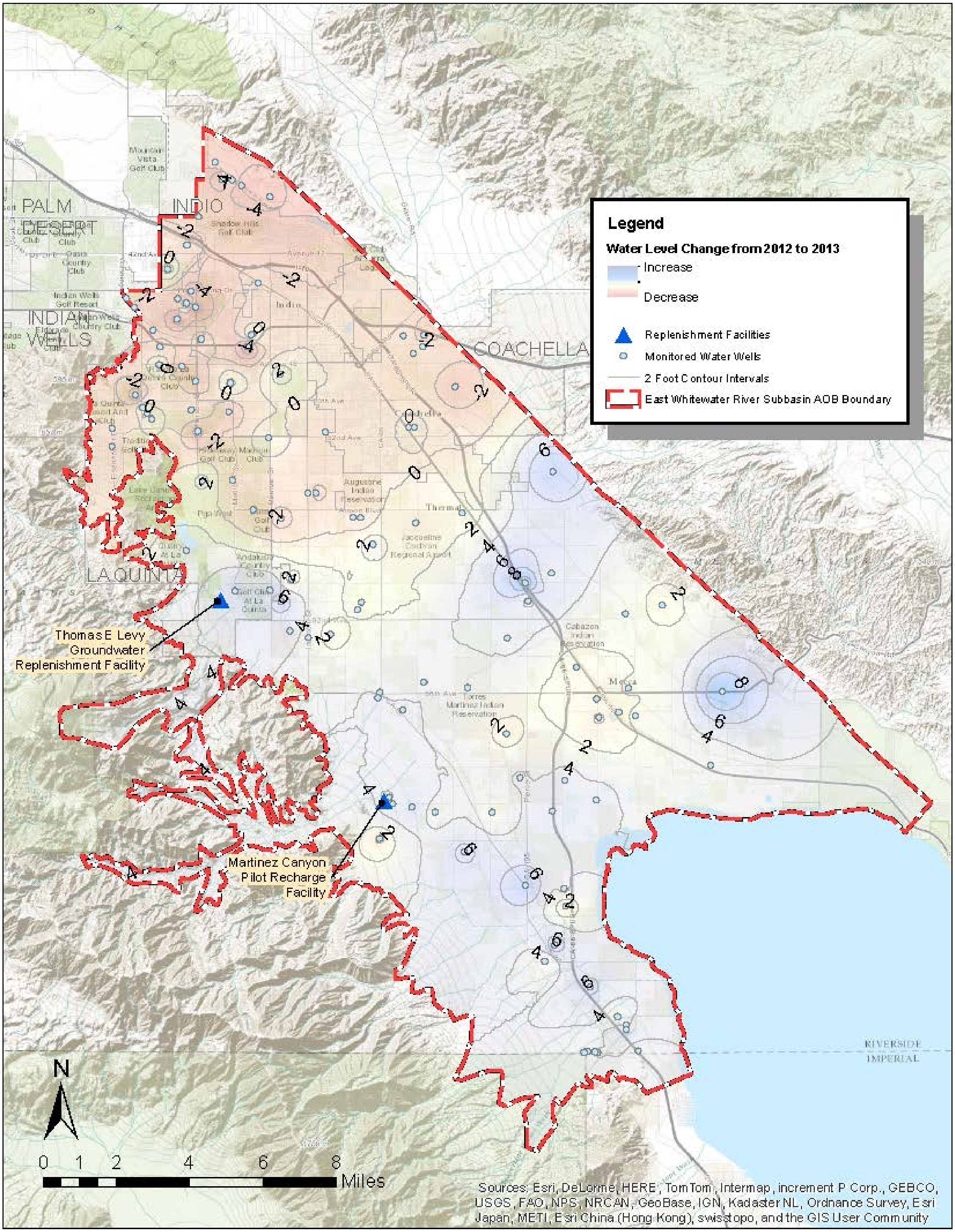
Although water levels declined throughout most of the Subbasins since 1945, water levels in the southeastern portion of the Valley rose until the early 1970s because of the use of imported water from the Coachella Canal and the resulting decreased pumpage in that area. The rate of groundwater level decline increased in the early 1980s due to increasing urbanization and increased groundwater use by domestic water purveyors, local farmers, golf courses and fish farms.

The historic declining water table in the east portion of the Whitewater River Subbasin led to the determination that a management program is required to stabilize water levels and prevent other adverse effects such as water quality degradation and land subsidence. Coachella Valley Water District's East Whitewater River Subbasin Area of Benefit GRP became effective in 2005. Since then, groundwater levels in wells throughout most of the east portion of the Whitewater River Subbasin have stabilized or are rising.

Water surface elevations in the northwestern area of the valley are highest at the northwest end of each Subbasin, illustrating that regional groundwater flow is from the northwest to the southeast in the center of the Valley.

Figure 2 depicts the change in average groundwater levels from 2012 to 2013 in the east portion of the Whitewater River Subbasin based on CVWD's groundwater level monitoring well data. The East Whitewater River Subbasin Area of Benefit boundary and the locations of

Figure 2
Groundwater Level Changes in East Whitewater River Subbasin Area of Benefit from 2012 to 2013



the Thomas E. Levy (TEL) Groundwater Replenishment Facility and Martinez Canyon Pilot Replenishment Facility are also provided in Figure 2.

The colored contours in Figure 2 represent water level changes for 131 wells in the East Whitewater River Subbasin Area of Benefit monitored by CVWD staff. The average rise in water levels observed in these monitored wells from 2012 to 2013 was 1.0 foot.

Management Area

CVWD manages groundwater in the east portion of the Whitewater River Subbasin as a separate unit from the west portion of the Whitewater River Subbasin. This management area was formed in 2004 and consists of the southerly portion of the Thermal Subarea and the Oasis Subarea that were experiencing declining groundwater levels. The Area of Benefit for this management program coincides with the management area.

East Whitewater River Subbasin Area of Benefit Boundary

Figure 2 presents the boundary of the East Whitewater River Subbasin Area of Benefit. This boundary is defined as follows:

That east portion of the Whitewater River Subbasin within the boundaries of CVWD, beginning at the northerly extension of Jefferson Street located on the San Andreas Fault, south to Avenue 40, west to Adams Street, south to Fred Waring Drive (Avenue 44), west to Washington Street, south to the Santa Rosa Mountains near Point Happy. The area's western boundary continues south along the foothills of the Santa Rosa Mountains to the southwest corner of section 25, township 7 south, range 7 east, thence to the southwest corner of section 36, township 8 south, range 8 east, which is approximately 3 miles due west of Travertine Rock. The boundary continues east along the Riverside County line to the southeast corner of section 34, township 8 south, range 9 east, which is inundated by the Salton Sea. The boundary continues northeasterly across the Salton Sea to the northeast corner of section 34, township 7 south, range 10 east, thence northwesterly along the San Andreas Fault to the point of beginning.

Groundwater Production

As presented in the 2010 CVWMP Update, groundwater production within the East Whitewater River Subbasin Area of Benefit was estimated to be 168,300 AF per year (AF/yr) during 1999. Table 2 presents the estimated 2013 groundwater production in the East Whitewater River Subbasin Area of Benefit.

When the Replenishment Assessment was adopted in June 2004, the CVWD Board of Directors required groundwater producers to report their groundwater production. The reported production for 2013 was 119,194 AF.

Artesian Conditions

Historically, the eastern portion of the Whitewater River Subbasin experienced confined aquifer artesian conditions with sufficient pressure to cause groundwater levels in wells to rise above the ground surface. Artesian flowing wells attracted early settlers to farm in this area. Artesian conditions declined in the late 1930's when increased groundwater pumping caused declining groundwater water levels. The completion of the Coachella Canal by the U.S. Bureau of Reclamation in 1949 brought Colorado River to the eastern Coachella Valley for agricultural irrigation purposes. Artesian conditions returned in the early 1960s through the 1980s as imported Colorado River water was substituted for groundwater production. Beginning in the late 1980s, groundwater use again increased, resulting in declining water levels and a loss of artesian conditions.

The East Whitewater River Subbasin Area of Benefit GRP combined with other water management elements including source substitution and water conservation are helping to control groundwater overdraft, restore water levels and return artesian conditions within the east portion of the Whitewater River Subbasin. This results in reduced groundwater pumping costs and water quality protection of the confined aquifer.

As artesian conditions return, water pressure in the lower confined aquifer increases and can cause uncontrolled flows in wells that are not properly constructed and/or poorly maintained. Coachella Valley Mosquito and Vector Control District (CVMVCD) and CVWD are cooperating in an effort to notify well owners of their responsibility to control artesian wells in accordance with state regulations and offering artesian well owners who properly control artesian flows the opportunity to apply for a rebate to offset their costs. California Health and Safety Code, Section 2000-2007 states flooding caused by artesian wells is a public nuisance which poses a risk to public health, safety and welfare. In addition, Section 305 of the California Water Code requires artesian wells to be capped or equipped with a mechanical appliance which will readily and effectively arrest and prevent the flow of water.

In accordance with Section 31638.5 of the California Water Code, Producers who extract greater than 25 acre-feet per year, including artesian flowing groundwater, are required to have water-measuring devices installed on all wells or other water producing facilities and report the total amount produced from all wells to CVWD on a monthly basis. Minimal pumpers are exempt from this provision.

Coachella Valley Land Subsidence Study

Since 1996, CVWD and the U.S. Geological Survey have cooperatively funded studies investigating land subsidence in the Coachella Valley. Global Positioning System surveying and interferometric synthetic aperture radar (InSAR) methods are used to determine the location, extent, and magnitude of the vertical land-surface changes in the Coachella Valley. A report was published by the U.S. Geological Survey in 2007 entitled *Detection and Measurement of Land Subsidence Using Global Positioning System Surveying and Interferometric Synthetic Aperture Radar, Coachella Valley, California 1996-2005* (USGS 2007). The current phase of the investigation is evaluating correlations between subsidence and recovery related to local geology and groundwater level changes during the period 1993 to 2010. The final report for this study is expected to be published by the U.S. Geological Survey in 2014.

Table 2 Groundwater Production Within the East Whitewater River Subbasin AOB	
Year	**Acre-feet [1]**
1999	168,300
2002	166,700
2003	199,800
2004	172,300
2005	172,000
2006	172,000
2007	172,000
2008	172,000
2009	160,000
2010	150,000
2011	145,000
2012	120,064
2013	119,194

(1) The 1999 production value is from the 2002 CVWMP, Table 3-2, Summary of Historical Water Supplies in 1936 and 1999. Production values for the years 2000-2011 were estimated from reported and projected unreported groundwater production. The 2012 and 2013 production values are equal to the reported groundwater production during those calendar years.

Groundwater Inflows and Outflows

Total inflows and outflows to the East Whitewater River Subbasin Area of Benefit for the year 2013 are summarized in Table 3. The natural inflow of 28,000 AF/year includes natural replenishment and flow across Subbasin boundaries. The nonconsumptive return of applied water is estimated at 137,324 AF, which is the sum of 35 percent of the estimated annual groundwater production and 35 percent of Colorado River water applied for irrigation within the Area of Benefit during 2013. The total inflow includes the natural inflow, the nonconsumptive return, and the 35,192 AF of actual water replenished by CVWD at the replenishment facilities. The total outflow is the groundwater production estimate plus 77,686 AF/year of subsurface drainage. The annual balance is the total inflow less the total outflow for a gain of 3,636 AF of water in storage in the Subbasin.

Table 3 Annual Water Balance in the East Portion of the Whitewater River Subbasin	
Item	**Annual Calculation (AF)**
Groundwater Production	-119,194
Non-consumptive return[1]	137,324
Natural inflow[2]	28,000
Flows to drains[3]	-77,686
Groundwater replenishment[4]	35,192
Annual balance[5]	3,636

(1) Based on 35% of production (119,194 AF x 0.35 = 41,718 AF) plus 35% of Colorado River water applied for irrigation in the AOB (273,160 AF x 0.35 = 95,606 AF).
(2) Includes 21,000 AFY natural replenishment and 7,000 AFY subsurface flow from the west portion of the Whitewater River Subbasin (USGS 1992).
(3) Subsurface drainage outflow.
(4) TEL Facility received 34,751 AF and the Martinez Canyon Facility received 441 AF.
(5) This is an increase in stored groundwater equal to 0.01 percent of the Subbasin's storage capacity.

Overdraft

Groundwater overdraft is manifested not only as a prolonged decline in groundwater storage but also through secondary adverse effects including decreased well yields, increased energy costs, water quality degradation, and land subsidence. The 2010 CVWMP Update defines overdraft as the calculated change in storage based on long-term local hydrology and imported water deliveries. The California Department of Water Resources California Water Plan Update 2009 defines overdraft as the condition of a groundwater basin in which the amount of water withdrawn by pumping exceeds the amount of water that replenishes the basin over a period of years during which water supply conditions approximate average conditions.

In 2013, the annual water balance for the East Whitewater River Subbasin Area of Benefit was positive, providing a decrease in the cumulative overdraft. Imported water may offset groundwater overdraft in a particular year. However, on a long-term basis, water requirements are likely to continue to place demands on groundwater storage. The 2010 CVWMP Update outlines a plan to address long-term overdraft in the Coachella Valley. Based on the water balance information presented in Table 3, the East Whitewater River Subbasin Area of Benefit experienced a gain of 3,636 AF of water storage during 2013.

It should be noted that overdrafting the groundwater basin may allow poor quality water from irrigation return and the Salton Sea to replace fresh water storage. An ongoing GRP is necessary to continue to reduce declining groundwater levels and to avoid any detrimental conditions that would otherwise occur.

REPLENISHMENT PROGRAM

Current Replenishment Activities

The TEL Replenishment Facility is located just south of Lake Cahuilla at Dike 4, a major flood control dike, near Avenue 62 and Madison Street. This location appears to be ideally suited for large-scale replenishment in the Thermal Subarea, given its proximity to Lake Cahuilla and its relative freedom from aquitards.

In 2013, CVWD replenished 34,751 AF/year at this location. Since 1997, 181,825 AF of water has been replenished at the TEL Replenishment Facility.

CVWD completed construction of a pilot replenishment facility and several monitoring wells on the Martinez Canyon alluvial fan in March 2005. This pilot facility was designed to replenish approximately 4,000 AF/year and received 441 AF of water in 2013. Results from the Martinez Canyon pilot project indicate the site may not be ideally suited for groundwater replenishment. At this time, water deliveries to the Martinez Canyon site have been discontinued. CVWD continues to monitor groundwater in the Martinez Canyon area to assess any changes in water quality or supply conditions that would support groundwater replenishment at this site in the future.

The annual amounts of water delivered for replenishment at the TEL Replenishment Facility and Martinez Canyon Pilot Replenishment Facility are shown in Table 4.

Table 4 East Portion of the Whitewater River Subbasin Annual Replenishment Deliveries	
Calendar Year	**Replenishment Delivery (AF/year)**
1997	415
1998	1,364
1999	2,802
2000	1,813
2001	3,572
2002	2,360
2003	1,671
2004	3,450
2005	4,743
2006	2,648
2007	5,775
2008	7,473
2009	21,735
2010	37,401
2011	32,417
2012	33,166
2013	35,192
Total	**197,997**
Reference: CVWD billing records.	

Monitoring Wells

Nine monitoring wells were installed near TEL Replenishment Facility in 1995 and are monitored quarterly for water quality and changes in water table elevation. Of these nine wells, four are shallow (176-315 feet), five are deep (543-740 feet), and are located both up and down-gradient of the original pilot ponds along Avenue 62.

Nine new monitoring wells were installed near TEL Replenishment Facility in 2009. Six wells are nested together in groups of two (one shallow and one deep) down-gradient of the facility, parallel to Dike 4. Three additional shallow monitoring wells are installed down-gradient of the facility at existing CVWD sites. The new monitoring wells are used to evaluate water quality and depth to water table, along with the original monitoring wells.

Monitoring wells at the Martinez Canyon Pilot Replenishment Facility were installed in 2001-2002 and are used to monitor water quality and water table elevation data. These wells range from a depth of 380 to 420 feet and are located down-gradient of the pilot ponds along Avenue 72.

Monitoring wells are also used to evaluate intrusion into the fresh water aquifer by water from the Salton Sea. CVWD has been studying this potential problem since 1996 using a multiple zone monitoring well near Lincoln Street on the northwest end of the Salton Sea. This well allows the evaluation of water level and quality at four different depths below the ground surface. During 2002, CVWD completed construction of two additional multiple zone monitoring wells near Avenue 78 on the west side of the Salton Sea. Each monitoring well allows measurements from two aquifer zones in the Oasis area. Monitoring data for these wells from 2004 indicated water levels in the shallower aquifers ranged from 25 feet to 70 feet below the elevation of the Salton Sea. Current monitoring data shows water levels in these wells are under artesian pressure and range from 5 feet below to 35 feet above the current elevation of the Salton Sea.

Data from these monitoring wells also show that the water levels in the primary production aquifers are increasing. The depth to water in 2004 in the primary production aquifer was 40 to 100 feet below the ground surface. Current water levels at the multiple zone monitoring well near Lincoln Street range from 4 feet below ground surface to 9 feet above ground surface.

Many areas of the East Whitewater River Subbasin Area of Benefit have shallow semi-perched groundwater conditions. Since groundwater levels in this perched aquifer are typically 8 to 10 feet below ground surface (controlled by agricultural drains), there can be a downward vertical gradient between the perched aquifer and the primary production zone. Salts that accumulate in the semi-perched zone from irrigation use can migrate slowly through the aquitard into the deeper aquifers thereby degrading the water quality. Rising water levels in the primary production aquifer, displayed in recent data collected at the multiple zone monitoring wells, reduces the likelihood of salt water intrusion into the fresh water aquifer.

Replenishment Facilities

The TEL Replenishment Facility went on-line in June, 2009. The 2010 CVWMP Update recommends a goal of 40,000 AF/year at this facility. CVWD replenished 34,751 AF at this location in 2013.

Early benefits of replenishment from TEL Replenishment Facility to the lower aquifer are observed in measurements collected from monitoring wells near the facility. The 18 monitoring wells located at the TEL Replenishment Facility provide representative monitoring of the preliminary effects of the replenishment efforts. The nine original monitoring wells at the TEL Replenishment Facility show an average water level increase of 5.9 feet during 2013. Eight of nine new monitoring wells installed in mid-2009 show an average water level increase of 68.6 feet from the time of installation through January 2014, and a 6.4 foot average increase in 2013. The average rise in water levels between 2012 and 2013 observed in the 150 East Whitewater River Subbasin Area of Benefit monitoring wells was 1.6 feet.

One of the nine new monitoring wells installed in 2009 was installed into the upper perched aquifer. Water levels observed in this well increased less than 2 feet in 2013.

CVWD is continuing to evaluate the need and feasibility of constructing a replenishment facility on the Martinez Canyon alluvial fan. The 2010 CVWMP Update recommends a replenishment goal of 20,000 to 40,000 AF/year at this facility.

In addition to the direct replenishment facilities described above, CVWD plans to provide nonpotable water (imported water and recycled water) to replace groundwater pumping as identified in the 2010 CVWMP Update. CVWD continues to work with groundwater users such as farmers, golf courses and other users to encourage the use of nonpotable water.

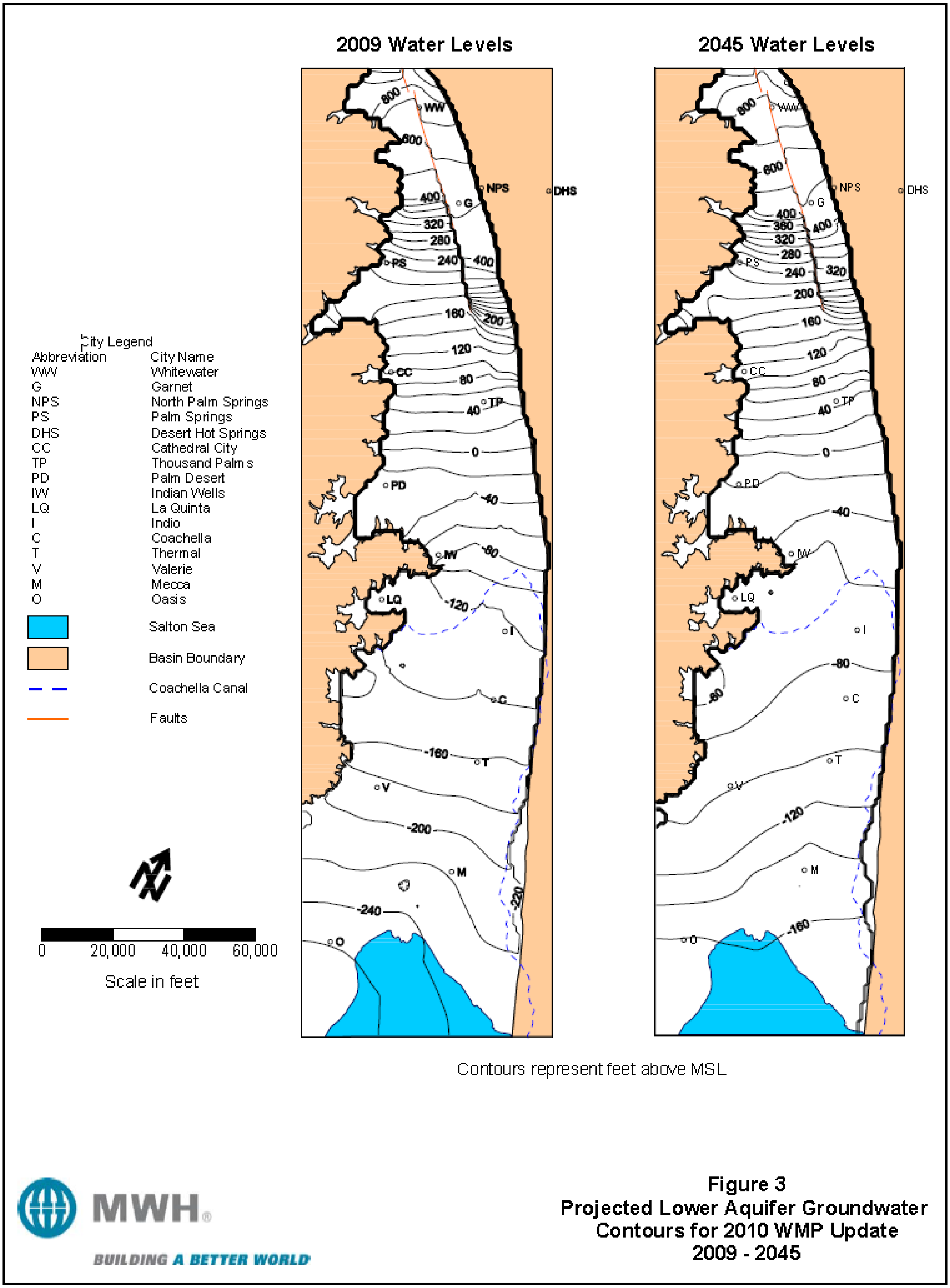
Future Replenishment Activities and Replenishment Model Projections

The extent of the Area of Benefit for the East Whitewater River Subbasin Management Area was determined during the course of preparation of the 2010 CVWMP Update and its associated PEIR that required extensive computer modeling of the Whitewater River Subbasin. The groundwater model allowed CVWD to gain a better understanding of water conditions in this subbasin and the benefits of water management activities identified in the 2010 CVWMP Update.

Figure 3 presents projected groundwater levels in 2045 during implementation of the 2010 CVWMP Update project (80,000 AFY in the East Whitewater River Subbasin Area of Benefit) compared to groundwater levels in 2009. Implementation of the project results in water levels that are 40-60 feet higher in the La Quinta area, and about 90 feet higher in the Oasis area than current water levels.

Construction of a canal water distribution system in the Oasis area is a source substitution project identified in the 2010 CVWMP Update. This project will convert agricultural irrigation from groundwater to Colorado River water on the Oasis slope. This project will conserve groundwater, utilize available Colorado River water, and help reduce aquifer overdraft. To date, an Assessment District (AD34) boundary has been approved by the CVWD Board of Directors, a preliminary project design and theory of operations have been developed, and public outreach to landowners and operators has been completed. Preliminary locations and sizes have been approved for major facilities, such as reservoirs, pump stations, and pipelines. A construction contract will be awarded in 2015.

Figure 3 Whitewater River Subbasin - Change in Water Levels from 2009 to 2045



Other Replenishment Activities

GRPs are also under way in the Mission Creek Subbasin and the west portion of the Whitewater River Subbasin. These programs are described in separate Engineer's Reports.

REPLENISHMENT ASSESSMENT

State Water Code

Sections 31630 through 31639 of the State Water Code authorize CVWD to levy and collect water replenishment assessments for the purpose of replenishing groundwater supplies within CVWD boundaries. The code defines production, producer, and minimal pumper for replenishment purposes as follows:

"Production" or **"produce"** means the extraction of ground water by pumping or any other method within the boundaries of the district or the diversion within the district of surface supplies which naturally replenish the ground water supplies within the district and are used therein.

"Producer" means any individual, partnership, association or group of individuals, lessee, firm, private corporation, or any public agency or public corporation, including, but not limited to, the Coachella Valley Water District.

"Minimal pumper" means any producer who produces 25 or fewer AF in any year.

The replenishment assessment is based on groundwater production within the east portion of the Whitewater River Subbasin within the boundaries of CVWD and is limited to the Area of Benefit.

Production by minimal pumpers is exempt from assessment. The number of minimal pumpers in the Area of Benefit is currently unknown. CVWD has an ongoing program to conduct a thorough field investigation of the use of all wells. Minimal pumpers predominantly pump water from small wells that are used for domestic or limited irrigation purposes.

The code defines "replenishment assessment" and it states that assessments may be levied upon all water production within the Area of Benefit, provided the assessment charge is uniform throughout said Area of Benefit. The RAC is a monetary charge authorized by the State Water Code and uniformly applied to extractions of groundwater within certain specified geographic boundaries of CVWD for payments of an imported or recycled (reclaimed) water supply purchased to supplement naturally existing water supplies. Charges for the water supply are limited to certain specified costs.

In the initial twelve years of the West Whitewater River Subbasin GRP, only certain portions of the SWP costs could be included in the RAC calculation. However, in 1991 the legislature passed and the governor signed into law AB 1070. This bill allowed additional costs including the cost of importing and recharging water from sources other than the SWP and the cost of treating and distributing recycled water. The RAC considered in this report is based on the most recent and reliable information available with respect to applicable costs or charges.

Replenishment Water

Replenishment water for the East Whitewater River Subbasin Area of Benefit GRP comes primarily from CVWD's Colorado River water contract and the Quantitative Settlement Agreement (QSA). Colorado River Water available for groundwater replenishment includes the following block amounts:

Base Allotment		301, 000 AF
1988 MWD/IID Approval Agreement		20,000 AF
IID to CVWD-First Transfer		50,000 AF
IID to CVWD-Second Transfer		53,000 AF
	Total	424,000 AF

Groundwater replenishment water is priced at CVWD's Canal Water Class 3 Rate plus Quagga Mussel and Gate Charges.

The QSA also provided CVWD a transfer from MWD in the amount of 35,000 AFY. This SWP water is exchanged for Colorado River Water and can be delivered at Imperial Dam for delivery via the Coachella Canal to the east portion of the Whitewater River Subbasin or can be delivered via the Colorado River Aqueduct for delivery to the west portion of the Whitewater River Subbasin or Mission Creek Subbasin.

Replenishment Program Accounting & Replenishment Assessment Development

Coachella Valley Water District State Water Project Tax

In 1959, the voters of California approved and adopted the Burns-Porter Act (The California Water Resources Development Bond Act-Water Code 12930) and in so doing, approved the use of local taxes when a local agency's board of directors determines such use to be necessary to fund that agency's water contract obligations. CVWD's Board of Directors determined that such a tax was necessary to carry out those obligations, which were incurred pursuant to CVWD's long-term plan to eliminate groundwater overdraft through replenishment basins that would benefit the entire Coachella Valley. This property tax has been levied on all property within the CVWD boundary since 1967 and is currently set at $0.08/$100 of assessed valuation. On March 12, 2013, the CVWD Board of Directors approved an increase in the property tax from $0.08/$100 of assessed valuation to $0.10/$100 of assessed valuation effective July 1, 2013. A portion of the State Water Project Tax (SWP Tax) revenues can be used to fund the direct and indirect GRP in the East Whitewater River Subbasin Area of Benefit.

Debt Consolidation

The East Whitewater Replenishment Fund received a loan from CVWD's Domestic Water Fund to construct the TEL Replenishment Facility in the amount of $49.2 million. Beginning in 2013, this capital debt is now consolidated with the Uncollected RAC First Four Years and Assessed vs Assessable amortizations from prior years to form one debt service amount and such debt will be paid back each year to the Domestic Water Fund. The transfer of SWP Tax revenues along with proposed RAC increases will make this possible.

Income Statement

Table 5 presents the items identified above into an income statement showing Actual Fiscal Year 2013, Projected Fiscal Year 2014 and Projected Fiscal Year 2015 Revenues, Expenses, and Cash Flow. Table 5 shows that even with the proposed $7/acre-foot RAC increase previously recommended, the reserve balance continues to decline.

The SWP Tax revenues and debt service payments in the Income Statement were presented in a multi-year forecast at the Joint Water Policy Advisory Committee (JWPAC) meeting on February 28, 2014 for the East Whitewater River Subbasin Area of Benefit.

Table 5 GROUNDWATER REPLENISHMENT PROGRAM INCOME STATEMENT

COACHELLA VALLEY WATER DISTRICT

EAST WHITEWATER RIVER SUBBASIN AREA OF BENEFIT

000"s	Actual FY 2013	Projected FY 2014	Projected FY 2015
Revenues			
Replenishment Assessment Charge Revenue (1)	$4,828	$5,445	$6,292
State Water Project Tax Revenue (2)	$ --	$6,676	$7,705
Total Revenues	**$4,828**	**$12,121**	**$13,997**
Expenses			
Total O&M Costs (3)	$636	$1,122	$1,161
Power Costs (4)	$856	$1,031	$1,125
Colorado River Water (5)	$3,112	$3,201	$3,201
Administrative Costs (6)	$1,064	$1,112	$1,112
Depreciation (7)	$392	$400	$400
Capital Improvement	$16	$86	$92
Oasis Project (8)	$--	$600	$750
Debt Service (9)	$--	$4,333	$4,330
Total Expenses	**$6,076**	**$11,885**	**$12,171**
Increase (Decrease) in Cash Flow (10)	**-$856**	**$636**	**$2,226**
Beginning Unrestricted Reserves	-$6,050	-$6,906	-$6,270
Ending Unrestricted Reserves (11)	**-$6,906**	**-$6,270**	**-$4,044**

NOTES:

(1) Replenishment Assessment Charge (RAC) Revenues FY 2013 = $38/Acre-Foot (AF), FY 2014 = $45/AF, FY 2015 = $52/AF. The RAC charges are based on July through June fiscal year production numbers.

(2) State Water Project revenues collected from $.01 Tax Levy

(3) Operations and Maintenance (O&M) costs include labor, equipment, and materials for the replenishment facilities.

(4) Power costs are the actual power & utility charges for the recharge facilities for FY 2013

(5) Colorado River water costs for FY 2013 were based on the delivered volume of 34,000 AF. FY 2014 water costs are based on an estimated 35,000 AF. The calculated rate per AF is comprised of CVWD's Class 3 Rate plus Quagga and Gate Charges.

(6) Annual cost to administer the groundwater replenishment program includes personnel, meter reading, investigation, report preparation, and billing.

(7) Depreciation is the annual depreciation expense for the TEL Groundwater Replenishment Facility.

(8) Preliminary design on the Oasis Area Irrigation Expansion Project

(9) Debt Service - 15 year variable debt instrument payable to the Coachella Valley Water District's Domestic Water Fund in the amount of $60,285,179. This note payable reimburses the Domestic Water Fund for the land and construction costs of the replenishment facilities within this Area of Benefit.

(10) Increase (Decrease) in Cash Flow = Total Revenues - Total Expenses + Depreciation (non cash item).

(11) A negative balance in the Ending Unrestricted Reserve balance indicates that cumulative revenues are insufficient to cover cumulative operating costs.

Methods for Determining Production

In accordance with Section 31638.5 of the California Water Code, Producers who extract greater than 25 acre-feet per year, including artesian flowing groundwater, are required to have water-measuring devices installed on all wells or other water producing facilities and report the total amount produced from all wells to CVWD on a monthly basis. Minimal pumpers are exempt from this provision.

Producers shall submit a water production statement on a CVWD approved form with their RAC payment each month or enter into a Water Production Metering Agreement with CVWD to have CVWD staff measure and report groundwater production.

If no statement of production is furnished, CVWD will calculate production based on energy consumption records (in kilowatt-hours) and the results of well pump tests indicating unit energy consumption per acre-foot of production (in kilowatt-hours per acre-foot).

If no energy consumption records are available, CVWD will compute the groundwater pumping based on consumptive use of water. Consumptive use will be computed by multiplying the irrigated acreage for each crop type using CVWD's zanjero maps of cropping patterns (conducted semi-annually) by a water consumption factor for each crop. The water consumption factor will be based on published crop evapotranspiration requirements, an allowance for leaching and an irrigation efficiency of 70 percent. Other water consumption factors will be used to compute production not used for irrigation. Production will be computed by subtracting any metered deliveries of Canal water or recycled water.

If the total metered, estimated or computed annual amount of production for any producer is 25 acre-feet or less, that entity will be designated a minimal pumper and will be exempt from the RAC for that year. Minimal pumpers will be re-evaluated as necessary.

Replenishment Assessment Charge

The JWPAC has previously recommended a RAC increase of $7 per acre-foot per year for successive fiscal years beginning July 1, 2009.   This would increase the RAC from the current $45 per acre-foot to $52 per acre-foot effective July 1, 2014 for a 15.6% increase.

Estimating 2014 production based on the 2013 calendar year reported production of 119,194 acre-feet, at $52 per acre-foot, the 2014 estimated assessment dollars equals $6,198,088.

CONCLUSIONS AND RECOMMENDATION

Because the average natural water inflow into the East Whitewater River Subbasin Area of Benefit is less than the production, the GRP must continue using imported water. Accordingly, it is recommended that the RAC of $52.00/AF be levied upon all producers within the Area of Benefit in accordance with the State Water Code.

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