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COACHELLA VALLEY WATER DISTRICT
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COACHELLA VALLEY WATER DISTRICT
ENGINEER'S REPORT ON
WATER SUPPLY AND REPLENISHMENT ASSESSMENT
FOR THE
MISSION CREEK SUBBASIN AREA OF BENEFIT
2015/2016

APRIL 2015

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TABLE OF CONTENTS

TABLE OF CONTENTS

Page

FIGURES

TABLES

LIST OF ABBREVIATIONS

Coachella Valley Water District	CVWD
Desert Water Agency	DWA
Metropolitan Water District of Southern California	MWD
State Water Project	SWP
Area of Benefit	AOB
Groundwater Replenishment Program	GRP
Acre Feet per Year	AF/Yr
Acre Feet	AF
California Department of Water Resources	CDWR
Replenishment Assessment Charge	RAC
Coachella Branch of the All American Canal	Coachella Canal or Canal
Mission Creek and Garnet Hill Subbasins Water Management Plan	Plan
State of California	State
United States Geological Survey	USGS
Mission Springs Water District	MSWD
Coachella Valley Water Management Plan	CVWMP
Rosedale Rio Bravo Water Storage District	Rosedale
State Water Code	Code
Fiscal Year	FY

CHAPTER I
EXECUTIVE SUMMARY

CHAPTER I
EXECUTIVE SUMMARY

Coachella Valley Water District (CVWD) and Desert Water Agency (DWA) have been importing Colorado River water exchanged for State Water Project (SWP) water allocations to replenish the groundwater within the Coachella Valley Groundwater Basin since 1973. CVWD and DWA have been replenishing the Mission Creek Subbasin with imported water since 2002.

If groundwater replenishment with imported water is eliminated, groundwater overdraft will result. Increased overdraft results in declining water levels, increased pump lifts, and increased energy consumption to pump groundwater for irrigation and domestic use. Extreme overdraft has the potential to cause ground surface subsidence and to impact water quality and groundwater storage volume.

CVWD's Mission Creek Subbasin Groundwater Replenishment Program (GRP) Area of Benefit (AOB) is illustrated in **Figures 2 and 3**. The costs of CVWD's GRP are recovered through the Replenishment Assessment Charge (RAC) applied to all non-exempted groundwater production within the AOB and through SWP Tax Revenues levied on all property within CVWD's boundary. Producers extracting groundwater from the Mission Creek Subbasin at rates of 25 acre feet per year (AF/Yr) or less are specifically exempted from the GRP and RAC.

There was a negative change in groundwater in storage within the Mission Creek Subbasin in 2014 as shown in **Figure 5**. However, overdraft in the Mission Creek Subbasin has been eliminated as evidenced by a positive ten-year average change in groundwater storage since 2009 due to artificial replenishment and other water management activities. As shown in **Figures 2, 3, and 4**, groundwater replenishment has been effective in stabilizing water levels within the AOB and continued groundwater replenishment is necessary to prevent overdraft in the future.

In its efforts to maintain water supplies in the Coachella Valley, CVWD has requested its maximum 2014 Table A SWP allocation of 138,350 acre feet (AF) pursuant to the SWP Contract. This allocation was increased from 23,100 AF in 2003 to 33,000 AF in 2004, to 121,100 AF in 2005, and to 138,350 AF in 2010. DWA also requested its maximum 2014 Table A water allocation, which was increased from 38,100 AF in 2004 to 50,000 AF in 2005, and to 55,750 AF in 2010.

The replenishment fund for the AOB is underfunded. The RAC Revenue is currently insufficient for the expenses associated with the GRP.

CVWD proposes to levy the RAC up to $112/AF(set forth in Proposition 218 proceedings), effective July 1, 2015. Based on the recommended RAC rate and on Projected Revenue shown in **Table 5**, the proposed RAC results in a projected decrease in the Cash Flow in fiscal year 2016 in the amount of $1.1 million.

CHAPTER II
INTRODUCTION

CHAPTER II
INTRODUCTION

This is the 13th annual Engineer's Report on Water Supply and Replenishment Assessment for the Mission Creek Subbasin Area of Benefit (AOB) as managed by the Coachella Valley Water District (CVWD). This program began in the 2003-2004 fiscal year and has replenished the Mission Creek Subbasin with a cumulative total of approximately 150,142 acre feet (AF) of imported water.

CVWD serves an area of approximately 1,000 square miles in the Coachella Valley within Riverside, Imperial, and San Diego Counties. The Coachella Valley is situated in the northwesterly portion of California's Colorado Desert. The Coachella 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 Coachella Valley's groundwater basin. The bulk of natural groundwater replenishment comes from runoff from the adjacent mountains.

The need to enhance the Coachella 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 the Imperial Valley. Early residents of the Coachella Valley also recognized action was needed to stem the decline of the water table resulting from groundwater extractions. Their concern led 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 Coachella Valley. Since 1949, the Coachella Canal has been providing water for irrigation use in the eastern Coachella Valley.

After establishing a supplemental water importation program in the eastern part of the Coachella Valley and with the onset of recreational development in the western part of the Coachella Valley, the need for a supplemental water importation program 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 purchase water from the State Water Project (SWP). A direct connection from the SWP to the Coachella Valley does not currently exist. Therefore, CVWD and DWA entered into an agreement with the Metropolitan Water District of Southern California (MWD) to exchange water from MWD's Colorado River Aqueduct, which crosses the western portion of the Coachella Valley near Whitewater, for CVWD and DWA allocations of SWP water. Since 1973, CVWD and DWA have been releasing Colorado River exchange water near Whitewater to replenish groundwater in the west portion of the Whitewater River Subbasin, and since 2002 to replenish groundwater in the Mission Creek Subbasin.

Both CVWD and DWA are permitted by the State Water Code to replenish groundwater basins and to levy and collect water replenishment assessments from any non-exempt groundwater extractor or surface water diverter within their jurisdictions who benefits from replenishment of groundwater. CVWD began assessment of groundwater producers within the Whitewater River Subbasin in fiscal year 1980-1981, and DWA began its assessment program in fiscal year 1978-1979, thereby creating the Groundwater Replenishment Program (GRP). The two agencies are not required to implement assessment procedures jointly or identically.

Due to overdraft conditions in the Mission Creek Subbasin, located northerly of the Whitewater River Subbasin, CVWD and DWA began constructing facilities to replenish the Mission Creek Subbasin in October 2001, in accordance with applicable law. Facilities were completed in June

2002 and, DWA and CVWD began replenishment activities in the Mission Creek Subbasin in December 2002.

In 2003, CVWD, DWA, and Mission Springs Water District (MSWD) recognized that management of the Mission Creek Subbasin extended across agency boundaries, and entered into the Mission Creek Groundwater Management Agreement. This agreement acknowledged the need to operate the Mission Creek Subbasin as a complete unit rather than as individual segments delineated by agency boundaries.

The agreement was developed following numerous investigations regarding the groundwater supply within the Coachella Valley. Those investigations are addressed in previous reports (Engineer's Reports on Water Supply and Replenishment Assessment for Coachella Valley Water District, 1980-1981 through 2002-2003).

The Mission Creek Groundwater Management Agreement calls for the maximum importation of water for replenishment of groundwater basins within a defined management area. The agreement also requires collection of data necessary for sound management of all water resources within the same management area.

The Mission Creek and Garnet Hill Subbasins Water Management Plan (Plan) Final Report Plan was completed in January 2013 as a collaborative effort between DWA, MSWD, and CVWD. The purpose of the Mission Creek and Garnet Hill Subbasins Water Management Plan is to manage the water resources to meet demands reliably and protect water quality in a sustainable and cost-effective manner. The Plan provides the status of the subbasins, current issues, and water management goals. As recommended by the Plan, additional information such as annual precipitation and groundwater levels have been included in these Engineer's Reports to more thoroughly describe the condition of the subbasin.

The State Water Code requires completion of an Engineer's Report regarding the GRP before CVWD can levy and collect a groundwater Replenishment Assessment Charge (RAC). The report must include the condition of groundwater supplies, the need for groundwater replenishment, the AOB boundary, water production within the AOB, and the RAC to be levied upon water production in the AOB. It must also contain recommendations regarding the GRP including the source and amount of replenishment water and related costs. The first Engineer’s Report for the Mission Creek Subbasin AOB was completed in April 2003.

The purpose of this report is to update the groundwater supply conditions and current GRP and to recommend a RAC for CVWD's Mission Creek Subbasin AOB for the upcoming fiscal year.

CHAPTER III
GROUNDWATER BASIN DESCRIPTION

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GROUNDWATER BASIN DESCRIPTION

A. Geology

The Coachella Valley Groundwater Basin, as described by the California Department of Water Resources (CDWR), is bounded on the north and east by non-waterbearing 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 Gorgonio 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 lower boundary 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 CDWR in 1964 and the United States Geological Survey (USGS) in 1971.

The Subbasins present in the Coachella Valley are the Mission Creek, Desert Hot Springs, Garnet Hill, San Gorgonio Pass, and Whitewater River (Indio) Subbasins. 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 defined by faults that serve as 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 CDWR and USGS designations:

- Mission Creek Subbasin
- Desert Hot Springs Subbasin
  - Miracle Hill Subarea
  - Sky Valley Subarea
  - Fargo Canyon Subarea

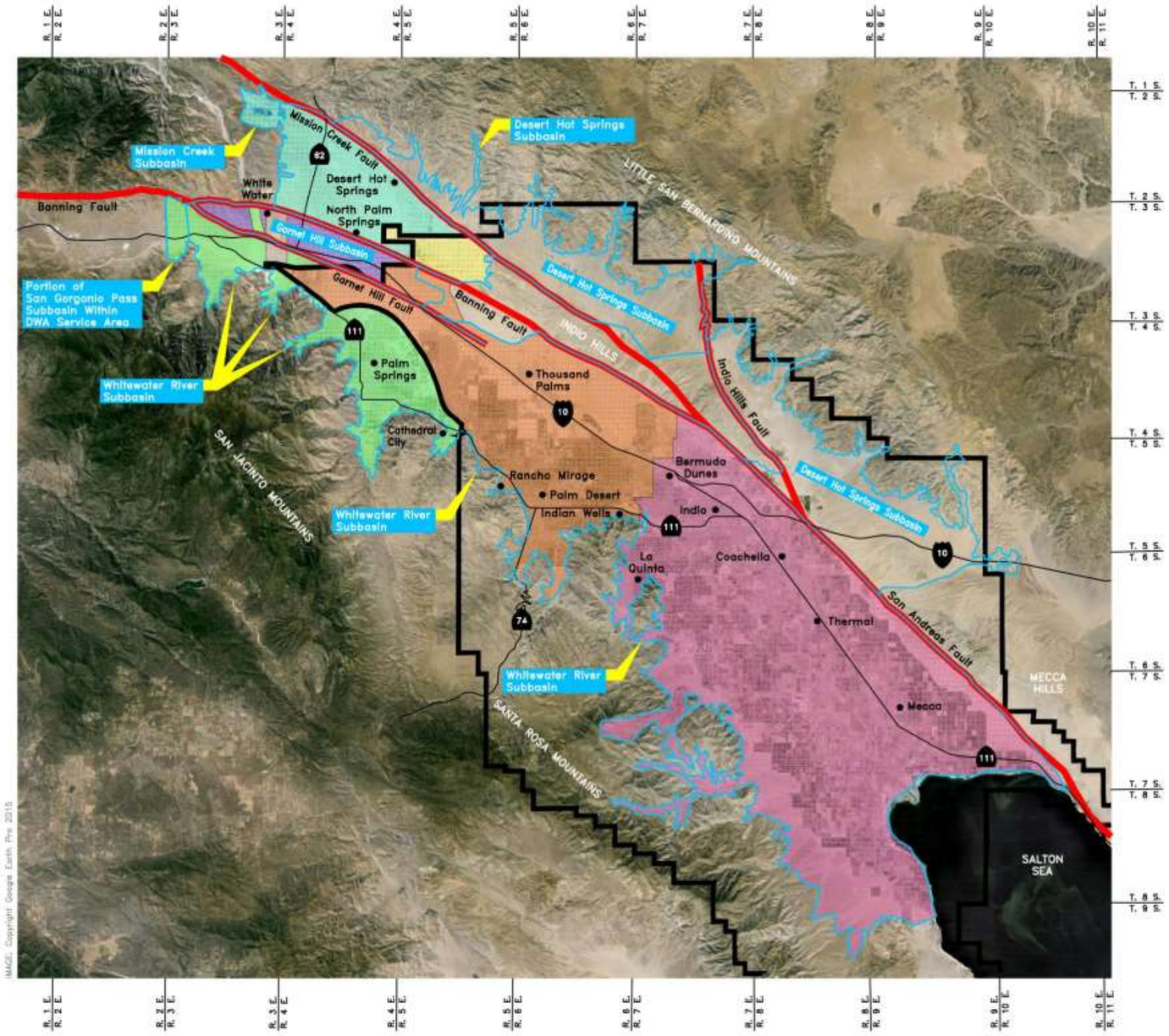
- Garnet Hill Subbasin
- San Gorgonio Pass Subbasin
- Whitewater River (Indio) Subbasin
    - Palm Springs Subarea
    - Thermal Subarea
    - Thousand Palms Subarea
    - Oasis Subarea

Figure 1 shows the locations of these subbasins. This report focuses on the Mission Creek Subbasin, but also presents brief descriptions of the Desert Hot Springs Subbasin, Garnet Hill Subbasin, San Gorgonio Pass Subbasin, and Whitewater River (Indio) Subbasin for context.

The following are areas within the Coachella 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

Figure 1
Coachella Valley Groundwater Basin



COACHELLA VALLEY WATER DISTRICT
GROUNDWATER REPLENISHMENT AND ASSESSMENT PROGRAM

2015–2016

GROUNDWATER SUBBASIN MAP
SHOWING
GROUNDWATER REPLENISHMENT AREAS OF BENEFIT
(EITHER DIRECT OR INDIRECT)

LEGEND

- CVWD BOUNDARY
- FAULTS
- SUBBASIN BOUNDARIES
- WEST WHITEWATER RIVER SUBBASIN AREA OF BENEFIT
- EAST WHITEWATER RIVER SUBBASIN AREA OF BENEFIT
- MISSION CREEK SUBBASIN AREA OF BENEFIT
- DWA WHITEWATER RIVER SUBBASIN AREA OF BENEFIT
- DWA MISSION CREEK SUBBASIN AREA OF BENEFIT
- DWA GARNET HILL SUBBASIN AREA OF BENEFIT

Prepared By:
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(IN FEET)

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Figure 1
Coachella Valley Groundwater Basin
Engineer's Reports On Water Supply And Replenishment Assessment

B. 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 CDWR'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.

Both the Mission Creek Fault and the Banning Fault are partially effective barriers to lateral groundwater movement, as evidenced by offset water levels, fault springs, and changes in vegetation. Water level differences across the Banning Fault, between the Mission Creek Subbasin and the Garnet Hill Subbasin, are on the order of 200 to 250 feet. Similar water level differences exist across the Mission Creek Fault between the Mission Creek and Desert Hot Springs Subbasins (MWH 2013).

This subbasin relies on the same imported SWP/Colorado River Exchange water source for replenishment as does the Whitewater River Subbasin. CVWD, DWA, and MSWD 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 CVWD and DWA specify that the available SWP 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.

C. Desert Hot Springs Subbasin

The Desert Hot Springs subbasin is bounded on the north by the Little San Bernardino Mountains and on the southeast by the Mission Creek and San Andreas Faults. The Mission Creek Fault separates the Desert Hot Springs subbasin from the Mission Creek Subbasin, and the San Andreas Fault separates the Desert Hot Springs subbasin from the Whitewater River Subbasin. Both faults serve as effective barriers to lateral 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 CDWR'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.

D. Garnet Hill Subbasin

The area between the Garnet Hill Fault and the Banning Fault, named the Garnet Hill Subarea of the Indio Subbasin by CDWR (1964), was considered a distinct subbasin by the USGS because of the partially effective Banning and Garnet Hill Faults as barriers to lateral groundwater movement. This is demonstrated 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 Garnet Hill Fault does not reach the surface, and is probably effective as a barrier to lateral groundwater movement only below a depth of about 100 feet (MWH 2013).

The 2013 Mission Creek and Garnet Hill Subbasins 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 large replenishment quantities 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 (MWH 2013). This subbasin is considered part of the Whitewater River (Indio) Subbasin in CDWR's Bulletin 118 (2003).

E. San Gorgonio Pass Subbasin

The San Gorgonio Pass Subbasin lies entirely within the San Gorgonio Pass, bounded by the San Bernardino Mountains on the north and the San Jacinto Mountains on the South (CDWR 2003). This subbasin is designated number 7-21.04 in CDWR's Bulletin 118 (2003).

The San Gorgonio Pass Subbasin is also hydrologically connected to the Whitewater River Subbasin on the east. Groundwater within the San Gorgonio Pass Subbasin moves from west to east and spills out into the Whitewater River Subbasin over the suballuvial bedrock constriction at the east end of the pass (CDWR 1964).

CVWD's service area does not encompass any portion of the San Gorgonio Pass Subbasin.

F. Whitewater River (Indio) Subbasin

The Whitewater River Subbasin, designated the Indio Subbasin (Basin No. 7-21.01) in CDWR Bulletin No. 118 (2003), underlies the major portion of the Coachella 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 (CDWR 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 lateral 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 lateral 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 bed deposits, impede the percolation of water applied for irrigation and limit groundwater replenishment opportunities to the westerly fringe of the subbasin.

The Whitewater River (Indio) Subbasin is divided into 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 other two Subareas are peripheral areas having unconfined groundwater conditions. The Whitewater River (Indio) Subbasin is discussed in more detail in the Engineer's Report on Water Supply and Replenishment Assessment West Whitewater River Subbasin AOB (CVWD 2013).

CHAPTER IV
WATER SUPPLY

CHAPTER IV
WATER SUPPLY

A. Groundwater Storage

In 1964, CDWR 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

Groundwater Storage Coachella Valley Groundwater Basin

Area	Storage (AF)[1]
Whitewater River 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
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
Total All Subbasins:	**39,200,000**

(1) First 1,000 feet below ground surface. CDWR estimate (CDWR, 1964). Water supply and groundwater replenishment for the Mission Creek Subbasin are calculated based on the entire Subbasin. The Subbasin is utilized jointly by CVWD and DWA for water supply purposes and the two agencies jointly manage the water supply there.

B. Precipitation and Streamflow

Average annual precipitation in the Coachella Valley varies from four inches on the valley floor to more than 30 inches in the surrounding mountains (CDWR 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 Coachella Valley Water Management Plan (CVWMP) Update.

During 2014, the average annual rainfall was 5.87 inches throughout the Mission Creek Subbasin Area, as recorded by nine rain gage stations located in the Mission Creek and West Whitewater River Subbasins monitored by Riverside County Flood Control and Water Conservation District.

C. Non-Potable Water

CVWD began producing reclaimed or recycled water in 1967. Recycled water is a significant potential local resource that can be used to help reduce overdraft. Although treated wastewater is not yet suitable for direct potable use, wastewater that has been treated to State standards can be reused for landscape irrigation and other purposes. Recycled wastewater has historically been used for irrigation of golf courses and municipal landscaping in the Coachella Valley.

At this time, within CVWD's Mission Creek Subbasin AOB, there is one golf course extracting groundwater for irrigation purposes; however, access to recycled water supplies is currently unavailable for source substitution within the Mission Creek Subbasin.

MSWD operates two wastewater treatment facilities at total capacity of 2.2 million gallons per day, but the treated effluent is currently percolated into the Mission Creek Subbasin (MWH 2013). However, as development progresses and additional infrastructure is constructed within the Mission Creek Subbasin AOB, opportunities for recycled water use may arise.

Developing recycled water use in the Mission Creek Subbasin would offset groundwater pumping for irrigation purposes and improve groundwater quality by removing nitrates that are otherwise percolated into the subbasin from MSWD's existing wastewater treatment facilities; however, it would not substantially lessen the need for artificial replenishment. This program was anticipated to be implemented within five years from the 2013 Mission Creek and Garnet Hill Subbasins Water Management Plan by MWH, but no progress has been made, to date, in developing the necessary additional wastewater treatment and recycled water distribution system in the Mission Creek Subbasin. According to MWH (2013), the total estimated cost to develop recycled water for the single golf course within DWA's Mission Creek Subbasin AOB would be approximately $4.7 million. Additional costs for developing recycled water supplies for other potential recycled water users, including one golf course within CVWD's AOB, may be prepared in the future.

D. Groundwater Levels

Historical water level declines and conditions producing those declines in the Coachella Valley Groundwater Basin have been extensively described by the USGS and CDWR.

Although groundwater levels in the Mission Creek Subbasin rose slightly between 1938 and 1952, they declined steadily since 1952 until replenishment began in 2002. The historic declining water table in the Mission Creek Subbasin AOB led to the determination that a management program was necessary to stabilize water levels and to prevent adverse effects such as water quality degradation and land subsidence.

Groundwater replenishment in the Mission Creek Subbasin began in 2002. After which, a reduction in the decline of water levels was observed.

Figure 2 depicts the change in average groundwater levels from 2013 to 2014 in CVWD's Mission Creek Subbasin AOB. The average rise observed in the six wells monitored from 2013 to 2014 was 1.5 feet. The Mission Creek Subbasin AOB boundary and location of the Mission Creek Replenishment Facility are also shown in **Figure 2**.

Figure 3 depicts the change in average groundwater levels from 2004 to 2014 in CVWD's Mission Creek Subbasin AOB. The average increase observed in the four wells monitored from 2004 to 2014 was 0.4 feet.

Figure 4 illustrates the response of water levels in the Mission Creek Subbasin to groundwater replenishment. Wells located nearest the Mission Creek Groundwater Replenishment Facility (Mission Creek Monitoring Well and MSWD 34) experienced more dramatic changes in water level than those further away; as with the wells located in CVWD'S AOB (CVWD 3405 and CVWD 3518). Despite the physical distance from the replenishment facility, wells within CVWD's AOB are, in fact, benefiting from groundwater replenishment, as evidenced by the stabilization of water levels since the program commenced in 2002.

Figure 2
Groundwater Level Changes in Mission Creek Subbasin Area of Benefit from 2013 to 2014

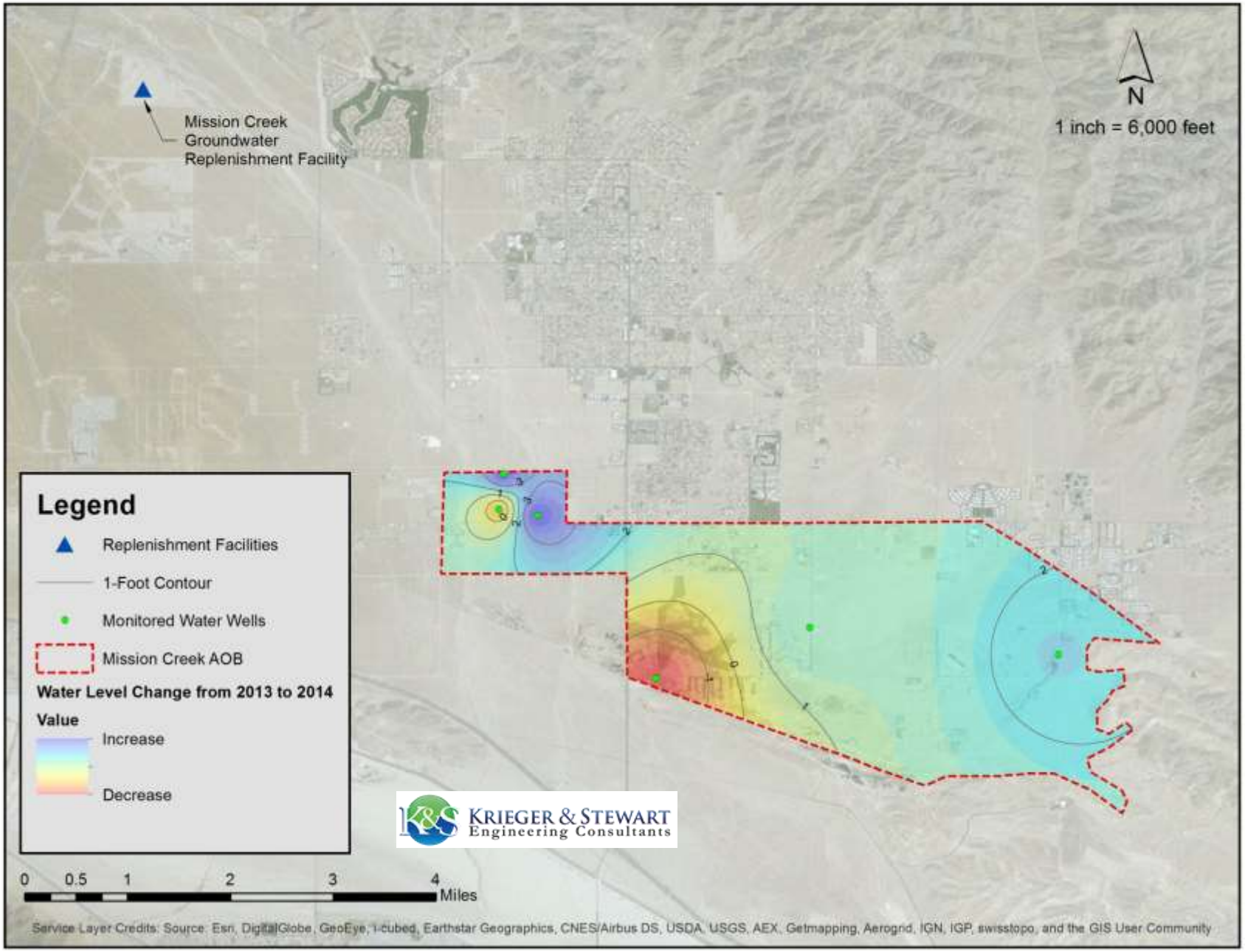


Figure 3
Groundwater Level Changes in Mission Creek Subbasin Area of Benefit from 2004 to 2014

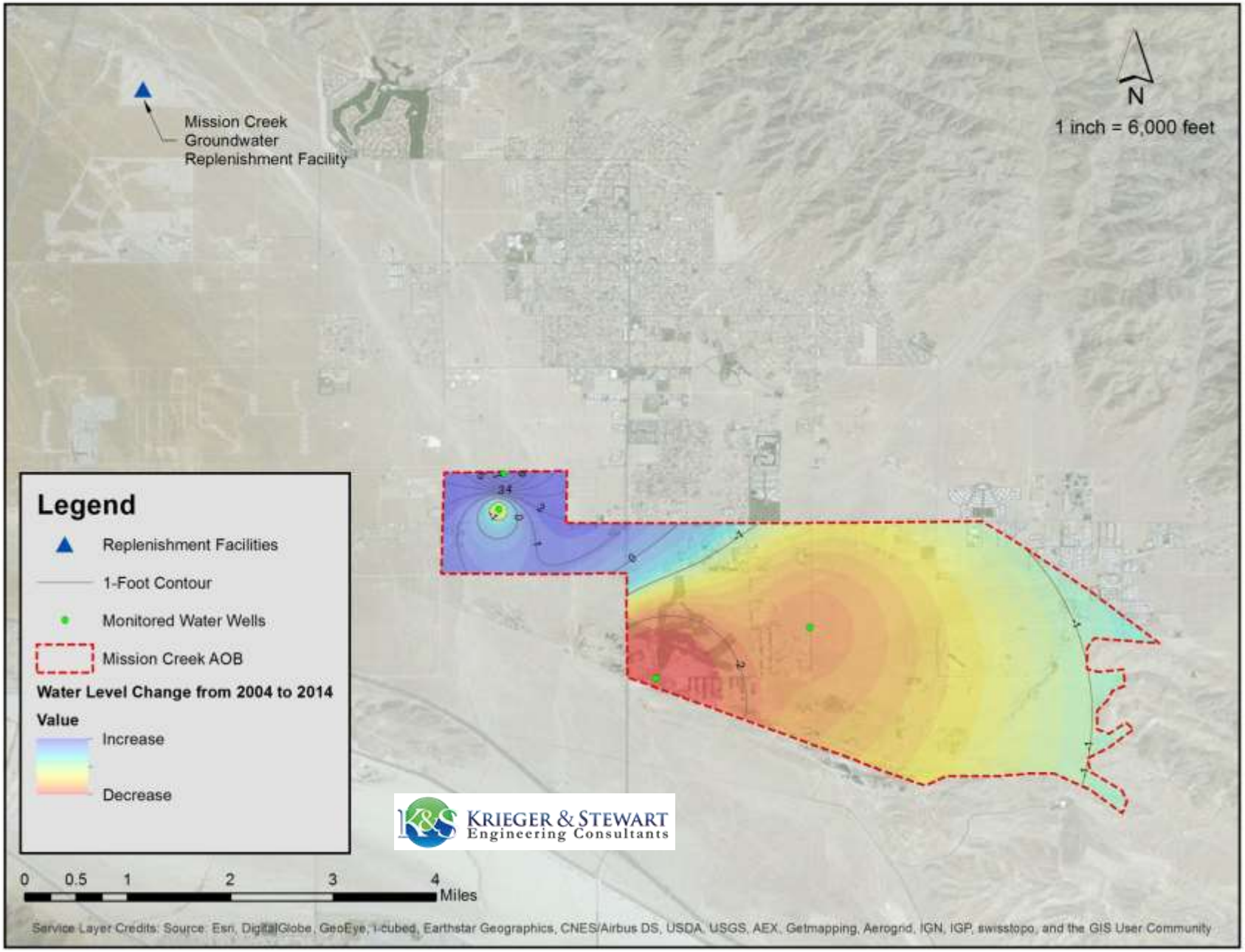
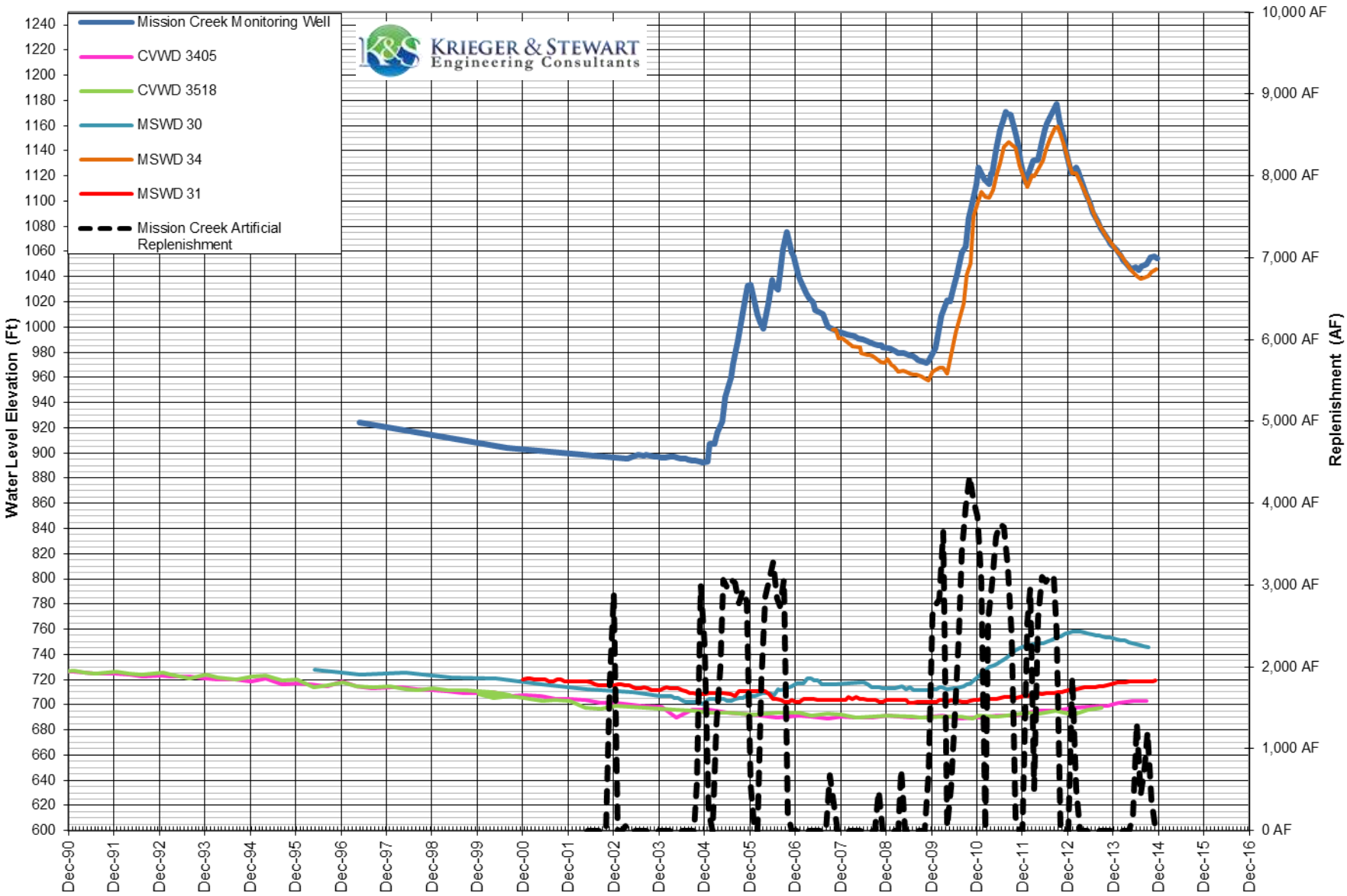


Figure 4
Mission Creek Subbasin Artificial Replenishment Quantities and Water Well Hydrographs



E. Management Area

CVWD and DWA have recognized the need to manage the Mission Creek Subbasin as a complete unit rather than as individual segments underlying the individual agencies' boundaries.

1. Mission Creek Subbasin Area of Benefit Boundary

Figures 2 and 3 show CVWD's Mission Creek Subbasin AOB. This boundary is defined as follows:

> That portion of the Mission Creek Subbasin within the boundaries of CVWD, bounded on the east beginning approximately one-eighth mile west of the center of Section 10, Township 3 South, Range 5 East, San Bernardino Base and Meridian; thence southeasterly along the trace of the Mission Creek Fault to the base of Edom Hill; thence curving westerly along the base of the Indio Hills following along the southern San Andreas Fault to the intersection of Avenue 20 and Palm Drive; thence north along Palm Drive to Avenue 18; thence west along Avenue 18 to Little Morongo Road; thence north along the west section line of Section 12, Township 3 South, Range 4 East, to Avenue 16; thence east along the north section line of said Section 12 to the northeast corner of the section; thence south along the east section line of said Section 12 to the east-west midsection line, which is Dillon Road; thence east along Dillon Road to the point of beginning.

2. Groundwater Production

Table 2 presents historical groundwater production in the Mission Creek Subbasin, including groundwater production for both CVWD's and DWA's AOBs. Production in 2014 totaled 13,834 AF.

Table 2

Production within the Mission Creek Management Area in Acre Feet

Year	Production within CVWD Area of Benefit	Production within DWA Area of Benefit[1]	Total[2]	Annual Change[3]	CVWD Percentage of total Production	DWA Percentage of total Production
1978	854	1,399	2,253	---	37.91	62.09
1979	1,001	2,564	3,565	1,312	28.08	71.92
1980	1,107	2,914	4,021	456	27.53	72.47
1981	1,421	2,878	4,299	278	33.05	66.95
1982	1,302	2,630	3,932	-367	33.11	66.89
1983	1,442	2,979	4,421	489	32.62	67.38
1984	1,915	3,740	5,655	1,234	33.86	66.14
1985	2,148	3,559	5,707	52	37.64	62.36
1986	2,159	4,278	6,437	730	33.54	66.46
1987	2,234	4,483	6,717	280	33.26	66.74
1988	2,302	4,834	7,136	419	32.26	67.74
1989	2,606	5,690	8,296	1,160	31.41	68.59
1990	2,512	5,790	8,302	6	30.26	69.74
1991	2,292	5,486	7,778	-524	29.47	70.53
1992	2,188	6,187	8,375	597	26.13	73.87
1993	2,528	6,333	8,861	486	28.53	71.47
1994	2,863	6,813	9,676	815	29.59	70.41
1995	2,865	7,237	10,102	426	28.36	71.64
1996	2,838	7,724	10,562	460	26.87	73.13
1997	2,104	7,795	9,899	-663	21.25	78.75
1998	2,757	7,534	10,291	392	26.79	73.21
1999	3,004	7,970	10,974	683	27.37	72.63
2000	3,433	8,405	11,838	864	29.00	71.00
2001	3,929	8,421	12,350	512	31.81	68.19
2002	4,371	9,597	13,968	1,618	31.29	68.71
2003	4,425	10,073	14,498	530	30.52	69.48
2004	4,628	11,920	16,548	2,050	27.97	72.03
2005	4,247	12,080	16,327	-221	26.01	73.99
2006	4,757	12,608	17,365	1,038	27.39	72.61
2007	4,547	11,862	16,409	-956	27.71	72.29
2008	4,543	11,232	15,775	-634	28.80	71.20
2009	4,813	10,295	15,108	-667	31.86	68.14
2010	4,484	9,820	14,304	-804	31.35	68.65
2011	4,653	9,550	14,203	-101	32.76	67.24
2012	4,582	9,493	14,075	-127	32.55	67.45
2013	4.415	10,080	14,495	420	30.46	69.54
2014	4,154	9,680	13,834	-661	30.02	69.97

Average Annual Change 322

(1) Production within DWA AOB, per Krieger and Stewart.
(2) Sum of production within CVWD's and DWA's Areas of Benefit.
(3) Current year total minus previous year total.

3. Groundwater Inflow and Outflow

Total inflow and outflow to the Mission Creek Subbasin AOB in 2014 is summarized in **Table 3**. The Mission Creek and Garnet Hill Subbasins Water Management Plan Final Report (MWH 2013) and Psomas Groundwater Model (Psomas 2013) provide updated estimates of natural replenishment and subsurface flows. The natural inflow of 9,340 acre feet per year (AF/Yr) includes natural replenishment and flow across subbasin boundaries into the Mission Creek Subbasin. The non-consumptive return of applied water is estimated at 4,842 AF, which is 35 percent of the estimated groundwater production of 13,834 AF/Yr. The total inflow includes the natural inflow, the non-consumptive return and the 4,325 AF of water replenished at the Mission Creek Groundwater Replenishment Facility.

The total outflow is the estimated groundwater production plus 5,700 AF/Yr of natural outflow. Natural outflows include 4,000 AF/Yr of subsurface outflow to the Garnet Hill Subbasin, 1,100 AF/Yr of subsurface outflow to the west portion of the Whitewater River Subbasin, and 900 AF/Yr of evapotranspiration (MWH 2013).

4. 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 as the calculated change in storage based on long-term local hydrology and imported water deliveries. The CDWR 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 2014, the change in groundwater in storage in the Mission Creek Subbasin was negative. Imported water may offset annual changes in the groundwater in storage in a particular year. On a long-term basis, water requirements are likely to continue to place demands on groundwater in storage.

Based on the calculations in **Table 3**, without artificial replenishment, the annual reduction in stored groundwater within the Mission Creek Subbasin in 2014 would be approximately -5,350 AF, compared to an annual balance of -1,027 AF. Continued groundwater replenishment is necessary to prevent overdraft.

Table 3
2014 Water Balance in the Mission Creek Subbasin

Item	Annual Calculation (AF)
2014 Groundwater Production	-13,834
Non-Consumptive Return[(1)]	4,842
Natural Inflow[(2)]	9,340
Natural Outflow[(3)]	-5,700
Artificial Replenishment[(4)]	4,325
Annual Balance[(5)]	-1,027

(1) Based on 35 percent of production (13,834 AF x 0.35 = 4,842 AF).
(2) Natural Replenishment and subsurface inflows across subbasin boundaries (MWH 2013).
(3) Subsurface outflows across subbasin boundaries and evapotranspiration (MWH 2013).
(4) Water delivered to the Mission Creek Replenishment Facility.
(5) This is a decrease in stored groundwater equal to 0.03 percent of the subbasin's storage capacity.

The annual balance is the total inflow less the total outflow, for a loss of 1,027 AF of water in storage in the subbasin in 2014.

Figure 5 shows the historic and projected change of groundwater in storage based on total inflows and outflows. The GRP has eliminated overdraft in the AOB. As shown by the ten-year average change in storage, evidenced by the positive average since 2009.

The total historic outflow shown in **Figure 5** consists of groundwater production and natural outflows as shown in **Table 3** of this Engineer's Report and past Engineer's Reports.

The total historic inflow shown in **Figure 5** consists of artificial replenishment, natural inflows, and non-consumptive return (35 percent of total groundwater production) as shown in **Table 3** of this Engineer's Report and past Engineer's Reports.

Projected groundwater production was obtained from MWH as prepared for the Mission Creek and Garnet Hill Subbasins Water Management Plan, which accounts for population growth within the management area as forecast by Coachella Valley Association of Governments in 2010. Groundwater production and population projections have not been reassessed by MWH since the water management plan was published in 2013.

Projections for groundwater replenishment are based on anticipated SWP deliveries as reported by the CDWR annually (as available) for 2015, and thereafter according to the 2013 final SWP Reliability Report long-term average delivery estimate.

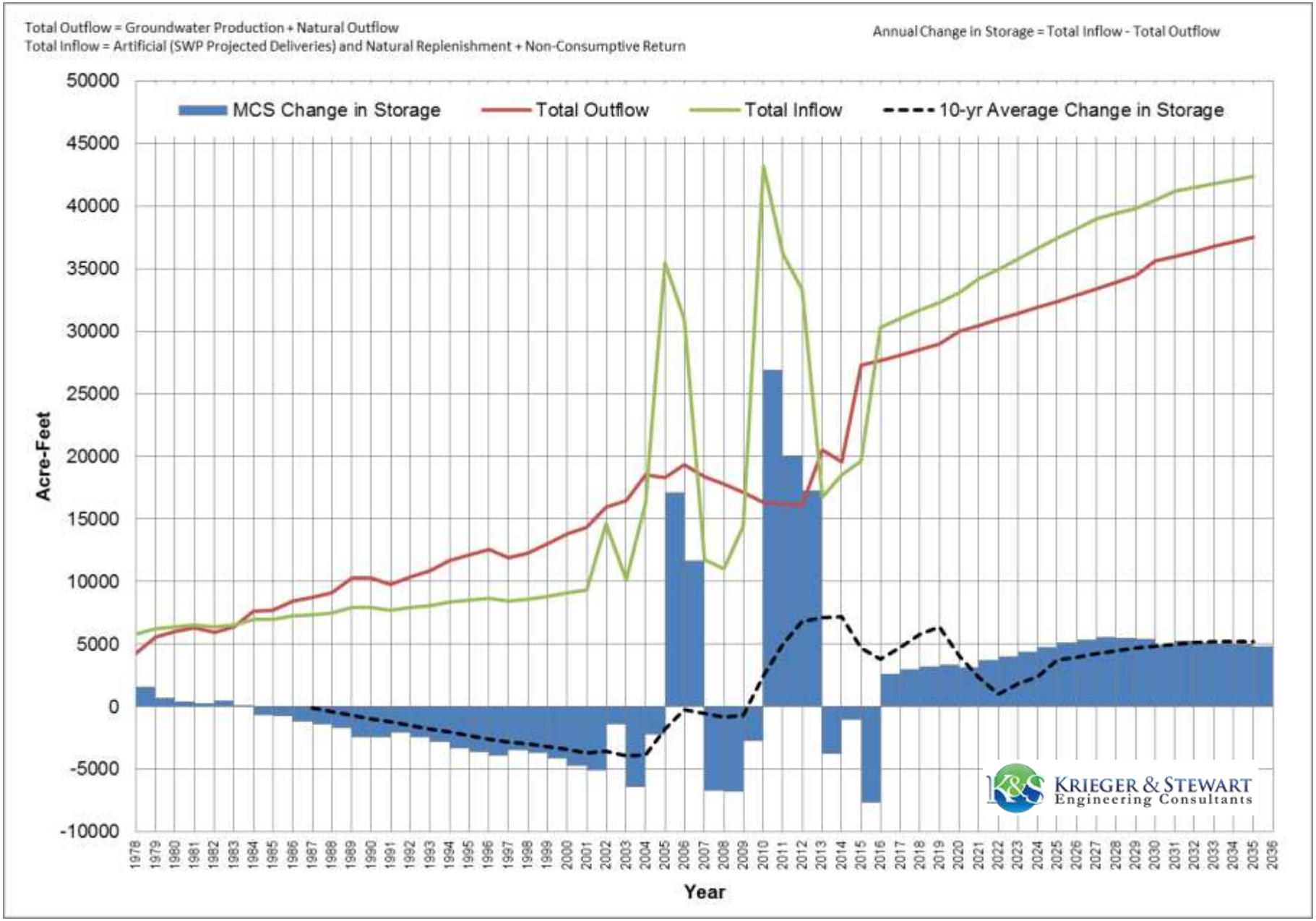
In accordance with the Mission Creek Groundwater Replenishment Agreement, dated April 8, 2003, each year DWA and CVWD calculate the total groundwater production and surface water diversion from the Mission Creek and West Whitewater River Subbasins in order to determine the quantity of SWP water to be delivered to each subbasin in the current year as a portion of the previous year's total production or diversion. Typically, the Mission Creek Subbasin has accounted for approximately seven percent of the total production within both subbasins, but based on current production projections, production will increase to a range of 12 to 19 percent through 2035.

The percentage of proportionate delivery is projected to increase due to assumptions made in the Mission Creek and Garnet Hill Subbasins Water Management Plan that population will increase in the Mission Creek AOB and groundwater production will decrease in the West Whitewater River AOB due to conservation and source substitution.

As of March 2, 2015, CDWR expects to deliver 20 percent of its total allocations to State Water Contractors in 2015. Of that 20 percent expected to be delivered to both DWA and CVWD, eight percent (per 2014 production) is projected for delivery to the Mission Creek Groundwater Replenishment Facility.

Projections of groundwater replenishment during the period 2016 through 2035 are based on a 58 percent long-term average of total allocations and projected groundwater production for both the Mission Creek and West Whitewater River Subbasins.

Figure 5
Mission Creek Subbasin Change in Groundwater Storage



CHAPTER V
REPLENISHMENT PROGRAM

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A. Current Replenishment Activities

Alleviation of overdraft in the Mission Creek Subbasin was initiated in 2002 by CVWD and DWA using SWP water (Table A Amount) exchanged for Colorado River Water.

1. State Water Project Table A Amounts

The SWP includes 660 miles of aqueduct and conveyance facilities from Lake Oroville in the north to Lake Perris in the south. The SWP has contracts to deliver 4.1 million AF/Yr to 29 contracting agencies. CVWD's original Table A Amount was 23,100 AF/Yr and DWA's original Table A Amount was 38,100 AF/Yr for a combined Table A Amount of 61,200 AF/Yr. In 2004, CVWD purchased 9,900 AF/Yr of SWP Table A Amount from the Tulare Lake Basin Water Storage District to bring its basic Table A Amount to 33,000 AF/Yr. The total basic Table A Amount for CVWD and DWA is 71,100 AF/Yr.

CVWD and DWA do not directly receive SWP water. CVWD and DWA have existing exchange agreements (signed in 1972 and amended in 1983) with MWD for delivery in the Whitewater River Subbasin. These agreements provide for CVWD and DWA to exchange their SWP water deliveries with MWD for Colorado River water. The 1984 Advance Delivery Agreement between CVWD, DWA and MWD allows MWD to store water in the Coachella Valley Groundwater Basin. The 2003 Exchange Agreement between CVWD, DWA and MWD provides for the transfer of 100,000 AF/Yr of MWD's Table A Amount to CVWD and DWA. MWD has transferred 88,100 AF/Yr and 11,900 AF/Yr of its Table A Amount to CVWD and DWA, respectively. The 2003 Exchange Agreement increased the total Table A Amount for CVWD and DWA to 171,100 AF/Yr with CVWD's portion equal to 121,100 AF/Yr.

In 2007, CVWD and DWA completed negotiations for two water transfers. The first transfer to CVWD and DWA for 12,000 AF/Yr and 4,000 AF/Yr, respectively, from Berenda Mesa Water District for a total Table A Amount of 16,000 AF/Yr. The second transfer to CVWD and DWA for 5,250 AF/Yr and 1,750 AF/Yr, respectively, from Tulare Lake Water Basin Storage District for a total of 7,000 AF/Yr. The transfers were completed in 2007 but did not take effect until January 1, 2010, when deliveries under these two transfers first began. These Table A Amount transfers increased the total combined Table A Amount for CVWD and DWA to 194,100 AF/Yr with CVWD's portion equal to 138,350 AF/Yr. CVWD and DWA also purchase available water from the SWP on the spot market including Pool A and Pool B water.

2. State Water Project Supplemental Water

In 2003, CVWD and MWD executed a Delivery and Exchange Agreement pursuant to the Quantification Settlement Agreement. Under the agreement, MWD delivers up to 35,000 AF of its SWP water to CVWD. CVWD exchanges the SWP water for an equal amount of MWD's Colorado River water. The exchanged Colorado River water can be delivered to Imperial Dam or the

Whitewater Connections. Pursuant to this agreement, no water was delivered to the Mission Creek Subbasin in 2014.

In 2008, CVWD and DWA executed agreements to augment SWP water supplies. CVWD and DWA executed separate agreements to acquire SWP supplemental water from the CDWR for a Water Supply and Conveyance Under a Dry Year Water Purchase Program. CDWR initiated this Dry Year Water Purchase Program to augment water supplies in anticipation of decreased water availability to SWP Contractors resulting from dry hydrologic conditions and/or regulatory constraints. CDWR will make the water available for purchase from its Yuba Agreement. The amount of water available for purchase will be based on CDWR's determination of the Water Year Classification. It is estimated that CVWD and DWA may be able to purchase up to four percent or 5,600 AF/Yr, and 1.3 percent or 1,820 AF/Yr, respectively. These Agreements provide for the exchange of these supplies with MWD for Colorado River water in accordance with existing exchange agreements. In 2014, 1,213 AF was delivered pursuant to this to agreement.

3. Non-State Water Project Supplemental Water

In 2003, CVWD and MWD entered into a one-time agreement for MWD to return 32,000 AF of Colorado River water received as a result of water conservation measures taken by CVWD in Palo Verde prior to execution of the Quantification Settlement Agreement. Per the agreement with MWD, MWD delivered half of the 32,000 AF (16,000 AF) to CVWD in 2007 at the Whitewater Spreading Basins. In 2008, 8,008 AF was delivered, and in 2009 the remaining 7,992 AF was delivered to CVWD at the Whitewater Groundwater Replenishment Facility.

In 2008, CVWD executed an Agreement with Rosedale Rio Bravo Water Storage District (Rosedale) for a one-time transfer of 10,000 AF, of banked Kern River flood water that is exportable to CVWD. Deliveries to CVWD began in 2008 when 3,000 AF was delivered and 3,000 AF was delivered in 2009. There were no deliveries in 2010 or 2011. The 4,000 AF remaining balance was delivered in 2012. CVWD entered into an Assignment Agreement with the Glorious Lands Company effective July 10, 2012 which transferred the existing Amended Water Supply Agreement between Glorious Lands Company and Rosedale to CVWD. CVWD will receive up to 9,500 AF/Yr of Rosedale water through 2035. In 2014, 5,000 AF was delivered to CVWD.

In 2008, DWA and MWD executed an Exchange Agreement for delivery of non-SWP supplemental water purchased by DWA from MWD. MWD will exchange these supplies with Colorado River water in accordance with existing exchange agreements. DWA plans to acquire up to 36,000 AF of non-SWP supplemental water during the period from 2008 through 2015 from entities in Kern County. MWD delivered 754 AF, 1,743 AF, and 5,350 AF, to the Mission Creek Subbasin from 2009, to 2011, pursuant to this agreement.

In 2010, CVWD executed an agreement with DMB Pacific, Inc. for the one-time transfer of 8,393 AF of "Nickel" water made available through Kern County Water Agency's Kern River Restoration and Water Supply Program. Per the agreement, CVWD received the full transfer amount in 2010.

4. 2014 Deliveries

In 2014, a total of 19,468 AF was delivered via the SWP to CVWD and DWA for replenishment at the Whitewater Groundwater Replenishment Facility and the Mission Creek Replenishment Facility as shown in **Table 4**.

Table 4
State Water Project Delivery in 2014

Description	CVWD (AF)	DWA (AF)	Total (AF)
Table A	6,918	2,788	9,706
Article 21	0	0	0
Turnback Pool A and B	0	0	0
Dry Year (Yuba)	952	261	1,213
Rosedale	5,000	0	5,000
MWD 35 TAF	3,549	0	3,549
Article 56 (c) “Carryover”	0	0	0
Total Delivered to MWD	16,491	3,049	19,468

During 2014, MWD delivered 7,858 AF of Colorado River exchange water for replenishment to the Mission Creek Subbasin and the west portion of the Whitewater River Subbasin. The Colorado River exchange water includes all deliveries except Article 56 (c) “Carryover” and MWD Advance Delivery. Article 56 (c) “Carryover” is water requested under Article 56 (c) of the Water Supply Contracts. SWP Contractors can carry over a portion of their allocated water approved for delivery in the current year for delivery during the next year. There were no carryover deliveries in 2014.

The amount of water that MWD has previously stored in the groundwater basin through the Advance Delivery Agreement was 260,413 AF at the beginning of 2014 and was decreased by 11,609 AF to 248,804 AF at the end of 2014.

Of the total amount of Colorado River exchange water, typically, 90 percent is delivered to the Whitewater River Subbasin and 10 percent is delivered to the Mission Creek Subbasin on average. However, in 2014, the total amount of water delivered for replenishment within the West Whitewater River Subbasin AOB was 3,533 AF, while the Mission Creek Subbasin AOB received 4,325 AF, as shown in **Table 5**.

Table 5
Colorado River Exchange
Water Delivered to Mission Creek Replenishment Facility[1]

Year	AF
2002	4,733
2003	59
2004	5,564
2005	24,723
2006	19,901
2007	1,011
2008	503[2]
2009	4,090[2]
2010	33,210[2]
2011	26,238[2]
2012	23,406
2013	2,379
2014	4,325
Total	**150,142**

(1) Delivered water quantities vary as a result of drought conditions and advance deliveries associated with the exchange agreement.
(2) Includes deliveries of DWA's non-SWP supplemental water purchased from entities in Kern County for the CPV Sentinel Energy power plant.

B. Future Replenishment Activities

CVWD and DWA request their full Table A allocations each year for a combined total of 194,100 AF.

Since water demand and groundwater extraction are expected to increase in the future, the current GRP will need to be continued and increased in the future to eliminate long-term overdraft (MWH 2013).

There may be limitations on the replenishment program such as supply availability and replenishment basin capacity, however, the 2003 Mission Creek Settlement Agreement Addendum states CVWD and DWA will replenish available water (MWH 2013). CVWD and DWA are both committed to acquiring additional water supplies for the Coachella Valley.

C. Other Replenishment Activities

DWA, MSWD, and CVWD completed the Mission Creek and Garnet Hill Subbasins Water Management Plan Final Report in January 2013. The purpose of the Mission Creek and Garnet Hill Subbasins Water Management Plan is to manage the water resources to meet demands reliably and protect water quality in a sustainable and cost-effective manner. The Plan provides the status of the subbasins, current issues, and water management goals.

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

CHAPTER VI
REPLENISHMENT ASSESSMENT

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A. State Water Code

Sections 31630 through 31639 of the State Water Code (Code) authorize CVWD to levy and collect RACs for the purpose of replenishing groundwater supplies within its area of jurisdiction. The Code defines production, producer, and minimal pumper for groundwater replenishment purposes as follows:

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

2. **"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 CVWD.

3. **"Minimal pumper"** means any producer who produces 25 or fewer AF of groundwater in any year.

This RAC is based on groundwater production within the Mission Creek Subbasin within the boundaries of CVWD and is limited to the AOB.

Production by minimal pumpers is exempt from assessment. There are approximately 10 to 20 minimal pumpers within the AOB. These are predominantly small wells used for domestic or limited irrigation purposes. Maximum pumpage by the minimal pumpers in the AOB would be less than 500 AF/Yr, or less than five percent of annual groundwater production within the management area.

The Code defines “replenishment assessment” and states that RACs may be levied upon all water production within the AOB, provided the RAC is uniform throughout said AOB. The RAC is a monetary charge authorized by the 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 upper portion of the Whitewater River Subbasin GRP, only the Variable Operation, Maintenance, Power and Replacement component of the Transportation Charge and the Delta Water Charge for the SWP could be included in the calculation. However, in 1991 the legislature passed and the governor signed into law AB 1070. This bill continues to limit the charges assessable against production, but includes an additional component of the Transportation Charge, the Off-Aqueduct Power component. CVWD has also been allowed, under the Water Code, to include in its calculations surplus or excess water charges, payments to DWA for similar payments by DWA to the State, 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.

CVWD has incurred additional costs associated with the GRP, which include continuing engineering studies, well meter reading and maintenance, and groundwater monitoring. These costs have now been included as a portion of the RAC.

B. Replenishment Program Accounting & Replenishment Assessment Development

1. 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. 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 to be effective July 1, 2013.

The CVWD SWP Tax Revenues are presently being used to fund the GRPs in the Mission Creek AOB, West Whitewater River AOB, and East Whitewater River AOB.

2. Income Statement

Table 6 presents an income statement showing Actual Fiscal Year 2014, Projected Fiscal Year 2015 and Projected Fiscal Year 2016 Revenues, Expenses, and Cash Flow. **Table 6** shows that without increasing the RAC rate, existing reserves are insufficient to support expenditures. Therefore, an increase to the Mission Creek Subbasin RAC is proposed for fiscal year 2016 to $112/AF.

Table 6
Coachella Valley Water District
Mission Creek Subbasin Area of Benefit
Groundwater Replenishment Program Income Statement

Description	Actual Fiscal Year (FY) 2014 ($)	Projected FY 2015 ($)	Projected FY 2016 ($)
Revenues			
RAC Revenues [1]	437,000	454,000	515,000
SWP Tax Revenue [2]	2,100,000	1,990,000	1,990,000
Other Revenue[3]	27,000	26,000	22,000
Total Revenues	**2,564,000**	**2,470,000**	**2,527,000**
Expenses			
Total O&M Costs	70,000	104,000	102,000
Administrative Costs[4]	101,000	135,000	139,000
State Water Project Cost			
SWP Table A Amounts Costs[5]	796,000	920,000	983,000
Supplemental SWP Water Costs[6]	51,000	51,000	50,000
Other SWP Costs[7]	1,334,000	1,434,000	1,529,000
Total SWP Costs	**2,181,000**	**2,405,000**	**2,562,000**
Supplemental Non SWP Water Costs[8]	418,000	785,000	852,000
Depreciation	1,000	1,000	1,000
Capital Improvement Budget	---	---	---
Supplemental Water Supply Charge - Use of Restricted Funds[9]	---	(50,000)	(50,000)
Total Expenses	**2,771,000**	**3,380,000**	**3,606,000**
Increase (Decrease) in Cash Flow - Replenishment	(125,000)	(494,000)	(506,000)
Increase (Decrease) in Cash Flow - SWP	(81,000)	(415,000)	(572,000)
Net Increase (Decrease) in Cash Flow	**(206,000)**	**(909,000)**	**(1,078,000)**
Ending Unrestricted Reserves	**1,470,000**	**1,761,000**	**1,255,000**
Ending Restricted Reserves	**3,050,000**	**2,635,000**	**2,063,000**
Ending Reserves	**4,520,000**	**4,396,000**	**3,318,000**

NOTES:
(1) RAC for FY 2014 and FY 2015= $98.73/AF. The RAC rate for FY 2016 is $112/AF. Projections are based on prior FY production.
(2) SWP Revenues collected from $.08 tax levy.
(3) Other Revenues include investment income.
(4) Includes personnel, meter reading, billing, groundwater monitoring and report preparation.
(5) SWP Table A costs that can be paid for by the RAC.
(6) SWP Turnback Water Pool A & B, Pool A & B Water and Yuba Dry Year that can be paid for by the RAC.
(7) SWP costs that cannot be paid for by the RAC.
(8) Mission Creek funds prorated amount of non-SWP water costs.
(9) Supplemental Water Supply Charge to off-set supplemental water purchases.

C. Methods for Determining Production

In accordance with Section 31638.5 of the California Water Code, Producers are required to have water-measuring devices installed on all wells or other water producing facilities within one year following the levy of a RAC. 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 AF of production (in kilowatt-hours per AF).

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 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 AF 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.

D. Replenishment Assessment Charge

GRP costs continue to increase. CVWD has analyzed projected expenses, revenues, and reserves over the next five years and determined that the RAC should be increased to $112/AF, effective July 1, 2015.

Based on Projected Revenue as shown in **Table 5**, the proposed RAC increase results in a projected decrease in Cash Flow in fiscal year 2016 in the amount of $1.1 million.

CHAPTER VII
CONCLUSION AND RECOMMENDATION

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CONCLUSION AND RECOMMENDATION

Because groundwater production from the Mission Creek Subbasin AOB continues to exceed natural inflow, the GRP must continue importing water for groundwater replenishment.

The GRP has proven to be effective in improving groundwater storage and eliminating groundwater overdraft. However, GRP costs continue to increase. CVWD has analyzed projected expenses, revenues, and reserves over the next five years and determined that the RAC should be increased in fiscal year 2016 to reduce the decrease in Cash Flow in the Mission Creek Replenishment Fund.

Therefore, an increase of the RAC to $112/AF is recommended to become effective on July 1, 2015.

CHAPTER VIII
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