TPWD

June 2021

2020 Urban Water Management Plan for Twentynine Palms Water District

FINAL

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Twentynine Palms Water District 2020 UWMP Update

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Prepared for

Twentynine Palms Water District
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Section 1: Layperson's Description/Introduction

1.1 Overview

This document presents the 2020 Urban Water Management Plan (UWMP, Plan) for the Twentynine Palms Water District (District, or TPWD) service area. This section describes the general purpose of the Plan, discusses Plan implementation, and provides general information about the District and service area characteristics.

The State of California mandates that all urban water suppliers within the state prepare an UWMP. Detailed information on what must be included in these plans as well as whom must complete them can be found in California Water Code (CWC) sections 10610 through 10657. According to the Urban Water Management Planning Act (UWMP Act) of 1983, an urban water supplier is defined as a supplier, either public or private, that provides water for municipal purposes either directly or indirectly to more than 3,000 customers or supplies more than 3,000 acre-feet (AF) annually.

1.2 Purpose

An UWMP is a planning tool that generally guides the actions of urban water suppliers. It provides managers and the public with a broad perspective on a number of water supply issues. It is not a substitute for project-specific planning documents, nor was it intended to be when mandated by the State Legislature. For example, the Legislature mandated that a plan include a section which "…describes the opportunities for exchanges or water transfers on a short-term or long-term basis." (Wat. Code, § 10631, subd. (d)). The identification of such opportunities and the inclusion of those opportunities in a plan's general water service reliability analysis neither commits an urban water supplier to pursue a particular water exchange/transfer opportunity, nor precludes it from exploring exchange/transfer opportunities never identified in its plan. Before an urban water supplier is able to implement any potential future sources of water supply identified in a plan, detailed project plans are prepared and approved, financial and operational plans are developed and all required environmental analysis is completed.

"A plan is intended to function as a planning tool to guide broad-perspective decision making by the management of water suppliers." (*Sonoma County Water Coalition v. Sonoma County Water Agency* (2010) 189 Cal. App. 4th 33, 39.) It should not be viewed as an exact blueprint for supply and demand management. Water management in California is not a matter of certainty and planning projections may change in response to a number of factors. "Long-term water planning involves expectations and not certainties. Our Supreme Court has recognized the uncertainties inherent in long-term land use and water planning and observed that the generalized information required . . . in the early stages of the planning process are replaced by firm assurances of water supplies at later stages." (Id., at 41.) From this perspective, it is appropriate to look at the UWMP as a general planning framework, not a specific action plan. It is an effort to generally answer a series of planning questions such as:

- What are the potential sources of supply and what amounts are estimated to be available from them?

- What is the projected demand, given a reasonable set of assumptions about growth and implementation of good water management practices?

- How do the projected supply and demand figures compare and relate to each other?

Using these "framework" questions and resulting answers, the implementing agency will pursue feasible and cost-effective options and opportunities to develop supplies and meet demands.

Water suppliers will explore enhancing basic supplies from traditional sources such as local groundwater and imported water as well as other options. These include groundwater extraction, water exchanges and transfers, water conservation, recycling, brackish water desalination and water banking/conjunctive use. Additional specific planning efforts may be undertaken in regard to each option, involving detailed evaluations of how each option would fit into the overall supply/demand framework, potential environmental impacts, and how each option would affect customers.

The Act requires preparation of a plan that, among other things:

- Accomplishes water supply planning over a 20-year period in five year increments (the District is going beyond the requirements of the Act by developing a plan which spans twenty-five years).

- Identifies and quantifies existing and projected water supply opportunities, including recycled water, for existing and future demands, in normal, single-dry and multiple-dry years.

- Implements conservation and efficient use of urban water supplies.

State legislation, Senate Bill 7 of Special Extended Session 7 (SBX7-7) was signed into law in November 2009, which calls for progress towards a 20 percent reduction in per capita water use statewide by 2020. The legislation requires that retailers develop and report the 2020 water use target, their baseline daily per capita use and 2020 compliance daily per capita use, along with the basis for determining those estimates. This UWMP reports on TPWD's progress in meeting the SBX7-7 targets.

The District's 2020 UWMP revises the 2015 UWMP and incorporates changes enacted by legislation since that time. The Act has been modified over the years in response to the state's water shortages, droughts, and other factors. The main changes since 2015 to note include:

1. UWMP Submittal Date: 2020 UWMP updates must be adopted and submitted to DWR by July 1, 2021.

2. Reporting on Compliance with SBx7-7 Targets: The 2020 UWMP will be required to document compliance with the 20% reduction described in the *20 by 2020 Water Conservation Plan*, and a comparison of actual water use against the target.

3. Reporting compliance with Water Loss Standard: The State Water Resources Control Board (SWRCB) was to adopt a water loss standard no later than July 1, 2020. Currently it appears as if the formal rulemaking and standards will not be adopted until 2021. Retail water suppliers such as the TPWD will have to show progress on meeting a water loss standard in the 2020 UWMP. Water loss standards go into effect June 30, 2022.

4. 5-year Drought Risk Assessment: In past UWMPs suppliers were to conduct a drought risk assessment assuming a period of drought lasting 3 consecutive years. This requirement has changed, and suppliers must now conduct an assessment for a drought lasting 5 years.

5. Sustainable Groundwater Management Act (AB 1739, SB1168, and SB1319): Requires UWMPs to show consistency with Groundwater Sustainability Plan (GSP) supply protections, if applicable.

6. Seismic Risk Assessment (SB 664): Requires an urban water supplier to include within its plan a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities. This bill allows an urban water supplier to comply with this requirement by submitting a copy of the most recent adopted local hazard mitigation plan or multi-hazard mitigation plan if that plan specifically addressed seismic risk to the water supplier's infrastructure.

7. Water Shortage Contingency Plan (WSCP) Updates: State requirements call for an update to the existing WSCP and that it be formally adopted as a stand-alone plan. The WSCP must be updated in parallel to the UWMP.

8. Making Water Conservation a California Way of Life (AB 1668 and SB 606): Regulations targeting indoor water demand and affecting the need for additional water use efficiency in the State.

9. Annual Water Supply and Demand Assessments will be required, starting June 2022, and the process to do the assessment must be described in the 2020 UWMP.

Items optional in the past, but now required, include: calculating the energy intensity of water, incorporation of land use changes in demand forecasting, and calculating water savings from codes and standards.

A checklist to ensure compliance of this Plan with UWMP Act requirements is provided in Appendix A.

It is the stated goal of the District to deliver a reliable and high-quality water supply to its customers, even during dry periods. Based on conservative water supply and demand assumptions over the next twenty-five years in combination with conservation of non-essential demand during normal water years, the 2020 UWMP successfully achieves this goal.

1.3 Basis for Preparing a Plan

In accordance with the CWC, urban water suppliers with 3,000 or more service connections, or supplying 3,000 or more AFY, are required to prepare a UWMP every five years. TPWD qualifies as an urban supplier and its 2020 UWMP must be approved and submitted to the Department of Water Resources (DWR) by July 1, 2021.

1.3.1 Relationship to Other Planning Done by the District

The District has developed plans and policies to expand and provide an adequate water supply and water quality for its service area and for the City of Twentynine Palms. The plans and policies include:

- 2014 Groundwater Management Plan (GMP) – The GMP was prepared in accordance with Assembly Bill 3030 (AB 3030) to protect the quantity and quality of groundwater within its service area and ensure a sustainable groundwater basin to meet future water supply needs.

- Salt and Nutrient Management Plan (SNMP) – The SNMP was developed to monitor and protect the groundwater resources in Twentynine Palms area in response to an increased need to assess potential groundwater quality impacts from salt and nutrient sources that are derived primarily from septic tanks.

- Participation in the Mojave Integrated Regional Water Management Plan (IRWM) – The IRWM Plan is a collaborative, stakeholder-driven effort to manage all aspects of water resources in the High Desert region and sets a vision for the next 10-plus years of water management.

- Local Hazard Mitigation Plan (LHMP) – The LHMP was developed to identify potential hazards to TPWD and formulate mitigation measures for future protection of the District's critical infrastructure and the community's safety with respect to the District's facilities and services.

- Pipeline and Water Storage Tank Condition Assessment – The condition assessment was prepared to perform a pipeline risk assessment, a seismic evaluation, and develop a prioritized pipeline and capital improvement program.

- Groundwater Monitoring Implementation Plan – In 2017 the District prepared a Groundwater Monitoring Implementation Plan. The purpose of the Plan was to develop an implementation plan to provide a detailed monitoring plan and time schedule for the proposed groundwater monitoring activities in accordance with the SNMP.

1.3.2 Relationship to Water Shortage Contingency Plan

Concurrent with the 2020 UWMP update, TPWD will also updated its WSCP consistent with CWC Section 10632 and Section 10635. The WSCP outlines the District's action plan for a drought or catastrophic water supply shortage and specifies opportunities to reduce demand and augment supplies under such conditions. The WSCP was adopted as a stand-alone document and is referenced in this Plan and is also included as an attachment in Appendix I.

1.4 Implementation of the Plan

This subsection provides the cooperative framework within which the Plan will be implemented including agency coordination, public outreach, and resources maximization.

1.4.1 Public Water Systems

Public water systems (PWS) are the systems that provide drinking water for human consumption, which are regulated by the State Water Resources Control Board Division of Drinking Water (SWRCB DDW). PWSs are required to electronically file Annual Reports with the SWRCB DDW, which include water usage and other information. TABLE 1-1 provides the name and PWS number of the public water system (drinking water only) that is managed by the District and covered in this UWMP.

TABLE 1-1 RETAIL PUBLIC WATER SYSTEM

Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Total Volume of Water Supplied 2020 (Acre-Feet [AF])[(a)]
3610049	TPWD	7,438	2,449
Total		**7,438**	**2,449**

Notes:
(a) Total production for 2020, includes losses (See Table 2-1 and Table 2-4).

1.4.2 Fiscal or Calendar Year

A water supplier may report on a fiscal year or calendar year basis but must clearly state in its UWMP the type of year that is used for reporting. The type of year should remain consistent throughout the Plan.

DWR prefers that agencies report on a calendar year basis in order to ensure UWMP data is consistent with data submitted in other reports to the State. All data in this Plan is reported in calendar years, and in AF.

1.5 Cooperative Preparation of the Plan

Water agencies are permitted by the State to either work independently to develop an UWMP whereby they can coordinate their planning with retail agencies within their service area to develop a cooperative regional plan. The former approach has been adopted by the District; however, the Plan was developed in coordination with the retail water agencies within the District's service area. Water resource specialists with expertise in water resource management were retained to assist the local water agencies in preparing the details of their Plans. Agency coordination for this Plan is summarized in TABLE 1-2

TABLE 1-2 AGENCY COORDINATION

	Participated in UWMP Development	Received Copy of Draft	Commented on Draft	Attended Public Meetings	Contacted for Assistance	Sent Notice of Intent to Adopt	Not Involved
City of Twentynine Palms	✓	✓				✓	
San Bernardino County Land Use Services	✓	✓				✓	
Joshua Basin Water District	✓	✓				✓	
Natural Resources Environmental Affairs	✓	✓				✓	
Twentynine Palms Band of Mission Indians	✓	✓				✓	

1.5.1 Plan Adoption

The District began preparation of this Plan in September 2020. The final draft of the Plan was adopted by the District Board on June 23, 2021 and was submitted to DWR within thirty days of Board approval.

This plan includes all information necessary to meet the requirements of Water Conservation Act of 2009 (Wat. Code, §§ 10608.12-10608.64) and the Urban Water Management Planning Act (Wat. Code, §§ 10610-10656).

1.5.2 Public Outreach

The District has encouraged community participation in water planning. Interested groups were informed about the development of the Plan along with the schedule of public activities. Notices of public meetings were published in the local press and at the water supplier website. The District neither receives water from a wholesaler nor supplies water to retail water purveyors. As such, information from other agencies was not necessary for the completion of this report. However, copies of the draft UWMP were sent to the County of San Bernardino and City of Twentynine Palms for review and comment as noted in TABLE 1-2. TABLE 1-3 presents a timeline for public participation during the development of the Plan. A copy of the public outreach materials are provided in Appendix B.

TABLE 1-3 PUBLIC PARTICIPATION TIMELINE

Date	Milestone	Public Participation Task
September 15, 2020	UWMP Kick-off	Describe UWMP requirements and process
June 14, 2021	Draft UWMP	Draft released to solicit input
June 23, 2021	Public Hearing	Review contents of Draft UWMP and take comments
June 23, 2021	Board Adoption	UWMP and WSCP considered for approval by the Board

1.6 Water Management within the Twentynine Palms Water District Service Area

The District service area encompasses approximately 87 square miles and includes the City of Twentynine Palms (City) (see FIGURE 1-1). The District is located in the high desert of southern California, approximately 72 miles due east of the City of San Bernardino and 35 miles northeast of the City of Palm Springs. Groundwater is the primary source of water for the District. Prior to 1954, the Twentynine Palms area was served by three privately owned water companies: Abell Water Company, Condor Mutual Water Company, and Pacific Water Company. The District was formed in 1954 and immediately purchased the three water companies. Their wells, storage facilities, and piping served as the initial water system for the District. Historical pumping and water deliveries by the District have steadily increased since its formation in the mid-1950s. The District's mission is to provide a safe and adequate supply of water at the lowest feasible cost to the people of the district and to preserve and protect the water resources within the established boundaries of the District.

The District provides groundwater to a population of approximately 18,700 residents within an 87-square mile area, consisting of 7,438 meter services, 200 miles of pipeline and 17 million gallons of water storage capacity. Wastewater is disposed of through individual septic systems and the District does not use any recycled water or other non-potable water sources. Annual water usage is approximately 2,100 – 2,900 AF which is mostly used by single-family residential (approximately 83%) and the other 20% is a combination of multi-family residential, commercial, or landscape/irrigation (see FIGURE 1-2).

100% of the District's water supply is provided by groundwater pumped from seven (7) water production wells, mostly along the southern edge of the service area. The District has one (1) groundwater treatment facility which removes fluoride from one (1) water production well. The pipelines distribute the water via eight (8) booster pump stations and ten (10) water storage reservoirs. The booster pump stations are electrically powered with provisions for back-up power provided by the District's mobile emergency generators. Water pressure for the District's customers is determined by the District's eight (8) pressure zones, which range from 2080' to 2830'.

Potable water is scarce in the District for the following reasons:

- Due to drought conditions the area has recently received far less than the historical average of approximately five inches of annual rainfall.
- There is negligible infiltration of direct precipitation in areas where alluvial deposits are thick.
- A substantial amount of available runoff is lost to evaporation after flowing into the basin.

There is no community sewage system and wastewater is disposed of through individual septic tank and tile field disposal systems.

1.7 Population, Demographics, and Socioeconomics

The District's service area falls within the Mojave Region, just east of Yucca Valley, Joshua Tree National Park, and includes the Twentynine Palms Marine Corps Base.

Residential development is currently the single largest land use within the District. Approximately 83% of residential development is single-family homes. The remaining 17% of the District's land use is made up of some multi-family residential units, commercial properties, and minor light industry, see FIGURE 1-2 for a schematic of the land uses. The current population that the District serves is approximately 16,182 (based on DWR Population Tool). The District's service area is considered 100% disadvantaged, based on the State's definition of a disadvantaged community having an income of 80% less than the State's Median Household Income (MHI). Using American Community Survey data for the years 2014-2019, 80% of the Statewide MHI is $62,843.

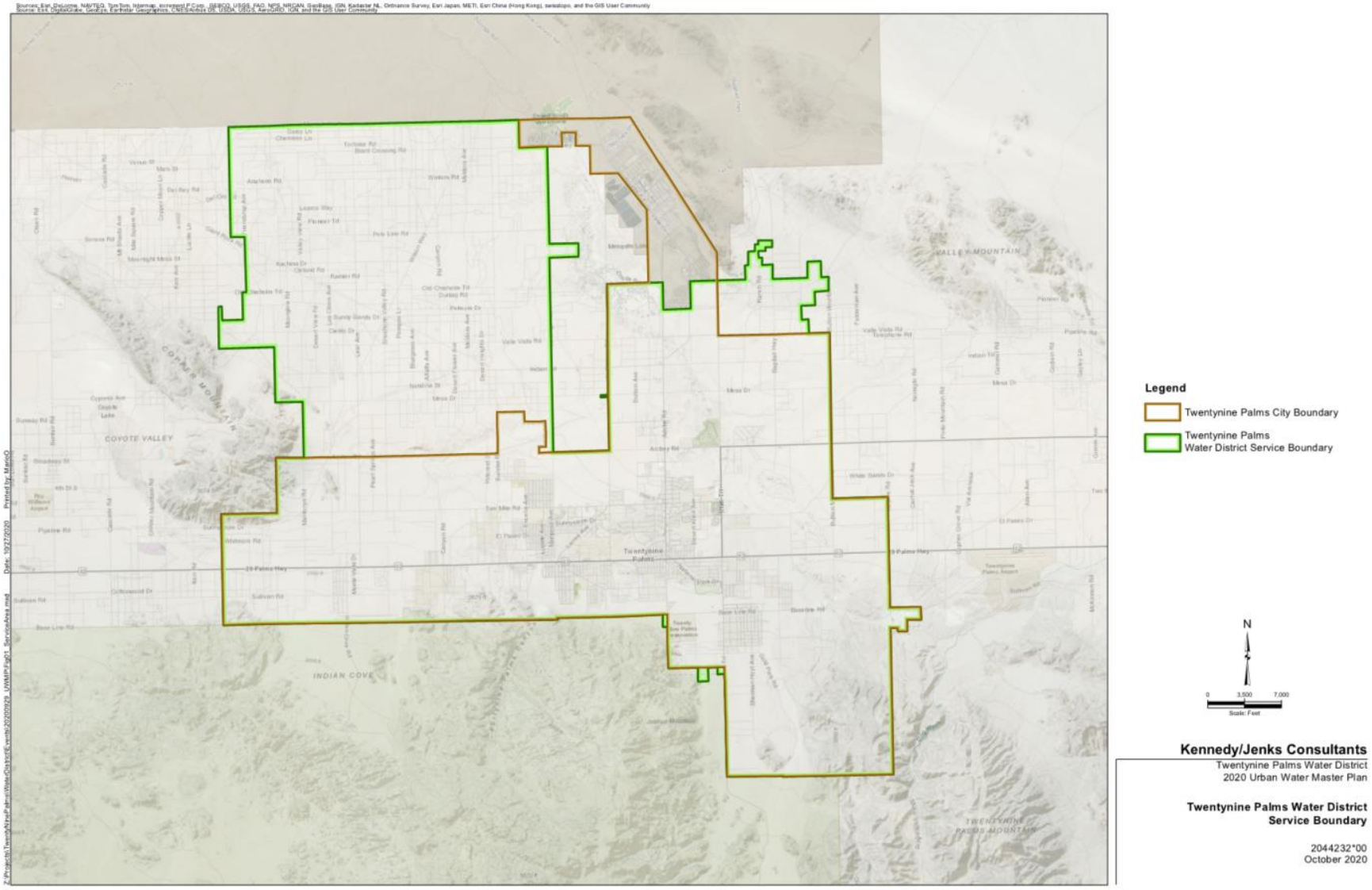

FIGURE 1-1 DISTRICT SERVICE AREA

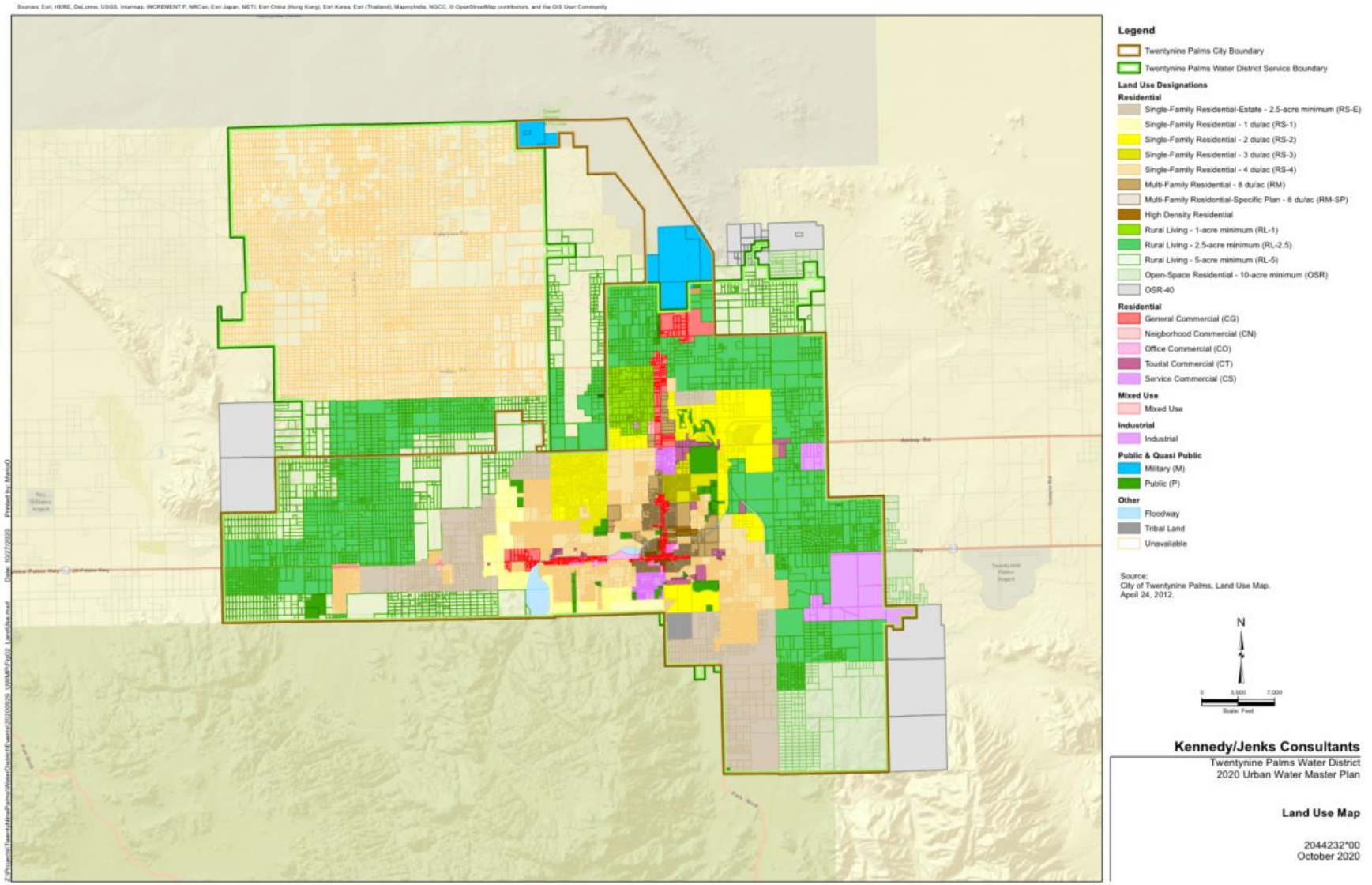

FIGURE 1-2 DISTRICT LAND USE

Potable water is scarce in the District for several reasons:

- Due to drought conditions the area has recently received far less than the historical average of approximately five inches of annual rainfall.
- There is negligible infiltration of direct precipitation in areas where alluvial deposits are thick.
- A substantial amount of available runoff is lost to evaporation after flowing into the basin.

Some of the local groundwater is unsuitable for drinking water purposes due to naturally occurring soluble minerals, such as fluoride, in addition to hexavalent chromium and arsenic. This is discussed in Section 6 of this Plan.

TABLE 1-4 AVERAGE DEMOGRAPHICS FOR TWENTYNINE PALMS AND JOSHUA TREE[1]

Demographic Category	Twentynine Palms Value	Joshua Tree Value
Age and Sex		
Persons under 5 years, percent	11.00%	8.50%
Persons under 18 years, percent	26.50%	17.90%
Persons 65 years and over, percent	6.10%	21.40%
Female persons, percent	42.90%	52.00%
Race and Hispanic Origin		
White alone, percent	72.40%	87.30%
White alone, not Hispanic or Latino, percent	55.80%	70.60%
Black or African American alone, percent	11.80%	1.30%
American Indian and Alaska Native alone, percent	1.20%	0.20%
Asian alone, percent	3.50%	1.70%
Native Hawaiian and Other Pacific Islander alone, percent	1.20%	0.60%
Two or More Races, percent	6.70%	7.30%
Hispanic or Latino, percent	21.80%	19.30%
Housing		
Owner-occupied housing unit rate, 2014-2018	30.40%	51.00%
Median value of owner-occupied housing units, 2014-2018	$132,200	$124,600
Families & Living Arrangements		
Persons per household, 2014-2018	2.7	2.34
Economy		
In civilian labor force, total, percent of population age 16 years+, 2014-2018	38.40%	43.00%
Persons in poverty, percent	23.50%	24.60

Notes:
1. Data taken from US Census Bureau (census.gov)

1.8 Population

The District currently (2020) serves 7,438 active connections, all of which are metered accounts and mostly (greater than 90%) residential. Commercial connections account for approximately 4%, and landscape irrigation and construction use/non-potable connections account for less than 1% of the District's total connections. TABLE 1-5 provides a summary of the District's historical service connections.

TABLE 1-5 HISTORICAL SERVICE CONNECTIONS

Land Use	2015	2020
Single Family Residential	5,369	6,038
Multi-Family Residential	1,061	1,083
Commercial/Institutional	294	282
Industrial	0	0
Landscape Irrigation	35	34
Other (Construction Use/ Non-potable)	0	1
Total	**6,759**	**7,438**

Source: District Public Water System Statistics.

The District's 2015 and 2020 populations were derived using the DWR's online population tool (see Appendix D) which utilizes Geographical Information Systems (GIS) and connection data based on Census years. These estimates were then interpolated to derive population in years between 2015 and 2020. Since 2015, the population has increased by about 25%. However, DWR recommends using their DWR Population Tool to calculate both the 2015 and the 2020 population which as mentioned is based on the most recent Census data (2019). The 2020 Census data was not available at the time of this UWMP preparation and so the values may not reflect actual conditions.

TABLE 1-6 shows the resulting historic population estimates.

TABLE 1-6 HISTORICAL POPULATION ESTIMATES

	2015[(a)]	2016	2017	2018	2019	2020[(a)]
Population	14,985	15,224	15,464	15,703	15,943	16,182

Notes:
(a) DWR online population tool. See Appendix D for the population tool printout.
(b) Population for 2016 through 2019 were interpolated from the 2015 and 2020 values.

Population projections for the TPWD were derived from the Southern California Association of Governments (SCAG) 2020 Regional Transportation Plan (RTP). TABLE 1-7 reflects the District's population projections.

TABLE 1-7 PROJECTED POPULATION ESTIMATES

	2025	2030	2035	2040	2045
Twentynine Palms Water District[(a)]	19,901	20,933	22,024	23,009	24,038

Notes:
(a) SCAG 2020 RTP for the Twentynine Palms Water District.

1.9 Land Uses in the Service Area

The breakdown of land uses in the service area were calculated using San Bernardino County (SBC) parcel data as well as the most recent land use data taken from general and specific plans (provided by TPWD). Existing land uses were determined from only developed parcels (not classified as "vacant" by SBC parcel data). TABLE 1-8 provides a breakdown of these land uses. FIGURE 1-2 shows the identified land use categories in the TPWD service area and identifies which areas are developed/undeveloped.

TABLE 1-8 EXISTING LAND USES IN SERVICE AREA

Land Use Type	Acreage
Single Family Residential	12,555
Multi-Family Residential	344
Commercial	888
Industrial	0
Landscape/Irrigation	139
Total	**13,926**

Of the 54,699 acres that make up the TPWD service area, 13,926 are currently developed. TPWD currently does not serve any industrial customers. A vast majority of the existing developed area in TPWD is single family residential (90%).

1.10 Climate

The climate in the District's water service area is arid with average annual rainfall of less than five inches, most of which occurs during the winter months. It is important to note that over the past five years, precipitation has been nearly zero (CIMIS Station No. 233).

Temperatures range in average from 46 to 50°F during the winter and from 61 to 104°F degrees during the summer. TABLE 1-9 presents the region's annual average climate data. The temperature, rainfall, and standard monthly average evapotranspiration (ETo) is provided from CIMIS Station Number 233 in Joshua Tree.

TABLE 1-9 CLIMATE DATA

Month	Standard Monthly Average Evapotranspiration (ETo) (inches)	Average Total Rainfall (inches)	Average Temperature (degrees Fahrenheit)	
			Max	Min
January	2.83	0.51	62.86	34.98
February	3.67	0.54	67.90	37.44
March	5.98	0.27	72.74	41.04
April	7.65	0.52	81.66	47.28
May	9.69	0.16	87.98	51.62

Month	Standard Monthly Average Evapotranspiration (ETo) (inches)	Average Total Rainfall (inches)	Average Temperature (degrees Fahrenheit)	
			Max	Min
June	10.83	0.00	100.48	61.74
July	10.19	0.60	104.34	69.64
August	9.39	0.16	103.72	69.94
September	7.4	0.46	94.03	60.73
October	5.18	0.37	82.63	48.95
November	3.29	0.16	72.88	39.98
December	2.42	0.32	62.80	33.70

Source: California Irrigation Management System (CIMIS) data provided from Station No. 233 in Joshua Tree, San Bernardino County, January 1, 2016 to August 31, 2020 http://wwwcimis.water.ca.gov/cimis/welcome.jsp.

1.11 Potential Effects of Climate Change

A topic of growing interest and research for water planners and managers is climate change and the potential impacts it could have on California's future water supplies. DWR's California Water Plan considers how climate change may affect water availability, water use, water quality, and the ecosystem. The California Water Plan Update 2018 builds upon previous updates and provides recommended actions, funding scenarios, and an investment strategy to meet the challenges and goals laid out in the prior 2013 Plan.[1] Chapter 3 of the California Water Plan, "Actions for Sustainability", Volume 1, Chapter 5 of the California Water Plan, "Managing an Uncertain Future," evaluated three different scenarios of future water demand based on alternative but plausible assumptions on population growth, land use changes, water conservation and future climate change. Future updates will test different response packages, or combinations of resource management strategies, for each future scenario. These response packages help decision-makers, water managers, and planners develop integrated water management (IRWM) plans that provide for resource sustainability and investments in actions with more sustainable outcomes. The 2018 Update provides recommended actions in order to support each of the identified goals of the plan. The goals are 1) Improve Integrated Watershed Management, 2) Strengthen Resiliency and Operational Flexibility of Existing and Future Infrastructure, 3) Restore Critical Ecosystem Functions, 4) Empower California's Under-Represented or Vulnerable Communities, 5) Improve Inter-Agency Alignment and Address Persistent Regulatory Challenges, and 6) Support Real-Time Decision-Making, Adaptive Management, and Long-Term Planning. California faces the prospect of additional water management challenges due to a variety of issues including population growth, regulatory restrictions and climate change. Climate change is of particular interest because of the range of possibilities and their potential impacts on essential operations. The most likely scenarios involve increased temperatures, which will reduce the Sierra Nevada snowpack and shift more runoff to winter months, and accelerated sea level rise. The other much-discussed climate change scenario is an increase in precipitation variability, with more extreme drought and flood events posing additional challenges to water managers (DWR 2014).

Even without population changes, water demand could increase. Precipitation and temperature influence water demand for outdoor landscaping and irrigated agriculture. Evaporative coolers

[1] California Water Plan Update 2018

and outdoor water use are a large component of water demands in the District's service area. Lower spring rainfall increases the need to apply irrigation water. Further, warmer temperatures increase crop evapotranspiration, which increases water demand. These effects and their potential to impact demands are considered in Section 2 of this Plan.

1.12 Climate Change Vulnerability Analysis

Identification of watershed characteristics that could potentially be vulnerable to future climate change is the first step in assessing climate change vulnerabilities in a Region. In the context of this analysis, vulnerability is defined as the degree to which a system is exposed to, susceptible to, and able to cope with and adapt to, the adverse effects of climate change, consistent with the definition in the recently issued Climate Change Handbook for Regional Water Planning (DWR 2011b).

Water-related resources that are considered important and potentially sensitive to future climate change include water demands, water supplies, water quality, sea level rise, flooding, and ecosystem and habitat. A qualitative assessment of each of these resources with respect to anticipated climate change impacts has been prepared in the 2014 IRWM Plan for the Mojave Region (KJC 2014d). The assessment follows the climate change vulnerability checklist assessment as defined in the Climate Change Handbook and highlights those water-related resources that are regionally important and sensitive to climate change. This checklist is provided as Appendix C. The effects of climate change on water use and reliability are further addressed in the water use section (Section 2), future supplies (Section 4), and water supply reliability (Section 7).

1.13 Fundamental Findings of the Urban Water Management Plan

It is the stated goal of TPWD to deliver a reliable and high-quality water supply for customers. The analysis in this Plan documents that in a normal, single-dry year, and multiple-dry year, TPWD has adequate supplies for customers.

Section 2: Water Use

2.1 Overview

This section describes historical and current water usage and the methodology used to project future demands within the District's service area. Water usage is divided into sectors such as residential, industrial, commercial, landscape and other. To undertake this evaluation, existing land use data and new housing construction information were compiled by the District. This information was then compared to historical trends for new water service connections and customer water usage information. In addition, weather and water conservation effects on historical water usage were considered in the evaluation.

Several factors can affect demand projections, including:

- Land use revisions
- New regulations
- Consumer choice
- Economic conditions
- Transportation needs
- Environmental factors
- Conservation programs
- Building and plumbing codes

The foregoing factors affect the amount of water needed, as well as the timing of when it is needed. During an economic recession, there is a major downturn in development and a subsequent slowing of the projected demand for water. The projections in this Plan do not attempt to forecast recessions or droughts. Likewise, no speculation is made about future building and plumbing codes or other regulatory changes. However, the projections do include water conservation consistent with new legislative requirements calling for a 20% reduction in per capita demand by 2020 (SBX7-7).

An analysis was performed that combined growth projections with water use data to forecast total water demand in future years. Water uses were broken out into specific categories and assumptions made about each to more accurately project future use. Three separate data sets were collected and included in the analysis: historical water use by land use type, current population and projected population.

2.2 Non-Potable Versus Potable Water Use

The District only serves potable water supplies within its service area, except for providing non-potable water for construction use. The District does not provide recycled water.

2.2.1 Water Use Sectors

The water use categories are characterized as follows:

- Single-Family Residential – A single family dwelling unit, generally a single lot containing a single home.
- Multi-Family Residential – Multiple dwelling units contained within one building or a complex of several buildings.
- Commercial/Institutional – This category captures water customers conducting business (i.e. providing a product or service), as well as water users dedicated to public service.
- Industrial – Water users under this category are typically manufacturers or processors of materials. There are no industrial customers in the District's service area.
- Landscape/Irrigation – Water connections supplying water solely for landscape irrigation, including landscapes in a residential, commercial, or institutional setting.
- Other – This water use category includes non-potable water provided for construction use.

2.3 Historical and Current Water Use

The District's service area customers include residential, irrigation, commercial, industrial, and institutional users. The District has meters on all residential, commercial and landscape service connections in the service area and requires meters on all new connections.

All water supplies used to meet the District's municipal water requirements are summarized in TABLE 2-1. Over the last five years, total water use has shown an overall increasing trend from 2015 when agencies had to manage demands largely due to response to drought conditions and statewide water use reduction mandates. As the state came out of the drought demands have rebounded as shown in FIGURE 2-1.

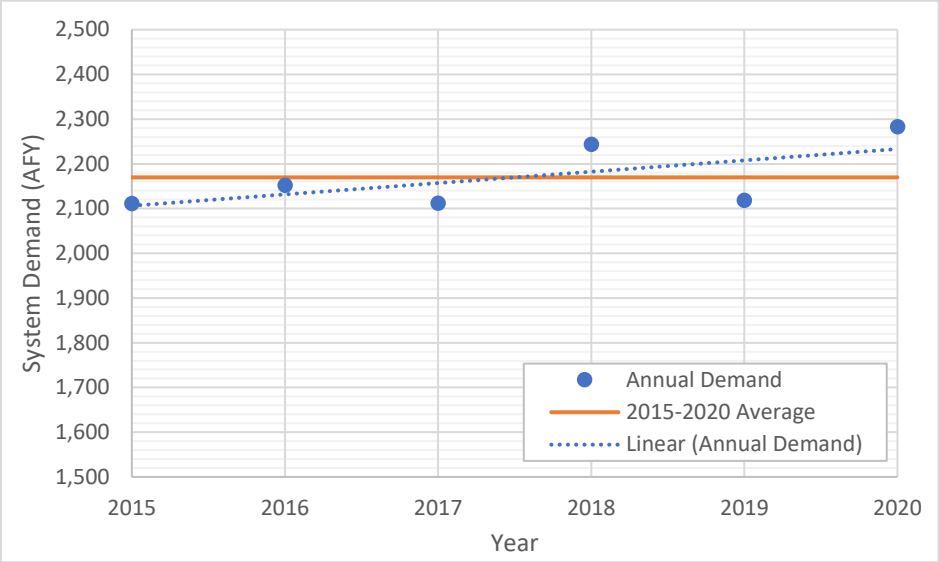

FIGURE 2-1 SYSTEM DEMAND WATER USE (2015-2020)

TABLE 2-1 WATER DELIVERIES 2010, 2015, AND 2020 (AF)

	Level of Treatment	2010	2015	2020[(a)]
Single Family Residential	Drinking Water	1,729	1,429	1,608
Multi-Family Residential	Drinking Water	442	335	420
Commercial/Institutional	Drinking Water	278	232	186
Industrial	Drinking Water	0	0	0
Landscape/Irrigation	Drinking Water	125	114	133
Other (Construction Use/ Non-potable)	Non-Potable	102	1	102
Total		**2,676**	**2,111**	**2,449**

Note:
(a) TPWD Billed Metered Authorized Consumption, 2020 and personal communication, Ray Kolisz, TPWD.

2.3.1 Historical Sales

The District does not sell water to other water agencies, however, does operate a pay meter station for residents who reside outside the District service area, as shown in TABLE 1-2. No other arrangements for delivery or sales to other agencies currently exist with the District.

TABLE 2-2 HISTORICAL SALES TO OTHER WATER AGENCIES[(a)] (AF)

Agency	2010	2015	2020
Sales (AF)	0	13.5	29.8
Total	0	13.5	29.8

Note:
(a) Water is provided at a pay meter for residents who reside outside of the District.

2.3.2 Distribution System Water Losses

In addition to the traditional demand sources, there is another component that impacts the District's water resources known as "water losses." This component is typically defined as the difference between water production and water sales. These water losses can come from authorized, but unmetered sources, such as firefighting and main flushing, or unauthorized sources such as leakage, illegal connections, and inaccurate flow meters.

For the 2020 UWMPs, water retailers must use the distribution system loss methodology provided by DWR to calculate these losses, based on the American Water Works Association's (AWWA) M36 Manual. Water losses are summarized in TABLE 2-3 and the water audits are provided in Appendix E. On average, over the last five years, system water losses have averaged 12 percent of total water consumption.

TABLE 2-3 12 MONTH WATER LOSS AUDIT REPORT SUMMARY

Reporting Period Start Date (Month/Year)	Volume of Water Loss (AF) [(a)]	Water Loss as % of Water Supplied
01/2016	353	14.02%
01/2017	365	14.45%
01/2018	268	10.45%
01/2019	206	8.62%
01/2020	256	9.46%

Note:
(a) Sum of real and apparent losses based on AWWA water audit software output (provided in Appendix E) and water loss from groundwater pumping to the District's system (Table 4-3).

At the current time a water loss standard has not been adopted by the State of California. Future UWMPs prepared by TPWD will report on compliance with any State water loss standards.

To reduce labor costs to manually read the water meters, provide early leak detection that will ultimately provide cost saving to the customer and provide water conservation, the District started to investigate the use of Automated Meter Infrastructure (AMI) and/or Automated Meter Reading (AMR) systems. The Board of Directors adopted Resolution 19-0 on March 12, 2019 to secure funding to convert all meters within the District to AMI/AMR. In June 2020, the District completed the installation of 8,000 water meters. The AMI project has allowed the District to monitor possible leaks on the customer side of the meter, resulting in faster response repairs, saving the customer from a high usage water bill and promoting water conservation.

TABLE 2-4 summarizes "other" water uses besides metered deliveries and sales to other agencies.

TABLE 2-4 HISTORICAL AND CURRENT "OTHER" WATER USES (AF)

Water Use[(a)]	2015	2020
Groundwater Recharge/Storage/Banking	0	0
Long Term System Storage	0	0
Saline Water Intrusion Barrier	0	0
Agricultural Irrigation	0	0
Other	0	0
System Losses	293[(b)]	256[(c)]
Total	**293**	**256**

Notes:
(a) Any water accounted for in Tables 2-1 and 2-2 are not included in this table.
(b) District's 2015 Public Water System Statistics.
(c) TPWD Billed Metered Authorized Consumption, 2020 and personal communication, Ray Kolisz, TPWD.

2.4 Projected Water Use

2.4.1 Water Delivery Demand Projections Based on Land Use

The TPWD's projected water deliveries were estimated considering various factors, including historical and current demands, SCAG population projection data, and land use data. FIGURE 1-2 shows the land use classifications of both the developed and undeveloped areas within TPWD service area.

A relationship was first developed between the projected population and the projected land uses of the undeveloped areas within the TPWD service area, using the estimated 2020 population within the TPWD service area and the total developed residential acreage within the TPWD service area. The estimated 2020 population within the TPWD service area is 16,182 based on the DWR online population tool (see TABLE 1-6). Based on existing land use data, there are approximately 14,000 acres of developed residential acreage within the TPWD service area, which equates to approximately 9 persons per acre of residential land. Therefore, for every 9 persons that SCAG estimates will be added to the TPWD service area, 1 acre of residential land will develop. Approximately 98% of the existing developed residential acreage is single-family residential and 2% is multi-family residential.

Using the average historical water deliveries by usage category from 2015-2020 (see TABLE 2-1) combined with the existing developed land use data (see TABLE 1-8), unit demand factors with units of AFY per acre (AFY/Ac) for each usage category were developed. TABLE 2-5 shows the unit demand factors developed for the demand projections analysis. Since TPWD has no "Industrial" customers, it was assumed that no future industrial demand would develop within the TPWD service area.

TABLE 2-5 UNIT DEMAND FACTORS [a]

Usage Type	AFY/Ac
Single Family Residential	0.12
Multi-Family Residential	1.10
Commercial [b]	0.24
Landscape/Irrigation	0.85

Notes:
(a) Based on 2015-2020 consumption and land use classifications
(b) Includes Institutional/Governmental Usage

Lastly, the land use data of the remaining undeveloped parcels within the TPWD service area was analyzed to develop a ratio of undeveloped residential acreage to undeveloped commercial, industrial, and landscape acreages. The remaining undeveloped parcel acreages by land use are shown in TABLE 2-6, as well as the area ratios.

TABLE 2-6 ACREAGE OF REMAINING UNDEVELOPED PARCELS WITHIN TPWD SERVICE AREA BY LAND USE

Usage Type	Acreage	Ratio to Residential Acreage
Single Family Residential	37,976	-
Multi-Family Residential	440	-
Commercial [a]	1,735	0.05
Landscape/Irrigation	622	0.02

Note:
(a) Includes Institutional/Governmental Usage

Based on the land use classifications of the remaining undeveloped parcels within the TPWD service area, for every 1 acre of residential area developed, approximately 0.05 acres of commercial and 0.02 acres of landscape irrigation area will develop. Since no specific timelines are available for when the various commercial or landscape irrigation projects will be completed, this method assumes that acreages associated with each land use type will increase in parallel with one another from the year 2020 up to “Buildout” (when all of the area inside of the TPWD service area is assumed to be developed) at the ratios/rates identified above. FIGURE 2-2 illustrates the projected growth in acreage in the TPWD service area by land use category and shows how the majority of growth expected in the service area is residential.

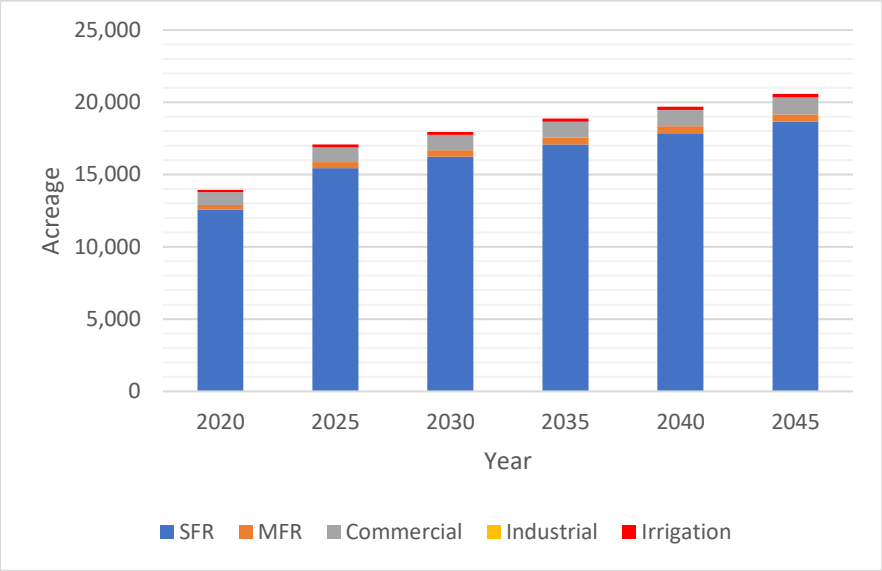

FIGURE 2-2 PROJECTED WATER DEMAND BY LAND USE CATEGORY

Given the projected population from TABLE 1-6 the calculated number of persons per residential acre, the unit demands from TABLE 2-5 and the area ratios for the remaining undeveloped parcels within the TPWD service area from TABLE 2-6 water delivery projections were developed through the year 2045, and are presented in TABLE 2-8. A linear growth rate for development was assumed between 2020 and 2045.

In addition, recent legislation provides that “if available and applicable” to the TPWD, demand projections “may” display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area. If such information is reported, the assessment will provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections. This UWMP does not include such savings in the demand projections.

The District was asked to identify any known identified projects, changes in water demands are expected to occur from the addition and conversion of residential, commercial, industrial and institutional, and landscape land use categories. As shown in TABLE 2-7 below, the District does not see any foreseeable changes in land use that will result in additional water demand.

It should be noted that transportation plans were not specifically accounted for in these demand projections.

TABLE 2-7 DEMANDS FROM ANTICIPATED FUTURE DEVELOPMENTS (AF)

Development Name	2025	2030	2035	2040	2045
NA	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**

Source: Personal Communication, Ray Kolisz, TPWD.

2.4.2 Effects of Climate Change on Water Use

The District plans to continue implementing effective demand management measures which are anticipated to impede major increases or rebounds in future per capita demands. Projected water demands based on the current population and existing land uses are therefore estimated to stay within the recent 5-year range, at around 2,170 AFY.

Water savings resulting from implementation of codes, standards and other ordinances were not specifically estimated for water use projections in this UWMP. However, their potential impact was considered, and overall, it is expected that the water savings potential from codes and standards would be limited based on the following two main factors. 1) Approximately 62 percent of housing units within the City of Twentynine Palms were built before 1990[2]. FIGURE 2-3 shows how the number of housing units has grown from 1990 – 2020, showing a rapid increase in growth in the early 2000's before plateauing as a result of the 2008 recession.

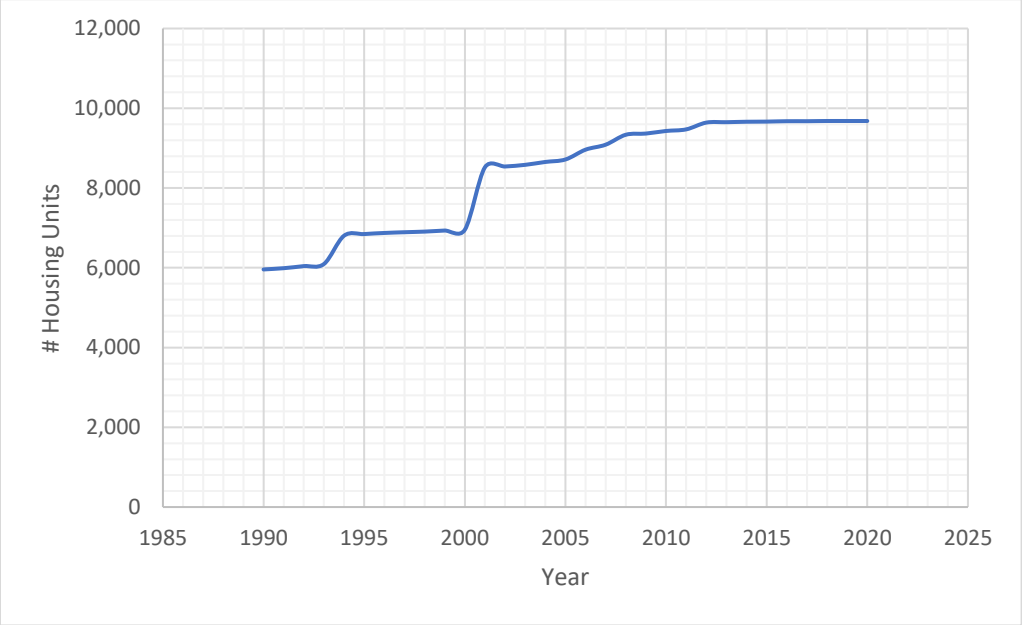

FIGURE 2-3 CITY OF TWENTYNINE PALMS # HOUSING UNITS 1990 - 2020

[2] State of California, Department of Finance, E-5 Population and Housing Estimates for Cities, Counties and the State — January 1, 2011-2020. Sacramento, California, May 2020. Available at: https://www.dof.ca.gov/Forecasting/Demographics/Estimates/

While water fixtures and appliances have become significantly more efficient since then due to standards and codes, these homes are also more likely to have already become more water efficient as a result of natural replacement of old or malfunctioning fixtures or appliances, retrofit upon resale, or remodels in the past 30 years. 2) There is minimal projected growth. New development would have to meet the newest water efficiency standards, thereby presenting a potential for water savings compared to the existing housing stock. However, the impact of the potential water savings from the new housing stock in the District's service area would overall be limited due to the minor growth anticipated in the service area. As such, the baseline water use calculated from the recent 5-year period is considered to reasonably reflect regular water conservation practices and water savings related to codes and standards implemented to date.

2.4.3 Total Projected Water Use

Estimating future water demand is a function of several factors. Water usage is influenced by geographic location, topography, land use, demographics, and water system characteristics (i.e., system pressures, water quality, and metering of connections). Therefore, water demand characteristics within the District will differ from water demands of other areas in Southern California according to each of these factors.

Future demand estimates were determined by multiplying the projected population (TABLE 1-7) by the target per capita water use:

$$\text{AFY} = \frac{\text{Population x GPCD (target) x 365 days per year}}{\text{325,851 gallons per AF}}$$

These calculations provided the District's projected future water demands shown in TABLE 2-8. The anticipated total water demand in 2045 will be approximately 3,210 AFY. These water use estimates do not account for future savings from codes, standards, ordinances or transportation and land use plans or reductions from demand management practices.

TABLE 2-8 PROJECTED DEMANDS FOR POTABLE WATER[(a)]

Water Use Sector	2025	2030	2035	2040	2045
Single Family Residential	1,780	1,870	1,970	2,060	2,150
Multi-Family Residential	460	480	510	530	560
Commercial/Institutional	240	250	260	260	270
Industrial	0	0	0	0	0
Landscape Irrigation	160	170	180	190	200
Other (Construction Use/ Non-potable)	20	20	20	20	20
Total	**2,660**	**2,790**	**2,940**	**3,060**	**3,200**

Note:
(a) Projected demands based on 2015-2020 historical demand data and projected land use demand data.

In addition to the demands anticipated from general growth, the District has confirmed no known potential developments are anticipated to be built in the future within its service area. Total demands from known developments are shown in TABLE 2-7.

TABLE 2-9 presents information on all projected water uses for the years 2025 to 2045.

TABLE 2-9 TOTAL PROJECTED WATER PRODUCTION (AF)

Water Use	2025	2030	2035	2040	2045
Total Water Deliveries (from TABLE 2-8)	2,660	2,790	2,940	3,060	3,200
Sales to Other Water Agencies (from TABLE 2-2)	29.8	29.8	29.8	29.8	29.8
Additional water uses and losses (from TABLE 2-4)[(a)]	359	376	396	413	430
Total	**3,048**	**3,196**	**3,366**	**3,502**	**3,660**

Note:
(a) Future water losses calculated using average % water loss from past 5 years of available data.

2.5 Characteristic Five-Year Water Use

A new requirement for the 2020 UWMP cycle is the preparation of a five-year Drought Risk Assessment (DRA), in which water suppliers compare available water supplies with projected water use for the drought period. The first step in preparing the DRA is estimating expected gross water use for the next five years (2021 to 2025) without drought conditions, i.e. without accounting for short-term demand reduction actions or other drought effects.

Table 2-10 presents estimated normal year water use over the next five years, based on factors anticipated to impact water use over the planning period, as described above. As noted above, baseline water demands take into account ongoing water conservation programs and permanent water conservation measures. Increases in demands above 2020 levels and through 2025 are a result of anticipated growth in the District's service area. As described in Section 7, demands are anticipated to increase by 10% in a single-dry year, and 2.5% in a multiple-dry year.

TABLE 2-10 PROJECTED FIVE-YEAR WATER USE (2021 – 2025)

Use Type	2021	2022	2023	2024	2025
Single family	1,520	1,590	1,650	1,710	1,780
Multi-family	400	410	430	440	460
Commercial	180	200	210	230	240
Landscape	130	140	140	150	160
Other	80	60	50	30	20
System Losses	311	324	334	347	359
Sales to Other Water Agencies	29.8	29.8	29.8	29.8	29.8
Total	**2,651**	**2,753**	**2,844**	**2,946**	**3,048**

Source: Linear interpolation of projected water use from 2020 to 2025 (Table 2-1, 2-6)

2.5.1 Water Use Projections for Lower Income Households

SB 1087 requires that water use projections of an UWMP include the projected water use for single-family and multi-family residential housing for lower income households as identified in the housing element of any city, county, or city and county in the service area of the supplier.

Based on a GIS analysis using census data, disadvantaged communities (DACs) made up approximately 100% of the District population. For purposes of estimating water use projections for the District's lower income households, the proportion of lower income households within the District is assumed to be 100% through 2045. Related demands are presented in TABLE 2-11 and are accounted for in total water demands described in Section 2.4.

TABLE 2-11 PROJECTIONS OF FUTURE LOWER-INCOME HOUSEHOLD WATER USE

Water Use (AF)	2025	2030	2035	2040	2045
Estimated Lower Income Water Use	2,240	2,350	2,480	2,590	2,710

Source: Combined Single Family and Multi-Family Residential projections from Table 2-8.

In addition, the District will not deny or condition approval of water services, or reduce the amount of services applied for by a proposed development that includes housing units affordable to lower income households unless one of the following occurs:

- The District specifically finds that it does not have sufficient water supply;
- The District is subject to a compliance order issued by the SWRCB DDW that prohibits new water connections; or
- The applicant has failed to agree to reasonable terms and conditions relating to the provision of services.

Section 3: SBx7-7 Baseline and Targets

3.1 Existing and Targeted Per Capita Water Use

The Water Conservation Act of 2009 (SBX7-7) is one of four policy bills enacted as part of the November 2009 Comprehensive Water Package (Special Session Policy Bills and Bond Summary). The Water Conservation Act of 2009 provides the regulatory framework to support the statewide reduction in urban per capita water use described in the 20x2020 Water Conservation Plan (DWR, 2010). Consistent with SBX7-7, each water supplier must determine and report its existing baseline water consumption and establish water use targets in gallons per capita per day (GPCD), and compare actual water use against the target; reporting began with the 2010 UWMP. The SBX7-7 Verification Form was completed for the 2015 UWMP and is not required again in 2020. The SBX7-7 2020 Compliance Form is completed for 2020 compliance only and is based on baseline and target calculations done in the Verification Form. The primary calculations required by SBX7-7 are summarized in TABLE 3-1.

TABLE 3-1 SBX7-7 CALCULATIONS

	2010 UWMP	2015 UWMP	2020 UWMP
Base Daily Water Use calculation (average GPCD used in past years)	First calculated and reported in the 2010 plan	May be revised in 2015 Plan; must be revised if 2010 Census data not used in original calculation	Must use calculation from the 2015 plan
Interim Water Use Target (target GPCD in 2015)	First calculated and reported in 2010 Plan	May be revised in 2015 Plan; must be revised if 2010 Census data not used in original calculation	May be revised in 2020 Plan under special circumstances
Compliance Water Use Target (target GPCD in 2020)	First calculated and reported in 2010 Plan	May be revised in 2015 Plan; must be revised if 2010 Census data not used in original calculation	May be revised in 2020 Plan under special circumstances
Actual 2015 Water Use (in GPCD)	NA	In 2015 Plan must compare actual 2015 GPCD against 2015 target	Reported in the 2015 UWMP
Actual 2020 Water Use (in GPCD)	NA	NA	In 2020 Plan must compare actual 2020 GPCD against 2020 target

In the 2020 UWMP a water supplier must demonstrate compliance with the target established for 2020 and demonstrate that it has met its 2020 Compliance Target by December 31, 2020. Compliance is done through the review of the SBX7-7 2020 Compliance Form submitted with the 2020 Plan (included as Appendix F).

DWR requires that if an Agency prepared a 2015 UWMP it must use the baseline and target identified in its 2015 UWMP to determine compliance for 2020. Therefore, the methodology provided below is consistent with what was reported in the District's 2015 UWMP.

The Base Daily Water Use calculation is based on gross water use by an agency in each year and can be based on a ten-year average ending no earlier than 2004 and no later than 2010, or a 15-year average if 10% of 2008 demand was met by recycled water. Base Daily Water Use must account for all water sent to retail customers, excluding:

- Recycled water
- Water sent to another water agency
- Water that went into storage

It is at an agency's discretion whether or not to exclude agricultural water use from the Base Daily Water Use Calculation. If agricultural water use is excluded from the Base Daily Water Use calculation it must also be excluded from the calculation of actual water use in later urban water management plans. The District did not supply water to agriculture during the period 1995 to 2010 and so agricultural water does not factor into the District's SBX7-7 calculations.

An urban retail water supplier must set a 2020 water use target (herein called the Compliance Water Use Target) and a 2015 interim target (herein called the Interim Water Use Target). There are four methods for calculating the Compliance Water Use Target:

1. Eighty percent of the urban water supplier's baseline per capita daily water use.
2. Per capita daily water use estimated using the sum of the following:
    a. For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of DWR's 2016 report to the Legislature reviewing progress toward achieving the statewide 20% reduction target, this standard may be adjusted by the Legislature by statute.
    b. For landscape irrigated through dedicated or residential meters or connections, water use efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in section 490 et seq. of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992.
    c. For CII uses, a 10% reduction in water use from the baseline CII water use by 2020.
3. Ninety-five percent of the applicable state hydrologic region target as stated in the Water Conservation Act of 2009. The District falls within the Colorado River Hydrologic Region (target for this region is 211 GPCD).

4. Reduce the 10 or 15-year Base Daily Per Capita Water Use a specific amount for different water sectors:
    a. Indoor residential water use to be reduced by 15 GPCD or an amount determined by use of DWR's "BMP Calculator".
    b. A 20% savings on all unmetered uses.
    c. A 10% savings on baseline CII use.
    d. A 21.6% savings on current landscape and water loss uses.

The Interim Water Use Target for 2015 is set as a halfway point between the Base Daily Water Use GPCD and the 2020 Compliance Water Use Target GPCD.

Finally, the selected Compliance Water Use Target must be compared against what DWR calls the "Maximum Allowable GPCD". The Maximum Allowable GPCD is based on 95% of a 5-year average base gross water use ending no earlier than 2007 and no later than 2010. The Maximum Allowable GPCD is used to determine whether a supplier's 2015 and 2020 per capita water use targets meet the minimum water use reduction requirements of SBX7-7. If an agency's Compliance Water Use Target is higher than the Maximum Allowable GPCD, the agency must instead use the Maximum Allowable GPCD as its target.

3.1.1 Base Daily Per Capita Water Use

TABLE 3-2 and TABLE 3-3 summarize the Base Daily Water Use calculation for the District. As is shown in these tables, the District is not eligible to use a 15-year base period. Years 1995 to 2004 have been selected for calculation of the 10-year base period while years 2003 to 2007 have been selected for calculation of the 5-year base period.

TABLE 3-2 BASELINE PERIOD RANGES

Baseline	Parameter	Value	Units
10 to 15 year baseline period	2008 total water deliveries	3,146	AFY
	2008 total volume of delivered recycled water	0	AFY
	2008 recycled water as a percent of total deliveries	0	Percent
	Number of years in baseline period[(a)]	10	Years
	Year beginning baseline period range	1995	-
	Year ending baseline period range[(b)]	2004	-
5 year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2003	-
	Year ending baseline period range[(c)]	2007	-

Notes:
(a) If the 2008 recycled water use is less than 10% of overall use, then the first baseline period is a contiguous 10-year period.
(b) The ending year must be between December 31, 2004 and December 31, 2010.
(c) The ending year must be between December 31, 2007 and December 31, 2010.

In order to calculate Base Daily Per Capita Water Use for past years, it was necessary to develop population estimates for past years. The population for the District was calculated for 1990, 2000, 2010 and 2015 using the DWR online population tool.

This was accomplished using a Geographic Information System (GIS) interface to derive population. By adding shape files for the entity service area boundaries or public water system boundary in 1990, 2000, and 2010, population is derived using U.S. Census Bureau census tract data from census years. Then, along with District production and service connections, the DWR population tool derives a persons-per-connection number, which is used to determine GPCD in the intervening years between 1990 and 2010.

As shown in TABLE 3-3, the District's 10-year Baseline is 178 GPCD, and the District's 5-year Baseline is 171 GPCD.

TABLE 3-3 BASELINE WATER USE

Year		Service Area Population	Gross Water Use (AFY)	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
1	1995	15,908	3,013	169
2	1996	14,918	3,145	188
3	1997	15,179	2,927	172
4	1998	15,433	2,993	173
5	1999	15,634	3,013	172
6	2000	15,846	3,248	183
7	2001	15,858	3,105	175
8	2002	15,859	3,416	192
9	2003	15,865	3,200	180
10	2004	16,225	3,203	176
10 to 15 Year Average Baseline GPCD				**178**
5 Year Baseline GPCD				
Year		**Service Area Population**	**Gross Water Use (AFY)**	**Daily Per Capita Water Use (GPCD)**
1	2003	15,865	3,200	180
2	2004	16,225	3,203	176
3	2005	17,061	3,152	165
4	2006	17,662	3,340	169
5	2007	17,859	3,328	166
5 Year Average Baseline GPCD				**171**
2015 Compliance Year GPCD				
2015		14,985	2,404	**143**
2020 Compliance Year GPCD				
2020		16,182	2,449	**135**

3.1.2 Compliance Water Use Targets

As explained above, SBX7-7 requires that the District identify its demand reduction targets for years 2015 and 2020 by utilizing one of four options.

Option 1. 80% of baseline GPCD water use (i.e., a 20% reduction).

Option 2. The sum of the following performance standards: indoor residential use (provisional standard set at 55 GPCD); plus landscape use, including dedicated and residential meters or connections equivalent to the State Model Landscape Ordinance (80% ETo existing landscapes, 70% of ETo for future landscapes); plus 10% reduction in baseline commercial, industrial institutional use by 2020.

Option 3. 95% of the applicable state hydrologic region target as set in the DWR "20x2020 Water Conservation Plan" (DWR, 2010).

Option 4. The provisional target method for determining water use targets developed by DWR pursuant to SBX7-7, which is not applicable here

Options 2 and 4 were considered and not selected because they required data not currently being collected within the District's service area.

The District service area is within the Colorado River Hydrologic Region as defined by DWR and this hydrologic region has been assigned a 2020 water use target of 211 GPCD per the DWR 20x2020 Water Conservation Plan.

The District has selected Method 3, achieving 95% of the applicable Colorado Hydrologic Region target. The Colorado Hydrologic Region target is 211 GPCD, 95% of this target is 200 GPCD. However, the District's 5-year Baseline GPCD is 171. As described earlier, the Maximum Allowable GPCD is 95% of the 5-year Baseline GPCD or 163. The Compliance Water Use Target, under Method 3 (200 GPCD) is more than the Maximum Allowable GPCD; the 2020 GPCD target therefore must be adjusted to the Maximum Allowable GPCD, 163. The Interim Water Use Target is 170 GPCD. These calculations are summarized in TABLE 3-4.

TABLE 3-4 COMPONENTS OF TARGET DAILY PER CAPITA WATER USE

Period	Value	Unit
Selected 10-year Average Base Daily Water Use	178	GPCD
Selected 5-year Average Base Daily Water Use	171	GPCD
Compliance Water Use Target (95% of the DWR 20x2020 Water Conservation Plan hydrologic region)	200	GPCD
Maximum Allowable Water Use Target (5% Reduction on 5-year Baseline GPCD)	163	GPCD
2020 Target	**163**	GPCD
2015 Target	**170**	GPCD
Methodology Used	Option #3	

The District had a 2015 GPCD of 143 (TABLE 3-3), which means the District met and exceeded the 2015 Interim Target of 170 GPCD which was first recorded in its 2015 UWMP. The District's 2020 GPCD of 135 (TABLE 3-3), which means the District has also met and exceeded its 2020 target of 163 GPCD.

The District plans to maintain progress on meeting the 20x2020 water use targets through the continuation of existing methods of conservation that have been successful to date, and other methods discussed in Section 8, Demand Management Measures.

Section 4: Water Resources

4.1 Overview

This section describes the water resources available to the District for the 25-year period covered by the Plan. Both currently available and planned supplies are discussed.

The District at this time does not import water and is reliant solely on local groundwater to meet its demand.

Although, the District does not currently use nor does it have immediate plans to use imported water, surface water, storm water, or recycled water, these could be future supply sources.

Water supply available to the District has been studied for many years with the most recent reports being the 2020 update to the District's Groundwater Monitoring Report (GMR) (KJC 2020) and 2014 update to the District's Groundwater Management Plan (GWMP) (Kennedy/Jenks Consultants, 2014). The GWMP evaluated the existing conditions of the Mesquite Lake, Indian Cove, Fortynine Palms and Eastern subbasins. The GWMP provided estimates for the amount of groundwater in storage, the 'safe yield' of groundwater bodies within the District's boundaries, the water quality characteristics of area groundwater, and the quantity and distribution of groundwater production within the District. The GMR summarizes the monitoring and data collection efforts performed and an assessment of the groundwater conditions in each of the subbasins. It is noted that both the GMR and GWMP are considered as a "living document" that the District intends to update periodically to report on the progress made in managing groundwater resources and to reflect the amendments to the California Water Code.

In 2015 the USGS approached the District and the City of Twentynine Palms to engage in a study to further assess the water quantity and water quality conditions within the District's boundaries. It is recognized that this study, and future studies will be necessary and instrumental in continuing to evaluate the sustainability of groundwater production and the potential impact of future growth and demand due to changes in population and climate change.

The District collects groundwater level, water quality and water production data for use in groundwater management and other reporting purposes. In addition, the USGS currently collects groundwater level monitoring primarily associated with the Marine Base that includes several wells in the Twentynine Palms area. These are posted on the DWR Water Data Library web site at http://www.water.ca.gov/waterdatalibrary/. These data are also posted on the DWR California Statewide Groundwater Elevation Monitoring (CASGEM) web site and can be downloaded from http://www.water.ca.gov/groundwater/casgem/.

TABLE 4-1 provides an overview of existing and planned water supplies.

TABLE 4-1 AVAILABLE WATER SUPPLIES (AFY)

Water Supply Source	2025	2030	2035	2040	2045
Existing Supplies					
Supplier Produced Groundwater	6,995	6,995	6,995	6,995	6,995
Total Supplies[(c)]	6,995	6,995	6,995	6,995	6,995

Notes:
(a) The District constructed a new well within the Indian Cove Subbasin in 2020 to replace the lost capacity from removing Well Nos. 9 and 11 from service in 2016.

4.2 Wholesale (Imported) Water Supplies

The District currently has no access to imported water supplies. Imported water from either the Metropolitan Water District of Southern California (MWD) or the Mojave Water Agency (MWA) while historically not pursued by the District may be considered in more detail in the future as the District assesses the supplies necessary to meet projected demands. The District is not within the service area of MWD or MWA; and MWD's closest facilities (Joshua Tree Basin) are 15 miles west of the District.

The 2020 UWMP Guidebook describes how urban water suppliers that anticipate participating in or receiving water from a "covered action" related to the Delta should provide information in their 2020 UWMPs to demonstrate consistency with *Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance* (Reduced Reliance Policy). DWR has suggested that any entity receiving imported water from the SWP should anticipate being part of a "covered action". As the District is not actively pursuing SWP water, and does not indicate use of such supply in any of its planning documents, demonstrating consistency with the Reduced Reliance Policy is not necessary.

4.3 Groundwater

The District currently relies solely on local groundwater as its source. This section presents information about the District's groundwater supplies, including a summary of the adopted GWMP (provided as Appendix G). The District overlies two non-adjudicated groundwater basins, the Twentynine Palms Valley Basin and the Joshua Tree Basin. Within the Twentynine Palms Valley Basin are the Mesquite Lake and Mainside subbasins. Within the Joshua Tree Basin are three subbasins, the Indian Cove, Fortynine Palms, and Eastern subbasins. The District also overlies a portion of the Dale Valley Basin, but there is little to no pumping or historical data from this basin and the District has no production wells in this basin. The location of the subbasins is shown on Figure 4-1. The District's infrastructure and well locations are shown on Figure 4-2.

Water provided by the District is derived solely from groundwater pumped from supply wells located along the southern limit of the service area. The District had 18 total groundwater production wells in its history. As of 2016, the District has seven (7) active production wells. The remaining wells are inactive and/or used for groundwater monitoring. Available information indicates that more than 400 private wells have also been constructed within the District's

service area. Most of these wells are not currently operated. The District collects groundwater level, water quality and water production data for use in groundwater management and other reporting purposes. Geology and groundwater characteristics of the subbasins are similar, as they are contiguous. However, there are some differentiating characteristics among the subbasins, as discussed in the following subsections.

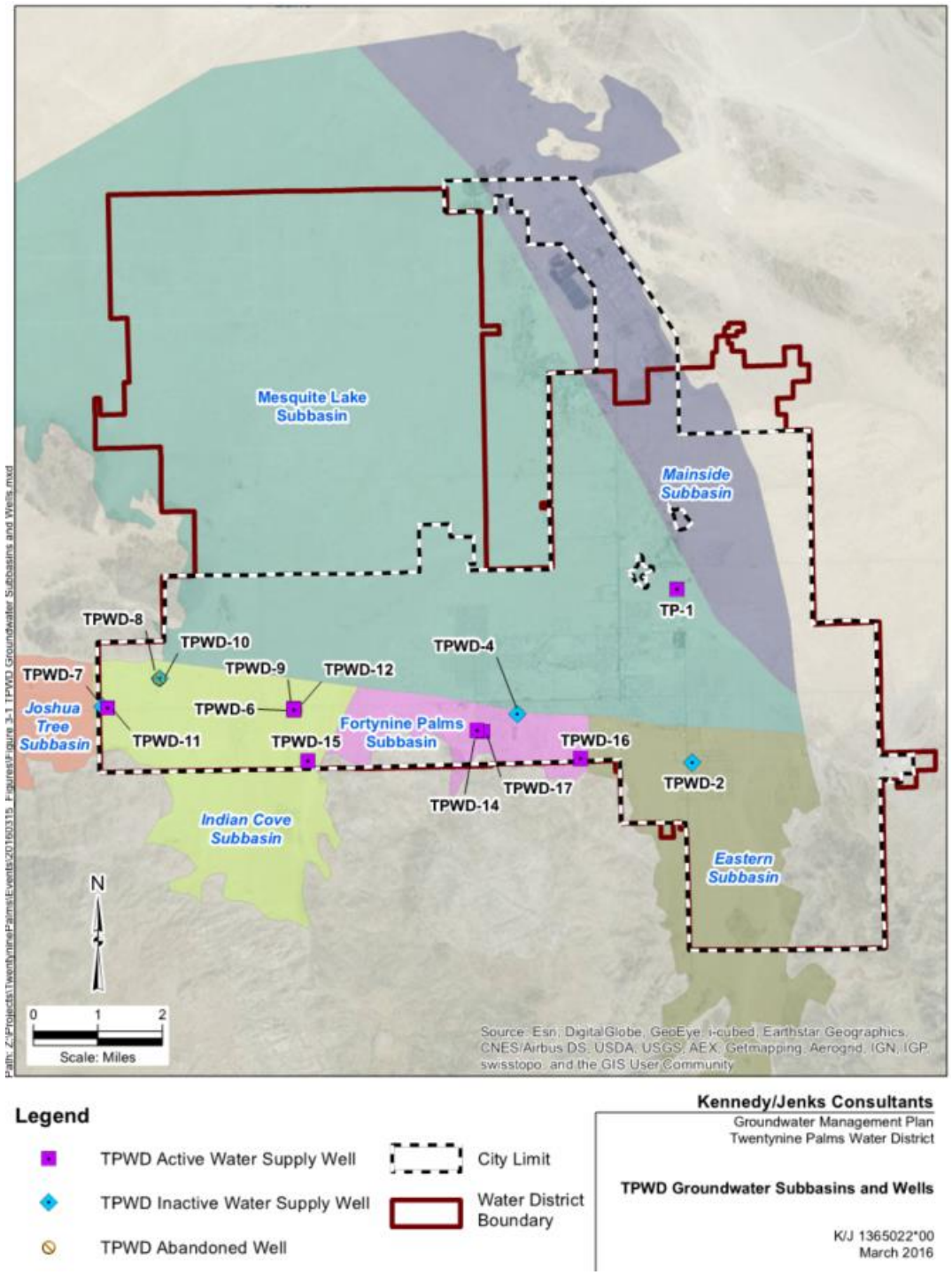

FIGURE 4-1 DISTRICT'S GROUNDWATER SUBBASINS AND WELLS

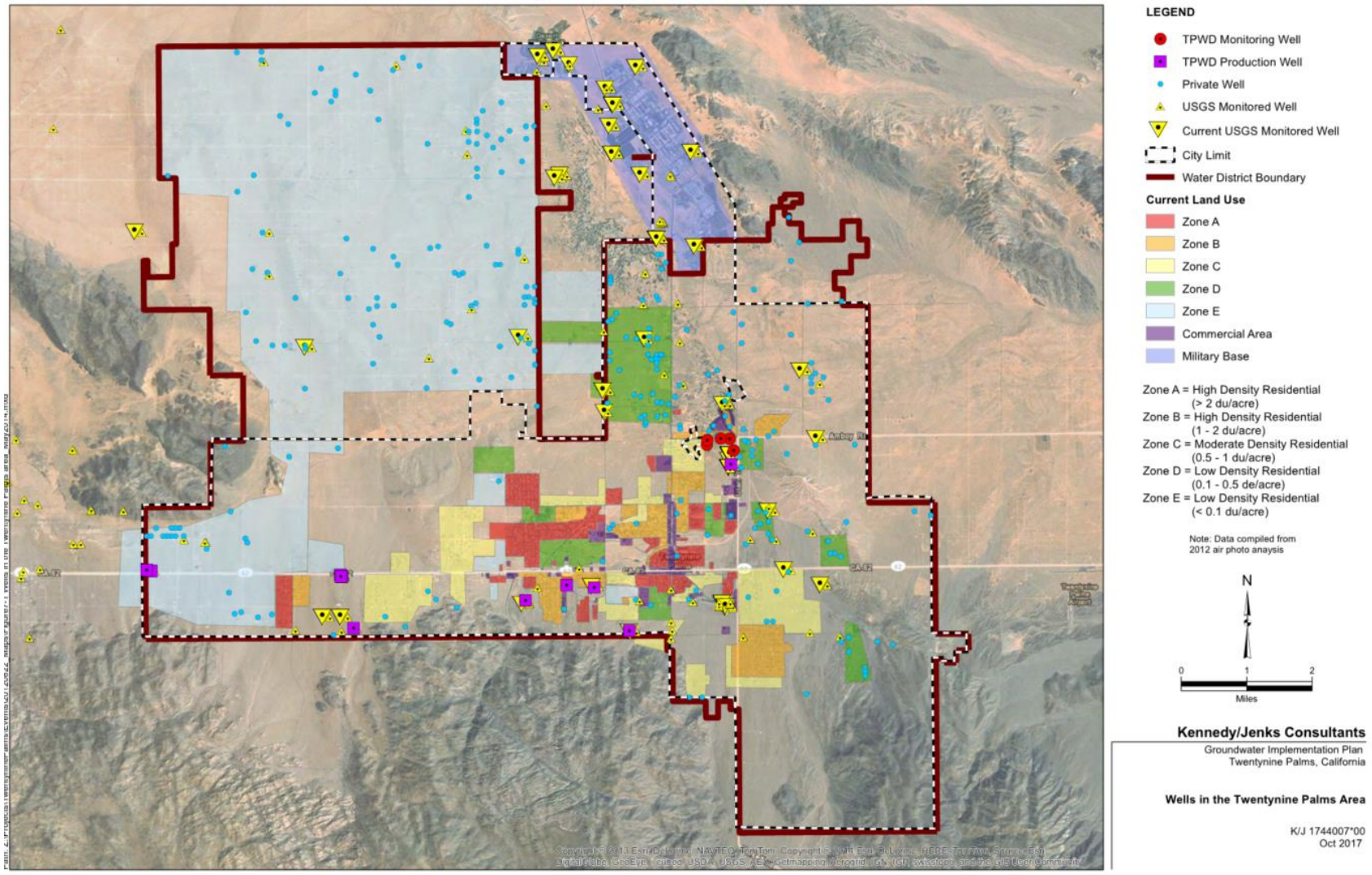

FIGURE 4-2 DISTRICT'S INFRASTRUCTURE

4.3.1 Twentynine Palms Valley Basin

The Twentynine Palms Valley Groundwater Basin encompasses about 98 square miles and underlies most of the northern portion of the District's service area (see Figure 4-2). It is bound to the south by the Pinto Mountain Fault, the north by the "transverse arch", the west by the Surprise Spring fault, and the east by the Mesquite Fault. The basin underlies an alluvial valley in the southern Mojave Desert below the dry Mesquite Lake and the town of Twentynine Palms. Groundwater levels in the basin are generally stable, with little to no water level declines observed (KJC 2011).

The Twentynine Palms Valley Basin includes two subbasins, the Mesquite Lake and Mainside subbasins. The following provides an overview of groundwater conditions and levels in these two subbasins.

4.3.1.1 Mesquite Lake Subbasin

Water is produced from the Mesquite Lake subbasin through the District's TP1 production well, which is a high-capacity production well with a pumping capacity of 2,100 gallons per minute (gpm) (3,395 AFY). Fluoride concentrations in the Mesquite Lake Subbasin groundwater are generally well above 3 mg/L. Groundwater from this well is extracted from the basin, treated at the Fluoride Removal Water Treatment Plant to remove fluoride to below the Maximum Contaminant Level (MCL), and delivered to District customers.

Most wells with long records show relatively steady water levels over time with total variations in groundwater levels ranging within 5 feet (KJC 2014a).

4.3.1.2 Mainside Subbasin

The District does not have production or monitoring wells in the Mainside subbasin. Estimated pumping from a Marine Base golf course well in the subbasin is not measured but has been estimated between 50 and 540 AFY (KJC 2014a). Groundwater levels have increased by 0 to 0.7 feet per year in wells for which the United States Geological Survey (USGS) has collected data, although most of the increases are due to single or few anomalously low water levels at the beginnings of the periods of record. Water levels within this basin have been basically stable since about 1990.

4.3.2 Joshua Tree Basin

The Joshua Tree Groundwater Basin encompasses about 54 square miles and underlies an area south of the Pinto Mountain Fault beneath the town of Joshua Tree, eastward to immediately south of the town of Twentynine Palms (see Figure 4-2). The Basin's northern area borders to the Twentynine Palms Valley Basin along the Pinto Mountain Fault. The southern boundary is exposed consolidated basement of the Little San Bernardino Mountains within Joshua Tree National Park. The western boundary is coincident with a basement constriction located between the towns of Yucca Valley and Joshua Tree. The eastern boundary lies along a line extending from the southern tip of the Mesdquite fault to a basement outcrop of the Little San Bernardino Mountains. Similar to the Twentynine Palms Valley Basin, groundwater in the

basin typically occurs in interbedded gravels, conglomerates, and silts deposited in alluvial fan systems. Data support that water levels in the basin have been dropping by an average of a foot per year since 1973 (KJC 2011).

The Joshua Tree Basin includes the three subbasins south of the Oasis Fault (Indian Cove, Fortynine Palms, and Eastern subbasins) from which the District pumps groundwater. There is a fourth subbasin underlying the Joshua Tree Basin, Joshua Tree subbasin, from which the neighboring Joshua Basin Water District (JBWD) pumps groundwater. It should be noted that the basin areas relied upon by the JBWD and the District are separated by an unnamed fault. The USGS treats these two subbasins as separate and independent from each other. For more information refer to the USGS Report, "Evaluation of Geohydrologic Framework, Recharge Estimates, and Groundwater Flow of the Joshua Tree Area, San Bernardino County, California" (2004). Therefore, the District does not have access to the entirety of the Joshua Tree Basin, only to the three subbasins overlain by the District described below.

4.3.2.1 Indian Cove Subbasin

The Indian Cove subbasin encompasses 20 square miles and is located southwest of the City of Twentynine Palms in the Joshua Tree Basin. It is bounded on the north by the Pinto Mountain Fault, which separates it from the Valley Basin. It is directly west of the Fortynine Palms subbasin (see Figure 4-2). Two of District's active production wells are located in this subbasin. The Indian Cove subbasin is a basement-floored alluvial basin, cut by several east-west striking subvertical faults and a steeply dipping northwest striking fault. These faults inhibit groundwater flow perpendicular to the faults. Alluvial sediments within the basin predominantly consist of alluvial fan deposits that interfinger with clay lenses and stream deposits. The sediments are dominated by sand and gravels and they become coarser and more heterogeneous near the mountain fronts. The stream valley rarely floods, suggesting that a significant part of the runoff is infiltrating into the groundwater.

Much of the groundwater flow through the Indian Cove subbasin occurs in the easternmost part of the subbasin since 60% of the watershed area drains into this area. Groundwater level depths vary from 173 to 426 feet bgs (below ground surface), while water level elevations measure between 2,100 and 2,400 feet. Water level declines of less than 10 feet have been observed in this subbasin (Haley & Aldrich, 2000). Water quality in the Indian Cove subbasin is generally good. Typically, fluoride concentrations tend to increase with increasing groundwater temperature. Regional water temperatures decrease southward; associated higher fluoride concentrations also decrease.

4.3.2.2 Eastern Subbasin

The Eastern subbasin has the largest watershed and sediment volume of the District's subbasins. It is located south of the Twentynine Palms Valley Basin and east of the Fortynine Palms subbasin (see Figure 4-2). One of the District's active production wells is in this subbasin. Groundwater supplies in the Eastern subbasin appear to be limited with most of the flow confined to a shallow zone above or in the bedrock. Groundwater depths vary widely from 19 feet to more than 450 feet bgs, while water level elevations show less variation and are

typically between 1,900 and 2,000 feet. Measured groundwater levels have mostly shown declines of 0.2 and 0.8 feet per year, resulting in declines by about 70 feet from the 1940s.

4.3.2.3 Fortynine Palms Subbasin

The Fortynine Palms subbasin is the smallest of the District's subbasins in volume and watershed (see Figure 4-2). It is separated from the Twentynine Palms Valley Basin on the north by the Pinto Mountain Fault. The Indian Cove subbasin lies to the west and the Eastern subbasin to the east. Two of the District's active production wells are in this subbasin.

Water level depths range between 176 and 258 feet bgs. Water elevations are typically around 1,950 feet. Water level declines of nearly 100 feet have been observed since 1980 in the Fortynine Palms subbasin.

4.3.3 Adopted Groundwater Management Plan

As part of legislation authorizing the District to provide retail water service to municipal customers, Assembly Bill 134 (2001) includes a requirement that the District prepare a GWMP in accordance with the provisions of Water Code Section 10753, which was originally enacted by Assembly Bill 3030 (AB 3030). AB 3030 declares that groundwater is a valuable resource that should be carefully managed to ensure its safe production and quality. The legislation also encourages local agencies to work cooperatively to manage groundwater resources within their jurisdiction. Senate Bill 1938 (SB 1938) was passed by the Legislature September 16, 2002 and made changes and additions to sections of the Water Code created by AB 3030.

The District's 2014 GWMP addresses all relevant components related to GWMPs, including mandatory and voluntary components of SB 1938, AB 359, and AB 3030, and DWR Bulletin 118-suggested components. The GWMP is intended to serve as a planning tool to assist the District to maintain safe, sustainable, and high quality groundwater resources in the long-term. A copy of the GWMP is included as Appendix G.

4.3.3.1 Basin Management Objectives

The overall goal of the District's GWMP is to maintain quality and long-term availability of groundwater to meet the current and future demands without adversely affecting groundwater resources within the GWMP area. The objective of the District's GWMP is to address issues of aquifer health and groundwater sustainability. In order to meet the stated goal of addressing key issues, the District established Basin Management Objectives (BMOs), which are specific, measurable accomplishments that must be completed to meet the goals.

The BMOs proposed for the District and included in the 2014 GWMP are:

- BMO #1 - Manage Groundwater Levels to Maintain Water Supply Sustainability and Reliability
- BMO #2 - Maintain and Protect Groundwater Quality

- BMO #3 - Support Development of a Local Program for Septic Tank Management
- BMO #4 - Monitor and Track Groundwater Supply, Water Quality and Land Subsidence
- BMO #5 - Promote Public Participation and Coordination with Other Local Agencies
- BMO #6 - Address Planned or Potential Future Water Supply Needs and Issues
- BMO #7 - Identify and Obtain Funding Sources for Groundwater Projects

The District maintains regular groundwater level and quality monitoring to improve the understanding of groundwater level fluctuations, potential impacts to groundwater quality, and changes in groundwater storage across the subbasins of interest. Changes to groundwater storage are accounted for by tracking groundwater levels. The District conducts water quality monitoring per DDW standards which is sufficient for the purpose of tracking changes in the groundwater quality of the basins.

4.3.3.2 Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act (SGMA) passed in 2014 and amended in 2015, creates a framework for sustainable, local groundwater management in California. SGMA directed DWR to identify priority groundwater basins for the purpose of implementing SGMA. SGMA requirements to create sustainable groundwater management agencies and sustainable groundwater management plans no later than 2022 applies only to high and medium priority basins. The District's basins are currently rated as very low priority basins (http://www.water.ca.gov/groundwater/casgem/pdfs/lists/StatewidePriority_Abridged_05262014.pdf.) However, the District intends to take actions to protect its groundwater supply and is currently evaluating options with regard to the new SGMA legislation. The District will continue to cooperate with regional partners to manage the basins.

4.3.4 Groundwater Supply Reliability

Storage capacity of the Twentynine Palms Valley Basin, made up of Mesquite Lake subbasin, is estimated in Bulletin 118 to be 1,420,000 AF. The total amount of groundwater available in the basin was estimated to be 132,000 AF in 1984 (DWR 1984). In the Mesquite Lake subbasin, most wells with long records show relatively steady water levels over time with total variations in groundwater levels ranging within 5 feet (TWPD 2014).

DWR Bulletin 118-03 estimates total storage capacity of the Joshua Tree Basin to be 2,540,000 AF using an estimated area of 33,800 acres, specific yield of 15%, and an average thickness of basin material of 500 feet. This estimate applies to the entire groundwater basin, and not just the area which the District manages. Estimates of groundwater in storage have a wide range from 480,000 AF to 1,010,000 AF, the highest of which is based on DWR calculations (DWR 2004). Actual groundwater extractions in the Joshua Tree Basin are measured by the Joshua Basin Water District.

Within the Joshua Tree Basin, long-term water level declines are evident south of the Pinto Mountain Fault throughout the Indian Cove and Fortynine Palms subbasins primarily near pumping centers. Data from 1998 suggest that groundwater levels dropped by an average of 1 foot per year since about 1973 within the Joshua Tree Basin (DWR 2004). In the Indian Cove subbasin, water level declines of less than 10 feet have been observed. In the northern part of the subbasin groundwater levels declined between 1.5 to 2.5 feet per year from the 1960s to 2000s. However, over the past approximately 10 years, water levels in most of the northern part generally increased at a rate of about 0.5 to 1.5 feet per year. Within the Fortynine Palms subbasin, measured groundwater levels have decreased approximately 150 feet since the 1940s, including about 100 feet since 1980. Groundwater elevations in the Eastern subbasin have shown declines between 0.2 to 0.8 feet per year, resulting in a decline in groundwater elevations by 70 feet since the 1940s, including about 50 feet since 1990.

Overall, the hydrologic water balance results presented in the 2014 GWMP indicate that more groundwater is being pumped than is being recharged during an average year. Results indicate that return flows, which are a return of water pumped from the basin, are the primary source of recharge. Natural recharge is limited because of the relatively low average rainfall in the area. Discharge is primarily pumping from wells. The net negative change in storage is reflected in the declining groundwater levels. Overdraft is considered a challenge for reliability of District supply, but the District has been working to balance the pumping among the four groundwater subbasins to help reduce groundwater level declines and enhance the long-term sustainability of existing water supplies. Particularly, the District has increased groundwater production in the Mesquite Lake subbasin in order to reduce the amount of groundwater pumped in the Indian Cove, Fortynine Palms, and Eastern subbasins. The Mesquite Lake subbasin contains a large volume of groundwater and the Fluoride Removal Water Treatment Plant is able to provide high quality groundwater from that source. The District will continue to practice shifting groundwater production between subbasins to help stabilize declining groundwater levels.

Implementation of the District's proposed BMO's and related actions, as discussed in the GWMP are anticipated to help maintain water supply sustainability and reliability into the future. The District does not have access to surface, imported or recycled water sources; therefore, the options for mitigating overdraft conditions are limited. Should access to an alternative water source become available in the future, the District would initiate an assessment on how best to utilize these resources to reduce groundwater overdraft including the use of "artificial recharge," "recycled water" or "conjunctive use" projects. Planned actions and projects are discussed further below, starting in Section 4.6. In addition, current pumping makes up only about 30% of the District's total pumping capacity and about 34% of the pumping capacity with DWR recommendations. As a result, the District still has a supply buffer for meeting growing demands and adapting groundwater resource management activities to improve sustainability.

Given the combination of current groundwater availability, proposed management measures, and the District's pumping capacity, District groundwater supplies are anticipated to be available in normal hydrologic conditions, a single-dry year, and multiple-dry years.

4.3.5 Historical Groundwater Pumping

At the time of the District's formation in the 1950s, groundwater pumping ranged from 500 to 1,000 AFY. By the 1990s, groundwater pumping had increased and ranged from approximately 2,730 to 3,145 AFY, with an average daily delivery per service connection slightly under 400 gallons. Groundwater pumping eventually peaked in 2002 and again in 2008. Since then, groundwater pumping has returned back to levels similar to the early 1990s. TABLE 4-2 provides a summary of the District's historical water production from 1990 to 2015.

TABLE 4-2 HISTORICAL WATER PRODUCTION (1990-2015)

Year	AF
1990	2,788
1991	2,728
1992	2,961
1993	3,013
1994	3,132
1995	3,013
1996	3,144
1997	2,983
1998	3,030
1999	3,077
2000	3,248
2001	3,105
2002	3,416
2003	3,200
2004	3,203
2005	3,152
2006	3,340
2007	3,328
2008	3,146
2009	3,123
2010	3,001
2011	3,005
2012	2,929
2013	2,842
2014	2,737
2015	2,221

Source:
District water production records.

Historical groundwater pumping by basin for the last 5 years is presented in TABLE 4-3. Current pumping is limited to DWR's recommendations to prevent overdraft in the Indian Cove and Fortynine Palms subbasins (KJC 2014a).

TABLE 4-3 HISTORICAL AMOUNT OF GROUNDWATER PUMPED (2016-2020, AFY)

Basin Name	2016	2017	2018	2019	2020
Mesquite Lakes Basin	1,240	1,386	1,483	1,395	1,337
Joshua Tree Basin					
Fortynine Palms Subbasin	752	761	631	698	672
Eastern Subbasin	251	253	276	195	300
Indian Cove Subbasin	282	150	194	121	140
Total	**2,525**	**2,550**	**2,584**	**2,409**	**2,449**
% of Total Water Supply	**100%**	**100%**	**100%**	**100%**	**100%**

4.3.6 Projected Groundwater Pumping

The District has an existing pumping capacity of approximately 4,785 gpm (7,720 AFY). To prevent overdrafting of the subbasins, DWR has recommended pumping limits for both the Fortynine Palms and Indian Cove subbasins resulting in an overall limited pumping capacity at 4,340 gpm (6,995 AF). TABLE 4-4 provides a breakdown of the pumping capacity by subbasin (KJC 2014a). Current pumping (2020) represents approximately 35% of the total pumping capacity.

TABLE 4-4 GROUNDWATER PUMPING CAPACITY

Basin Name	Total Pumping Capacity[(a)] (gpm)	Total Pumping Capacity[(a)] (AFY)	Limited Pumping Capacity[(b)] (gpm)	Limited Pumping Capacity[(b)] (AFY)
Mesquite Lake Basin	2,100	3,390	2,100	3,395
Joshua Tree Basin				
Fortynine Palms Subbasin	1,400	2,260	870	1,400
Eastern Subbasin	500	800	500	800
Indian Cove Subbasin[(c)]	785	1,270	870	1,400
Total	**4,785**	**7,720**	**4,340**	**6,995**

Notes:
(a) From TPWD 2014 Groundwater Management Plan, Table 3-3 (KJC 2014a), adjusted to reflect lost capacity as a result of taking Well No. 9 and Well No. 4 offline and putting Well No. 11-B in the Indian Cove Subbasin in service in 2020.
(b) DWR recommended pumping limit to prevent overdraft.
(c) Well 11 was taken out of service in 2016 after the sampling event due to well casing failure and replaced with Well 11-B in 2018. Well 11-B was put into service in 2020.

TABLE 4-5 presents projections of groundwater pumping through the end of the 25-year planning period. The projected groundwater pumping is determined by the projected demand (Table 2-8) and then adjusted for water loss between production and consumption. Based on historical groundwater pumping and production numbers from 2015-2020, the average non-revenue water loss is 13%. District groundwater resources are anticipated to be available at the same levels during average/normal, single-dry, and multiple-dry years.

TABLE 4-5 PROJECTED GROUNDWATER PUMPING (AFY)[(A)]

Basin Name	2025	2030	2035	2040	2045
Mesquite Lake Basin	1,528	1,639	1,669	1,740	1,806
Joshua Tree Basin					
Fortynine Palms Subbasin	809	882	902	950	993
Eastern Subbasin	265	290	297	313	328
Indian Cove Subbasin	182	222	233	260	284
Total	**2,784**	**3,033**	**3,101**	**3,263**	**3,411**
% of Total Water Supply	**100%**	**100%**	**100%**	**100%**	**100%**

Notes:
(a) Based on the past 2015-2020 water loss, the average non-revenue water loss is 13%. Projected groundwater pumping is determined by adding the average 13% non-revenue water to each basin based the combined projected water demand value for each year (Table 2-8).

4.4 Potential Supply Inconsistency

Because the District relies solely on groundwater to meet its demand, the District does not have any inconsistent water sources that cause reduced deliveries to users within the service area. Localized groundwater quality impairments may have the potential to limit potable use of District groundwater sources as happened in 2016 with the removal of Well Nos. 9 and 11 from service for which the District is actively taking actions to address (see Section 4.8). However, no substantial water supply changes are anticipated to occur as a result of water quality impacts, as is described in more detail in Section 5.

Surface runoff from rain events is one of the primary sources of recharge to the groundwater basins used by the District. As a result, climatic factors, including more frequent and intense dry weather conditions can impact the supply replenishment of the District. However, overall the groundwater basins used within the District service area have substantial storage capacity and storage volumes to allow for continued water use during dry periods without significantly hindering the water supply. Management actions to improve the sustainable use and reliability of District water supplies, including proposed actions related to the BMOs of the GWMP are necessary to maintain the consistency and reliability of this supply.

4.5 Transfers and Exchanges

The District is not within the service areas of either MWD or MWA to receive imported water, as described in Section 4.2. At this time, there are no other opportunities for the District to transfer or exchange water.

4.6 Recycled Water

There is no community sewage system. Wastewater is disposed of through individual septic tanks and tile field disposal systems. Septic return flows contribute to recharge to the basin and may impact the beneficial use of local groundwater resources. If future actions by the District and City include implementation of a centralized sewer collection and treatment system, the District shall evaluate ways of utilizing recycled water to help reduce groundwater demand or contribute to aquifer recharge. See Section 5 for more information on recycled water.

4.7 Water Energy Reporting

Reporting of energy information associated with sources of water used by urban water suppliers was voluntary in the 2015 UWMP, but now required for the 2020 UWMP by Water Code Section 10631.2(a). For the purposes of the required water energy reporting, urban water Suppliers are only expected to report the energy use information associated with water management processes occurring within their operational control.

Southern California Edison (SCE) supplies and provides energy for the TPWD service area, including the groundwater wells and booster stations (See Appendix F). Since TPWD utilizes only retail potable deliveries, the Total Utility Approach was applicable to calculate water-related energy-consumption data. TABLE 4-6 presents the energy consumption data for one year of data from 2019-2020.

TABLE 4-6 ENERGY REPORTING – TOTAL UTILITY APPROACH (2019-2020)

Parameter	Total Utility	Units
Volume of Water Entering Process[(a)]	2,449	AF
Energy Consumed[(b)]	3,122,629	kWh
Self-Generated Renewable Energy	0	kWh
Energy Intensity[(c)]	3,913	kWh/MG

Notes:
(a) Total volume of water supplied in 2020 (Table 1-1)
(b) Energy consumed determined by SCE 2019-2020 Billing & Usage report
(c) Calculated by total energy consumed divided by volume of water entering process (volume converted to million gallon)

4.8 Planned Water Supply Projects and Programs

As described in Section 4.3.6, future pumping capacity, which is limited by DWR's recommendations to prevent overdraft, is sufficient to meet the projected demand in 2040 assuming capacity lost by the shutdown of Wells No. 9 and 11 in 2016 is recovered.

The District has several reservoirs for system storage, which enable the District to provide adequate service for peak demands plus fire flow and emergency reserve. The District regularly evaluates its distribution and storage network. As part of this process, the need for new improvements including additional storage capacity is evaluated and a capital improvement program is developed in order to construct the necessary improvements. There are no plans for any large-scale storage projects or conjunctive use/groundwater storage facilities at this time. In addition, the need for additional extraction facilities is evaluated and wells are incorporated into the capital improvements program. However, the District continues to evaluate the potential of expanding the infrastructure to meet the future demands that exceed current projections if that should occur.

Another future groundwater supply project may include maximizing the use of the only source of recharge available (precipitation) by providing recharge enhancement. However, recharge from percolation of precipitation falling directly on the subbasin floor is not considered to represent a major source of groundwater recharge (DWR, 1984).

There is the potential to expand the Mesquite Lake subbasin facilities to include another well if needed in the future, Well TP-2. The well has been drilled and is anticipated to be operation This additional well would improve reliability by allowing for redundancy in the Mesquite Lake subbasin as well as increasing pumping capacity. Also, as part of the GWMP, recharge enhancement could further improve the reliability and may lead to an increase for the 1,400 AFY DWR pumping recommendation of the Fortynine Palms subbasin and Indian Cove subbasin. Other potential future projects could involve investigation of locating production wells into the portion of the Dale Valley Basin which is within the District's boundaries.

Lastly, the District recognizes that water conservation is an important method to augment demands on the basins. The District utilizes public outreach to promote conservation, specifically water conservation brochures available through the District and distributed in new customer packages and water bills, as well as through speakers and events conducted at local schools and community events, which include poster contests and involvement in earth day activities. Additional water conservation measures are addressed in the GWMPs BMOs and the current and planned water management strategies targeting conservation and water savings are described in Section 8. The District will continue to evaluate whether there are other potential new demand management measures that could be developed as well as potential development of new water sources.

4.9 Development of Desalination

The UWMP Act requires a discussion of potential opportunities for use of desalinated water (Water Code Section 10631[i]). The District has evaluated opportunities for using desalinated water in future supply options. However, at this time, none of the opportunities is practical or economically feasible for the District, and the District has no current plans to pursue them. Therefore, desalinated supplies are not included in the supply summaries in this Plan.

4.9.1 Opportunities for Brackish Water and/or Groundwater Desalination

The groundwater supplies in the existing District service area are not considered brackish in nature, and desalination is not required. At some point in the future however the District may investigate in more detail the potential for extracting high total dissolved solids (TDS) groundwater from the nearby Dale Valley Basin (see Section 4.3).

4.9.2 Opportunities for Seawater Desalination

Because the District is not in a coastal area, it is neither practical nor economically feasible for it to implement a seawater desalination program. However, the District and MWA for example could team up with imported water supply contractors and provide financial assistance in construction of other regional seawater desalination facilities in exchange for imported supplies; should imported water become a plausible resource for the District in the future.

Section 5: Recycled Water

5.1 Wastewater and Recycled Water

The District does not have a municipal sewer system or a wastewater treatment plant. At this time all residential and non-residential accounts use septic tank systems for the disposal of wastewater. In 2014 the District and City of Twentynine Palms prepared a Wastewater Master Plan (WWMP) (KJC, 2014b) to develop a conceptual sewer collection and treatment system that could serve both the City and the District. The WWMP was prepared in conjunction with a Salt and Nutrient Management Plan (SNMP) which assessed the long-term potential impacts to groundwater quality from the continued use of septic systems (Kennedy/Jenks 2014c). The results of those studies found that the infrastructure costs associated with the construction of centralized system infrastructure are extremely, and prohibitively, high in the near-term.

If future actions by the District and the City include implementation of a centralized sewer collection and treatment system, the District will evaluate ways of utilizing recycled water to help reduce groundwater demand or provide for aquifer recharge. Septic tank system return flows currently comprise a significant component of recharge to the basin; therefore, recycled water should be put to an appropriate beneficial use in-lieu of groundwater if it becomes available.

For the time being, due to the small size of the District's system, low annual demand and the use of individual septic systems, a recycled water system is not feasible. Subsequently, as there is no source of recycled water, the District has not developed any plans for serving recycled water.

The District recognizes the important contribution that recycled water can bring to its supply portfolio and to the supply efficiencies and conservation efforts within the State. If and when a future recycled water delivery system is developed, methods to encourage recycled water use, such as financial incentives, will be analyzed.

Section 6: Water Quality

The quality of any natural water is dynamic in nature. This is true of local groundwater basins with the quality of water changing over the course of a year. Depending on water depth, groundwater will pass through different layers of rock and sediment and leach different materials from those strata. Water depth is a function of local rainfall and pumping. During periods of drought, the mineral content of groundwater increases. Water quality is not a static feature of water, and these dynamic variables must be recognized.

Water quality regulations also change. This is the result of the discovery of new contaminants, changing understanding of the health effects of previously known as well as new contaminants, development of new analytical technology, and the introduction of new treatment technology. All water purveyors are subject to drinking water standards set by the USEPA and the California Department of Public Health (DPH) (now Division of Drinking Water [DDW]). An annual Consumer Confidence Report (CCR) is provided to all residents who receive water from the District. That report includes detailed information about the results of quality testing of the water supplied during the preceding year (TPWD, 2020). The quality of water received by individual customers will vary depending on whether the ground water is blended and the predominant basin which is pumped.

This section provides a general description of the water quality of the groundwater supplies, aquifer protection, and a discussion of potential water quality impacts on the reliability of these supplies.

6.1 Groundwater Quality

District groundwater is typically of good quality, although there are concerns about high levels of arsenic, fluoride, hexavalent chromium and TDS in specific areas of the District. Additionally, the historic and current use of septic tank systems for wastewater disposal may have a negative effect on groundwater quality. The District's 2019 CCR shows the groundwater meeting all federal and state standards. In addition, the State of California created the Groundwater Ambient Monitoring (GAMA) Program for select groundwater basis in the Borrego Valley, Central Desert, and Low-Use Basins within the Mojave and Sonoran Deserts. The 2020 Groundwater Monitoring Report (GMR) assessed the water quality of the groundwater wells and primary constituents of concern related to septic system discharge. Three of the 8 wells were noted as being the most susceptible to septic systems, high density housing, office buildings/complexes, and schools and parks. In addition, all wells are considered vulnerable to one or more of the following activities: automobile repair shops, private wells, historic gas stations, roads, highways, fleet terminals, and maintenance areas. However, no contaminants have been detected above standard water quality levels.

Local groundwater generally does not have microbial water quality problems. Parasites, bacteria, and viruses are filtered out as the water percolates through the soil, sand, and rock on its way to the aquifer. Even so, disinfectants are added to local groundwater when it is pumped by wells to protect public health due to the many septic tanks that may be a source of microbial

contamination. Local groundwater has very little total organic carbon (TOC) and generally has very low concentrations of bromide, minimizing potential for DBP formation. Taste and odor problems from algae are not an issue with groundwater. Overall, all groundwater meets current drinking water standards.

6.2 Water Quality Constituents

All water purveyors are subject to drinking water standards set by the USEPA and the DDW. The District is committed to providing its customers with high quality water that meets all federal and state primary drinking water standards. Although the District supplies its customers with high quality water, it recognizes that improving technology and science will continue to impact the evolving nature of state and federal standards. Public Health Goals (PHGs) represent non-enforceable goals based solely on public health considerations, which are developed using the best available health effects data in current scientific literature.

The water quality of the various sources of drinking water, which include rivers, lakes, streams, ponds, reservoirs, springs, and wells is reported. Water near the mountain fronts, which has been recharged relatively recently, tends to be of high quality, with low concentrations of chemical constituents. Some contaminants are naturally-occurring, such as minerals and radioactive material, and in some cases the presence of animals or from human activity can contribute to the constituents in the source waters. The minerals in groundwater may also be concentrated by evaporation when the water table is close to the ground surface.

Listed below are constituents that represent a summary of those reported in the District's 2020 GMR, 2019 CCR, and the District's 2017 Groundwater Monitoring Implementation Plan that may impact water supply reliability.

6.2.1 Fluoride and Arsenic

The District has been historically pumping from the Indian Cove, Fortynine Palms and Eastern Subbasins in the south because of the generally good water quality in these areas. The District also pumps from the Mesquite Subbasin. However, the District does have to treat water from certain wells for naturally-occurring constituents including fluoride and arsenic.

Elevated fluoride concentrations above the maximum contaminant level (MCL) are widespread across the District's service area. In 1993, TPWD was granted a variance from the California Primary MCL for fluoride, which states "the District shall not serve water containing fluoride levels in excess of 3.0 mg/L or 75 percent of the USEPA Primary Drinking Water Standard (currently at 4.0 mg/L), whichever is higher." The District made its request for the variance based on provisions outlined in SB 694 and AB 2681 which provide for the granting of a variance from the Primary Drinking Water Standard for fluoride by the DDW for a period of up to 30 years, provided that a review of the variance status is conducted every five years. The variance is set to expire in 2023.

Fluoride concentrations in the Indian Cove, Fortynine Palms and Eastern Subbasins generally averages below 2 mg/L, but several wells, especially in the Eastern Subbasin, average above 3 mg/L. Several older wells with high fluoride concentrations were taken out of operation in the 1990s and replaced by newer wells located in areas with lower fluoride concentrations. Because of the variance, groundwater from these wells has been allowed for use without treatment for fluoride. Because the fluoride concentrations in the Mesquite Lake subbasin are generally well above 3 mg/L, groundwater from these subbasins cannot comply with the variance without treatment.

In 2003, the District began pumping from the Mesquite Lake subbasin; however, this groundwater has high levels of fluoride. Water pumped from the Mesquite Lake subbasin is treated to reduce fluoride before being distributed into the pipeline system using the Twentynine Palms Fluoride Removal Water Treatment Plant in the Twentynine Palms Valley Basin. The plant is designed to reduce fluoride concentrations in the groundwater to levels below the MCL of 2 mg/l. The treatment plant is currently producing approximately 1.2 MGD and has a maximum capacity of 3 MGD. With the operation of the treatment plant, it is the District's long-term goal to maintain fluoride levels of not more than 2 mg/L.

Arsenic (As) is a naturally occurring element in groundwater that forms from the erosion and breakdown of geologic deposits; however, arsenic is less commonly associated with contaminant plumes. The primary MCL for arsenic is 10 μg/L. The occurrence of arsenic in the Twentynine Palms area is from natural sources. In 2020, groundwater sampled from Well 11-B had the highest concentration of Arsenic but was still below the MCL (8.8 mg/L) (KJC 2020).

6.2.2 Total Dissolved Solids and Nitrates

The TDS content of groundwater within the District ranges from about 140 to 380 mg/L. Lowest TDS concentrations usually occur south of the Pinto Mountain Fault, with a wide range of values occurring east of the Mesquite Fault (KJC 2014a). Groundwater TDS concentrations typically increase through natural mineral resources and recharge of septic effluent but remains below the secondary MCL limit of 1,000 mg/L.

The groundwater south of the Pinto Mountain Fault is bicarbonate type with a low TDS and calcium and sodium as the predominant cations. Groundwater between the Mesquite and Pinto Mountain Faults is also bicarbonate type, with sodium as the primary cation. The central and western portions of the Mesquite Lake subbasin have sodium-sulfate type water. East of the Mesquite Fault, the water type varies considerably from sodium-bicarbonate to sodium-sulfate (District, 2000). Due to these various sources of natural minerals, the District monitors for elevated levels.

Anthropogenic groundwater nitrate sources can come from a number of sources but are typically related to agriculture and wastewater. DDW has set the MCL for nitrate in drinking water at 45 mg/L for nitrate as nitrate (as NO_3) or 10 mg/L for nitrate as nitrogen (as N). These values are stoichiometrically equivalent. Nitrate concentrations in public drinking water supplies exceeding the MCL require water system actions to provide safe drinking water.

Nitrate concentrations in the samples collected in 2020 were below the MCL. The concentration in Well 14 (3.2 mg/L) was comparatively higher than the other wells (KJC 2020).

6.2.3 Uranium

Uranium (Ur) is a naturally occurring radioactive groundwater contaminant that forms from erosion of natural deposits. Groundwater sampled in 2019 revealed an average level of 7.4 pCi/L detected for Uranium, with a range 3.05-13.2 pCi/L. The MCL for Uranium is 20 pCi/L and current levels do not exceed the MCL limit, and is therefore not a concern to the District's drinking water.

6.2.4 Disinfection By-Products

Disinfection By-Products (DBPs), which include Trihalomethanes (THMs) and Haloacetic Acids (HAA5) are generated by the interaction between naturally occurring organic matter and disinfectants such as chlorine and ozone. As the District relies on groundwater for its supply, DBPs should be minimal and not a concern but the District will continue to monitor and report on these compounds.

6.2.5 Microbiological

Microbial contaminants, such as viruses and bacteria, can be naturally occurring or result from urban storm water runoff, sewage treatment plants, septic systems, agricultural livestock operations, and wildlife. Microbial testing has consistently been below the state and federal standards.

6.2.6 Radiological Tests

Radioactive compounds can be found in both ground and surface waters, and can be naturally occurring or be the result of oil and gas production and mining activities. Testing is conducted for two types of radioactivity: alpha and beta. Although naturally occurring radioactivity can be detected in the water supply, the levels on average meet the federal and state MCL standards.

6.2.7 Hexavalent Chromium

Hexavalent Chromium (Chromium VI) is produced from by-products of industrial applications and the manufacturing of stainless steel and other alloys as well as having a natural component. Samples from 2002 showed an average of 0.017 mg/L of Chromium VI in the water supply. In 2013, DDW adopted an MCL for Chromium VI of 0.010 mg/L. As of 2013, the District currently meets the federal and state MCL of 0.05 mg/L with an average detection of .019 mg/L in 2013 and a maximum of .026 mg/L for total chromium. Following adoption of the more stringent MCL in July of 2014, and in response to the hexavalent chromium concentrations present in the wells, the District shut down three of its eight production wells, reducing overall water production capacity by 15%. The wells are not operating, but two of the wells are still physically connected to the distribution system.

Well head treatment system (or other alternatives such as blending) to reduce concentrations of hexavalent chromium in the water supply are necessary to return these wells to service and restore the water production capacity. In September 2015, SB 385 was signed into law to authorize the SWRCB to grant a limited period of time for affected water systems to work toward achieving compliance, by January 1, 2020, without being deemed in violation as long as strict safeguards are met. However, in May 2017, the Superior Court of California, Sacramento County, issued an order requiring the California SWRCB to withdraw the current MCL for hexavalent chromium of 0.01 mg/L and establish a new MCL. Until the new MCL is established, it is unclear whether the District will need to move forward with hexavalent chromium treatment, or if there will still be a need to comply with SB 385.

6.3 Aquifer Protection

The region has generally a low density population and minimal industry; therefore, the aquifers are not expected to be impacted significantly. Water quality is continuously monitored and the largest threats to the aquifers remain the septic tanks in the region.

6.4 Groundwater Monitoring

The District actively incorporates new constituents into its monitoring program as a result of new regulatory actions or trends in water quality. The District's monitoring program consists of sampling both raw and treated water from production wells, monitoring of shallow groundwater, and monitoring of surface water in the region. The District also collects and analyzes samples for general minerals, physical characteristics, select metals, and organic chemicals often associated with industrial or commercial sites.

6.4.1 Groundwater Monitoring Implementation Plan

In 2014 the District prepared a Salt and Nutrient Management Plan (SNMP) (KJC 2014) with the primary purpose of developing a strategy for the District, along with the City of Twentynine Palms, to monitor and protect the groundwater resources in the Twentynine Palms area. The SNMP recognizes and addresses the increased need to assess potential groundwater quality impacts from salt and nutrient sources, primarily regional septic tanks.

In 2020 the District prepared a Groundwater Monitoring Implementation Plan (KJC 2020). The purpose of the Plan was to develop an implementation plan to provide a detailed monitoring plan and time schedule for the proposed groundwater monitoring activities in accordance with the SNMP.

This groundwater monitoring plan is designed as part of the SNMP to provide water quality data to help determine, in part, if a sewer system would be required to protect public health and water quality in the District. This may also reduce the significant hardship that residents would have to face given the prohibitive cost associated with design, financing, and constructing a sanitary sewer system. The Implementation Plan was approved by the Regional Water Board in a letter dated 10 December 2019 and consists of four phases:

- Phase 1 – Increase Sampling Frequency of the District's Existing Production Wells
- Phase 2 – Establish a Water Quality Monitoring Well Network Using Existing Wells
- Phase 3 – Installation of New Monitoring Wells
- Phase 4 – Conduct a One-Time Existing Conditions Sampling Event

Although the well sampling efforts moved to an annual basis for Phase I, the Implementation Plan had proposed additional constituents be analyzed which have not yet been included. Progress on Phases 2, 3, and 4 has been delayed in large part to the disruption and challenges of the COVID-19 pandemic.

It is anticipated that in 2021, the District's activities will return to a more normal routine. The well sampling protocols should be updated to include the additional constituents to fully implement Phase I. For Phase 2, the USGS can be contacted to inquire about additional well data and the City can install the three monitoring wells in the high-density housing areas. Phases 3 and 4 will likely continue to be delayed pending the needed funds for completion, however, efforts to identify and apply for funding should continue.

In general, groundwater conditions in the basins are stable and are not subject to significant seasonal variations. Therefore, once sufficient sampling has been conducted to establish the conditions in a well, the frequency of long-term groundwater quality monitoring should not need to account for seasonality. Annual reports will summarize the monitoring data each year along with a brief data assessment to described groundwater conditions in each of the subbasins. The annual reports will note any issues regarding the effectiveness of the monitoring plan. Revisions to the plan will be reported to the Colorado River Regional Water Quality Control Board (RWQCB) as needed to adequately characterize the groundwater quality conditions in the basins.

6.5 Water Quality Impacts on Reliability

Three factors affect the availability of groundwater: 1) sufficient source capacity (wells and pumps); 2) sustainability of the groundwater resource to meet pumping demand on a renewable basis; and 3) protection of groundwater sources (wells) from known contamination, or provisions for treatment in the event of contamination. The first two of those factors are addressed in previous sections. The resolution of elevated fluoride levels has been addressed with an allowed variance. The District maintains acceptable levels of fluoride through the use of wells with lower levels of fluoride being pumped as much as possible when water demand on the system dictates. The District is evaluating the possibility of adding an additional well to the fluoride treatment plant to provide additional redundancy in the system. The District is also evaluating treatment options for Chromium VI. All other water quality constituents are not expected to impact reliability (TABLE 6-1).

Maintaining the quality of the groundwater supply increases the reliability of the source by ensuring that deliveries are not interrupted due to water quality concerns. A direct result from

the degradation of the groundwater is increased treatment cost before consumption. The poorer the quality of the source water, the greater the treatment cost. Water may degrade in quality to the point that it is not economically feasible for treatment. In this scenario the degraded source water is taken off-line. This in turn can decrease water supply reliability by potentially decreasing the total supply and increasing demands on alternative water supplies.

Based on current conditions and the fact that treatment is available, water quality is not anticipated to affect the quantity of the District's water supply. However, water quality issues are constantly evolving and the District will have to continue to take action to protect and treat water supplies when needed. It is recognized that water quality treatment can have significant cost.

TABLE 6-1 CURRENT AND PROJECTED WATER SUPPLY CHANGES DUE TO WATER QUALITY[(a)]

Water source	2025	2030	2035	2040	2045
Mesquite Lake Basin	0%	0%	0%	0%	0%
Joshua Tree Basin					
Indian Cove Subbasin [(b)]	0%	0%	0%	0%	0%
Eastern Subbasin	0%	0%	0%	0%	0%
Fortynine Palms Subbasin	0%	0%	0%	0%	0%

Notes:
(a) Reflects percent change in supply as a result of water quality changes.
(b) In 2016 Wells No. 9 and 11 were either taken offline or shutdown. As a result, the total capacity for the Indian Cove Subbasin was reduced by about 55%. As a new well is being constructed to make up the lost capacity by summer of 2021, no reductions in water supply changes are projected in the table.

Section 7: Reliability Planning

The UWMP Act requires urban water suppliers to assess water supply reliability that compares total projected water use with the expected water supply over the next twenty years in five year increments. The UWMP Act also requires an assessment for a single-dry year and multiple-dry years. This section presents the reliability assessment for the District's service area.

7.1 Reliability of Water Supplies

The District relies solely on groundwater to meet its water demands. A summary of the potential factors limiting District supplies is presented in TABLE 7-1.

TABLE 7-1 FACTORS RESULTING IN INCONSISTENCY OF SUPPLY

Water Supply Source	Legal	Environmental	Water Quality	Climatic
Supplier produced groundwater	None identified	None identified	Beneficial uses may be impacted by elevated fluoride levels, or other contaminants.	The basins are largely dependent on annual run-off which may be highly variable.

As described in Sections 2 and 3, District groundwater supplies are not anticipated to be susceptible to inconsistencies resulting from legal or environmental impacts. The combination of basin storage volumes, pumping capacity, treatment capacity and management actions outlined in the District GWMP (Kennedy/Jenks, 2014a) minimize possible water quality and climatic constraints and ensure consistency of District supplies.

7.2 Supply and Demand Comparisons

The available supplies and water demands for the District's service area were analyzed to assess the District's ability to satisfy demands during three scenarios: a normal water year, single-dry year, and multiple-dry years. TABLE 7-2, TABLE 7-3, and TABLE 7-4 in this section present the supplies and demands under the various water year scenarios for the 25-year planning period in five year increments.

7.2.1 Normal Water Year

The normal water year is a year in the historical sequence that most closely represents median runoff levels and patters. TABLE 7-2 summarizes the District's water supplies available over the planning period during an average/normal year and compares them to demands for the same period. The numbers demonstrate that the District anticipates adequate supplies for 2025 to 2045 under normal water conditions.

TABLE 7-2 SUPPLY AND DEMAND COMPARISON-NORMAL YEAR (AFY)

	2025	2030	2035	2040	2045
Supply Totals[a]	6,995	6,995	6,995	6,995	6,995
Estimated Delivery Demands[b]	2,660	2,790	2,940	3,060	3,200
Difference (Supply –Demand)	*4,335*	*4,205*	*4,055*	*3,935*	*3,795*

Notes:
(a) From Table 4-4. DWR recommended pumping limit to prevent overdraft.
(b) From Total Water Deliveries in Table 2-9.

7.2.2 Single-Dry Year

The water supplies and demands for the District's service area over the 20-year planning period were analyzed in the event that a single-dry year occurs, similar to the drought that occurred in California in 1977 or 2015. TABLE 7-3 summarizes the District supplies available to meet demands during a single-dry year. Demand during dry years was assumed to increase by 10% based on the highest single-dry year increase in 2002. The numbers demonstrate that the District anticipates adequate supplies through 2045 under single-dry water conditions.

TABLE 7-3 SUPPLY AND DEMAND COMPARISON – SINGLE-DRY YEAR (AFY)

	2025	2030	2035	2040	2045
Supply Totals[a]	6,995	6,995	6,995	6,995	6,995
Groundwater from Storage [b]	0	0	0	0	0
Total Supply	*6,995*	*6,995*	*6,995*	*6,995*	*6,995*
Estimated Delivery Demands[c]	2,926	3,070	3,234	3,366	3,520
Difference (Supply –Demand)	*4,069*	*3,915*	*3,761*	*3,607*	*3,464*

Notes:
(a) From Table 4-1. DWR recommended pumping limit to prevent overdraft.
(b) For details see Section 4.3. In this table "Groundwater from Storage" is water could be taken from the Joshua Tree Basin that is in excess of recharge. The District has the ability to pump from storage to meet demands in excess of natural recharge and return flow.
(c) Assumes a 10% increase in demands during a single-dry year, not including anticipated sales to other agencies. Based on the highest single-dry year increase (2002) in demands over the historical period 1990-2015.

7.2.3 Multiple-Dry Year (5-years)

The water supplies and demands for the District's service area over the 20-year planning period were analyzed in the event that a multiple-dry year event occurs. Demand during multiple dry years was assumed to increase by 2.5% based on the highest five-year multiple dry period of 1991-1993. TABLE 7-4 summarizes District supplies available to meet demands during multiple-dry years. The numbers demonstrate that the District anticipates adequate supplies through 2045 under multiple-dry water conditions. In order to compensate for the deficiency, the District may temporarily stress the Mesquite or Joshua Tree Basins in order to meet demands. The District also plans to construct an additional well to increase capacity or implement other

management activities (like treating supplies not currently used due to poor water quality) to reduce demand.

TABLE 7-4 SUPPLY AND DEMAND COMPARISON – MULTIPLE-DRY YEAR (AFY)

	2025	2030	2035	2040	2045
Supply Totals[(a)]	6,995	6,995	6,995	6,995	6,995
Groundwater from Storage[(b)]	0	0	0	0	0
Total Supply	*6,995*	*6,995*	*6,995*	*6,995*	*6,995*
Estimated Demands[(c)]	2,727	2,860	3,014	3,137	3,280
Difference (Supply –Demand)	*4,268*	*4,125*	*3,981*	*3,838*	*3,705*

Notes:
(a) From Table 4-1. DWR recommended pumping limit to prevent overdraft.
(b) For details see Section 4.3. In this table "Groundwater from Storage" is water that could be taken from the Joshua Tree Basin that is in excess of recharge. It has been assumed the District may pump from storage if needed to meet demands in excess of natural recharge and return flow.
(c) Assumes a 2.5% increase in demands during a multiple-dry year, not including anticipated sales to other agencies. Based on the highest five year multiple-dry year increase (2011-2015) in demands over the historical period 1990-2015.

7.2.4 Summary of Comparisons

As shown in the analyses above, the District has adequate supplies to meet demands during normal, single-dry, and multiple-dry years throughout the 20-year planning period. In addition, as shown in the tables above, there is sufficient production capacity planned to meet projected future demands with the actions the District is taking to maintain supply availability.

7.3 Drought Risk Assessment

The Water Code requires that every urban water supplier include in its UWMP, a drought risk assessment for its water service to its customers. This is to benefit and inform the demand management measures and water supply projects and programs to be included in the urban water management plan.

7.3.1 Data and Methodologies Used

7.3.1.1 Water Demands

The water demands for this UWMP utilize water demand forecast based on the projected population from TABLE 1-6, the calculated number of persons per residential acre, the unit demands from TABLE 2-5, and the area ratios for the remaining undeveloped parcels within the District's service area from Table 2-6. The water delivery projections were then developed through the year 2045 and are presented in TABLE 2-8 A linear growth rate for development was assumed between 2020 and 2045. More details on this methodology are found in Section 2.4. Using this methodology, the District has estimated water demands 2021 through 2025 shown in Table 7-5 below.

7.3.1.2 Water Supplies

This Drought Risk Assessment looks at all the water supplies anticipated to be available 2021 through 2025, including any limitations due to infrastructure, regulations, and assuming drought conditions.

The District anticipates being able to pump up to 6,995 AF native groundwater in dry years 2021 to 2025.

7.3.2 Comparison of Total Water Supply Sources and Total Projected Water Use 2021 through 2025

As shown in Table 7-5 below, the District anticipates having adequate supplies to meet service area demands from 2021 to 2025 even if there is drought during these years.

TABLE 7-5 FIVE YEAR DROUGHT RISK ASSESSMENT 2021-2025 (AF)
(Modified from DWR Table 7-5)

	2021	2022	2023	2024	2025
Total Water Use [(a)]	**2,610**	**2,753**	**2,844**	**2,946**	**3,048**
Total Supplies	6,995	6,995	6,995	6,995	6,995
Surplus/Shortfall w/o WSCP Action	4,385	4,242	4,151	4,049	3,947
Planned WSCP Action					
WSCP - Supply Augmentation Benefit	NA	NA	NA	NA	NA
WSCP - Use Reduction Savings Benefit	NA	NA	NA	NA	NA
Revised Surplus/(Shortfall)	NA	NA	NA	NA	NA
Resulting % Use Reduction from WSCP Action	NA	NA	NA	NA	NA

(a) From Table 2-10

Section 8: Water Demand Management Measures

8.1 Demand Management

The purpose of the Demand Management Measures (DMM) section of this UWMP is to (a) provide a description of the past water conservation programs that the District has implemented since 2016 to meet its urban water use reduction targets and (b) describe the activities and actions the District plans to use in the future to meet its urban water use reduction targets. DMMs, listed below are those DMMs that the UWMP Act and Water Code specifically mention:

a) Water waste prevention ordinances
b) Metering
c) Conservation pricing (the District has a flat rate and does not do conservation pricing)
d) Public education and outreach
e) Programs to assess and manage distribution system real loss
f) Water conservation program coordination and staffing support

8.1.1 Water Waste Prohibitions

The District supports water waste prevention activities and ordinances through both direct Board activities and in collaboration with the City of Twentynine Palms.

In May 2015, the Board of Directors enacted Resolution No. 15-07 (Appendix H) which mandates Stage II mandatory restrictions on water use. Table 8-1 outlines the water waste prohibitions in effect and associated with the resolution. The resolution encourages residents and businesses to help protect water resources by practicing water saving measures and becoming more aware of the need to save water.

The District is also actively supporting the City in establishing terms of service for water efficient fixtures and design as required by state law. The City has adopted AB 1881 by statute and is enforcing California Green Building Code requirements through building permits. In February 2011 the District adopted Resolution 11-02 supporting the Model Landscape Water Ordinance and the California Green building standards (Appendix H). The District has developed processes to ensure water service is provided only after the proper approval and permits have been issued and notification has been provided by the City that all water efficiency related requirements are met.

The District also has a Water Shortage Contingency Plan that identifies six stages of water shortage and District response; this is described in more detail in Appendix I.

TABLE 8-1 SUMMARY OF WATER WASTE PROHIBITIONS OF ORDINANCE 15-07

Prohibitions
Outdoor irrigation of ornamental landscape and turf between the hours of 9AM and 6PM
Serving water at restaurants other than upon request
Repairing controllable leaks within a reasonable period of time after notification
A request will be made of hotels to place messaging in hotel rooms asking guests to conserve water
Applying water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures
Using a hose to wash an automobile except where the hose is equipped with a shut-off nozzle
Applying water to any hard surface including, but not limited to, driveways, sidewalks, and asphalt
Using potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system
Use of water to wash down buildings or structures for purposes other than construction use
Flushing gutters or permitting water to run or accumulate in any gutter or street
The application of potable water to outdoor landscapes during and within 48 hours after measureable rainfall
Limit outdoor irrigation of ornamental landscapes or turn with potable water to no more than 3 days per week
The irrigation with potable water of ornamental turf on public streets medians
The irrigation with potable water of landscapes outside of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Buildings Standards Commission and the Department of Housing and Community Development
Limit outdoor irrigation of ornamental landscapes or turn with potable water to no more than 3 days per week
The irrigation with potable water of ornamental turf on public streets medians

8.1.2 Metering

All of the District's customers are metered and billed by volume. All District meters were converted to Advanced Metering Infrastructure (AMI) in in 2019-2020.

8.1.3 Conservation Pricing

The District has meters for each customer and charges a 1) fixed service charge based on meter size; a 2) flat water commodity charge; and a 3) fixed monthly fire meter service charge. The District also has a pay meter station where it charges a fee based on the amount of

metered gallons of water pumped at the station. On January 27, 2021, the District approved Resolution 21-02 (provided in Appendix H) which sets the fees and rates for water service.

In 2009, Ordinance 92 (provided in Appendix H) was approved setting forth rules and regulations for the provision of retail water service and providing among other things, that water service rates and charges and other water fees and charges may be set from time to time by the District in order to generate revenues sufficient to cover the District's ongoing costs of operations, maintenance, and capital facilities. Rates were subsequently updated in 2015 as noted in Ordinance 96 and 97, and most recently in January 2021 with Resolution 21-02. These documents can be found in Appendix H.

The District has a current flat rate potable water quantity charge of $3.33 per 100 cubic feet of water consumed which is anticipated to increase to $4.83 by 2025 (NBS, 2020). There are also separate fixed monthly charges based on meter size. Pricing for potable water consumed is consistent regardless of the amount consumed. Conservation pricing, charging progressively more expensive rates for higher consumption rates, is not currently implemented in the District. Should the District move to import water in the future the ability to tier the rate structure may be considered to reduce water use.

8.1.4 Public Education and Outreach

The District recognizes the importance of public education and outreach for water resource conservation, and works towards providing materials to its customers informing them on ways to conserve water. It utilizes a number of different resources including "Let's Go Native", "Water Leaks", "Groundwater Foundation", "GetWise", "Groundwater Guardians", and the Save Our Water campaign. All of these resources are made available on the district website (www.29palmswater.net) free of charge for the benefit of its customers. In 2012, the District completed a conservation observation garden showcasing drought tolerant, native plants. The garden is open to the public Monday thru Friday and is a self-guided tour. Additionally, the District supports and provides funding to the Morongo Basin Conservation Association which advocates for environmental protection of the desert landscape.

The District had a school education program whereby it offered support and materials to teachers in the Twentynine Palms area within District boundaries, from lesson plans to classroom presentations. The District conducted elementary school presentations informing students about the local water supply and the importance of water conservation and protection. The presentations were designed to support grade level state curriculum standards and to assist students in discovering basic water concepts. The presentations consisted of lecture, short videos, discussion, and classroom activities. All classes covered grade appropriate information on water sources, source protection and conservation. In addition, individual grade level presentations addressed California water history, the earth's fresh water supply, the water cycle and drinking water treatment, and water as a material resource and how it is used to make common objects.

Historically an average of 15-20 classroom programs were conducted annually at no cost to participating schools within the District service area. While the requests for presentations and

outreach from the schools have diminished over the last ten years, likely due to other more widely known conservation campaigns such as the Save Our Water campaign, the District continues to offer classroom instruction at no cost.

8.1.5 Programs to Assess and Manage Distribution System Real Loss

Consistent with Senate Bill 555, the District conducts an AWWA water loss audit each year and reports water loss to DWR annually. In addition, the District guards against water loss by maintaining and replacing meters and pipelines when necessary.

The District has focused significant efforts on water loss control through replacement of aging infrastructure and controlling water loss in the distribution system. Through the District pipeline replacement program, which ran from 1991 through 2004, and other District maintenance programs, all 200 miles of District pipelines have been replaced and are being surveyed each year. The District reviews telemetry graphical data daily showing well and pump run times and reservoir levels that can indicate leaks. The District utilizes the Water Audit Methodology, and specifically the AWWA M36 standards to complete a system wide audit to estimate both real and apparent water loss. The 12-month period used in the analysis was January to December, in 2019. Based on this audit the total water loss (apparent losses plus real losses) was 206 AF, or about 9% of the water supplied by the District in that year.

Copies of the Audit reporting worksheets are provided in Appendix E.

8.1.6 Water Conservation Program Coordination and Staffing Support

The District's conservation program is run by the Operations Manager, supported by meter reading and customer services staff. The Operations Manager and customer services staff hours devoted to the conservation program is equivalent to one half time employee. Together they work together to coordinate conservation programs and implementation, as well as communicate and promote water conservation issues to the District Board and the community at large.

8.2 Other DMMs

<u>Residential Assistance Program and Landscape Water Surveys</u>

The District has a Residential Assistance Program that is initiated either at the customer's request or when District staff identifies that usage at a particular meter is excessive or out of the standard range. The newly implemented AMI system helps staff determine the meter readers determine if a customer's account is using more water than normal based on historical data. The account is then reviewed to confirm the "out of range" usage and the customer is notified by telephone of the higher than normal water usage. The AMI system also helps the customer self-monitor their water use and make adjustments as necessary and the District also provides audits to customers if they have questions or concerns.

Less than 5% of the District's use goes to irrigation. Residential customers typically have little to no landscaping and there are a small number of customers including motels and the school district that have some landscaping.

The City has adopted AB 1881, the State Landscape Model Ordinance, by statute and the District supports its enforcement as appropriate. The District concurs with the conservation related measures which are outlines in the Landscape Ordinance and continues to work with the City to identify efficiency opportunities.

A leak audit is a free service provided to the customer to assist in determining if there is a leak on the property on the customer's side of the meter. This includes educating the customer on how to read their water meter and monitor the leak indicator on the meter. Typically these leaks are indoors since most District customers do not have irrigated landscaping.

Water Sense Specification for New Residential Development

The District does not have rule making authority, however it works closely with the City to support its requirements for water efficiency in buildings and landscape design.

8.3 Planned DMMs to Meet Water Use Targets

Over the next five years, the District will continue to implement the DMMs as described in Section 8.1.1. In addition, District staff will continue to offer residents educational programs and information and outreach; will continue leak detection and auditing; and will continue working with the City on implementing efficiency measures as feasible and appropriate.

The District recognizes that conserving water is an integral component of a responsible water management strategy. The District has a uniquely low water use for a high desert area. At 135 GPCD, the District is significantly lower than the rest of the Colorado River region, which has a 10-year average baseline of 346 GPCD, and has met its 2020 SBX7-7 goal of 163 GPCD. The District has achieved its goals largely by focusing on system performance, rates increases and a community culture of conservation and small landscapes. The District is committed to providing its customers with the education and tools to maintain their low use.

8.3.1 Planned Implementation of DMMs to Achieve Water Use Targets

The District is currently exceeding water use targets set by SBX7-7. The District will continue to implement the DMMs as available and described in this section. These programs, taken together, will assist the District in helping to maintain the conservation levels to allow it to meet current and future water use reduction targets pursuant to *Making Water Conservation a California Water of Lif*e.

Section 9: Seismic Risk Assessment

Per the Water Code Section 10632.5, Suppliers are required to assess seismic risk to water supplies as part of their WSCP. The plan also must include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

Pursuant to Water Code, the seismic risk assessment must include a description of the vulnerability of each of its water system(s) facilities. Suppliers are encouraged to assess the vulnerability of external facilities or components that extend outside the Supplier's service distribution area (e.g., transmission pipes, delivery canals, surface water diversion pumps) since failure of them would still ultimately disrupt the Supplier's ability to serve their customers.

The Local Hazard Mitigation Plan (LHMP) for the District was developed and adopted in 2018 to identify potential hazards and formulate mitigation measures for future protection of the District's critical infrastructure and the community's safety with respect to the District's facilities and services. The LHMP was completed with the coordination and involvement of the Twentynine Palms District staff and representatives from the local community. The Planning Team reviewed FEMA's "Hazard Mitigation Plan Crosswalk", and San Bernardino County OES supplied information on past events that affected the service area.

The Planning Team reviewed the following plans:

- Bighorn Desert View LMHP
- Hi-Desert Water District, Draft LHMP
- San Bernardino County HMP
- USGS Golden Guardian 2008
- Twentynine Palms Water District Water Master Plan
- 2016 California HMP
- San Bernardino County Flood Control
- FEMA Flood Insurance Study for S.B. County

The District has identified hazards in the community, assessed those hazards that pose the most significant risk, and identified projects to help reduce and/or eliminate those risks. After the hazards were identified, mitigation goals are set. Global measures that apply across all hazards include:

- Continually improve the community's understanding of potential impacts due to hazards and the measures needed to protect lives and critical infrastructure;

- Continually provide State and Local Agencies with updated information about hazards, vulnerabilities, and mitigation measures at the District;
- Review local codes and standards to verify that they protect human life and the District's facilities;
- Review and verify that the District's owned and operated infrastructure meet minimum standards for safety;
- Review the District facilities and developments in high-risk areas to verify that these areas are appropriately protects for potential hazards;
- Identify and mitigate imminent threats to life safety and facility damage.

In addition to the 2018 LHMP, a desktop assessment of the District's pipelines and storage tanks was performed based on available information. The purpose of the desktop assessment was to perform a risk assessment and to develop a prioritized pipeline replacement program and capital improvement program.

The following were evaluated and recommended for the District's pipeline and storage tanks:

- Storage tanks to comply with seismic freeboard requirements
- Modify the discharge elevation of the overflow pipe in the storage tanks
- Modify then storage tank roof to facilitate water drainage to prevent ponding from rain events
- Site drainage modifications to reduce erosion damage to the storage tank ring road
- Replace and upsize existing pipelines, of any size, that are hydraulically deficient
- Replace existing pipelines, of any size, that have a significant leak occurrence
- Replace or modify existing pipelines that have a high-probability and high-consequence of failure based on its condition assessment analysis
- Replace or modify existing pipelines that have a high-probability and low-consequence of failure based on its condition assessment analysis

9.1 Water Shortage Contingency Plan

Per the requirements of Section 10632 of the UWMP Act, the District's Water Shortage Contingency Plan (WSCP) has been developed as a separate document from the 2020 UWMP and is located in Appendix I.

Section 10: References

California Department of Water Resources (DWR). 1984. Twentynine Palms Ground Water Study.

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Appendix A: DWR Checklist

Appendix F. UWMP Checklist

This checklist is developed directly from the Urban Water Management Planning Act and SB X7-7. It is provided to support water suppliers (Suppliers) during preparation of their Urban Water Management Plans (UWMP). Two versions of the UWMP Checklist are provided below – the first one is organized according to the California Water Code and the second checklist according to subject matter. The two checklists contain duplicate information and the Supplier should use whichever checklist is more convenient. In the event that information or recommendations in these tables are inconsistent with, conflict with, or omit the requirements of the Act or applicable laws, the Act or other laws shall prevail.

Each water supplier submitting an UWMP can also provide DWR with the UWMP location of the required element by completing the last column of either checklist. This will support DWR in its review of these UWMPs. The completed form can be included with the UWMP.

If an item does not pertain to a Supplier, then state the UWMP requirement and note that it does not apply to the Supplier. For example, if a Supplier does not use groundwater as a water supply source, then there can be a statement in the UWMP that groundwater is not a water supply source.

Checklist Arranged by Water Code Section

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Chapter 5	**Section 3.1.1 and 3.1.2, Table 3-10 and Table 3-11**
10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.7.2	**Section 3.1.2, Table 3-11**
10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 5.7	**Section 3.11.2, Table 3-10 and Table 3-11**
10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Sections 5.2 and 5.5.7	**Not Applicable**

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets.	Plan Adoption, Submittal, and Implementation	Chapter 10	**Section 1.5.2, Table 1-3**
10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	Section 5.1	**Not Applicable**
10608.4	Retail suppliers shall report on their progress in meeting their water use targets. The data shall be reported using a standardized form.	Baselines and Targets	Section 5.8 and App E	**Section 3.1.2, Table 3-10 and 3-11**
10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.1	**Section 1.3, Table 1-3**

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.5.2	**Section 1.5, Table 1-2**
10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.4	**Section 1.6**
10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.	Plan Adoption, Submittal, and Implementation	Section 10.2.1	**Section 1.5, Table 1-2**
10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	Sections 10.3.1 and 10.4	**Section 1.3**

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information.	Summary	Chapter 1	
10631(a)	Describe the water supplier service area.	System Description	Section 3.1	**Section 1.6, Figure 1-1**
10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3	**Section 1.9**
10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Sections 3.4 and 5.4	**Section 1.8**
10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Section 3.4	**Section 1.8, Table 1-7**
10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 3.4	**Section 1.7**

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10631(a)	Describe the land uses within the service area.	System Description	Section 3.5	**Section 1.7, Figure 1-2**
10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	Section 6.2.8	**Section 4.1, Table 4-1**
10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2	**Section 4.3, Table 4-3 and 4-4.**
10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought.	System Supplies	Section 6.2	**Section 4.9**

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	Section 6.1	**Not Applicable**
10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Section 6.1	**Section 4.8**
10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.2.2	**Section 4.3.3 and Section 4.3.6, Table 4-4 and 4-5**
10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 6.2.2	**Section 4.3.2 and Section 4.3.2**

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2.2	**Section 4.3**
10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	Section 6.2.3	**Section 4.3.4**
10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Section 6.2.4	**Section 4.3.5. Table 4-3**
10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Section 6.2	**Section 4.3.6. Table 4-4**

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis.	System Supplies	Section 6.7	**Section 4.5**
10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2	**Section 2.4 and Section 2.5. Table 2-4 and Table 2-12**
10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update.	System Water Use	Section 4.3	**Section 7.2.3. Table 7-4**
10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Section 4.2	**Section 2.3.2. Table 2-4.**
10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Sections 9.2 and 9.3	**Section 8**
10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Sections 9.1 and 9.3	**Section 8.1 and Section 8.2**

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	System Supplies	Section 6.8	**Section 4.8**
10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6	**Section 4.9**
10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	Section 2.5.1	**Not Applicable**
10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	Section 2.5.1	**Not Applicable**
10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.5	**Section 2.5.1. Table 2-11**

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10631.2(a)	The UWMP must include energy intensity information as stated in the code.		Section 6.4 and Appendix O	**Section 4.7. Table 4-6**
10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Chapter 8	**WSCP**
10632(a)(2)(A)	Provide the written decision-making process and other methods that the supplier will use each year to determine its water reliability.	Water Shortage Contingency Planning	Section 8.2	**WSCP Section 2.1**
10632(a)(2)(B)	Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water Shortage Contingency Planning	Section 8.2	**WSCP Section 2.4**
10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water Shortage Contingency Planning	Section 8.3	**WSCP Section 3.1**

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	Section 8.3	**WSCP Section 3.1. Table 3-2.**
10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	Section 8.4	**WSCP Section 3.3**
10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Section 8.4	**WSCP Section 3.4**
10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	Section 8.4	**WSCP Section 3.5**

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions.	Water Shortage Contingency Planning	Section 8.4	**WSCP Section 3.7.4**
10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water Shortage Contingency Planning	Section 8.4	**WSCP Section 3.7.5**
10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water Shortage Contingency Planning	Section 8.5	**WSCP Section 4**
10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water Shortage Contingency Planning	Section 8.5, 8.6	**WSCP Section 4.1**

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	Section 8.7	**WSCP Section 6**
10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	Section 8.7	**WSCP Section 7**
10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water Shortage Contingency Planning	Section 8.7	**WSCP Section 4.1**
10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Section 8.8	**WSCP Section 7.1**

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Section 8.8	**WSCP Section 7.3**
10632(a)(8)(C)	Describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought.	Water Shortage Contingency Planning	Section 8.8	**WSCP Section 3.1**
10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	Section 8.9	**WSCP Section 5.2**
10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	Section 8.10	**WSCP Section 1.4**

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water Shortage Contingency Planning	Section 8.11	**WSCP Section 3.4**
10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.2	**Not Applicable**
10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.2	**Not Applicable**
10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.2	**Not Applicable**

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.2	**Not Applicable**
10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.2	**Not Applicable**
10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.2	**Not Applicable**
10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Chapter 7	**Section 7.1, Table 7-1**

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10635(a)	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.3	**Section 7.2, Table 7-2, Table 7-3, Table 7-4**
10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	Section 7.3	**Section 7.3**
10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Water Supply Reliability Assessment	Section 7.3	**Section 7.3.1**
10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	Section 7.3	**Section 7.1**

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Section 7.3	**Section 7.3.2, Table 7-5**
10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change condition, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	Section 7.3	**Section 7.3.1**
10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 60 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Sections 8.12, 10.4	**Section 9.1**
10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan Preparation	Section 2.6	**Section 1.5.2**

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing.	Plan Adoption, Submittal, and Implementation	Sections 10.2.2, 10.3, and 10.5	**Section 1.5.2, Table 1-3**
10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Section 10.2	**Section 1.5.2, Table 1-3**
10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3.1	
10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.5	
10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.5	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location
10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Sections 10.4.1 and 10.4.2	
10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5	
10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5	

Checklist Arranged by Subject

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Chapter 5	
10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.7.2	
10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 5.7	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Sections 5.2 and 5.5.7	
10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	Section 5.1	
10608.4	Retail suppliers shall report on their progress in meeting their water use targets. The data shall be reported using a standardized form.	Baselines and Targets	Section 5.8 and App E	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years.	Demand Management Measures	Sections 9.2 and 9.3	
10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Sections 9.1 and 9.3	
10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets.	Plan Adoption, Submittal, and Implementation	Chapter 10	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.	Plan Adoption, Submittal, and Implementation	Section 10.2.1	
10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	Sections 10.3.1 and 10.4	
10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 60 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Sections 8.12, 10.4	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	Sections 10.2.2, 10.3, and 10.5	
10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Section 10.2	
10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3.1	
10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.5	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.5	
10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Sections 10.4.1 and 10.4.2	
10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5	
10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.1	
10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.5.2	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan Preparation	Section 2.6	
10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information.	Summary	Chapter 1	
10631(a)	Describe the water supplier service area.	System Description	Section 3.1	
10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3	
10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Section 3.4	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 3.4	
10631(a)	Describe the land uses within the service area.	System Description	Section 3.5	
10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Sections 3.4 and 5.4	
10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	Section 6.2.8	
10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2	
10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and	System Supplies	Section 6.2	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
	severe periods of drought.			
10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	Section 6.1	
10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Section 6.1	
10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of	System Supplies	Section 6.2.2	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
	the plan or authorization.			
10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 6.2.2	
10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2.2	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	Section 6.2.3	
10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Section 6.2.4	
10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Section 6.2	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis.	System Supplies	Section 6.7	
10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	System Supplies	Section 6.8	
10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6	
10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	Section 2.5.1	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	Section 2.5.1	
10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.2	
10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.2	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.2	
10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.2	
10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.2	
10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.2	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2	
10631(d)(3)(A)	Report the distribution system water loss for for each of the 5 years preceding the plan update.	System Water Use	Section 4.3	
10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Section 4.2	
10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.5	
10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Chapter 8	
10632(a)(2)(A)	Provide the written decision-making process and other methods that the supplier will use each year to determine its water reliability.	Water Shortage Contingency Planning	Section 8.2	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
10632(a)(2)(B)	Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water Shortage Contingency Planning	Section 8.2	
10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water Shortage Contingency Planning	Section 8.3	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	Section 8.3	
10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	Section 8.4	
10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Section 8.4	
10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	Section 8.4	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions.	Water Shortage Contingency Planning	Section 8.4	
10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water Shortage Contingency Planning	Section 8.4	
10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water Shortage Contingency Planning	Section 8.5	
10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water Shortage Contingency Planning	Section 8.5, 8.6	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	Section 8.7	
10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	Section 8.7	
10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water Shortage Contingency Planning	Section 8.7	
10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Section 8.8	
10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with	Water Shortage Contingency Planning	Section 8.8	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
	activated shortage response actions.			
10632(a)(8)(C)	Describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought.	Water Shortage Contingency Planning	Section 8.8	
10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	Section 8.9	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	Section 8.10	
10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water Shortage Contingency Planning	Section 8.11	
10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.4	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Chapter 7	
10635(a)	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.3	
10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	Section 7.3	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Water Supply Reliability Assessment	Section 7.3	
10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	Section 7.3	
10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Section 7.3	

Water Code Section	Summary as Applies to UWMP	Subject	2020 Guidebook Location	2020 UWMP Location (Optional Column for Agency Review Use)
10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change condition, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	Section 7.3	
10631.2(a)	The UWMP must include energy intensity information as stated in the code.	System Suppliers, Energy Intensity	Section 6.4 and Appendix O	

Appendix B: Public Outreach Materials

TPWD
TWENTYNINE PALMS WATER DISTRICT

September 22, 2020

Mark Ban, General Manager
Joshua Basin Water District
61750 Chollita Road
Joshua Tree, CA 92252

Notice of Public Hearing
2020 Urban Water Management Plan for Twentynine Palms Water District

Twentynine Palms Water District is undertaking review, update, and revision of its Urban Water Management Plan (UWMP). Twentynine Palms Water District is located in San Bernardino County and serves the residents of Twentynine Palms and areas of unincorporated San Bernardino County. The Urban Water Management Planning Act requires every "urban water supplier" of a certain size to prepare and adopt an UWMP at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. A complete UWMP is necessary for Twentynine Palms Water District to remain eligible for state drought water bank assistance and is a requirement of state grant and loan funding programs.

The 2020 UWMP will include an update of anticipated water demands in the Twentynine Palms Water District service area. Concurrent with the UWMP Update, Twentynine Palms Water District will revise its Water Shortage Contingency Plan (WSCP). Twentynine Palms Water District is encouraging participation by land use agencies, water use agencies, and other interested parties in the UWMP and WSCP. Twentynine Palms Water District would like to extend to your agency an opportunity to meet with us to go over the various elements of the UWMP and WSCP, including assumptions about future population, future water demand, future water supplies, and upcoming water conservation programs.

We anticipate that a draft UWMP and WSP will be available for public review starting in April 2021 and the District will hold a public hearing in June 2021, prior to adoption of the UWMP and WSCP. Hence, we would like to solicit your input in the near future.

If your agency would like to learn more about the Urban Water Management Plan and Water Shortage Contingency Plan, please contact Ray Kolisz, General Manager, (760) 367-7546, rkolisz@29palmswater.org, no later than November 16, 2020.

Sincerely,

Ray Kolisz
General Manager

TPWD
TWENTYNINE PALMS WATER DISTRICT

September 22, 2020

Frank Luckino, City Manager
City of Twentynine Palms
6136 Adobe Road
Twentynine Palms, CA 92277

Notice of Public Hearing
2020 Urban Water Management Plan for Twentynine Palms Water District

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Sincerely,

Ray Kolisz
General Manager

TPWD
TWENTYNINE PALMS WATER DISTRICT

September 22, 2020

Heidi Duron, Planning Director
San Bernardino County Land Use Services
385 N. Arrowhead Ave.
San Bernardino, CA 92415

Notice of Public Hearing
2020 Urban Water Management Plan for Twentynine Palms Water District

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Sincerely,

Ray Kolisz
General Manager

TPWD
TWENTYNINE PALMS WATER DISTRICT

September 22, 2020

Chris Elliot, Water Resources Manager
Natural Resources Environmental Affairs
MCAGCC, Bldg. 1418 Box 788110
Twentynine Palms, CA 92278-8110

Notice of Public Hearing
2020 Urban Water Management Plan for Twentynine Palms Water District

Twentynine Palms Water District is undertaking review, update, and revision of its Urban Water Management Plan (UWMP). Twentynine Palms Water District is located in San Bernardino County and serves the residents of Twentynine Palms and areas of unincorporated San Bernardino County. The Urban Water Management Planning Act requires every "urban water supplier" of a certain size to prepare and adopt an UWMP at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. A complete UWMP is necessary for Twentynine Palms Water District to remain eligible for state drought water bank assistance and is a requirement of state grant and loan funding programs.

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Sincerely,

Ray Kolisz
General Manager

TPWD
TWENTYNINE PALMS WATER DISTRICT

September 22, 2020

Darrell Mike, Tribal Chairman
Twenty-nine Palms Band of Mission Indians
46-200 Harrison Place
Coachella, CA 92236

Notice of Public Hearing
2020 Urban Water Management Plan for Twentynine Palms Water District

Twentynine Palms Water District is undertaking review, update, and revision of its Urban Water Management Plan (UWMP). Twentynine Palms Water District is located in San Bernardino County and serves the residents of Twentynine Palms and areas of unincorporated San Bernardino County. The Urban Water Management Planning Act requires every "urban water supplier" of a certain size to prepare and adopt an UWMP at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. A complete UWMP is necessary for Twentynine Palms Water District to remain eligible for state drought water bank assistance and is a requirement of state grant and loan funding programs.

The 2020 UWMP will include an update of anticipated water demands in the Twentynine Palms Water District service area. Concurrent with the UWMP Update, Twentynine Palms Water District will revise its Water Shortage Contingency Plan (WSCP). Twentynine Palms Water District is encouraging participation by land use agencies, water use agencies, and other interested parties in the UWMP and WSCP. Twentynine Palms Water District would like to extend to your agency an opportunity to meet with us to go over the various elements of the UWMP and WSCP, including assumptions about future population, future water demand, future water supplies, and upcoming water conservation programs.

We anticipate that a draft UWMP and WSP will be available for public review starting in April 2021 and the District will hold a public hearing in June 2021, prior to adoption of the UWMP and WSCP. Hence, we would like to solicit your input in the near future.

If your agency would like to learn more about the Urban Water Management Plan and Water Shortage Contingency Plan, please contact Ray Kolisz, General Manager, (760) 367-7546, rkolisz@29palmswater.org, no later than November 16, 2020.

Sincerely,

Ray Kolisz
General Manager

Appendix C: Climate Change Vulnerability Assessment

Appendix C.3

Climate Change Vulnerability Checklist

Draft Climate Change Vulnerability Checklist

Mojave Integrated Regional Water Management Plan

Identification of watershed characteristics that could potentially be vulnerable to future climate change is the first step in assessing the climate change vulnerabilities in the Region. In the context of this analysis, vulnerability is defined as the degree to which a system is exposed to, susceptible to, and able to cope with and adapt to, the adverse effects of climate change, consistent with the definition in the recently issued Climate Change Handbook for Regional Water Planning and consistent with climate change requirements in the Proposition 84 IRWM Plan Guidelines (October 2012).

This Climate Change Vulnerability Checklist for the Mojave Region is a required element for an IRWM Plan and was provided by the Department of Water Resources (DWR) in its Climate Change Handbook found at http://www.water.ca.gov/climatechange/CCHandbook.cfm.

The questions found in the checklist are identified by number and are **bold** and italicized. This checklist is intended to be an appendix to the IRWM Plan. For the questions with no checks in the boxes, this indicates the answer being "no". A checked box means "yes". Therefore, the more boxes checked in a category indicates the more vulnerable the Region is to that category/element of climate change.

I. Water Demand

☑ ***Are there major industries that require cooling/process water in your planning region?***

- As average temperatures increase, cooling water needs may also increase.
- Identify major industrial water users in your region and assess their current and projected needs for cooling and process water.

☑ ***Does water use vary by more than 50% seasonally in parts of your region?***

- Seasonal water use, which is primarily outdoor water use, is expected to increase as average temperatures increase and droughts become more frequent.
- Where water use records are available, look at total monthly water uses averaged over the last five years (if available). If maximum and minimum monthly water uses vary by more than 25%, then the answer to this question is "yes".
- Where no water use records exist, is crop irrigation responsible for a significant (say >50%) percentage of water demand in parts of your region?

☐ ***Are crops grown in your region climate-sensitive? Would shifts in daily heat patterns, such as how long heat lingers before night-time cooling, be prohibitive for some crops?***

- Fruit and nut crops are climate-sensitive and may require additional water as the climate warms.

☐ ***Do groundwater supplies in your region lack resiliency after drought events?***

- Droughts are expected to become more frequent and more severe in the future. Areas with a more hardened demand may be particularly vulnerable to droughts and may become more dependent on groundwater pumping.

☑ ***Are water use curtailment measures effective in your region?***

- Droughts are expected to become more frequent and more severe in the future. Areas with a more hardened demand may be particularly vulnerable to droughts.

☐ ***Are some instream flow requirements in your region either currently insufficient to support aquatic life, or occasionally unmet?***

- Changes in snowmelt patterns in the future may make it difficult to balance water demands. Vulnerabilities for ecosystems and municipal/agricultural water needs may be exacerbated by instream flow requirements that are:

1. not quantified,
2. not accurate for ecosystem needs under multiple environmental conditions including droughts, and
3. not met by regional water managers.

II. Water Supply

☑ ***Does a portion of the water supply in your region come from snowmelt?***

- Snowmelt is expected to decrease as the climate warms. Water systems supplied by snowmelt are therefore potentially vulnerable to climate change.
- Where watershed planning documents are available, refer to these in identifying parts of your region that rely on surface water for supplies; if your region contains surface water supplies originating in watersheds where snowpack accumulates, the answer to this question is "Yes."
- Where planning documents are not available, identify major rivers in your region with large users. Identify whether the river's headwaters are fed by snowpack.

☑ ***Does part of your region rely on water diverted from the Delta, imported from the Colorado River, or imported from other climate-sensitive systems outside your region?***

- Some imported or transferred water supplies are sources from climate-sensitive watersheds, such as water imported from the Delta and the Colorado River.

☐ ***Does part of your region rely on coastal aquifers? Has salt intrusion been a problem in the past?***

- Coastal aquifers are susceptible to salt intrusion as sea levels rise, and many have already observed salt intrusion due to over-extraction, such as the West Coast Basin in southern California.

☐ ***Would your region have difficulty in storing carryover supply surpluses from year to year?***

- Droughts are expected to become more severe in the future. Systems that can store more water may be more resilient to droughts.

☐ ***Has your region faced a drought in the past during which it failed to meet local water demands?***

- Droughts are expected to become more severe in the future. Systems that have already come close to their supply thresholds may be especially vulnerable to droughts in the future.

☑ ***Does your region have invasive species management issues at your facilities, along conveyance structures, or in habitat areas?***

- As invasive species are expected to become more prevalent with climate change, existing invasive species issues may indicate an ecological vulnerability to climate change.

III. Water Quality

? ***Are increased wildfires a threat in your region? If so, does your region include reservoirs with fire-susceptible vegetation nearby which could pose a water quality concern from increased erosion?***

- Some areas are expected to become more vulnerable to wildfires over time. To identify whether this is the case for parts of your region, the California Public Interest Energy Research (PIER) Program has posted wildfire susceptibility projections as a Google Earth application at: http://cal-adapt.org/fire/. These projections are only the results of a single study and are not intended for analysis, but can aid in qualitatively answering this question. Read the application's disclaimers carefully to be aware of its limitations.

☑ ***Does part of your region rely on surface water bodies with current or recurrent water quality issues related to eutrophication, such as low dissolved oxygen or algal blooms? Are there other water quality constituents potentially exacerbated by climate change?***

- Warming temperatures will result in lower dissolved oxygen levels in water bodies, which are exacerbated by algal blooms and in turn enhance eutrophication. Changes in streamflows may alter pollutant concentrations in water bodies.

☐ ***Are seasonal low flows decreasing for some waterbodies in your region? If so, are the reduced low flows limiting the waterbodies' assimilative capacity?***

- In the future, low flow conditions are expected to be more extreme and last longer. This may result in higher pollutant concentrations where loadings increase or remain constant

☐ ***Are there beneficial uses designated for some water bodies in your region that cannot always be met due to water quality issues?***

- In the future, low flows are expected decrease, and to last longer. This may result in higher pollutant concentrations where loadings increase or remain constant.

☐ ***Does part of your region currently observe water quality shifts during rain events that impact treatment facility operation?***

- While it is unclear how average precipitation will change with temperature, it is generally agreed that storm severity will probably increase. More intense, severe storms may lead to increased erosion, which will increase turbidity in surface waters. Areas that already observe water quality responses to rainstorm intensity may be especially vulnerable.

IV. Sea Level Rise

☐ ***Has coastal erosion already been observed in your region?***

- Coastal erosion is expected to occur over the next century as sea levels rise.

☐ ***Are there coastal structures, such as levees or breakwaters, in your region?***

- Coastal structures designed for a specific mean sea level may be impacted by sea level rise.

☐ ***Is there significant coastal infrastructure, such as residences, recreation, water and wastewater treatment, tourism, and transportation) at less than six feet above mean sea level in your region?***

- Coastal flooding will become more common, and will impact a greater extent of property, as sea levels rise. Critical infrastructure in the coastal floodplain may be at risk.
- Digital elevation maps should be compared with locations of coastal infrastructure.

☐ ***Are there climate-sensitive low-lying coastal habitats in your region?***

- Low-lying coastal habitats that are particularly vulnerable to climate change include estuaries and coastal wetlands that rely on a delicate balance of freshwater and salt water.

☐ ***Are there areas in your region that currently flood during extreme high tides or storm surges?***

- Areas that are already experiencing flooding during storm surges and very high tides, are more likely to experience increased flooding as sea levels rise.

☐ ***Is there land subsidence in the coastal areas of your region?***

- Land subsidence may compound the impacts of sea level rise.

☐ ***Do tidal gauges along the coastal parts of your region show an increase over the past several decades?***

- Local sea level rise may be higher or lower than state, national, or continental projections.
- Planners can find information on local tidal gauges at http://tidesandcurrents.noaa.gov/sltrends/sltrends_states.shtml?region=ca.

V. Flooding

☑ ***Does critical infrastructure in your region lie within the 200-year floodplain? DWR's best available floodplain maps are available at:***
http://www.water.ca.gov/floodmgmt/lrafmo/fmb/fes/best_available_maps/.

- While it is unclear how average precipitation will change with temperature, it is generally agreed that storm severity will probably increase. More intense, severe storms may lead to higher peak flows and more severe floods.
- Refer to FEMA floodplain maps and any recent FEMA, US Army Corps of Engineers, or DWR studies that might help identify specific local vulnerabilities for your region. Other follow-up questions that might help answer this question:

1. What public safety issues could be affected by increased flooding events or intensity? For example, evacuation routes, emergency personnel access, hospitals, water treatment and wastewater treatment plants, power generation plants and fire stations should be considered.
2. Could key regional or economic functions be impacted from more frequent and/or intense flooding?

☐ ***Does part of your region lie within the Sacramento-San Joaquin Drainage District?***

- The SSJDD contains lands that are susceptible to overflows from the Sacramento and San Joaquin Rivers, and are a key focus of the Central Valley Flood Protection Plan. (http://www.water.ca.gov/cvfmp/program.cfm).

☐ ***Does aging critical flood protection infrastructure exist in your region?***

- Levees and other flood protection facilities across the state of California are aging and in need of repair. Due to their overall lowered resiliency, these facilities may be particularly vulnerable to climate change impacts.
- DWR is evaluating more than 300 miles of levees in the San Joaquin and Sacramento Rivers Valleys and the Delta (http://www.water.ca.gov/levees/).

☑ ***Have flood control facilities (such as impoundment structures) been insufficient in the past?***

- Reservoirs and other facilities with impoundment capacity may be insufficient for severe storms in the future. Facilities that have been insufficient in the past may be particularly vulnerable.

☑ ***Are wildfires a concern in parts of your region?***

- Wildfires alter the landscape and soil conditions, increasing the risk of flooding within the burn and downstream areas. Some areas are expected to become more vulnerable to wildfires over time. To identify whether this is the case for parts of your region, the California Public Interest Energy Research Program (PIER) has posted wildfire susceptibility projections as a Google Earth application at: http://cal-adapt.org/fire/. These projections are the results of only a single study and are not intended for analysis, but can aid in qualitatively answering this question. Read the application's disclaimers carefully to be aware of its limitations.

VI. Ecosystem and Habitat Vulnerability

☑ ***Does your region include inland or coastal aquatic habitats vulnerable to erosion and sedimentation issues?***

- Erosion is expected to increase with climate change, and sedimentation is expected to shift. Habitats sensitive to these events may be particularly vulnerable to climate change.

☐ ***Does your region include estuarine habitats which rely on seasonal freshwater flow patterns?***

- Seasonal high and low flows, especially those originating from snowmelt, are already shifting in many locations.

☑ ***Do climate-sensitive fauna or flora populations live in your region?***

- Some specific species are more sensitive to climate variations than others.

☑ ***Do endangered or threatened species exist in your region? Are changes in species distribution already being observed in parts of your region?***

- Species that are already threatened or endangered may have a lowered capacity to adapt to climate change.

☐ ***Does the region rely on aquatic or water-dependent habitats for recreation or other economic activities?***

- Economic values associated with natural habitat can influence prioritization.

☐ ***Are there rivers in your region with quantified environmental flow requirements or known water quality/quantity stressors to aquatic life?***

- Constrained water quality and quantity requirements may be difficult to meet in the future.

☐ ***Do estuaries, coastal dunes, wetlands, marshes, or exposed beaches exist in your region? If so, are coastal storms possible/frequent in your region?***

- Storm surges are expected to result in greater damage in the future due to sea level rise. This makes fragile coastal ecosystems vulnerable.

☑ ***Does your region include one or more of the habitats described in the Endangered Species Coalition's Top 10 habitats vulnerable to climate change*** *(http://www.itsgettinghotoutthere.org/)?*

- These ecosystems are particularly vulnerable to climate change.

☐ ***Are there areas of fragmented estuarine, aquatic, or wetland wildlife habitat within your region? Are there movement corridors for species to naturally migrate? Are there infrastructure projects planned that might preclude species movement?***

- These ecosystems are particularly vulnerable to climate change.

VII. Hydropower

☐ ***Is hydropower a source of electricity in your region?***

- As seasonal river flows shift, hydropower is expected to become less reliable in the future.

☑ ***Are energy needs in your region expected to increase in the future? If so, are there future plans for hydropower generation facilities or conditions for hydropower generation in your region?***

- Energy needs are expected to increase in many locations as the climate warms. This increase in electricity demand may compound decreases in hydropower production, increasing its priority for a region.

Appendix D: DWR Population Tool

Please print this page to a PDF and include as part of your UWMP submittal.

Confirmation Information

Generated By	Water Supplier Name	Confirmation #	Generated On
Lauren Everett	Twentynine Palms Water District	8829236686	2/12/2021 5:15:02 PM

Boundary Information

Census Year	Boundary Filename	Internal Boundary ID
1990	29Palms_Boundary_1990_assumed.kml	484
2000	29Palms_Boundary_2000_assumed.kml	485
2010	29Palms_Boundary_2010_assumed.kml	486
1990	29Palms_Boundary_1990_assumed.kml	484
2000	29Palms_Boundary_2000_assumed.kml	485
2010	29Palms_Boundary_2010_assumed.kml	486

Baseline Period Ranges

10 to 15-year baseline period

Number of years in baseline period: 10

Year beginning baseline period range: 1995

Year ending baseline period range[1]: 2004

5-year baseline period

Year beginning baseline period range: 2003

Year ending baseline period range[2]: 2007

[1] The ending year must be between December 31, 2004 and December 31, 2010.

[2] The ending year must be between December 31, 2007 and December 31, 2010.

Persons per Connection

Year	Census Block Level Total Population	Number of Connections *	Persons per Connection
1990	12,691	6212	2.04
1991	-	-	2.07
1992	-	-	2.10
1993	-	-	2.13
1994	-	-	2.16
1995	-	-	2.19
1996	-	-	2.22
1997	-	-	2.25
1998	-	-	2.28
1999	-	-	2.31
2000	15,846	6782	2.34
2001	-	-	2.33
2002	-	-	2.32
2003	-	-	2.32
2004	-	-	2.31
2005	-	-	2.30
2006	-	-	2.29
2007	-	-	2.28
2008	-	-	2.28
2009	-	-	2.27
2010	18,030	7983	2.26
2011	-	-	2.25
2012	-	-	2.24
2013	-	-	2.24
2014	-	-	2.23
2015	-	-	2.22
2020	-	-	2.18 **

Population Using Persons-Per-Connection

Year		Number of Connections *	Persons per Connection	Total Population
10 to 15 Year Baseline Population Calculations				
Year 1	1995	7264	2.19	15,908
Year 2	1996	6720	2.22	14,918
Year 3	1997	6746	2.25	15,179
Year 4	1998	6769	2.28	15,433
Year 5	1999	6768	2.31	15,634
Year 6	2000	6782	2.34	15,846
Year 7	2001	6800	2.33	15,858
Year 8	2002	6824	2.32	15,859
Year 9	2003	6850	2.32	15,865
Year 10	2004	7030	2.31	16,225
5 Year Baseline Population Calculations				
Year 1	2003	6850	2.32	15,865
Year 2	2004	7030	2.31	16,225
Year 3	2005	7418	2.30	17,061
Year 4	2006	7706	2.29	17,662
Year 5	2007	7819	2.28	17,859
2020 Compliance Year Population Calculations				
2020		7438	2.18 **	16,182

Hide Print Confirmation

/

Appendix E: AWWA Water Loss

AWWA Free Water Audit Software v5.0

This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. It provides a "top-down" summary water audit format, and is not meant to take the place of a full-scale, comprehensive water audit format.

Auditors are strongly encouraged to refer to the most current edition of AWWA M36 Manual for Water Audits for detailed guidance on the water auditing process and targetting loss reduction levels

The spreadsheet contains several separate worksheets. Sheets can be accessed using the tabs towards the bottom of the screen, or by clicking the buttons below.

Please begin by providing the following information

Name of Contact Person:	Ray
Email Address:	Kolisz
Telephone | Ext.:	760-367-7546
Name of City / Utility:	Twentynine Palms Water District
City/Town/Municipality:	Twentynine Palms
State / Province:	California (CA)
Country:	United States
Year:	2017 Calendar Year
Audit Preparation Date:	9/18/2018
Volume Reporting Units:	Acre-feet
PWSID / Other ID:	3610049

The following guidance will help you complete the Audit

All audit data are entered on the ***Reporting Worksheet***

- Value can be entered by user
- Value calculated based on input data
- These cells contain recommended default values

Use of Option (Radio) Buttons: Pcnt: 0.25% Value:

Select the default percentage by choosing the option button on the left

To enter a value, choose this button and enter a value in the cell to the

The following worksheets are available by clicking the buttons below or selecting the tabs along the bottom of the page

Instructions
The current sheet. Enter contact information and basic audit details (year, units etc)

Reporting Worksheet
Enter the required data on this worksheet to calculate the water balance and data grading

Comments
Enter comments to explain how values were calculated or to document data sources

Performance Indicators
Review the performance indicators to evaluate the results of the audit

Water Balance
The values entered in the Reporting Worksheet are used to populate the Water Balance

Dashboard
A graphical summary of the water balance and Non-Revenue Water components

Grading Matrix
Presents the possible grading options for each input component of the audit

Service Connection Diagram
Diagrams depicting possible customer service connection line configurations

Definitions
Use this sheet to understand the terms used in the audit process

Loss Control Planning
Use this sheet to interpret the results of the audit validity score and performance indicators

Example Audits
Reporting Worksheet and Performance Indicators examples are shown for two validated audits

Acknowledgements
Acknowledgements for the AWWA Free Water Audit Software v5.0

If you have questions or comments regarding the software please contact us via email at: wlc@awwa.org

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0
American Water Works Association.

? Click to access definition
+ Click to add a comment

Water Audit Report for: Twentynine Palms Water District (3610049)
Reporting Year: 2017 1/2017 - 12/2017

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ----------> Pcnt: Value:

Volume from own sources:	+ ?	6	2,526.373	acre-ft/yr	+ ?	3			acre-ft/yr
Water imported:	+ ?	n/a	0.000	acre-ft/yr	+ ?				acre-ft/yr
Water exported:	+ ?	n/a	0.000	acre-ft/yr	+ ?				acre-ft/yr
WATER SUPPLIED:			**2,526.373**	acre-ft/yr					

Enter negative % or value for under-registration
Enter positive % or value for over-registration

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

Pcnt: Value:

Billed metered:	+ ?	5	2,132.840	acre-ft/yr			
Billed unmetered:	+ ?	n/a	0.000	acre-ft/yr			
Unbilled metered:	+ ?	8	22.590	acre-ft/yr			
Unbilled unmetered:	+ ?	5	6.316	acre-ft/yr		6.316	acre-ft/yr
AUTHORIZED CONSUMPTION:	?		**2,161.746**	acre-ft/yr			

Use buttons to select percentage of water supplied **OR** value

WATER LOSSES (Water Supplied - Authorized Consumption)

364.627 acre-ft/yr

Apparent Losses

Pcnt: Value:

Unauthorized consumption:	+ ?		6.316	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	+ ?	5	21.772	acre-ft/yr	1.00%		acre-ft/yr
Systematic data handling errors:	+ ?		5.332	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: ? **33.420** acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? **331.207** acre-ft/yr

WATER LOSSES: **364.627** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: ? **393.533** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+ ?	5	210.0	miles	
Number of active AND inactive service connections:	+ ?	7	8,090		
Service connection density:	?		39	conn./mile main	
Are customer meters typically located at the curbstop or property line?			Yes		
Average length of customer service line:	+ ?				(length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure:	+ ?	3	85.0	psi	

COST DATA

Total annual cost of operating water system:	+ ?	10	$3,618,397	$/Year	
Customer retail unit cost (applied to Apparent Losses):	+ ?	10	$2.96	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	+ ?	5	$275.86	$/acre-ft	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 64 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Billed metered
3: Customer metering inaccuracies

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City/Town/Municipality:	Twentynine Palms
State / Province:	California (CA)
Country:	United States
Year:	2018 Calendar Year
Audit Preparation Date:	9/6/2019
Volume Reporting Units:	Acre-feet
PWSID / Other ID:	3610049

The following guidance will help you complete the Audit

All audit data are entered on the ***Reporting Worksheet***

- Value can be entered by user
- Value calculated based on input data
- These cells contain recommended default values

Use of Option (Radio) Buttons: Pcnt: 0.25% Value:

Select the default percentage by choosing the option button

To enter a value, choose this button and enter a value in the cell to the right

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AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0
American Water Works Association

? Click to access
+ Click to add a comment

Water Audit Report for: Twentynine Palms Water District (3610049)
Reporting Year: 2018 | 1/2018 - 12/2018

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

					Pcnt:	Value:	
Volume from own sources:	5	2,564.990	acre-ft/yr	3			acre-ft/yr
Water imported:	n/a	0.000	acre-ft/yr				acre-ft/yr
Water exported:	n/a	0.000	acre-ft/yr				acre-ft/yr
WATER SUPPLIED:		**2,564.990**	acre-ft/yr				

Enter negative % or value for under-registration
Enter positive % or value for over-registration

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:	
Billed metered:	5	2,261.890	acre-ft/yr			
Billed unmetered:	n/a	0.000	acre-ft/yr			
Unbilled metered:	9	28.670	acre-ft/yr			
Unbilled unmetered:	5	6.412	acre-ft/yr		6.412	acre-ft/yr
AUTHORIZED CONSUMPTION:		**2,296.973**	acre-ft/yr			

Use buttons to select percentage of water supplied **OR** value

WATER LOSSES (Water Supplied - Authorized Consumption)

268.017 acre-ft/yr

Apparent Losses

				Pcnt:	Value:	
Unauthorized consumption:		6.412	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	3	23.137	acre-ft/yr	1.00%		acre-ft/yr
Systematic data handling errors:		5.655	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: **35.204** acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: **232.813** acre-ft/yr

WATER LOSSES: **268.017** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: **303.100** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	5	213.0	miles
Number of active AND inactive service connections:	9	8,090	
Service connection density:		38	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 3 | 85.0 psi

COST DATA

Total annual cost of operating water system:	10	$4,005,981	$/Year	
Customer retail unit cost (applied to Apparent Losses):	10	$3.14	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	5	$278.51	$/acre-ft	☑ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 60 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Billed metered

AWWA Free Water Audit Software v5.0

This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. It provides a "top-down" summary water audit format, and is not meant to take the place of a full-scale, comprehensive water audit format.

Auditors are strongly encouraged to refer to the most current edition of AWWA M36 Manual for Water Audits for detailed guidance on the water auditing process and targetting loss reduction levels

The spreadsheet contains several separate worksheets. Sheets can be accessed using the tabs towards the bottom of the screen, or by clicking the buttons below.

Please begin by providing the following information

Name of Contact Person:	Ray
Email Address:	Kolisz
Telephone | Ext.:	760-367-7546
Name of City / Utility:	Twentynine Palms Water District
City/Town/Municipality:	Twentynine Palms
State / Province:	California (CA)
Country:	United States
Year:	2019 Calendar Year
Audit Preparation Date:	9/21/2019
Volume Reporting Units:	Acre-feet
PWSID / Other ID:	CA3610049

The following guidance will help you complete the Audit

All audit data are entered on the ***Reporting Worksheet***

- Value can be entered by user
- Value calculated based on input data
- These cells contain recommended default values

Use of Option (Radio) Buttons: Pcnt: 0.25% Value:

Select the default percentage by choosing the option button

To enter a value, choose this button and enter a value in the cell to the right

The following worksheets are available by clicking the buttons below or selecting the tabs along the bottom of the page

Instructions
The current sheet. Enter contact information and basic audit details (year, units etc)

Reporting Worksheet
Enter the required data on this worksheet to calculate the water balance and data grading

Comments
Enter comments to explain how values were calculated or to document data sources

Performance Indicators
Review the performance indicators to evaluate the results of the audit

Water Balance
The values entered in the Reporting Worksheet are used to populate the Water Balance

Dashboard
A graphical summary of the water balance and Non-Revenue Water components

Grading Matrix
Presents the possible grading options for each input component of the audit

Service Connection Diagram
Diagrams depicting possible customer service connection line configurations

Definitions
Use this sheet to understand the terms used in the audit process

Loss Control Planning
Use this sheet to interpret the results of the audit validity score and performance indicators

Example Audits
Reporting Worksheet and Performance Indicators examples are shown for two validated audits

Acknowledgements
Acknowledgements for the AWWA Free Water Audit Software v5.0

If you have questions or comments regarding the software please contact us via email at: wlc@awwa.org

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0
American Water Works Association

? Click to access definition
+ Click to add a comment

Water Audit Report for: Twentynine Palms Water District (CA3610049)
Reporting Year: 2019 (1/2019 - 12/2019)

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

					Pcnt:	Value:	
Volume from own sources:	5	2,391.190	acre-ft/yr	3			acre-ft/yr
Water imported:	n/a	0.000	acre-ft/yr				acre-ft/yr
Water exported:	n/a	0.000	acre-ft/yr				acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 2,391.190 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option

			Pcnt:	Value:	
Billed metered:	7	2,148.540	acre-ft/yr			
Billed unmetered:	n/a	0.000	acre-ft/yr			
Unbilled metered:	9	31.120	acre-ft/yr			
Unbilled unmetered:	5	5.978	acre-ft/yr		5.978	acre-ft/yr

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION: 2,185.638 acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) 205.552 acre-ft/yr

Apparent Losses

				Pcnt:	Value:	
Unauthorized consumption:		5.978	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	3	22.017	acre-ft/yr	1.00%		acre-ft/yr
Systematic data handling errors:		5.371	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 33.366 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 172.186 acre-ft/yr

WATER LOSSES: 205.552 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 242.650 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	5	213.0	miles
Number of active AND inactive service connections:	9	8,543	
Service connection density:		40	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure:	3	85.0	psi

COST DATA

Total annual cost of operating water system:	10	$ 4,152,800.00	$/Year
Customer retail unit cost (applied to Apparent Losses):	10	$3.33	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	5	$317.99	$/acre-ft

☑ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 62 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Customer metering inaccuracies
3: Variable production cost (applied to Real Losses)

Appendix F: DWR Standardized Tables

SB X7-7 2020 Compliance Form

The SB X7-7 2020 Compliance Form is for the calculation of 2020 compliance only. All retail suppliers must complete the SB X7-7 Compliance Form. Baseline and target calculations are done in the SB X 7-7 Verification Form.

The SB X7-7 Verification Form is for the calculation of baselines and targets and is a separate workbook from the SB X7-7 2020 Compliance Form. Most Suppliers will have completed the SB X7-7 Verification Form with their 2015 UWMP and do not need to complete this form again in 2020. See Chapter 5 Section 5.3 of the UWMP Guidebook for more information regarding which Suppliers must, or may, complete the SB X7-7 Verification Form for their 2020 UWMP. 2020 compliance calculations are done in the SB X7-7 2020 Compliance Form.

Process Water Deduction tables will not be entered into WUE Data Portal tables.
SB X7-7 tables 4-C, 4-C.1, 4-C.2, 4-C.3, 4-C.4 and 4-D
A supplier that will use the process water deduction will complete the appropriate tables in Excel, submit them as a separate upload to the WUE Data Portal, and include them in its UWMP.

Where to submit? Suppliers submit the completed table data and UWMPs (including the Water Shortage Contingency Plan) electronically through the WUE Data Portal (https://wuedata.water.ca.gov/). The portal will be updated in Spring 2021 and will be announced to the urban listserv, DWR webpage and WUE Data Portal opening page when it is available for plan and table submittals.

Unlocking templates (use with caution): The templates provided in this workbook are formated to mirror the structure of information that is submitted through the WUE Data Portal for the electronic submission of Submittal Tables in the UWMP. The tables are offered in a protected (locked) version to maintain the structure of the templates. However, for those needing to adjust the tables for their own planning needs beyond the Submittal Tables, the password to 'unprotect' each worksheet is 'dwr' (no quotes). To unprotect the worksheet, go to the Review tab, select Unprotect Sheet, and enter the password 'dwr' in the pop-up (no quotes). Preparers will still need to submit the information using the original template structure provided. To redownload the templates in their original format, visit https://wuedata.water.ca.gov in the Resources button of the Urban Water Management Plan section (no login necessary).

SB X7-7 Table 0: Units of Measure Used in 2020 UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.*
NOTES:

SB X7-7 Table 2: Method for 2020 Population Estimate	
Method Used to Determine 2020 Population (may check more than one)	
	1. Department of Finance (DOF) or **American Community Survey** (ACS)
	2. Persons-per-Connection Method
	3. DWR Population Tool
	4. Other DWR recommends pre-review
NOTES: See Appendix D for the DWR Population Tool information.	

SB X7-7 Table 3: 2020 Service Area Population	
2020 Compliance Year Population	
2020	16,182
NOTES: Based on DWR Population Tool 2020 Compliance Year Population Calculation	

SB X7-7 Table 4: 2020 Gross Water Use							
		2020 Deductions					
Compliance Year 2020	**2020 Volume Into Distribution System** *This column will remain blank until SB X7-7 Table 4-A is completed.*	**Exported Water** *	**Change in Dist. System Storage*** (+/-)	**Indirect Recycled Water** *This column will remain blank until SB X7-7 Table 4-B is completed.*	**Water Delivered for Agricultural Use***	**Process Water** *This column will remain blank until SB X7-7 Table 4-D is completed.*	**2020 Gross Water Use**
	2,449			-		-	**2,449**

*** Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Groundwater
This water source is *(check one)* **:**	
☑	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	2,449		2,449

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES: Total Volume of Water Supplied in 2020 to the District, See Table 1-1.

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s) Meter Error Adjustment

Complete one table for each source.

Name of Source	Enter Name of Source 2
This water source is *(check one)* **:**	
☐	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
			0

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Enter Name of Source 3
This water source is *(check one)* **:**	
☐	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
			0

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Enter Name of Source 4
This water source is *(check one)* **:**	
☐	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
			0

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Enter Name of Source 5
This water source is *(check one)* **:**	
☐	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
			0

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Enter Name of Source 6
This water source is *(check one)* **:**	
☐	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
			0

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Enter Name of Source 7
This water source is *(check one)* **:**	
☐	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
			0

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Enter Name of Source 8
This water source is *(check one)* **:**	
☐	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
			0

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Enter Name of Source 9
This water source is *(check one)* **:**	
☐	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
			0

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Enter Name of Source 10
This water source is *(check one)* **:**	
☐	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
			0

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Enter Name of Source 11
This water source is *(check one)* **:**	
☐	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
			0

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Enter Name of Source 12
This water source is *(check one)* **:**	
☐	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
			0

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Enter Name of Source 13
This water source is *(check one)* **:**	
☐	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
			0

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Enter Name of Source 14
This water source is *(check one)* **:**	
☐	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
			0

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	Enter Name of Source 15
This water source is *(check one)* **:**	
☐	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
			0

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-B: 2020 Indirect Recycled Water Use Deduction *(For use only by agencies that are deducting indirect recycled water)*

2020 Compliance Year	2020 Surface Reservoir Augmentation					2020 Groundwater Recharge			Total Deductible Volume of Indirect Recycled Water Entering the Distribution System
	Volume Discharged from Reservoir for Distribution System Delivery[1]	Percent Recycled Water	Recycled Water Delivered to Treatment Plant	Transmission/ Treatment Loss[1]	Recycled Volume Entering Distribution System from Surface Reservoir Augmentation	Recycled Water Pumped by Utility[1,2]	Transmission/ Treatment Losses[1]	Recycled Volume Entering Distribution System from Groundwater Recharge	
			-		-			-	-

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

[2] *Suppliers will provide supplemental sheets to document the calculation for their input into "Recycled Water Pumped by Utility". The volume reported in this cell must be less than total groundwater pumped - See Methodology 1, Step 8, section 2.c.*

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

SB X7-7 Table 4-C: 2020 Process Water Deduction Eligibility (For use only by agencies that are deducting process water) Choose Only One	
	Criteria 1- Industrial water use is equal to or greater than 12% of gross water use. Complete SB X7-7 Table 4-C.1
	Criteria 2 - Industrial water use is equal to or greater than 15 GPCD. Complete SB X7-7 Table 4-C.2
	Criteria 3 - Non-industrial use is equal to or less than 120 GPCD. Complete SB X7-7 Table 4-C.3
	Criteria 4 - Disadvantaged Community. Complete SB x7-7 Table 4-C.4
NOTES:	

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

SB X7-7 Table 4-C.1: 2020 Process Water Deduction Eligibility *(For use only by agencies that are deducting process water using Criteria 1)*

Criteria 1
Industrial water use is equal to or greater than 12% of gross water use

2020 Compliance Year	2020 Gross Water Use Without Process Water Deduction	2020 Industrial Water Use	Percent Industrial Water	**Eligible for Exclusion Y/N**
	2,449		0%	NO

NOTES:

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

SB X7-7 Table 4-C.2: 2020 Process Water Deduction Eligibility *(For use only by agencies that are deducting process water using Criteria 2)*

Criteria 2
Industrial water use is equal to or greater than 15 GPCD

2020 Compliance Year	2020 Industrial Water Use	2020 Population	2020 Industrial GPCD	**Eligible for Exclusion Y/N**
		16,182	-	NO

NOTES:

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

SB X7-7 Table 4-C.3: 2020 Process Water Deduction Eligibility *(For use only*
by agencies that are deducting process water using Criteria 3)

Criteria 3
Non-industrial use is equal to or less than 120 GPCD

2020 Compliance Year	2020 Gross Water Use Without Process Water Deduction *Fm SB X7-7 Table 4*	2020 Industrial Water Use	2020 Non-industrial Water Use	2020 Population *Fm SB X7-7 Table 3*	Non-Industrial GPCD	**Eligible for Exclusion Y/N**
	2,449		2,449	16,182	135	NO

NOTES:

README

This Excel Workbook contains revisions made as of May 10, 2021 to the Energy Use tables for the 2020 UWMP templates. Changes made include the following:

*Revision: Equation for Reporting End Date was removed from templates, so now it is manually entered.
*Revision: Equations were added to cells that had missing formulas.
*Revision: Suppliers can now choose the water volume unit. In addition, an Equation was added to convert Energy Intensity to kWh/MG based on the supplier's volume unit.

To access the tracked changes version of this workbook, download it from the following site (Stakeholder Sharepoint site) or request it from UWMPhelp@water.ca.gov:

https://cawater.sharepoint.com/sites/dwr-wusw/UWMP%20Guidebook/1-Final%20Guidance%20Materials%20-%20UWMP%202020%20(April%202021)/FINAL%20-%20Excel%20Templates%20UWMP%202020

Table O-1A Instructions

Step #	Cell	Input / Optional	Instructions
		Note	Only enter energy consumption or hydropower production that occurs within Urban Water Suppliers Operational Control.
1	C1	Input	Enter name of Urban Water Supplier
2	A4	Input	From drop down menu select type of water delivery product being delivered by Urban Water Supplier (Retail Potable, Retail Non-Potable, Retail Agricultural, Wholesale Potable, Wholesale Non-Potable, Environmental, or Other)
3	C7:C8	Input	Enter Start Date and End Date for one year reporting period. Ideally one year reporting period will match time period used to report 2015 data in other sections of UWMP. If you are presenting an average over multiple years, fill in the End Date and describe the range in the Narrative.
4	C10	Input	Select the checkbox if reported values include embedded upstream information.
5	D12	Input	Select units used to report volume of water.
6	E12:I12	Input	Enter volume of water entering each water mangement process in volume unit selected in D12.
7	E13:I13	Input	Enter amount of energy consumed by each water management process less any consequential hydropower generation in kWh.
	J12	Calculation	Calculated cell is equal to volume of water within an urban water supplier's operational control for all water management processes [sum(E12:I12)]
	J13	Calculation	Calculated cell is equal to energy consumed for all water mangement processes. [sum(E13:I13)]
8	K12	Optional	Enter volume of water used to generate non-consequential hydropower.
9	K13	Optional	Enter amount of energy generated by non-consequential hydropower as a negative value.
	L12	Calculation	Calculated cell is equal to volume of water for all water management processes less any consequential hydropower production. [J12+k12]
	L13	Calculation	Calculated cell is equal to energy consumed for all water mangement processes less energy generated by consequential hydropower production. [J13 + K13]
	E14:L14	Calculation	Calculated cell is equal to amount of energy consumed divided by volume of water entering water management process. Volume is converted to MG in this table. Example: =E13/(IF($D12="MG",E12*1,IF($D12="AF",E12/3.068892,IF($D12="CCF",E12/1336.809037,""))))
10	A17	Optional	Enter amount of renewable energy generated by urban water supplier that was not covered by consequential ~~or~~ non-consequential hydropower generation.
11	A19	Input	From dropdown menu select data quality for information entered in Table O-1A. (Estimate, Metered Data, Combination of Estimates and Metered Data)
12	A21	Input	Provide brief narrative documenting the sources and quality of the data entered in Table O-1A. List assumptions and methods used to complete the energy intensity calculations.
13	A23	Input	Provide a brief narrative for each water supply describing water management processes in which energy is consumed or produced.

***Note that calculation of energy intensity is optional, but those cells marked as Required here must be entered if the Supplier wants the energy intensity calculated. New to 2020 UWMPs, Suppliers must include information that could be used to calculate the energy intensity of their water service, when readily obtainable. The tables are designed to automatically calculate energy intensity once the cell are filled.**

Table O-1B Instructions

Step #	Cell	Input/Calculated	Instructions
		Note	Only enter energy consumption or hydropower production that occurs within Urban Water Suppliers Operational Control.
1	C1	Input	Enter name of Urban Water Supplier
2	B4	Input	From drop down menu select type of water delivery product being delivered by Urban Water Supplier (Retail Potable, Retail Non-Potable, Retail Agricultural, Wholesale Potable, Wholesale Non-Potable, Environmental, or Other)
3	C7:C8	Input	Enter Start Date and End Date for one year reporting period. Ideally one year reporting period will match time period used to report 2015 data in other sections of UWMP. If you are presenting an average over multiple years, fill in the End Date ~~manually~~ and describe the range in the Narrative.
4	C10	Input	Select units used to report volume of water from dropdown menu.
5	D11	Input	Enter volume of water entering all water management processes in volume unit selected in C10.
6	D12	Input	Enter total amount of energy consumed for all water management process less any consequential hydropower generation in kWh.
7	E11	Input	Enter volume of water used to generate non-consequential hydropower.
8	E12	Input	Enter amount of energy generated by non-consequential hydropower as a negative value.
	F11	Calculation	Calculated cell is equal to volume of water entering the distribution system. [D11+E11]
	F12	Calculation	Calculated cell is equal to energy consumed for all water mangement processes less energy generated by consequential hydropower production. [D12 + E12]
	D13:F13	Calculation	Calculated cell is equal to amount of energy consumed divided by volume of water entering process. [D13:F13 = D12:F12 / D11:F11]
9	B16	Input	Enter amount of renewable energy generated by urban water supplier that was not covered by consequential or non-consequential hydropower generation
10	B18	Input	From dropdown menu select quality of data entered in Table O-1B. (Estimate, Metered Data, Combination of Estimates and Metered Data)
11	B20	Input	Provide brief narrative documenting the sources and quality of the data entered in Table O-1A. List assumptions and methods used to complete the energy intensity calculations.
12	B22	Input	Provide a brief narrative for each water supply describing water management processes in which energy is consumed or produced.

***Note that calculation of energy intensity is optional, but those cells marked as Required here must be entered if the Supplier wants the energy intensity calculated. New to 2020 UWMPs, Suppliers must include information that could be used to calculate the energy intensity of their water service, when readily obtainable. The tables are designed to automatically calculate energy intensity once the tables are completed.**

Table O-1C Instructions

Step #	Cell	Input/Calculated	Instructions
		Note	**Only enter energy consumption or hydropower production that occurs within Urban Water Suppliers Operational Control.**
1	D1	Input	Enter name of Urban Water Supplier
2	C5:C6	Input	Enter Start Date and End Date for one year reporting period. Ideally one year reporting period will match time period used to report 2015 data in other sections of UWMP. If you are presenting an average over multiple years, fill in the End Date ~~manually~~ and describe the range in the Narrative.
3	D8	Input	Select the checkbox if reported values include embedded upstream information.
4	B11	Input	Select units used to report volume of water from dropdown menu.
5	E10:I10	Input	Enter total volume of water for each water mangement process in volume unit selected in [B11].
6	E11:I17	Input	For each water mangement process (columns E:I) enter the percentage of Total Volume of Water Entering Process that should be attributed to each water product type (rows 11:17). Total percentage in each column must equal 0% or 100%.
	E18:I18	Calculation	Total percentage in each column for rows 11-17 must equal 0% or 100%. Cells in row 18 are highlighted in red if this condition is not met.
7	E19:I19	Input	Enter total amount of energy consumed by each water management process less any consequential hydropower generation in kWh.
	J19	Calculation	Calculated cell is equal to energy consumed for all water mangement processes. (E19:I19)
	E20:I20,K20	Calculation	Calculated cell is equal to amount of energy consumed divided by volume of water entering water management process. Volume is converted to MG in this table. Example =E19/(IF($B11="MG",E10*1,IF($B11="AF",E10/3.0689,IF($B11="CCF",E10/1336.8056,""))))
8	K10	Input	Enter volume of water used to generate non-consequential hydropower.
9	K19	Input	Enter amount of energy generated by non-consequential hydropower as a negative value.
10	K11:K17	Input	Enter the percentage of total non-consequential hydropower generation that should be attributed to each water product type (rows 11:17). Total percentage of rows 11-17 must equal 0% or 100%.
	L19	Calculation	Calculated cell is equal to energy consumed for all water mangement processes less energy generated by consequential hydropower production. [J19 + K19]
	E23:E29	Calculation	Calculated cell is equal to sumproduct production volume for each water delivery product. If water delivery product enters distribution system production volume is equal to Total Volume of Water Entering Distribution [I10] multiplied by the delivery product percentage in column I. =IFERROR(SUMPRODUCT(E11:I11,$E$10:$I$10),0)
	F23:F29	Calculation	Calculated cell is equal to sumproduct water delivery product percentage and energy consumed for five water management processes divided by water delivery type production volume.
	G23:G29	Calculation	Calculated cell is equal to sumproduct water delivery product percentage and energy consumed for five water management processes and hydropower divided by water delivery type production volume.
	E30	Calculation	Calculated cell is equal to total production volume for all water delivery types. [sum(E23:E29)]
	F30	Calculation	Calculated cell is equal to the average Total Utility Energy Intensity weighted by production volume. =ROUND(IFERROR(SUMPRODUCT(F23:F29),0),1)
	G30	Calculation	Calculated cell is equal to the average Net Utility Energy Intensity weighted by production volume. =ROUND(IFERROR(SUMPRODUCT(G23:G29),0),1)
11	B33	Input	Enter amount of renewable energy generated by urban water supplier that was not covered by consequential or non-consequential hydropower generation
12	B35	Input	Dropdown menu to report data quality.
13	B37	Input	Provide brief narrative documenting the data sources and quality of the data entered in Table O-1C. Please document data sources, assumptions and methods used to complete the energy intensity calculations.
14	B39	Input	Provide a brief narrative for each water supply discussing water management processes in which energy is consumed or produced.

***Note that calculation of energy intensity is optional, but those cells marked as Required here must be entered if the Supplier wants the energy intensity calculated. New to 2020 UWMPs, Suppliers must include information that could be used to calculate the energy intensity of their water service, when readily obtainable. The tables are designed to automatically**

Table O-2 Instructions

Step #	Cell	Input / Calculated	Instructions
		Note	Only enter energy consumption or hydropower production that occurs within Urban Water Supplier's Operational Control.
1	C1	Input	Enter name of Urban Water Supplier
2	C4:C5	Input	Enter Start Date and End Date for one year reporting period. Ideally one year reporting period will match time period used to report 2015 data in other sections of UWMP. If you are presenting an average over multiple years, fill in the End Date and describe the range in the Narrative.
3	B7	Input	Select the checkbox if reported values include embedded upstream information.
4	C8	Input	Select units used to report volume of water.
5	D9:F9	Input	Enter volume of water entering each wastewater mangement process in volume units selected in C8.
6	D10:F10	Input	Enter amount of energy consumed by each wastewater management process less any consequential energy generation in kWh.
	G9	Calculation	Calculated cell is equal to volume of water entering the wastewater treatment plant. [sum(D9:F9)]
	G10	Calculation	Calculated cell is equal to energy consumed for all wastewater mangement processes. [sum(D10:F10)]
	D11:G11	Calculation	Calculated cell is equal to amount of energy consumed divided by volume of water entering wastewater management process. [=G10/IF($C8="MG",G9*1,IF($C8="AF",G9/3.0689,IF($C8="CCF",G9/1336.8056,"")))]
7	D12:F12	Input	Enter volume of water entering each recycled water mangement process in volume units selected in C8.
8	D13:F13	Input	Enter amount of energy consumed by each recycled water management process less any consequential energy generation in kWh.
	G12	Calculation	Calculated cell is equal to volume of water entering the recycled water distribution system. [sum(D12:F12)]
	G13	Calculation	Calculated cell is equal to energy consumed for all recycled water mangement processes. [sum(D13:F13)]
	D14:G14	Calculation	Calculated cell is equal to amount of energy consumed divided by volume of water entering recycled water management process. [=G13/IF($C8="MG",G12*1,IF($C8="AF",G12/3.0689,IF($C8="CCF",G12/1336.8056,"")))]
9	B17	Optional	Enter amount of renewable energy generated by urban water supplier that is directly related to recycledwater and wastewater operations.
10	B20	Input	From dropdown menu select data quality for information entered in Table O-1A. (Estimate, Metered Data, Combination of Estimates and Metered Data)
11	B23	Input	Provide brief narrative documenting the sources and quality of the data entered in Table O-1A. List assumptions and methods used to complete the energy intensity calculations.
12	B27	Input	Provide a brief narrative for each wastewater and recycled water management process describing processes in which energy is consumed or produced.

***Note that calculation of energy intensity is optional, but those cells marked as Required here must be entered if the Supplier wants the energy intensity calculated. New to 2020 UWMPs, Suppliers must include information that could be used to calculate the energy intensity of their water service, when readily obtainable. The tables are designed to automatically calculate energy intensity once the tables are completed.**

Urban Water Supplier: *enter supplier name*

Water Delivery Product (If delivering more than one type of product use Table O-1C)
dropdown menu

Table O-1A: Recommended Energy Reporting - Water Supply Process Approach

Enter Start Date for Reporting Period		Urban Water Supplier Operational Control							
End Date		Water Management Process						Non-Consequential Hydropower (if applicable)	
Is upstream embedded in the values reported?									
	Water Volume Units Used	Extract and Divert	Place into Storage	Conveyance	Treatment	Distribution	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process	AF						*0*		*0*
Energy Consumed (kWh)	*N/A*						*0*		*0*
Energy Intensity (kWh/vol. converted to MG)	*N/A*	*#DIV/0!*	*#DIV/0!*	*#DIV/0!*	*#DIV/0!*	*#DIV/0!*	*#DIV/0!*	*#DIV/0!*	*#DIV/0!*

Quantity of Self-Generated Renewable Energy
kWh

Data Quality *(Estimate, Metered Data, Combination of Estimates and Metered Data)*

Data Quality Narrative:

Narrative:

Urban Water Supplier: *TwentyNine Palms Water District*

Water Delivery Product (If delivering more than one type of product use Table O-1C)

Retail Potable Deliveries

Table O-1B: Recommended Energy Reporting - Total Utility Approach				
Enter Start Date for Reporting Period	6/30/2019	**Urban Water Supplier Operational Control**		
End Date	6/28/2020			
Is upstream embedded in the values reported?		**Sum of All Water Management Processes**	**Non-Consequential Hydropower**	
Water Volume Units Used	*AF*	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process (volume unit)		*2449*	*0*	*2449*
Energy Consumed (kWh)		*3122629*	*0*	*3122629*
Energy Intensity (kWh/vol. converted to MG)		*3913.0*	*0.0*	*3913.0*

Quantity of Self-Generated Renewable Energy

0 kWh

Data Quality *(Estimate, Metered Data, Combination of Estimates and Metered Data)*

Metered Data

Data Quality Narrative:

Energy consumed determined by Southern California Edison 2019-2020 Billing & Usage report.
Volumes of Water delivered by District's 2020 Public Water System Statistics

Narrative:

The District's energy usage includes groundwater wells, booster stations, the district's office, paymeter, and a treatment plant.

Urban Water Supplier: *enter supplier name*

Table O-1C: Recommended Energy Reporting - Multiple Water Delivery Products

Enter Start Date for Reporting Period

End Date

Is upstream embedded in the values reported?

			Urban Water Supplier Operational Control							
			Water Management Process						Non-Consequential Hydropower (if applicable)	
			Extract and Divert	Place into Storage	Conveyance	Treatment	Distribution	Total Utility	Hydropower	Net Utility
Water Volume Units	*Total Volume of Water Entering Process (volume units)*							*N/A*		*N/A*
AF		*Retail Potable Deliveries (%)*								
		Retail Non-Potable Deliveries (%)								
		Wholesale Potable Deliveries(%)								
		Wholesale Non-Potable Deliveries (%)								
		Agricultural Deliveries (%)								
		Environmental Deliveries (%)								
		Other (%)								
		Total Percentage [must equal 100%]	*0%*	*0%*	*0%*	*0%*	*0%*	*N/A*	*0%*	*N/A*
		Energy Consumed (kWh)						*0*		*0*
		Energy Intensity (kWh/vol. converted to MG)	*#DIV/0!*	*#DIV/0!*	*#DIV/0!*	*#DIV/0!*	*#DIV/0!*	*N/A*	*#DIV/0!*	*N/A*

Water Delivery Type			*Production Volume (volume units defined above)*	*Total Utility (kWh/volume)*	*Net Utility (kWh/volume)*
		Retail Potable Deliveries	*0*	*0.0*	*0.0*
		Retail Non-Potable Deliveries	*0*	*0.0*	*0.0*
		Wholesale Potable Deliveries	*0*	*0.0*	*0.0*
		Wholesale Non-Potable Deliveries	*0*	*0.0*	*0.0*
		Agricultural Deliveries	*0*	*0.0*	*0.0*
		Environmental Deliveries	*0*	*0.0*	*0.0*
		Other	*0*	*0.0*	*0.0*
		All Water Delivery Types	*0*	*0.0*	*0.0*

Quantity of Self-Generated Renewable Energy

kWh

Data Quality *(Estimate, Metered Data, Combination of Estimates and Metered Data)*

dropdown menu

Data Quality Narrative:

Narrative:

Urban Water Supplier: *enter supplier name*

Table O-2: Recommended Energy Reporting - Wastewater & Recycled Water					
Enter Start Date for Reporting Period	10/1/2019	**Urban Water Supplier Operational Control**			
End Date		**Water Management Process**			
Is upstream embedded in the values reported?		Collection / Conveyance	Treatment	Discharge / Distribution	Total
Volume of Water Units Used	MG				
Volume of Wastewater Entering Process (volume units selected above)					*0*
Wastewater Energy Consumed (kWh)					*0*
Wastewater Energy Intensity (kWh/volume)		*#DIV/0!*	*#DIV/0!*	*#DIV/0!*	*#DIV/0!*
Volume of Recycled Water Entering Process (volume units selected above)					*0*
Recycled Water Energy Consumed (kWh)					*0*
Recycled Water Energy Intensity (kWh/volume converted to MG)		*#DIV/0!*	*#DIV/0!*	*#DIV/0!*	*#DIV/0!*

Quantity of Self-Generated Renewable Energy related to recycled water and wastewater operations

kWh

Data Quality *(Estimate, Metered Data, Combination of Estimates and Metered Data)*

dropdown menu

Data Quality Narrative:

Narrative:

Templates of Submittal Tables for the Urban Water Management Plan 2020

Workbook Contents: This workbook contains the templates for Submittal Tables that Suppliers use to organize information as part of their Urban Water Management Plans 2020 (due July 1, 2021). Table numbers correspond to the chapter number where they are described in the UWMP Guidebook. If the table name is followed by a letter, the letter corresponds to whether the table is specific for Wholesale Suppliers or Retail Suppliers only (W and R, respectively). For those table names that are not followed by a letter, these are Submittal Tables for all Suppliers.

Where to submit? Suppliers submit the completed table data and UWMPs (including the Water Shortage Contingency Plan) electronically through the WUE Data Portal (https://wuedata.water.ca.gov/). The portal will be updated in Spring 2021 and will be announced to the urban listserv, DWR webpage and WUE Data Portal opening page when it is available for plan and table submittals.

Unlocking templates (use with caution): The templates provided in this workbook are formated to mirror the structure of information that is submitted through the WUE Data Portal for the electronic submission of Submittal Tables in the UWMP. The tables are offered in a protected (locked) version to maintain the structure of the templates. However, for those needing to adjust the tables for their own planning needs beyond the Submittal Tables, the password to 'unprotect' each worksheet is 'dwr' (no quotes). To unprotect the worksheet, go to the Review tab, select Unprotect Sheet, and enter the password 'dwr' in the pop-up (no quotes). Preparers will still need to submit the information using the original template structure provided. To redownload the templates in their original format, visit https://wuedata.water.ca.gov in the Resources button of the Urban Water Management Plan section (no login necessary).

Submittal Table 2-1 Retail Only: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020 *
Add additional rows as needed			
3610049	TPWD	7,438	2,449
	TOTAL	7,438	2,449
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*			
NOTES: Total production for 2020, including losses, See Table 1-1.			

Submittal Table 2-2: Plan Identification			
Select Only One	**Type of Plan**		**Name of RUWMP or Regional Alliance** *if applicable* (select from drop down list)
	Individual UWMP		
		Water Supplier is also a member of a RUWMP	
		Water Supplier is also a member of a Regional Alliance	
	Regional Urban Water Management Plan (RUWMP)		
NOTES:			

Submittal Table 2-3: Supplier Identification	
Type of Supplier (select one or both)	
	Supplier is a wholesaler
	Supplier is a retailer
Fiscal or Calendar Year (select one)	
	UWMP Tables are in calendar years
	UWMP Tables are in fiscal years
If using fiscal years provide month and date that the fiscal year begins (mm/dd)	
Units of measure used in UWMP * (select from drop down)	
Unit	AF
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*	
NOTES:	

Submittal Table 2-4 Retail: Water Supplier Information Exchange
The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.
Wholesale Water Supplier Name
Add additional rows as needed
NOTES: The District neither recieves water from a wholesaler nor supplies water to retail water purveyors.

Submittal Table 2-4 Wholesale: Water Supplier Information Exchange (select one)	
	Supplier has informed more than 10 other water suppliers of water supplies available in accordance with Water Code Section 10631. Completion of the table below is optional. If not completed, include a list of the water suppliers that were informed.
	Provide page number for location of the list.
	Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with Water Code Section 10631. **Complete the table below.**
Water Supplier Name	
Add additional rows as needed	
NOTES:	

Submittal Table 3-1 Retail: Population - Current and Projected						
Population Served	2020	2025	2030	2035	2040	2045*(opt)*
	16,182	19,901	20,933	22,024	23,009	24,038
NOTES: The current 2020 population is determined from the DWR Online Population Roo. The projected populations were derived from the SCAG 2020 Regional Transportation Plan, See Table 1-6 and 1-7.						

Submittal Table 3-1 Wholesale: Population - Current and Projected						
Population Served	2020	2025	2030	2035	2040	2045*(opt)*
NOTES:						

Submittal Table 4-1 Retail: Demands for Potable and Non-Potable[1] Water - Actual			
Use Type	2020 Actual		
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool	Additional Description (as needed)	Level of Treatment When Delivered Drop down list	Volume[2]
Add additional rows as needed			
Single Family		Drinking Water	1,608
Multi-Family		Drinking Water	420
Commercial		Drinking Water	186
Industrial		Drinking Water	0
Landscape		Drinking Water	133
Other Non-Potable	Construction Use/Non-Potable	Other Non-Potable Water	102
		TOTAL	2,449

[1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.*
Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.

[2]

NOTES: TPWD Billed Metered Authorized Consumption, 2020 and personal communication, Ray Kolisz, TPWD, See Table 2-1.

Submittal Table 4-1 Wholesale: Demands for Potable and Non-Potable[1] Water - Actual

Use Type	2020 Actual		
Drop down list May select each use multiple times These are the only use types that will be recognized by the WUE data online submittal tool	Additional Description (as needed)	Level of Treatment When Delivered Drop down list	Volume[2]
Add additional rows as needed			
		TOTAL	0

[1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.*

[2] *Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 4-2 Retail: Use for Potable and Non-Potable[1] Water - Projected						
Use Type	Additional Description (as needed)	Projected Water Use[2] *Report To the Extent that Records are Available*				
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool		2025	2030	2035	2040	2045 (opt)
Add additional rows as needed						
Single Family		1,780	1,870	1,970	2,060	2,150
Multi-Family		460	480	510	530	560
Commercial		240	250	260	260	270
Industrial		0	0	0	0	0
Landscape		160	170	180	190	200
Other Non-Potable	Construction Use	20	20	20	20	20
TOTAL		2,660	2,790	2,940	3,060	3,200

[1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.* [2] *Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Projected demands based on 2015-2020 historical demand data and projected land use demand data.

Submittal Table 4-2 Wholesale: Use for Potable and Raw Water [1] - Projected						
Use Type		Projected Water Use [2] Report To the Extent that Records are Available				
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool.	Additional Description (as needed)	2025	2030	2035	2040	2045 (opt)
Add additional rows as needed						
TOTAL		0	0	0	0	0

[1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.* [2] *Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 4-3 Retail: Total Water Use (Potable and Non-Potable)						
	2020	2025	2030	2035	2040	2045 (opt)
Potable Water, Raw, Other Non-potable *From Tables 4-1R and 4-2 R*	2,449	2,660	2,790	2,940	3,060	3,200
Recycled Water Demand[1] *From Table 6-4*	0	0	0	0	0	0
Optional Deduction of Recycled Water Put Into Long-Term Storage[2]						
TOTAL WATER USE	2,449	2,660	2,790	2,940	3,060	3,200

[1] Recycled water demand fields will be blank until Table 6-4 is complete

*[2] Long term storage means water placed into groundwater or surface storage that is not removed from storage in the same year. Supplier **may** deduct recycled water placed in long-term storage from their reported demand. This value is manually entered into Table 4-3.*

NOTES:

Submittal Table 4-3 Wholesale: Total Water Use (Potable and Non-Potable)						
	2020	2025	2030	2035	2040	2045 (opt)
Potable and Raw Water From Tables 4-1W and 4-2W	0	0	0	0	0	0
Recycled Water Demand* From Table 6-4W	0	0	0	0	0	0
TOTAL WATER DEMAND	0	0	0	0	0	0
**Recycled water demand fields will be blank until Table 6-4 is complete.*						
NOTES:						

Appendix G: GWMP

FINAL REPORT

Groundwater Management Plan - 2014 Update

28 May 2014

Prepared for

Twentynine Palms Water District

72401 Hatch Road
Twentynine Palms, CA 92277-2935

Prepared by

Kennedy/Jenks Consultants

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K/J Project No. 1365022*00

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Twentynine Palms Groundwater Management Plan 2014 Update

28 May 2014

Prepared for

Twentynine Palms Water District
72401 Hatch Road
Twentynine Palms, California 92277-2935

K/J Project No. 1365022*00

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List of Abbreviations

AB	Assembly Bill
af	Acre-feet
afy	Acre-feet per year
As	Arsenic
asl	Above sea level
bgs	below ground surface
BMOs	Best Management Objectives
BMPs	Best Management Practices
CDPH	California Department of Public Health
CEC	Contaminant of emerging concern
City	City of Twentynine Palms
County	San Bernardino County
CUWCC	California Urban Water Conservation Council
District	Twentynine Palms Water District
DWR	California Department of Water Resources
DWSAP	Drinking Water Source Assessment and Protection
ET	Evapotranspiration
ft/d	Feet per day
ft^2/d	Square feet per day
GMP	Groundwater Management Plan
gpcd	Gallons per capita per day
gpm	Gallons per minute
GPP	Groundwater Protection Plan
K	Hydraulic Conductivity
Marine Base	Marine Air Ground Task Force Training Command Center
MBAS	Methylene Blue Activate Substances
MCL	Maximum Contaminant Level
mgd	Million gallons per day
μg/L	Micrograms per liter
mg/L	Milligrams per liter
μ□	micromhos
MSL	Mean Sea Level
MWA	Mojave Water Agency
MWD	The Metropolitan Water District of Southern California
OWTS	Onsite Wastewater Treatment System

PCAs	Potentially Contaminating Activities
PHG	Public Health Goal
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SOI	Sphere of Influence
Ss	Specific storage
Sy	Specific yield
SWRCB	State Water Resources Control Board
T	Transmissivity
TDS	Total Dissolved Solids
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
WSA	Water Supply Assessment

Section 1: Introduction

This updated Groundwater Management Plan (GMP) was prepared in accordance with Assembly Bill 3030 (AB 3030), also called the Groundwater Management Act (Section 10750 et. seq. of the California Water Code) for the Twentynine Palms Water District (TPWD or District) to protect the quantity and quality of groundwater within its service area.

1.1 Plan Objectives

The GMP serves as a planning tool to assist the District to maintain safe, sustainable, and high quality groundwater resources in the long-term. Groundwater management is planned and coordinated locally to ensure a sustainable groundwater basin to meet future water supply needs. The objective of the updated GMP is to address issues of "aquifer health" and "groundwater sustainability". These issues include:

- Maintain sustainable long-term water supplies
- Treatment of natural water quality constituents
- Wastewater management especially of septic tanks
- Providing water supply for anticipated population growth

The GMP is considered as a "living document" that the District intends to update periodically to report on the progress made in managing groundwater resources and to reflect the amendments to the California Water Code. This Groundwater Management Plan Update was prepared to expand further on the role of the District in the management of the local groundwater resources and water quality based on the substantial work that has been completed since the 2008 Update (Kennedy/Jenks, 2008).

1.2 Plan Requirements and Organization

AB 3030 was intended to provide local public agencies increased management authority over groundwater resources. Any local public agency which provides water service to all or a portion of its service area and whose service area includes all or a portion of a groundwater basin may adopt a GMP. AB 3030 was amended in 2002 with the passage of The Groundwater Management and Planning Act of 2002 (SB 1938).

The Twentynine Palms Groundwater Management Plan includes three types of components: SB 1938 and AB 359 mandatory components, AB 3030 and SB 1938 voluntary components, and DWR Bulletin 118-suggested components (DWR 2003). These components are addressed in the GMP, and Table 1-1 identifies where in this GMP the information addressing each of these components can be found.

A GMP is a required "baseline" document for agencies seeking State grant funding opportunities. SB 1938 requires that for an agency to be eligible for state funding from the Department of Water Resources (DWR), the GMP must incorporates the SB 1938 Mandatory Components listed in Table 1-1 (DWR, 2003).

TABLE 1-1
LEGISLATIVE REQUIREMENTS SUMMARY

Components Section	Section
SB 1938 and AB 359 Mandatory Components	
1. Documentation of public involvement statement	Sec. 1.3, App. A
2. Basin Management Objectives (BMOs)	Sec. 6
3. Monitoring and management of groundwater elevations, groundwater quality, inelastic land subsidence, and changes in surface water flows and quality that directly affect groundwater levels or quality or are caused by pumping	Sec. 4,5.4 and 6.5, App. B
4. Plan to involve other agencies located in the groundwater basin	Sec. 6.6
5. Adoption of monitoring protocols	Sec. 6.5, App. B
6. Map of groundwater basin boundary, as delineated by DWR Bulletin 118, with agency boundaries that are subject to GMP	Sec. 2.3
7. For agencies not overlying groundwater basins, prepare the GMP using appropriate geologic and hydrogeologic principles	Not Applicable
8 Map identifying the substantial recharge areas to be provided to local planning agencies (new as of January 1, 2013	Sec. 5.5
AB 3030 and SB 1938 Voluntary Components	
1. Control of saline water intrusion	Sec. 5.6.1
2. Identify and manage well protection and recharge areas	Sec 5.6.3
3. Regulate the migration of contaminated groundwater	Sec 5.6.2
4. Administer well abandonment and destruction program	Sec. 5.6.5
5. Control and mitigate groundwater overdraft	Sec. 4.5.1
6. Replenish groundwater	Sec. 4.5.3 and 6.7
7. Monitor groundwater levels	Sec. 6.5, App. B
8. Develop and operate conjunctive use projects	Sec. 4.5.3 and 6.7
9. Identify well-construction policies	Sec. 5.6.4
10. Develop and operate groundwater contamination cleanup, recharge, storage,	Sec 4.5.3
11. Develop relationships with State and federal regulatory agencies	Sec. 6.6
12. Review land use plans and coordinate with land use planning agencies to assess activities that create reasonable risk of groundwater contamination	Sec. 6.6
DWR Bulletin 118 Suggested Components	
1. Manage with guidance of advisory committee	Sec. 6.6
2. Describe area to be managed under GMP	Sec. 2
3. Create links between BMOs and goals and actions of GMP	Sec. 6
4. Describe GMP monitoring programs	Sec. 6.5, App. B
5. Describe integrated water management planning efforts	Sec. 6.6
6. Report of implementation of GMP	Sec. 6.5
7. Evaluate GMP periodically	Sec. 6.7

1.3 Plan Preparation and Adoption Process

The District Board of Directors invited public comment by holding a public hearing on September 25, 2013 to consider adopting the intent to prepare the GMP. The item was included on the Board agenda and was published in local media outlets in the area. After the public hearing, the Board passed Resolution 13-17 declaring the District's intention to amend the District Groundwater Management Plan. The September 25, 2013 Board agenda, minutes and Resolution 13-17 are included in Appendix A. For those who could not attend, the meeting was televised on a local cable channel station (Time Warner Cable Channel 10).

The District Board of Directors held a second public hearing on April 23, 2014 to present a Draft GMP to the public and solicit comments to the plan. The Draft GMP was distributed to key stakeholders prior to the hearing. The public was given an opportunity to ask questions at the hearing and interested parties were invited to participate in development of the GMP. If the parties could not attend the public hearing, they could express their interest in writing to the District as explained in the public notice. Water managers at neighboring water agencies were also notified of the GMP process. The April 23, 2014 public hearing notifications, agenda, and minutes are included in Appendix A.

The District Board of Directors held a third public hearing on May 28, 2014 to consider adoption of the final GMP. The GMP was adopted by the District Board of Directors by passing Ordinance 95 on May 28, 2014. Ordinance 95 is presented in Appendix A.

Section 2: GMP Management Area

This section identifies the GMP management area and, as required, a map showing the DWR groundwater basins within and adjacent to the GMP area, as defined by DWR Bulletin 118 along with a description of the physical structure. A more detailed description of the local groundwater conditions in the TPWD area is presented in Sections 3 and 4.

2.1 Twentynine Palms Water District

The District encompasses approximately 87 square miles and includes the City of Twentynine Palms (City) and a portion of the areas outside the City (Figure 2-1). The management area for this GMP includes the groundwater basins and subbasins underlying the TPWD service area. Within the GMP management area, the groundwater basins are compartmentalized into a number of smaller subbasins that are more or less separated from one another by hydrologic barriers, including bedrock ridges, faults, and folds. The degree of separation between these subbasins is dependent upon the character of the barriers separating them. Figure 2-1 shows the subbasins in the TPWD area.

Groundwater is the primary source of water in the GMP management area. Increased pumping to meet the needs of an increasing resident population has resulted in groundwater overdraft in parts of the groundwater basin. Prior to 1954, the Twentynine Palms area was served by three privately owned water companies: Abell Water Company, Condor Mutual Water Company, and Pacific Water Company. TPWD was formed in 1954 and immediately purchased the three water companies. Their wells, storage facilities, and piping served as the initial water system for the District. Historical pumping and water deliveries by the District have steadily increased since its formation in the mid-1950s. Annual pumping in the 1990s regularly exceeded 900 million gallons, (approximately 2,760 afy), with an average daily delivery per service connection slightly under 400 gallons.

The District collects groundwater level, water quality and water production data in the management area for use in groundwater management and other reporting purposes. The GMP monitoring plan is presented in Appendix B. In addition, the USGS currently collects groundwater level monitoring primarily associated with the Marine Base that includes several wells in the Twentynine Palms area. These are posted on the DWR Water Data Library web site at http://www.water.ca.gov/waterdatalibrary/. These data are also posted on the DWR California Statewide Groundwater Elevation Monitoring (CASGEM) web site and can be downloaded from http://www.water.ca.gov/groundwater/casgem/.

2.2 Regional Water Purveyors

Figure 2-2 includes areas from the Town of Yucca Valley to Twentynine Palms where groundwater management is covered by several entities in addition to TPWD. Other local and regional entities located immediately adjacent or in the vicinity of the GMP area are shown in Figure 2-3. Figure 2-4 shows the name of the DWR Groundwater Basin underlying the other local and regional entities. A brief description of the neighboring water purveyors includes:

- Mojave Water Agency (MWA) is a regional wholesale water provider to retail water purveyors that serve a large area of the Mojave River Valley and the Morongo Basin. MWA was found in 1960 due to concerns over declining groundwater levels. MWA is one of the State Water Project (SWP) contractors and serves an area of 4,900 square miles of the High Desert in San Bernardino County. Through MWA, imported water has become available for groundwater recharge in the Town of Yucca Valley and Joshua Tree.

- Joshua Basin Water District (JBWD) is part of MWA and lies on the western boundary of TPWD. Its service area covers a 96-square mile area between Yucca Valley, Twentynine Palms, Joshua Tree National Park and the Marine Base. JBWD serves 4,426 connections in 2009 with local groundwater from the Joshua Tree (DWR Number 7-62) and Copper Valley Groundwater Basins (DWR Number 7-11) to the west of TPWD. The JBWD Recharge Project will create a mechanism for JBWD to use 1,000 afy of imported SWP water for local groundwater recharge.

- The Marine Corps Air Ground Combat Center (MCAGCC or Marine Base) is a United States Marine Corps base that lies along the northern boundary of TPWD. The developed portion of the base covers 1.4 square miles in the Morongo Basin and had a total population of 8,413 in 2000. The developed portion is included within the City. The Marine Base provides its own water supply from groundwater primarily from near Surprise Springs in the Deadman Valley Groundwater Basin (DWR Number 7-13), located north of the Twentynine Palms Valley Groundwater Basin (Figure 2-3). The Marine Base golf course operates an irrigation well in the Twentynine Palms Valley Basin; however, no records of pumpage are kept, but the volume is considered small (Li and Martin, 2011).

- Unincorporated areas outside the District to the east are covered by the San Bernardino County Desert Groundwater Management Ordinance adopted October 29, 2002, which gives the San Bernardino County (County) jurisdiction over the management of groundwater in the unincorporated, unadjudicated desert region of the County for areas of the County east of TPWD, MWA and the MCAGCC.

- Joshua Tree National Park lies on the southern boundary of TPWD. As a national park, much of the area is undeveloped natural space. Water supply is provided at park facilities including visitor centers, exhibits and campgrounds; however, all of the water is produced locally within the Park and is not derived from within the GMP area.

2.3 Delineation of DWR Groundwater Basins and Subbasins

TPWD is located within the Morongo Basin, which covers about 1,000-square-miles of several alluvium-filled valleys or basins surrounded by mountains. Previous investigators have divided the Morongo Basin into multiple groundwater basins. A required element of the GMP, Figure 2-4 shows the groundwater basin boundaries, as defined by DWR Bulletin 118, covered by this GMP along with the basins and agencies adjacent to this GMP management area.

This GMP addresses the portions of groundwater basins and subbasins that underlie or are immediately adjacent to the TPWD, but are outside the jurisdiction of other managing agencies

such as JBWD. The GMP covers the Indian Cove, Eastern, and Fortynine Palms Subbasins of the Joshua Tree Basin, but does not cover the Joshua Tree Subbasin which underlies JBWD (Figure 2-1). TPWD overlies large portions of the Mesquite Lake and Mainside Subbasins in the Twentynine Palms Valley Basin and the GMP covers both of these subbasins (Figure 2-1 and 2-4). The District overlies a portion of the Dale Valley Groundwater Basin, but there is little to no pumping or historical data from this basin. Therefore, the GMP includes some discussion of the Dale Valley Groundwater Basin but does not consider it a part of the management area.

The Twentynine Palms Valley Groundwater Basin (Number 7-10) underlies Mesquite Lake (dry) and the City of Twentynine Palms covering a surface area of 62,400 acres (97.5 square miles) (Figure 2-4). The basin is bounded on the north by a structural barrier named the “transverse arch” (Schaefer, 1978; Mendez and Christensen, 1997) and on the south by the Pinto Mountain fault. The basin is bounded on the east by the southern Bullion Mountains and extends west to the flank of Copper Mountain. The basin is subdivided into the Mesquite Lake and Mainside Subbasins (Figure 2-1). The deposits in the region are interpreted to range to 10,000 feet in thickness (Moyle, 1984). However, in the Twentynine Palms Valley, wells have been drilled to a depth of 1,250 feet bgs without encountering bedrock. Total storage capacity of the basin is estimated to be 1,420,000 af (DWR, 1984). Groundwater in storage was estimated for a 100-foot thickness of saturated sediments to be about 132,000 af (DWR, 1984).

The Joshua Tree Basin (Number 7-62) includes the water-bearing sediments south of the Pinto Mountain fault beneath Joshua Tree, eastward to immediately south of the town of Twentynine Palms, which is outside the boundaries of the basin (Figure 2-4). The northern boundary of the Joshua Tree Basin (Number 7-62) is the Pinto Mountain fault, and the southern boundary is exposed consolidated basement of the Little San Bernardino Mountains within Joshua Tree National Park. The western boundary of the basin is coincident with a basement constriction located between the Town of Yucca Valley and Joshua Tree that causes a change in the groundwater level gradient. The eastern boundary of the basin lies along a line extending from the southern tip of the Mesquite fault to a basement outcrop of the Little San Bernardino Mountains. The basin is subdivided into four subbasins that include the Joshua Tree, Indian Cove, Fortynine Palms and Eastern Subbasins (Figure 2-1). Estimates of storage capacity of the Joshua Tree Basin have a wide range from 480,000 to 750,000 af (Krieger and Stewart, 1996), 975,000 af (Whitt and Jonker, 1998), and 1,010,000 af (DWR, 1984).

The Dale Valley Basin is located immediately to the east of the Mesquite Lake Subbasin (Figure 2-4). Little work has been done on the hydrogeology of the Dale Basin, as it is not a host to significant population, nor does it contain many wells. Its western boundary is the Mesquite Fault, which separates it from the Mesquite Lake Subbasin. The northern boundary is the Bullion Mountains. The southern boundary is the Pinto Mountains. The depth to bedrock in this basin is unknown. Groundwater levels have increased by 0 to 0.7 feet per year in the seven wells for which records exist, although most of the increases are due to single or few anomalously low water levels at the beginnings of the periods of record. Water levels within this basin have been basically stable since about 1960.The District has not pumped from this basin historically and has no production wells in this basin.

The Copper Mountain Valley (DWR #7-11), Warren Valley (#7-12), Deadman Valley (DWR #7-13), and Ames Valley (DWR #7-16) Groundwater Basins lie outside of management area for this GMP and are provided on Figure 2-4 for reference in demonstrating that the

adjoining water districts obtain water from groundwater basins separate from those used by TPWD.

2.4 Geology

The geology in the Twentynine Palms area primarily consists of Tertiary to Quaternary alluvium deposits in the basins enclosed by bedrock materials in the surrounding hills and mountains (Riley and Worts, 1953). The geology of the region is complex due to the tectonic forces that created the Morongo Basin and surrounding mountains.

2.4.1 Geologic Units

The geology of the GMP area is typical of many extensional basins throughout the western United States. Basin-bounding ranges are fronted by normal faults along which they have risen relative to the basin floor (Riley and Worts, 1952). Over time, the basin has filled with highly heterogeneous deposits. The sediments within the basin have been buried progressively deeper as later sediments have been laid down on top of them; those at the greatest depth are more compacted than are those near the ground surface.

The geological materials in the region are grouped into stratigraphic units based on the geologic characteristics (Figure 2-5). The following brief description of the geologic units is summarized from earlier reports by Riley and Worts (1953), Rogers (1967), Londquist and Martin (1991), Nishikawa *et al. (*2004) and Li and Martin (2011):

- The Bedrock units are exposed in the mountain ranges but also underlie the groundwater basin. These units consist of Precambrian igneous and metamorphic rocks and Mesozoic-aged granitic and metamorphic rocks. The Mesozoic-aged rocks are primarily granite that intruded into the pre-existing Precambrian rocks.

- The Tertiary alluvium directly overlies the bedrock and consists of interbedded layers of clayey sand and sandy gravel. This unit is commonly consolidated with interstitial clay and calcium-carbonate cement. This unit is found only in the subsurface.

- The Quaternary alluvium overlies the Tertiary alluvium and is mostly made up of beds of coarse sand with little clay, with the rest composed of finer-grained beds made up of very fine silty sand to clay. This unit is divided into two subunits based on their characteristics. In general, the upper subunit is more permeable than the lower because of the predominance of the coarser-grained deposits and the lack of cementation. The upper Quaternary alluvium is the primary aquifer for the region.

- Playa lake deposits are typically composed of very clay rich sediments formed at the playa lakes. These deposits are as much as 45 to 50 feet thick beneath the Mesquite Dry Lake.

The alluvium is highly variable both vertically and horizontally. The coarsest alluvium tends to occur along the mountain fronts (Kennedy/Jenks, 2001, 2008, 2010) and progressively finer-grained sediments are found with distance away from the mountain fronts. The sediment size

grades progressively to fine sand at the lower ends of the washes and eventually to silt and clay at the playas (Riley and Worts, 1952).

2.4.2 Faults and Folding

Structural features are very important to the hydrogeology of the Twentynine Palms area, as they act as flow limiting features that separate the groundwater subbasins from one another. These features are mainly faults, which crisscross this area due to an intense tectonic history in this area (Figure 2-5). There are three sets of faults running through the region (Riley and Worts, 1952). Several other unnamed faults do not fall into the three fault sets described herein, but are visible on geologic maps and may be important to the hydrogeology.

- The first set consists of normal faults that cross the basin in a generally north-northwest to northwest direction. The easternmost is the Mesquite Fault (Riley and Worts, 1952). Deadman and Mesquite Dry Lakes are located directly on top of this fault (Figure 2-5).

- The second set of faults includes the Elkins and Sand Hill Faults (Figure 2-5) that run generally north-south, with faults most important in the southern end of the basin and dying out toward the north (Riley and Worts, 1953).

- The third set of faults runs east-west along the southern end of the basin and includes the Oasis, Bagley, and Pinto Faults (Figure 2-5). The Oasis Fault (also known as the Pinto Mountain Fault in many references) was reported by Thompson (1929) as having a scarp 15 to 30 feet high next to the Oasis of Mara. The Bagley Fault is about half a mile north of the Oasis Fault in the area of Twentynine Palms, and intersects with the Oasis Fault west of the City of Twentynine Palms.

Faults make effective barriers for several possible reasons (Riley and Worts, 1952). With movement along the fault, beds of differing permeability can be juxtaposed across the fault. Groundwater flow across the fault may be reduced due to fault gouge consisting of clay or very fine particles or precipitation of calcium carbonate cement within the fault zone. The effectiveness of a fault as a barrier to groundwater flow does not require a great deal of movement along the fault (Riley and Worts, 1952). The fact that faults do act as barriers can be seen by the presence of significant areas of historical groundwater discharge as springs on the upgradient sides of some faults (e.g., Surprise Spring on the Surprise Spring Fault, Oasis of Mara on the Oasis Fault, and Mesquite Spring on the Mesquite Fault) as shown on Figure 2-5.

The area is seismically active as evidenced by the 7.3 magnitude Landers Earthquake in 1992, which is the largest magnitude earthquake in the lower 48 states since the 1906 San Francisco earthquake. The Landers Earthquake was centered on several faults about 20 miles west of Twentynine Palms. Earthquakes have been known to change the location and character of springs, change the flow character of wells, and cause fluctuations in groundwater levels (Roeloffs *et al*., 1995). However, the groundwater characteristics of the faults bounding the groundwater subbasins in the Twentynine Palms area have experienced numerous seismic events over their geologic history. It is these events that have defined the hydrogeologic characteristics of the faults that are observed today. Therefore, it is considered unlikely that a single seismic event in the future would significantly change the hydrologic characteristics of the groundwater subbasins.

In addition to the faulting in the area, folding has played a significant role in the geology and hydrology of the region. The USGS conducted a gravity survey to better understand the structure and thickness of subsurface fill by mapping the depth to the granitic or volcanic bedrock material (Roberts *et al*., 2002, Moyle, 1984). The estimated depth to bedrock is variable across the region. The estimated depth to bedrock beneath Mesquite Lake area is estimated to be more than 16,000 feet deep (Roberts *et al*., 2002). In other areas of the basin, bedrock highs bring bedrock units nearer to the surface. The Transverse Arch is bedrock high that brings bedrock to within 500 feet of land surface (Londquist and Martin, 1991) and forms the northern boundary of the Twentynine Palms Valley Basin (Figure 2-5). A second bedrock high exists in the southern part of the Mesquite Lake Subbasin that extends under the City of Twentynine Palms. This area likely represents an extension of Copper Mountain uplift which is composed of Precambrian and Mesozoic rocks (Figures 2-1 and 2-5) along the western margin of the Twentynine Palms Valley Basin.

2.5 Hydrology

In the arid to semiarid environment of the Twentynine Palms area, surface water is generally rare, localized, and short-lived. The climate in the Twentynine Palms area is classified as arid, upland desert climate, with hot summers and mild winters. The Twentynine Palms area is quite dry, with average annual precipitation of less than 5 inches. Most of the annual precipitation falls either during the summer monsoon or the winter wet season.

There are no perennial streams in the region, but there are several ephemeral streams that flow during high rainfall events. The largest of these is Fortynine Palms Creek (Figure 2-6). When runoff is generated by a storm, streamflow typically percolates into the alluvial soils in the stream channels (Kennedy/Jenks, 2001, 2008). Some areas contain caliche (layers of concentrated mineral salts), which can limit the downward movement of water, (Riley and Worts, 1953, USDA, 1994, Nishikawa *et al*., 2004).

Playa lakes form at the lowest elevations in a number of the surface drainage basins in the region (Figure 2-6). These dry lakes represent topographic low points where surface water ends up if runoff is high enough. The playa lakes are typically dry; however, a playa may represent an area of groundwater discharge that is typically lost to evaporation or taken up by vegetation. Playas with discharging groundwater are typified by rough surfaces with accumulations of alkali and other mineral salts (Thompson, 1929; USDA, 1994, Nishikawa et al., 2004). Among the playa lakes, the Mesquite Dry Lake is the largest in the area and is the lowest point in the area. South of Mesquite Dry Lake is a small unnamed playa that some older maps refer to as Shortz Lake (Figure 2-6). Due to erosion, ephemeral streams that formerly drained into Shortz Lake now bypass the lake so that the playa area is now largely covered with sand dunes. Two smaller playas occur just east of Copper Mountain.

Springs have historically been an important hydrologic feature as the only easily available source of water in this desert region. The Oasis of Mara is a mile long line of springs that form along the Oasis Fault. Mesquite Spring (Figure 2-6) once consisted of at least two pools, each 3 to 4 feet across and 2 feet deep, supporting a discharge of water that flowed about 200 feet into the desert (Thompson, 1929). However, Riley and Worts (1953) noted that by 1952 there was no water at the surface at the Oasis of Mara or flowing at Mesquite Springs.

Section 3: Groundwater Usage

This section provides the required GMP summary of historical data, historical and future water demand and supplies of the TWPD service area. The local groundwater basin conditions for the GMP area are presented in Section 4.

3.1 Historical Groundwater Pumpage by TPWD

Groundwater is the sole source of water supply for TPWD, thus, groundwater pumping by the District is a good indication of water use in the service area. The District has had eighteen total groundwater production wells in its history. As of 2013, the District has eight active production wells and pumps with wells located in four of different groundwater subbasins. Figure 3-1 shows the locations of the District's active and historical supply wells within the four groundwater subbasins in the Twentynine Palms area. Table 3-1 presents a summary of the District's well completion details grouped by subbasin.

Groundwater pumping by the District steadily increased since its formation in the mid-1950s until about 2002 (Figure 3-2). In the 1950's, groundwater pumping ranged from 500 to 1,000 acre-feet per year (afy). By the 1990s, groundwater pumping ranged from 2,730 to 3,145 afy with an average daily delivery per service connection slightly under 400 gallons.

The highest total groundwater pumping for one year was 3,569 acre-feet in 2002. Since 2002, groundwater pumping has shown a consistent decline. In 2012, total groundwater pumping in the District was 2,933 acre-feet (af), which as the lowest annual pumping volume since 1992.

Most TPWD water supply wells are located along the southern limit of the service area in the Indian Cove, Eastern, and Fortynine Palms Subbasins because of the superior water quality compared to that in the Mesquite Lake Subbasin, where fluoride concentrations are of concern. Figure 3-2 also shows the annual groundwater pumping by subbasin. In the 1950s and 1960s, groundwater pumping was primarily in the Fortynine Palms Subbasin; in the 1970s and 1980s, the pumping was shifted to be primarily in the Indian Cove Subbasin; and, in the mid-1980s, groundwater pumping in the Fortynine Palms Subbasin was increased in response to decreasing groundwater levels in the Indian Cove Subbasin. In 1993, groundwater pumping in the Eastern Subbasin was also increased.

In 2003, the first production well in the Mesquite Lake Subbasin (WTP-1) began providing water to TPWD, with that production now passing through the Twentynine Palms Fluoride Removal Water Treatment Plant. TPWD is considering increasing groundwater pumping in the Mesquite Lake Subbasin to 3.0 million gallons per day (mgd), with a concomitant decrease in pumping in the Indian Cove, Fortynine Palms, and Eastern Subbasins (Figure 3-2).

Since 2003, the District has worked to balance the pumping amongst the four groundwater subbasins to help reduce groundwater level declines. A more detailed discussion of the responses of groundwater levels to changes in pumping are discussed in Section 4.

TABLE 3-1
TPWD PRODUCTION WELL COMPLETION SUMMARY

Well Name	Total Well Depth (feet bgs)	Screened Interval (feet bgs)	Well Status	Year Drilled	Years of Operation
Mesquite Lake Subbasin					
WTP-1	1,010	350-440; 460-620	Active	1993	2003-ongoing
Eastern Subbasin					
TPWD-1	-	-	Abandoned	-	1955-2011
TPWD-2	275	-	Inactive	-	1953-1993
TPWD-16	320	0-320	Active	1988	1991-ongoing
Fortynine Palms Subbasin					
TPWD-3	340	120-340	Abandoned	-	1953-1992
TPWD-3B	398	160-280; 300-320; 340-398	Abandoned	1992	1993-2006
TPWD-4	283	-	Inactive	1935	1953-2013
TPWD-5	-	-	Abandoned	-	1953-1996
TPWD-13	337	152-337	Abandoned	1985	1985-2004
TPWD-14	430	220-420	Active	1993	1993-ongoing
TPWD-17	-	-	Active	2009	2010-ongoing
Indian Cove Subbasin					
TPWD-6	406	195-403	Inactive	1956	1957-2010
TPWD-7	407	258-403	Inactive	1962	1963-2005
TPWD-8	785	80-100, 140-160, 215-600	Abandoned	1965	1969-1993
TPWD-9	530	318-510	Active	1968	1970-ongoing
TPWD-10	400	145-213; 238-312; 326-335; 365-382	Inactive	1968	1969-2006
TPWD-11	400	200 - 400	Active	1978	1966-ongoing
TPWD-12	410	310-330; 350-410	Active	1983	1983-ongoing
TPWD-15	352	250-350	Active	1987	1990-ongoing

Note: Data provided by TPWD.

3.2 TPWD Water Use Assessment

Currently, the District serves the area solely by groundwater pumping. Water demand in the service area, and in turn groundwater pumping, is anticipated to increase in response to population increase and groundwater will continue to be the sole source for meeting future demand. Population trends and water demand data for the District service area are described below for the current and 2035 conditions.

The majority of land use is designated for residential development and open space residential, with a small portion made up by commercial, institutional, and industrial. Residential

development is currently the single largest land use in the area served by the District. Approximately 80 percent of the residential development is single-family homes. The remaining 20 percent of land use is made up of some multi-family residential units and commercial property. Industrial property makes up a minor amount of the land use. There is no large-scale agricultural development in the management area.

The population served by the District in 2010 is approximately 18,975, but the population for 2035 was projected to be 30,931 based on the estimate from the 2010 UWMP. Table 3-2 presents the historical population from 2000 to 2010.

Based on the 2010 UWMP, the District water demand during 2010 was 2,674 acre-feet (af), serving 7,983 connections, all of which are metered accounts. Based on the most recent water usage data available from the District for March 2010 through February 2012, total annual water use is estimated to be 2,552 acre-feet per year (afy). While this is slightly lower than the 2010 water use of 2,674 af presented in the 2010 UWMP, it is more representative of the current conditions.

The population for 2035 is projected to be 30,931 with water use in the District service area projected to increase to 5,119 af by 2035, based on the 2010 UWMP. Total residential water demand is projected to be 3,401 af for single family and 839 af for multi-family residential. The base daily per capita water use in 2010 was estimated to be 147 gallons per capita per day (gpcd). The District's future projected per capita water use is estimated to be 135 gpcd, for compliance with the SBX7-7 required water reduction by 2020 (Kennedy/Jenks, 2011).

TABLE 3-2
ESTIMATED ANNUAL WATER DEMAND 2000 TO 2035

	Annual Water Use (afy)					
Land Use	**2000[(a)]**	**2005[(a)]**	**2010[(a)]**	**2015[(a)]**	**2025[(a)]**	**2035[(a)]**
Single family	1,686	2,727	1,727	2,525	3,006	3,401
Multifamily	552	564	442	623	741	839
Commercial/institutional	339	392	278	417	496	561
Industrial	0	0	0	0	0	0
Landscape irrigation	111	108	125	112	134	151
Other (fire protection/non-potable)	131	153	102	124	148	167
Total	**2,818**	**2,832**	**2,674**	**3,801**	**4,525**	**5,119**

Note: (a) Data from 2010 UMWP (Kennedy/Jenks, 2011).

3.3 Groundwater Pumping Capacity

The District has a total pumping capacity of approximately 5,210 gpm (8,400 afy). Table 3-3 provides a breakdown of this capacity by subbasin. The 2012 total groundwater volume extracted utilizes about 33 percent of the current pumping capacity. Historically, total groundwater volume extracted has been about 18 percent higher than the annual water demand. Therefore, the estimated 2035 total groundwater volume extracted, using the same ratio, would be about 6,040 afy. The District's current pumping capacity is above the current pumping levels and should be sufficient to meet the projected 2035 water demand without

expansion. This would represent about 72 percent of the District's current pumping capacity, which may be close to the practical pumping capacity limit. However, the estimated population increase assumes a substantially higher rate in population increase than has been experienced in the past. Therefore, the 2035 water demand estimate may an overestimation; however, it is reasonable to use such a conservative estimate for long-term planning considerations.

In addition, current pumping is limited by DWR's recommendations to prevent overdraft in the Indian Cove and Fortynine Palms Subbasins, as discussed further in Section 4. The District's current source capacity is 7.4 MGD which adequately meets the maximum daily demand. For reliability, CDPH recommends that a water system be able to meet its maximum daily demand with the highest capacity source offline, which is the well at the fluoride treatment plant. With that well offline, the capacity is 4.5 MGD, which would not meet the maximum daily demand. Although the District's system is in compliance with these source capacity requirements, the addition of a new well and treatment facility in the Mesquite Lake Subbasin is needed.

TABLE 3-3
TPWD PRODUCTION WELL CAPACITY AND USE SUMMARY

Well Name	Pumping Capacity (gpm)	Potential Maximum Annual Extraction (afy) [(a)]	2012 Groundwater Extracted (acre-feet)	2012 Percent of Capacity
Mesquite Lake Subbasin				
WTP-1	2,100	3,395	1,168	35%
Eastern Subbasin				
TPWD-16	500	800	311	39%
Fortynine Palms Subbasin				
TPWD-4	100	160	49	30%
TPWD-14	700	1,130	439	39%
TPWD-17	700	1,130	524	46%
Indian Cove Subbasin				
TPWD-6		0	0	--
TPWD-9	325	520	131	25%
TPWD-11	300	485	92	20%
TPWD-12	385	620	172	28%
TPWD-15	100	160	47	30%

Note: Data provided by TPWD.
(a) Potential Maximum Annual Extraction assumes the well operating at the pumping capacity for 24 hours per day for 365 days per year.

Section 4: Groundwater Supply Assessment

This section summarizes the groundwater basin conditions and groundwater management actions that have been taken previously. The section includes an assessment of the current status of the groundwater basins as supported by monitoring results.

4.1 Aquifers

The alluvial fan deposits are the principal water-bearing unit in the region. Li and Martin (2011) divide the upper alluvial fan deposits into two subunits based on their characteristics. In general, the upper subunit is more permeable than the lower subunit because of the predominance of the coarser-grained deposits and the lack of cementation. The thickness of the upper alluvial fan deposits reaches about 400 feet in the Joshua Tree Subbasin, with a saturated thickness of 300 feet. The thickness of the lower Quaternary alluvium varies from zero along the basin margins to a maximum of 400 feet in the western Indian Cove and eastern Mesquite Lake Subbasins and throughout much of the Joshua Tree Subbasin. The maximum saturated thickness of the Tertiary alluvium in the Twentynine Palms area is about 1,700 feet along the western edge of the Indian Cove Subbasin and reaches up to 3,000 feet, according to Nishikawa *et al.* (2004). Sediments that have become deeply buried tend to be more consolidated, compacted, and cemented with depth. Therefore, the deepest sediments tend to be less transmissive than the upper sediments.

The traces of two representative cross sections are shown on Figure 4-1. Cross Section A-A' (Figure 4-2) extends from west to east through the Indian Cove, Fortynine Palms and Eastern Subbasins. Cross section B-B' shown on Figure 4-3 runs from southwest to northeast starting in the Indian Cove Subbasin across the Fortynine Palms Subbasin, the Mesquite Lake Subbasin and into the Dale Valley Basin. The upper and middle aquifers shown on the cross sections correlate to subdivisions of the alluvial fan deposits of Tertiary-Quaternary age (QTf) and the Lower Aquifer correlates to the older sedimentary deposits of Tertiary age (Ts). The cross sections show the complex geology of the faulting and depth to bedrock. Groundwater elevations shown are representative of current groundwater levels and illustrate the differences in groundwater levels across the faults that form the boundaries for the various subbasins. Additional hydrologic cross sections across the area are found in Nishikawa *et al*. (2004), Kennedy/Jenks (2010), and Li and Martin (2011).

Groundwater flow directions in the Twentynine Palms area are largely determined by the structural geologic framework and the natural processes of recharge and ET. The faults act as a barrier that limits the volume of groundwater that flows into adjacent subbasins. These barriers are reflected on the map with distinct changes over small distances across some of the faults. Figures 4-4 shows the general flow direction based on the groundwater model results for 1982, 2008, and 2012, respectively (Kennedy/Jenks, 2010). Groundwater conditions are described here only for the subbasins within the boundary of TPWD.

4.2 Joshua Tree Basin

The Joshua Tree Groundwater Basin includes the three subbasins south of the Oasis Fault (Indian Cove, Fortynine Palms, and Eastern Subbasins). The following provides an overview of groundwater conditions and levels in the three subbasins.

4.2.1 Groundwater Conditions

In general, groundwater flows north and east across the subbasins (Figure 4-4). The highest groundwater levels are found along the mountain front of the Little San Bernardino Mountains to the south, which is the primary recharge area for these three subbasins. Flow between these three subbasins is considered limited due to the presence of hydrologic barriers that may consist of faults or bedrock highs. For example, the water level in the Indian Cove Subbasin is more than 250 feet above the water level in the Fortynine Palms Subbasin to the east, indicating that there is some barrier between the two subbasins, although its character is not defined. The groundwater elevation is approximately the same in the Fortynine Palms and Eastern Subbasins, which suggests that there is limited flow between the subbasins.

Within the Joshua Tree Basin, long-term water level declines are evident south of the Pinto Mountain Fault throughout the Indian Cove and Fortynine Palms Subbasins primarily near pumping centers. The following discussion provides additional details on groundwater level changes for each subbasin.

4.2.2 Indian Cove Subbasin Groundwater Level History

The Indian Cove Subbasin is located between the Joshua Tree Subbasin on the west and the Fortynine Palms Subbasin on the east (Figure 4-1). The basin is floored by bedrock, which generally slopes northward with depth to bedrock ranging from 100 to 1,200 feet bgs (Kennedy/Jenks, 2010).

In the Indian Cove Subbasin, pumping records go back to 1957, and varied from about 30 afy initially to a peak of 2,075 afy in 1985. In 2012, total pumping in the subbasin was 442 afy. The current production capacity for wells located within this subbasin is 1,785 afy (Table 3-3). The greatest annual pumping from a single well in the basin was about 620 afy, from TPWD-10 in 1976.

The groundwater levels vary more widely in the Indian Cove Subbasin than the other subbasins in the area. Hydrographs of the TPWD wells in the Indian Cove Subbasin are presented on Figure 4-5. The groundwater elevations in the northern part of the subbasin have declined between 1.5 and 2.5 feet per year from the 1960s to the 2000s. Groundwater elevation dropped most quickly from about 1970 to 1990 before decreasing more slowly to the present time. Over the past 10 years, water levels in most of these wells generally increased at the rate of about 0.5 to 1.5 feet per year.

Wells south of the Pinto Fault did not experience similar declines in the groundwater levels. The water levels in the southern group wells range from about 2,210 to 2,440 feet asl (Figure 4-5). This suggests that the Pinto Fault is an effective groundwater barrier that separates Indian Cove Subbasin into a northern and southern subarea.

4.2.3 Fortynine Palms Subbasin Groundwater Level History

The Fortynine Palms Subbasin is located directly east of the Indian Cove Subbasin (Figure 4-1). The known depth to bedrock in the subbasin is between 170 and 430 feet bgs making this the shallowest among the subbasins in the area (Kennedy/Jenks, 2010). The Pinto Fault also traverses the southern part of this basin; however, there are no wells exist south of the fault to verify whether or not the fault is a barrier to flow. No other significant faults are known within this subbasin.

In the Fortynine Palms Subbasin, pumping records go back to 1952. Since then, pumping has varied from about 260 afy in 1953 to a peak of 1,620 afy in 2002. In 2012, total pumping in the subbasin was 1,012 afy. The current production capacity for wells located within this subbasin is 2,420 afy (Table 3-3). The greatest discharge from a single well in the subbasin was about 920 afy, from TPWD-14 in 2007.

Hydrographs of the TPWD wells in the Fortynine Palms Subbasin are presented on Figure 4-6. From the 1940s to about 1970, groundwater levels declined by about 1 foot per year before leveling off about 1990, coinciding with a pumping decline in this basin. Starting around 1990, water levels declined as pumping again increased in the subbasin; until 2003, when pumping was reduced and water levels again leveled off. Water levels in TPWD-13 and TPWD-14, in the southwestern part of the subbasin, have experienced a much steadier decline than other TPWD wells in the subbasin. Measured groundwater elevations have decreased 150 feet from the 1940s, including about 100 feet since 1980.

4.2.4 Eastern Subbasin Groundwater Level History

The Eastern Subbasin is located immediately to the east of the Fortynine Palms Subbasin (Figure 4-1). Woodward-Clyde (1985) noted that groundwater supplies in the Eastern Subbasin appear limited due to most of the flow being confined to a shallow zone above or in the bedrock. The depth to bedrock varies from 160 to 750 feet bgs (Kennedy/Jenks, 2001, 2008, 2010). Test wells drilled in 1987 near the large housing tract encountered bedrock at depths ranging from 327 to 415 feet bgs, and the water table was inferred at depths ranging from160 to 170 feet bgs (BCI, 1988).

In the Eastern Subbasin, pumping records go back to 1952. Since then, pumping has varied from about 200 afy in 1953 to a peak of 829 afy in 2002. In 2012, total pumping in the subbasin was 311 afy. The current production capacity for wells located within this subbasin is 800 afy (Table 3-3). The greatest discharge from a single well in the subbasin was 580 afy from TPWD-16 in 2002.

Hydrographs of the TPWD wells in the Eastern Subbasin are presented on Figure 4-7. Groundwater elevations for wells with at least 20 years of record have mostly declined between 0.2 and 0.8 feet per year. Measured groundwater elevations have decreased 70 feet from the 1940s, including about 50 feet since 1990.

4.3 Twentynine Palms Valley Basin

The Twentynine Palms Valley Groundwater Basin includes two subbasins, the Mesquite Lake and Mainside Subbasins. The following provides an overview of groundwater conditions and levels in these two subbasins.

4.3.1 Groundwater Conditions

The Twentynine Palms Valley Groundwater Basin underlies much of the City of Twentynine Palms and includes the Mesquite Lake and Mainside Subbasins. Within the Mesquite Lake Subbasin, groundwater flows toward Mesquite Dry Lake from all directions (Figure 4-4). Riley and Worts (1952) noted that groundwater is confined by playa deposits along the western half of Mesquite Dry Lake. Within the Mesquite Lake Subbasin, several faults and a bedrock high form significant flow restrictions that further subdivide this subbasin into distinct groundwater zones. In the southwestern part of the subbasin, bedrock is at or near the land surface, so groundwater may flow around the southern part of this ridge. In the northwestern part of the subbasin, several faults including the Elkins and Surprise Spring Faults appear to form flow barriers that limit flow across this section of the Mesquite Lake Subbasin. Small playas associated with these faults further support this observation, but there are few wells in this area.

4.3.2 Mesquite Lake Subbasin Groundwater Level History

TPWD has one high-capacity supply well (WTP-1) in this subbasin (Figure 4-1). WTP-1 came on line in 2003 and has a discharge capacity of 3,395 afy. The well has pumped between 610 and 1,168 afy since then. Otherwise, groundwater pumping in this subbasin is limited due to naturally-occurring water quality issues. There are private irrigation wells for the Roadrunner Dunes Golf Course and Luckie Park that have been estimated to pump as much as 580 afy.

Hydrographs of the TPWD wells in the Mesquite Lake Subbasin are presented on Figure 4-8. The static water level in WTP-1 has dropped by about 6 feet over the 10-year period of record. A significant amount of historical data is available from the USGS. Most water level measurements through the past 60 years are from the eastern and southern parts of the subbasin, with limited data from the western half of the subbasin. Most wells with long records show relatively steady water levels over time with total variations in groundwater levels ranging within 5 feet.

4.3.3 Mainside Subbasin Groundwater Levels

TPWD does not have production or monitoring wells in the Mainside Subbasin. Estimated pumping from the Marine Base golf course well in not measured but has been estimated between 50 and 540 afy from the Mainside Subbasin. Groundwater level data available from the USGS are shown on Figure 4-9. Groundwater levels have increased by 0 to 0.7 feet per year in the eight wells for which the USGS has collected data, although most of the increases are due to single or few anomalously low water levels at the beginnings of the periods of record. Water levels within this basin have been basically stable since about 1990.

4.4 Summary of Hydrologic Water Budget

The calculation of hydrologic water budget can vary based on the input data and methodology. The following is a summary of the hydrologic water balance that is presented in Table 4-1. A more detailed discussion on the data and assumptions used for each water balance component is provided in Appendix B. Return flows from irrigation and septic systems are included for each subbasin. The methodology is provided in Appendix B.

In the Indian Cove, Fortynine Palms and Eastern Subbasins, groundwater recharge is primarily derived from surface runoff resulting from rainfall in the mountains. The surface runoff percolates into the soils of the mountain-front alluvial fans to recharge groundwater in the aquifer. Another form of recharge is infiltration of precipitation into fractured bedrock exposed in the mountains that later discharges to the subbasins at the bedrock-aquifer interface. Groundwater pumping is the primary outflow from the three subbasins. Natural groundwater outflow occurs across (or, more likely, overtopping) the Oasis Fault into the Mesquite Lake Subbasin since the Oasis Fault is considered an effective groundwater flow barrier. DWR (1984) noted a probable water level difference of at least 100 feet across the Oasis Fault between these subbasins and the Mesquite Lake Subbasin.

Recharge to the Mesquite Subbasin is primarily from subsurface groundwater flow from the Deadman Valley Groundwater Basin across the Transverse Arch, the Copper Mountain Valley Basin around the south end of Copper Mountain, and the Indian Cove, Fortynine Palms, and Eastern Subbasins across the Oasis Fault. Additional recharge may occur within the subbasin, as runoff from storm flows off of the Little San Bernardino Mountains to the south may flow occasionally (Riley and Worts, 1953). Recharge from percolation of precipitation falling directly on the subbasin floor is not considered to represent a major source of groundwater recharge (DWR, 1984). Discharge from this subbasin occurs at the area of Mesquite Spring and Mesquite Dry Lake as evapotranspiration and groundwater flow over the Mesquite Fault into the Mainside Subbasin. The Mesquite Fault is considered “highly impervious” by Riley and Worts (1952), with groundwater levels varying by 200 feet over a horizontal distance of 100 feet from the west to the east side of the fault. As noted above, the Mesquite Fault is expressed on the surface by discharge at Mesquite Spring and a sharp delineation in the vegetation on the surface of the Mesquite Dry Lake.

Recharge for the Mainside Subbasin is primarily from outflow from Mesquite Lake Subbasin and infiltration of runoff from the Bullion Mountains. Outflow is limited to flow across the Bullion Mountain Fault into the Dale Valley Basin, but this is considered to be a very low volume.

Groundwater pumping uses the 2012 TPWD pumping from Table 3-3 plus private pumping from the Roadrunner Dunes Golf Course, Luckie Park and Marine Base golf course wells. Return flows include both irrigation and septic return flows, but are predominantly septic return flows. The return flow range assumes an 80-percent water to sewer conversion based on 2012 TPWD pumping and distributed to the appropriate subbasin due to septic system density.

The Colorado River Basin Plan identifies overdraft as being a concern in the Twentynine Palms area. Long-term water level declines have been observed in the Indian Cove, Fortynine Palms, and Eastern Subbasins. The hydrologic water balance results shown in Table 4-1 indicate that more groundwater is being pumped than is being recharged during an average year. These results indicate that return flows, which are a return of water pumped from the basin, as the

primary source of recharge. Natural recharge is limited because of the relatively low average rainfall in the area. Discharge is primarily pumping from wells. Natural outflows vary and are affected by changes in groundwater levels caused by pumping, such as the decrease in spring flows. The net effect is that discharge exceeds recharge and that is reflected in the declining groundwater levels as discussed in Sections 4.2 and 4.3.

TABLE 4-1
HYDROLOGIC WATER BUDGET SUMMARY

	Groundwater Inflow (AFY).			Groundwater Outflow (AFY).			
Subbasin	**Total Return Flow**	**GW Inflow**	**Natural Recharge**	**Wells**	**Natural Discharge**	**GW Outflow**	**Change in Storage**
Indian Cove	153	36 to 75	3 to 110	442	0	10 to 30	-260 to -134
Fortynine Palms	157	0 to 140	7 to 280	1,012	0 to 140	0 to 120	-848 to -695
Eastern	200	0 to 50	2 to 240	311	20 to 75	0 to 50	-129 to +54
Mesquite Lake	1,380	105 to 810	0 to 180	1,458	360 to 1,630	0 to 115	-333 to -833
Mainside	27	0 to 115	0 to 20	540	0 to 340	0	-513 to -718
Total	**1,917**	**141 to 1,190**	**12 to 830**	**2,933**	**380 to 2,185**	**10 to 315**	**-2,083 to -2,326**

4.5 Sustainability of Long-Term Water Supply

The District has employed several different practices to further enhance the long-term sustainability of water supplies for Twentynine Palms. The following summarizes several of the key management actions to address these issues including those of the voluntary 12 specific technical elements identified in the California Water Code that pertain to groundwater levels.

4.5.1 Mitigation of Conditions of Overdraft

The District has used the practice of shifting groundwater production between subbasins to help stabilize declining groundwater levels to provide intervals for groundwater levels to stabilize and recover in groundwater wells, especially in the Indian Cove and Fortynine Palms Subbasins,.

The District has increased groundwater production in the Mesquite Lake Subbasin to reduce the amount of groundwater pumped in the Indian Cove, Fortynine Palms, and Eastern Subbasins. The Mesquite Lake Subbasin contains a large volume of groundwater but that groundwater requires water treatment primarily for fluoride. The current Fluoride Removal Water Treatment Plant has a capacity of 3 mgd, but currently treats 1.2 mgd, operating at 40 percent of capacity. The District plans to expand the operation of the treatment plant up its design capacity of

3.0 mgd. This will allow further pumping reductions in the other basins and provide additional capacity for the practice of shifting groundwater production between subbasins.

Water conservation is an important method to reduce overdraft. The District utilizes public outreach to promote conservation, specifically water conservation brochures available through the District and distributed in new customer packages and water bills, as well as through speakers and events conducted at local schools and community events, which include poster contests and involvement in earth day activities. Additional water conservation measures are addressed in the BMOs and the current and planned water management strategies targeting conservation and water savings are described in the 2010 UWMP Update.

In evaluating potential future growth, SB 610 and SB 221 amended state law to improve the link between information on water supply availability and certain land use decisions made by cities and counties for defined project types and thresholds. These statutes require detailed information regarding water availability to be provided to city and county decision-makers prior to approval of specified large development projects. To provide that information, the governing body of the water agency that will serve the development must adopt an SB 610 Water Supply Assessment (WSA). Both statutes also require this detailed information be included in the administrative record that serves as the evidentiary basis for an approval action by the city or county on such projects. The District will continue to prepare SB 610 WSAs for the Twentynine Palms area to assess future water supplies and control overdraft.

4.5.2 Groundwater Model Analysis of Potential Future Conditions

The District has undertaken key efforts related to groundwater and management of groundwater resources to understand the state of the groundwater basins and to report on groundwater management activities. The 2010 Mesquite Lake Groundwater Study (Kennedy/Jenks, 2010) provided an updated hydrogeological conceptual model for the District. A numerical model was developed to help support informed decisions in future management of groundwater resources in a sustainable manner while meeting increased water demand. For the GMP, the numerical model was updated and used to evaluate potential future conditions. The following discussion summarizes the model analysis results. A more detailed discussion of the numerical model update and analysis is presented in Appendix D.

The Baseline Scenario assumes that pumping and septic recharge do not change over time, which is assumed to depend directly on pumping. This is not expected to be representative of actual conditions, but provides a condition against which the other scenarios can be compared. Groundwater model results are considered most representative when presented as a relative comparison to a baseline rather than as absolute numbers.

Scenarios 1, 2 and 3 use a linear growth rate of 2.58% per year to predict pumping and septic recharge over the 25-year simulation duration. The differences between the scenarios are the distribution of the groundwater pumping and septic tank return flows. In summary, the conditions of the three scenarios are:

- For Scenario 1, the increased pumping is distributed to the existing wells exactly proportional to their pumping in 2010. That is, if a well provided 5% of total demand in 2010, it would also experience 5% of the increased demand every year. Therefore, the

increase is distributed amongst the Mesquite Lake, Indian Cove, Fortynine Palms and Eastern Subbasins.

- Scenario 2 assumes that all of the increased pumping over time occurs in the Mesquite Lake Subbasin. Pumping in the Indian Cove, Fortynine Palms and Eastern Subbasins remain at their initial pumping rates throughout the simulation.

- Scenario 3 uses the same pumping assumptions as Scenario 2, but septic return flow is eliminated immediately and totally at the beginning of the simulation. This represents the assumption that the septic systems present in the basin are converted to sewerage.

The results of the model analysis shown in Table 4-2 indicate the increased pumping in the Mesquite Lake Subbasin will result in some potential for recovery of groundwater levels in the Indian Cove, Fortynine Palms and Eastern Subbasins. The larger Mesquite Lake Subbasin is considered to have a higher capacity so that decreases in groundwater storage would result in lower declines in groundwater levels than would occur in the smaller Indian Cove, Fortynine Palms and Eastern Subbasins.

Scenario 3 indicates that the septic return flows play an important role in groundwater management since they account for a significant percentage of extracted groundwater being returned to the groundwater basin. Removing those return flows completely from the groundwater basin could potentially lead to a decrease in groundwater storage that would result in significantly lower groundwater levels (Table 4-2). However, water quality issues with septic tank return flows may also have an impact on the beneficial use of groundwater in the region. The results of Scenario 3 indicate that if all or part of City of Twentynine Palms were to be converted to a centralized sewer system, it will be important to include a provision to recycle the treated wastewater in a manner that would help maintain groundwater levels.

TABLE 4-2
RELATIVE CHANGE IN GROUNDWATER STORAGE
FROM GROUNDWATER MODEL ANALYSIS

	Average Annual Change in Groundwater Storage Relative to the Baseline Scenario (AFY)		
Subbasin	**Scenario 1**	**Scenario 2**	**Scenario 3**
Indian Cove	-186	61	-203
Fortynine Palms	-46	14	-99
Eastern	-47	44	-216
Mesquite Lake	-4	-174	-1,286
Total	**-283**	**-55**	**-1,804**

4.5.3 Groundwater Recharge and Storage Projects

The District does not have access to surface, imported or recycled water sources; therefore, the options for mitigating overdraft conditions are limited. Should access to an alternative water source become available in the future, the District would initiate an assessment on how best to utilize these resources to reduce groundwater overdraft including the use of “artificial recharge,” “recycled water” or “conjunctive use” projects.

The only source of water currently available for replenishment is the impoundment or collection of stormwater runoff. Therefore, groundwater replenishment should be increased by maximizing the use of the only source of recharge available (precipitation) by providing recharge enhancement. The District should investigate the feasibility of implementing a recharge enhancement program. This program would involve the construction of berms to allow increased percolation of stormwater into the aquifer. Currently, this concept is in a conceptual stage and no detailed information is available.

The District has several reservoirs for system storage, which enable the District to provide adequate service for peak demands plus fire flow and emergency reserve. The District regularly evaluates its distribution and storage network. As part of this process, the need for new improvements including additional storage capacity is evaluated and a capital improvement program is developed in order to construct the necessary improvements. Existing storage facilities are operated and maintained by District staff. There are no plans for any large-scale storage projects or conjunctive use/groundwater storage facilities at this time. In addition, the need for additional extraction facilities is evaluated and wells are incorporated into the capital improvements program. District staff operates and maintain the wells.

4.5.4 Potential of Land Subsidence

Land subsidence can occur as a result of declining groundwater levels if a compressible sediment layer is present. In certain types of geologic formations, declining groundwater levels cause water to move out of the pore space causing the sediment to compress into a smaller volume. This primarily occurs in loose fine-grained mud deposits. Granular sediments, typical of the alluvial filled basins in the Twentynine Palms area, are generally not considered compressible.

Land subsidence has not been identified as an issue within the Twentynine Palms area; however, playa lake deposits such as those found in the Mesquite Lake and Mainside Subbasins have been noted as sources of land subsidence in Antelope Valley and other similar areas. Since there have not been any substantial historical groundwater level declines in these basins under current pumping conditions, it is unlikely to suspect that any subsidence has occurred. However, future increases in pumping in the Mesquite Lake Subbasin could lower groundwater levels to a degree that subsidence could be an issue if a compressible sediment layer is present.

In the Indian Cove, Fortynine Palms and Eastern Subbasins, no compressible sediment layers are known to exist; therefore, it is unlikely that subsidence would occur in these locations. Also, since groundwater levels have declined by up to 200 feet in parts of these basins, subsidence would have already occurred. Since none has been observed, this is consistent with the observation that no compressible sediment layer is present in these areas.

To address the potential for subsidence, the District should consider the presence of playa lake deposits when siting future production wells in the Mesquite Lake Subbasin and locate them outside of the playa area. In addition, the District should consider doing a benchmark survey that would evaluate historical data and provide a baseline of comparison for future surveys. A benchmark survey has been added to the Monitoring Plan in Appendix B.

Section 5: Groundwater Quality Conditions

This section summarizes the current status of the water quality in the groundwater basins as supported by monitoring results and groundwater management actions that have been taken.

5.1 Water Quality

District groundwater is typically of good quality. The historical and current use of septic systems for wastewater disposal has an effect on groundwater quality. In addition, high levels of naturally-occurring fluoride and arsenic are present in some water supply wells in certain areas of the District.

5.1.1 Salts and Nutrients

The historic and current use of septic systems for wastewater disposal in the District service area has the potential to affect groundwater quality. The key constituents considered for monitoring septic tank influence are nitrates and TDS. The maximum contaminant level (MCL) by the California Department of Public Health (CDPH) is 45 mg/L for nitrate as NO_3 or 10 mg/L for nitrate as N. Nitrate concentrations in public drinking water supplies exceeding the MCL require water system actions to provide safe drinking water. For the TPWD production wells, nitrate (as NO_3) ranges from non-detect to 36 mg/L, as summarized in Table 5-1. Historical and current data are below the MCL of 45 mg/L for nitrate. As part of the GPP and WMP that are currently being prepared to protect groundwater quality, the District and the City are proposing a groundwater monitoring plan to identify water quality issues related to the use of septic systems and future alternatives for wastewater management in the area.

The TDS content of groundwater within the District ranges from about 100 to 350 mg/L from the water supply wells, as summarized in Table 5-1. TDS has a secondary MCL by the CDPH of 500 mg/L. *Secondary MCLs regulate contaminant levels based on aesthetics such as taste, color or odor that do not pose a risk to health. These secondary MCLs are guidelines, not enforceable limits.* Higher levels of TDS noted in the area are typically associated with naturally-occurring, higher-salinity water shallow groundwater associated with playa deposits. Elevated TDS can also be associated with septic tank return flows.

5.1.2 Natural Constituents

Fluoride (F) naturally occurs in the local groundwater and is a constituent of concern for the water delivery system in the District service area. The CDPH-mandated MCL for fluoride in drinking water is 2.0 mg/L. Fluoride is relatively low in the Indian Cove, Fortynine Palms, and Eastern Subbasins, but several samples have exceeded the MCL for drinking water (Table 5-2). Average fluoride concentrations range from 0.4 to 2.3 mg/l, but some older wells did have higher fluoride levels. Groundwater in the Mesquite Lake Subbasin has a different chemical character with substantially higher fluoride concentrations. Fluoride has been measured in WTP-1 in the Mesquite Lake Subbasin, hovering around 6.0 mg/L in only two samples, above the 2.0 mg/L MCL. Samples reported by DWR (1984) throughout the Mesquite Lake Subbasin

varied between 3.0 and 22.0 mg/L. Concentrations in the area of the Mesquite Dry Lake are mostly around 11 mg/L.

Arsenic (As) is a naturally occurring element in groundwater that forms from the erosion and breakdown of geologic deposits; however, arsenic is less commonly associated with contaminant plumes. The primary MCL for arsenic is 10 micrograms per liter (μg/L). The occurrence of arsenic in the Twentynine Palms area is from natural sources. Arsenic has been detected in concentrations up to 31 μg/L; however, the average arsenic concentration is below 10 μg/L in most of the District's wells (Table 5-2). Arsenic above the MCL is most prevalent in the Indian Cove Subbasin and Well #3B in the Fortynine Palms Subbasin. Arsenic is below the MCL in the Eastern and Mesquite Lake Subbasins as well as the other Fortynine Palms Subbasin wells. The elevated arsenic concentrations require treatment at some of the District wells.

5.2 Groundwater Quality Trends

Groundwater quality in the region is quite variable. Minerals are added to the groundwater as it flows through the aquifer; water that spends more time in the aquifer tends to have higher concentrations of chemical constituents than does water with a low residence time. Water near the mountain fronts, which has been recharged relatively recently, tends to be of high quality, with low concentrations of chemical constituents. This is the case in the Indian Cove, Fortynine Palms, and Eastern Subbasins, where groundwater is close to its source area. In the Mesquite Lake Subbasin, groundwater has had a longer residence time and, therefore, tends to have higher concentrations of minerals. A general summary of the spatial trends in groundwater quality are summarized below:

- The groundwater in the Mesquite Lake Subbasin is predominantly sodium sulfate character. Locally elevated levels of TDS can be found associated with the playas, but is not present in high concentrations in the District's water supply wells. TDS content ranges from about 300 to 1,300 milligrams per liter (mg/L), but reaches 3,100 mg/L (DWR, 1984). Some wells in the basin exceed the recommended levels for drinking water in fluoride, arsenic and sulfate concentrations. Thermal waters or hot springs are also known to occur in this basin (DWR, 1984).

- The groundwater in the Indian Cove, Fortynine Palms and Eastern Subbasins is predominantly sodium bicarbonate in character (DWR, 1984) or sodium calcium bicarbonate in character (Krieger and Stewart, 1996). TDS content ranged from 139 to 164 mg/L for water in production wells in 1994 (Krieger and Stewart, 1996). Data from 14 public supply wells show an average TDS content of 159 mg/L and a range of 117 to 185 mg/L. Fluoride concentration in water from some wells has reached 9.0 mg/L, exceeding recommended maximum concentration levels of 2.0 mg/L (DWR, 1984).

Water may take thousands of years to migrate from the recharge area to its discharge point. Nishikawa *et al*. (2004) used carbon-14 dating methods to determine that groundwater in the Copper Mountain Subbasin is likely to have been in the aquifer for approximately 10,000 years. This relationship can be complicated by the environment within the aquifer; groundwater that experiences elevated temperatures dissolves aquifer minerals more readily, and additional chemicals can be added from other aquifers or the ground surface. The minerals in groundwater

may also be concentrated by evaporation when the water table is close to the ground surface. Water quality is described here only for the subbasins within the boundary of TPWD.

5.3 TPWD Water Treatment

The District has been historically pumping from the Indian Cove, Fortynine Palms and Eastern Subbasins in the south because of the generally good water quality in these areas. However, the District does have to treat water from certain wells for naturally-occurring constituents including fluoride and arsenic.

Elevated fluoride concentrations above the MCL are widespread across the TPWD service area. In 1993, TPWD was granted a variance from the California Primary MCL for fluoride, which states "the District shall not serve water containing fluoride levels in excess of 3.0 mg/L or 75 percent of the U.S. Environmental Protection Agency (USEPA) Primary Drinking Water Standard (currently at 4.0 mg/L), whichever is higher." The District made its request for the variance based on provisions outlined in SB 694 and AB 2681 which provide for the granting of a variance from the Primary Drinking Water Standard for fluoride by the CDPH for a period of up to 30 years, provided that a review of the variance status is conducted every five years. The CDPH finds that there is no need for a comprehensive fluorosis study based on present levels of fluoride being served. The variance is set to expire in 2023.

Fluoride concentrations in the Indian Cove, Fortynine Palms and Eastern Subbasins generally averages below 2 mg/L, but several wells, especially in the Eastern Subbasin, average above 3 mg/L. Several older wells with high fluoride concentrations were taken out of operation in the 1990s and replaced by newer wells located in areas with lower fluoride concentrations. Because of the variance, groundwater from these wells has been allowed for use without treatment for fluoride.

Because the fluoride concentrations in the Mesquite Lake Subbasin are generally well above 3 mg/L, groundwater from these subbasins cannot comply with the variance without treatment. In 2003, the District began pumping from the Mesquite Lake Subbasin; however, groundwater has high levels of fluoride. Water pumped from the Mesquite Lake Subbasin is treated to reduce fluoride before being distributed into the pipeline system using the Twentynine Palms Fluoride Removal Water Treatment Plant in the Twentynine Palms Valley Basin. The plant is designed to reduce fluoride concentrations in the groundwater to levels below the State maximum contaminant level (MCL) of 2 mg/L allowed by the CDPH for fluoride. The treatment plant is currently producing approximately 1.2 mgd and has a maximum capacity of 3 mgd. With the operation of the treatment plant, it is the District's long-term goal to maintain fluoride levels of not more than 2 mg/L.

In 2008, the CDPH lowered the MCL for arsenic from 50 µg/L to 10 µg/L. Arsenic concentrations from all of the District’s wells complied with the earlier MCL, but several wells, especially in the Indian Cove Subbasin, have arsenic concentrations that exceed the new 10 µg/L MCL. Therefore, the District has been required to install an arsenic treatment system for compliance with the new MCL.

On August 23, 2013, CDPH proposed an MCL for hexavalent chromium of 10 µg/L and announced the availability of the proposed MCL for public comment through October 2013.

Completion of the rulemaking process may take up to 12 months after the proposal. In the absence of any major delays, an enforceable MCL is anticipated to be established in 2014. In response, the District began collecting samples to test for hexavalent chromium from the District's wells and provided comments on the proposed new MCL to CDPH and the Office of the Governor. The District will continue to evaluate the impact of this regulatory change on the treatment requirements for the District's water supply.

5.4 Wastewater Management

There is no community sewage system within the District service area and wastewater is disposed through individual septic tank and tile field disposal systems. There are two major categories of onsite wastewater treatment systems in the Twentynine Palms area – residential and non-residential. Single family and multifamily households all fall under the residential category. A variety of commercial (e.g., restaurants and hotels) and institutional (e.g., school) establishments and facilities fall into the non-residential wastewater category.

The District and City are currently working together to develop a Groundwater Protection Plan (GPP) to specifically address potential groundwater quality issues associated with existing septic tanks and a Wastewater Master Plan (WMP) to evaluate potential alternatives for future wastewater treatment especially for more developed areas with higher septic tank densities. This effort may lead to the development of a Local Area Management Plan (LAMP) under the new Onsite Wastewater Treatment System (OWTS) Policy issued by the SWRCB in 2012. The District and City will coordinate these efforts with the Colorado River RWQCB (Region 7).

As part of the GPP, the District and the City are preparing a monitoring plan to collect groundwater quality data to assess potential impacts to groundwater from septic system use in the Twentynine Palms area. This effort is intended to guide the development of a groundwater monitoring program by collecting water quality data that can be evaluated to support informed decisions on wastewater management. In the context of the GPP, the District and the City are developing a Septic System Management Program (SSMP) that will be implemented to more properly manage septic tanks and to protect both groundwater quality and the beneficial uses of the local groundwater basins. The SSMP includes a series of administrative and operational measures, as well as recommended specific studies to gather site data for future evaluation of potential impacts from septic tanks. The GPP is anticipated to be completed in 2014.

5.5 DWR Definition of Recharge Areas

As of January 1, 2013, DWR requires that the GMP include a map identifying the recharge areas for the groundwater basins that substantially contribute to their replenishment. This map shall be provided to local planning agencies after the adoption of the GMP.

As discussed in Section 4, natural recharge is primarily associated with storm water runoff from the Little San Bernardino Mountains that lie along the southern margin of the Joshua Tree Basin. During large summer storms, runoff in Fortynine Palms Creek can flow out across the highway toward the Twentynine Palms Valley Basin towards the Mesquite Dry Lake. The distribution of natural surface recharge shown on Figure 5-1 reflects this pattern.

Other areas of the basin are not considered to have substantial recharge from natural surface sources. However, the highly-permeable soils underlying most of the basin are susceptible to urban recharge from human activity. Urban recharge associated with return flows from septic tank leach fields, leaking water pipes and irrigation of lawns occurs in the developed areas of the District. These return flows account for a large volume of the annual recharge in the Basin. Figure 5-1 shows the current distribution pattern of urban recharge for the area.

5.6 Water Quality Management Actions

The District undertakes several actions for the protection of the water quality of groundwater delivered to its customers. The following summarizes several of the key management actions for issues including those of the voluntary 12 specific technical elements identified in the California Water Code that pertain to water quality.

5.6.1 Control of High-Salinity Waters

Areas near historical dry lakes, such as Mesquite Dry Lake and Shortz Dry Lake, tend to have higher salinity contents in both the groundwater and surface water. The District's groundwater supplies do not appear to be suffering from this phenomena and no action is recommended at this time. Monitoring wells near to the WTP-1 production well that is located in the vicinity of the Mesquite Dry Lake are periodically sampled for TDS to monitor for high salinity water.

5.6.2 Regulation of the Migration of Contaminated Groundwater

No contaminated groundwater from industrial or commercial sources has been identified in the District's service area. The responsibility for regulating and controlling the migration and cleanup of contaminated groundwater from industrial or commercial sources rests with various County, State, and Federal agencies, including the County of San Bernardino and the Colorado River RWQCB (Region 7).

5.6.3 Wellhead Protection Areas and Recharge Areas

The purpose of a recharge and wellhead protection area is to establish a protective zone around wells, well fields, and recharge areas to protect groundwater sources from contamination, eliminating the need for costly treatment to meet drinking water standards. The State has a formal wellhead and recharge protection program as part of the CDPH Drinking Water Source Assessment and Protection (DWSAP) Program, which is being incorporated into the District's own DWSAP Program. The District is active in efforts to protect groundwater sources, and recently worked with a developer, the City, and the Colorado River RWQCB (Region 7), to condition a housing tract development to incorporate a package wastewater treatment plant in an effort to protect water resources.

The District's DWSAP was completed in 2002 and indicates that the geology of the area places most of the District's wells in the moderate category (moderately vulnerable). This is because the District's wells are largely in unconfined aquifers. The DWSAP also indicates that very few potentially contaminating activities (PCAs) are located near the District's wells. PCAs that are

located near the District's wells including roads and streets, wells (drinking water and/or monitoring), and golf courses, which are lower risk uses than industrial facilities.

As part of developing a wellhead protection area program, it is essential that the designated wellhead protection areas are communicated to the local land use planning agencies, namely the City and San Bernardino County, and that the land use planning agencies agree to make the necessary modifications to their zoning and/or General Plans to prevent any potentially contaminating activities from being sited within the wellhead protection areas. While the City of Twentynine Palms General Plan Update of 2012 identified actions for the general protection of groundwater from development, no wellhead protection policies were included.

5.6.4 Well Construction Policies

Improperly constructed wells can result in poor yields and contaminated groundwater. A properly constructed well can also minimize contaminant migration between aquifers. Sections 13700 through 13806 of the California Water Code require all water wells to meet certain minimum standards. DWR Bulletins 74-81 and 74-90 (DWR 1991) describe these minimum standards.

All District groundwater extraction, injection, and monitoring wells and all piezometer wells will be constructed according to applicable county and State, including CDPH regulations. Minimum state standards are specified in DWR Bulletin 74-90 (DWR 1991). District well drilling contractors will possess an active C57 (Water Well Drilling) Contractor's license. District well construction activities will be observed and inspected by District personnel.

The construction of private wells in the District is not within the District's jurisdiction. The County is responsible for enforcing well construction standards for these types of wells. However, outreach and coordination with private well owners is identified as an important component of the SSMP implementation. This includes working with private well owners to increase data collection efforts for better supply source management and management actions related to water quality.

5.6.5 Well Abandonment and Destruction Program

The continued presence of unusable wells creates several concerns. Older wells were often screened or perforated over a long depth, allowing vertical communication between various water bearing zones, which could lead to mixing of poor and good quality groundwater and/or interzonal movement of pollutants. Rusting, corrosion, and caving can compromise the integrity of the well casing, and older wells may lack the concrete sanitary seals that meet current standards. These wells are potential conduits for ground surface pollutants to enter groundwater and create a surface hazard to people and animals.

California Well Standards, Bulletin 74-81 (DWR 1991), and its supplements, provide minimum standards for well abandonment and destruction. The County of San Bernardino Public Health Department determines how those standards are implemented within the County. There are several methods of well abandonment and destruction in the Well Standards; the County would make a determination which method is appropriate for the particular well. Additionally, the

County does require a permit for all well destruction activities. These permits are required for activities within both incorporated and unincorporated areas of the County.

The District currently adheres to these minimum well abandonment and destruction standards for its own wells. In addition to abandoning and destroying unusable wells, the District will also strive to educate private well owners of the need for proper well abandonment and their responsibility under the law. Available information from the DWR, USGS, and CDWR, and the District indicate that more than 400 private wells have been constructed within the District's service area. Most of these wells are not currently operated. The District has field located and inspected approximately 250 (60 percent) of the private wells.

California Well Standards, Bulletin 74-81 and its supplements, require at least a 100 feet minimum horizontal separation of any septic tank or subsurface sewage leaching field from a well. In October 2009, a private well was tested and had an elevated nitrate concentration; however, subsequent investigation concluded that the water in the well was under the influence of wastewater from a septic system due to poor maintenance. This illustrates the need for both proper septic tank maintenance and destruction of private wells located close to septic systems, as well as the importance of educating private well owners on the matter.

TABLE 5-1 – NITRATES AND TDS SUMMARY FOR TPWD PRODUCTION WELLS

	Nitrate (as NO3) (mg/L)			*Total Dissolved Solids (TDS) (mg/L)*			*Years of Well Sampling History*	
	Primary MCL = 45 mg/l			**Secondary MCL = 500 mg/l**				
Well	**Average**	**Maximum**	**Minimum**	**Average**	**Maximum**	**Minimum**	**Year first sampled[(a)]**	**Year last sampled[(b)]**
Indian Cove Subbasin								
TPWD-6	5.9	9.2	1.0	123	157	101	1958	2009
TPWD-7	5.4	8.0	1.0	118	140	102	1962	2003
TPWD-8	9.7	14.1	5.0	163	242	123	1964	1993
TPWD-9	10.0	14.4	2.0	160	257	120	1968	2013
TPWD-10	11.1	13.5	1.0	163	192	140	1968	2006
TPWD-11	12.6	24.0	9.0	171	202	149	1978	2013
TPWD-12	9.6	14.0	7.8	144	180	129	1983	2013
TPWD-15	10.8	12.0	8.8	145	178	126	1987	2013
Summary[(c)]	**9.4**	**24.0**	**1.0**	**148**	**257**	**101**		
Fortynine Palms Subbasin								
TPWD-3	8.7	13.4	3.0	151	173	135	1953	1992
TPWD-3B	9.2	12.1	6.9	132	151	121	1992	2006
TPWD-4	20.7	36.0	8.0	170	220	135	1951	2013
TPWD-5	10.1	16.0	3.0	149	173	121	1951	1996
TPWD-13	9.2	14.3	5.2	166	215	142	1985	2003
TPWD-14	9.8	14.0	5.5	131	150	100	1993	2013
Summary[(c)]	**11.3**	**36.0**	**3.0**	**150**	**220**	**100**		
Eastern Subbasin								
TPWD-1	6.1	10.0	1.0	250	304	198	1953	1998
TPWD-2	5.3	9.0	ND	176	190	154	1951	1993
TPWD-16	6.1	8.7	2.9	160	173	145	1991	2013
TPWD-17	8.3	9.0	7.6	n/s	n/s	n/s	2011	2013
Summary[(c)]	**6.5**	**10.0**	**ND**	**195**	**304**	**145**		
Mesquite Lake Subbasin								
WTP-1	3.5	5.0	ND	340	350	320	2006	2013
Summary[(c)]	**3.5**	**5.0**	**ND**	**340**	**350**	**320**		

Notes: MCL – maximum contaminant level; ND: non-detect; n/s: not sampled.
(a) Well first sampled is based on TPWD records
(b) Well last sampled is based on TPWD records.
(c) Summary provides the average, maximum and minimum of all samples in each subbasin.

TABLE 5-2 – FLUORIDE AND ARSENIC SUMMARY FOR TPWD PRODUCTION WELLS

Well	*Fluoride (mg/L)*			*Arsenic (µg/L)*			*Years of Well Sampling History*	
	Primary MCL = 2 mg/l			**Primary MCL = 10 µg/l**				
	Average	**Maximum**	**Minimum**	**Average**	**Maximum**	**Minimum**	**Year first sampled[a]**	**Year last sampled[b]**
Indian Cove Subbasin								
TPWD-6	0.8	1.9	0.3	2.8	6.4	ND	1958	2009
TPWD-7	0.6	2.1	0.3	2.7	6.0	ND	1962	2003
TPWD-8	1.2	2.6	0.5	ND	16.0	ND	1964	1993
TPWD-9	2.3	4.0	0.8	4.8	10.8	ND	1968	2013
TPWD-10	1.5	2.3	0.6	12.6	31.0	ND	1968	2006
TPWD-11	2.1	3.4	0.2	7.7	18.0	ND	1978	2013
TPWD-12	1.5	2.6	0.4	3.4	11.0	ND	1983	2013
TPWD-15	0.4	1.1	0.2	ND	ND	ND	1987	2013
Summary[c]	**1.3**	**4.0**	**0.2**	**5.7**	**31.0**	**ND**		
Fortynine Palms Subbasin								
TPWD-3	1.5	2.3	0.4	ND	ND	ND	1953	1992
TPWD-3B	2.1	3.6	0.4	16.3	31.0	ND	1992	2006
TPWD-4	1.7	2.6	0.6	3.0	7.0	ND	1951	2013
TPWD-5	1.5	2.7	0.8	ND	6.0	ND	1951	1996
TPWD-13	1.1	2.0	0.3	1.4	2.8	ND	1985	2003
TPWD-14	0.7	1.5	0.4	1.3	3.2	ND	1993	2013
Summary[c]	**1.4**	**3.6**	**0.3**	**5.5**	**31.0**	**ND**		
Eastern Subbasin								
TPWD-1	5.7	7.2	1.8	2.5	5.0	ND	1953	1998
TPWD-2	2.6	5.9	1.2	ND	4.0	ND	1951	1993
TPWD-16	1.7	2.1	0.4	1.0	2.7	ND	1991	2013
TPWD-17	0.8	1.9	0.7	n/s	n/s	n/s	2011	2013
Summary[c]	**2.7**	**7.2**	**0.4**	**1.8**	**5.0**	**ND**		
Mesquite Lake Subbasin								
WTP-1	5.9	6.4	5.1	2.4	4.8	ND	2006	2013
Summary[c]	**5.9**	**6.4**	**5.1**	**2.4**	**4.8**	**ND**		

Notes: MCL – maximum contaminant level; ND: non-detect; n/s: not sampled.
(a) Well first sampled is based on TPWD records.
(b) Well last sampled is based on TPWD records.
(c) Summary provides the average, maximum and minimum of all samples in each subbasin.

Section 6: Basin Management Objectives and Strategies

Basin Management Objectives (BMOs) are required under California Water Code (CWC) §10753.7(a)(1) to provide flexible guidelines for the management of groundwater resources that describe specific actions to be taken by stakeholders to meet locally developed objectives at the basin or sub-area scale. SB 1938 amended existing law related to groundwater management plans requiring a public agency seeking State funds administered through DWR to prepare and implement a groundwater management plan that includes BMOs. This section establishes Basin Management Objectives (BMOs) that are intended to help the District plan for a more reliable water supply for long-term beneficial uses in the plan area, and describes the existing or planned management actions to achieve the BMOs.

6.1 Goals

The overall goal of this GMP is to maintain the quality and long-term availability of groundwater to meet the current and future demands without adversely affecting groundwater resources within the GMP area. The objective of the updated GMP is to address issues of "aquifer health" and "groundwater sustainability". These key issues include:

- Sustainable long-term water supplies
- Treatment of natural water quality constituents
- Wastewater management, specifically septic tanks
- Water supply for anticipated population growth

The BMO method of groundwater management is intended to provide a flexible approach that can be adapted to changing local conditions and increased understanding of the groundwater resource as better monitoring data are collected. The more traditional way of managing groundwater basins typically focused on often difficult to define concepts such as safe yield, replenishment and overdraft. To meet the stated goal of addressing the key issues for the District, the following BMOs are proposed for the TPWD.

- BMO #1 – Manage Groundwater Levels to Maintain Water Supply Sustainability and Reliability
- BMO #2 – Maintain and Protect Groundwater Quality
- BMO #3 – Support Development of a Local Program for Septic Tank Management
- BMO #4 – Monitor and Track Groundwater Supply, Water Quality and Land Subsidence
- BMO #5 – Promote Public Participation and Coordination with Other Local Agencies
- BMO #6 – Address Planned or Potential Future Water Supply Needs and Issues
- BMO #7 – Identify and Obtain Funding Sources for Groundwater Projects

This section presents the BMOs developed by the District; a series of plan components that discuss and identify the actions necessary for BMO implementation.

6.2 BMO #1 – Manage Groundwater Levels to Maintain Water Supply Sustainability and Reliability

Of the two groundwater basins that underlie the District, most of the groundwater production has been from the Joshua Tree Basin because of higher groundwater quality, but this has led to long term declines in groundwater levels. The purpose of BMO #1 is to implement measures to manage the groundwater levels in a manner to increase the long-term sustainability and reliability of the water supply for TPWD in the Indian Cove, Fortynine Palms, Eastern and Mesquite Lake Subbasins. For BMO #1, the following actions are proposed:

- **Continue adaptive management by balancing pumping between the subbasins** – The District will continue the practice of shifting groundwater production between subbasins to help stabilize declining groundwater levels. This would include scheduling rest periods for groundwater wells, especially in the Indian Cove and Fortynine Palms Subbasins, to provide intervals for groundwater levels to stabilize and recover.

- **Expand groundwater production in the Mesquite Lake Subbasin** – The Mesquite Lake Subbasin contains a large volume of groundwater but that groundwater requires water treatment primarily for fluoride. Because the fluoride is naturally occurring, treatment is the most practical and effective means to achieve drinking water quality standards. The current Fluoride Removal Water Treatment Plant is designed to handle 3.0 mgd, but currently treats 1.2 mgd, so it is operating at 40% of capacity. The District will plan to bring the operation of the Fluoride Removal Water Treatment Plant up to the 3.0 mgd capacity. The District will install additional production wells at an appropriate well spacing to minimize drawdown in this subbasin.

- **Continue and expand water conservation measures** – Water conservation reduces the overall demand for groundwater, and thus helps to sustain groundwater levels and long-term groundwater production. The District will continue to implement water conservation policies and practices to promote water conservation among customers through public outreach activities. In addition, the District will continue implementing conservation management practices including water usage audits to customers, ongoing pipeline replacement and prompt leak repairs. In the future, the District may explore a tiered rate structure; however, with current outdoor usage relatively low in the District, it is not clear how this measure would provide significant water conservation.

- **Continue assessment for future infrastructure improvements** – To better manage groundwater resources, the District will continue to assess infrastructure improvements that provide greater flexibility in operating wells to manage water quantity and quality issues. The District will assess if sufficient source capacity is available to provide adequate redundancy in the system to cover possible future system failures and to allow flexibility for adaptive management practices that shift groundwater production between the various subbasins. The District will continue to monitor aging infrastructure and develop cost-effective schedules for replacing pipeline and aging infrastructure to reduce system water loss.

6.3 BMO #2 – Maintain and Protect Groundwater Quality

Groundwater in the District is typically of good quality; however, groundwater in some of the District's wells requires treatment for fluoride and arsenic. There is no known contamination in the District, yet the use of septic systems for wastewater disposal in certain areas of the District could potentially introduce nitrate to groundwater. The purpose of BMO #2 is to implement measures that maintain and protect groundwater quality in the District in a manner not to impact the beneficial use of the groundwater resources. For BMO #2, the following actions are proposed:

- **Continue measures to control spread of highly saline groundwater** – Highly saline groundwater is primarily limited to the vicinity of the existing or historic playa lakes in the Mesquite Lake and Mainside Subbasins. The District will continue to employ practices to control spreading of highly saline groundwater by locating wells away from the playa lakes areas if possible and minimizing drawdown to avoid its migration into areas of higher water quality. New production wells will be designed to avoid depth intervals with highly saline groundwater near the playa lakes. The monitoring program will include monitoring wells in these areas to monitor for changes in water quality trends.

- **Continue wellhead protection measures** – California's Drinking Water Source Assessment and Protection (DWSAP) Program was developed by the CDPH to protect the State's public water systems and includes both a source water assessment and wellhead protection program. The District will continue to complete these assessments for new production wells, and also consider updating the source assessments for older wells if there has been a significant change in the land use in the vicinity of these wells. The District will also work with the City to ensure that land use policies protect critical wellhead areas.

- **Monitor activities at environmental investigation and remediation sites** – The only environmental investigation and remediation sites that are currently being conducted are located at the Marine Base. The District will coordinate with the Colorado River RWQCB (Region 7) to be notified if any new environmental investigation and remediation sites are opened within the District boundaries.

- **Continue the District's well abandonment policy** – Abandoned wells provide a conduit for migration of contaminants and poor quality water through the aquifer. The District will continue to adhere to the requirements for well abandonment and destruction for all District-owned wells. These actions will be conducted according to County of San Bernardino Public Health Department requirements and California Well Standards, Bulletin 74-81 and its supplements. Information for private well owners on proper well abandonment procedures will be available at public outreach activities and the District Office. The District may also pursue outside funding sources to assist with private well abandonment if appropriate.

- **Conduct groundwater quality studies** – Vertical water quality profiling involves chemically profiling periodic samples from a new well being drilled. With the information gained through profiling, wells can be better designed to block off the source of poor quality water by sealing selected intervals during drilling, plugging the bottom of a hole,

or building better surface seals. Vertical profiling on new wells will be undertaken when feasible and cost-effective including the pursuit of outside funding sources when appropriate.

6.4 BMO #3 – Support Development of a Local Program for Septic Tank Management

Wastewater disposal within the District is principally through septic tanks, which are currently regulated by San Bernardino County. Septic tank return flows are a significant component of groundwater recharge to the groundwater basins; however, these return flows can add nitrate, salts and possibly other contaminants to the groundwater. If properly managed, septic tanks return flows may not affect the beneficial use of the groundwater. The new state Onsite Wastewater Treatment System (OWTS) Policy issued in 2012 provides a mechanism for local management of septic tanks. The District and City will assess the potential for the development of a local management program for regulation of septic tanks in Twentynine Palms. For BMO#3, the following actions are proposed:

- **Finalize the GPP and WMP** – The District and City are currently finalizing the Groundwater Protection Plan (GPP) and Wastewater Master Plan (WMP) to evaluate potential groundwater quality issues from existing septic tanks and whether the continued discharges from septic systems would unreasonably degrade groundwater quality and result in widespread groundwater pollution. Next steps will be to present these reports to the Colorado River RWQCB (Region 7).

- **Continue to work with City on developing a plan to address septic tank use** – The District and the City are currently developing the GPP and WMP to specifically address water quality issues associated with septic tanks within the District service area. The District is a co-sponsor and will continue to participate in the development and implementation of the GWPP. The District will continue to participate in meetings and discussions regarding the septic tank issue.

- **Support development of a Local Area Management Plan** – The GPP and WMP are intended to lead up to the possible development of a LAMP under Tier 2 of the OWTS Policy for Twentynine Palms. Local regulation would provide a means to help address potential high-risk areas of nitrate loading from septic tanks and allow for continued septic tank operation in low risk areas. The District will continue to support efforts of cooperation with the City toward development of a LAMP for Twentynine Palms.

- **Pursue outside funding sources to support abandonment of private wells** – The District service area contains hundreds of unused private wells that may act as conduits for migration of contaminants to the aquifer. Jurisdiction for well abandonment lies with the County; however, the District can provide information to private property and well owners about the need to properly destroy wells that are no longer in use. This would especially include information on wells within 100 feet of a septic tank or leach field that can be distributed to customers and/or made available at local public meetings. This proposed action is dependent on the District's obtaining outside funding, preferably through a grant, to support local property owners in well abandonment.

- **Assess methods for recycled water use** – If future actions by the District and City include implementation of a centralized sewer collection and treatment system, the District will evaluate ways of utilizing recycled water to help reduce groundwater demand or provide for aquifer recharge. Septic tank system return flows currently comprise a large component of recharge to the basin; therefore, recycled water should be put to an appropriate beneficial use in-lieu of groundwater if available.

6.5 BMO #4 – Monitor and Track Groundwater Supply, Water Quality and Land Subsidence

A key element of a GMP is monitoring groundwater conditions. The District will maintain regular groundwater level and quality monitoring to improve the understanding of groundwater level fluctuations, potential impacts to groundwater quality and subsidence across the District. Changes to groundwater storage will be accounted for by tracking groundwater levels. The District currently conducts water quality monitoring per the CDPH standards which is sufficient for the purpose of tracking changes in the quality of the groundwater basin. For BMO #4, the following actions are proposed:

- **Collect groundwater supply monitoring data** – The District will collect data necessary to evaluate the change in the quantity of groundwater including the volume of groundwater pumped by the District and others, static and pumping groundwater levels from the production wells, groundwater levels from monitoring wells, and climatic data. Data will be collected according to the GMP Monitoring Plan with appropriate field record keeping that will be maintained. Relevant data will be kept in an electronic database so that the data can be readily used to support District decision-making needs. The District will continue to coordinate with the USGS on monitoring of groundwater levels in the region and will include these data into the District's monitoring database and the DWR California Statewide Groundwater Elevation Monitoring (CASGEM) Program records. Locations of District wells are shown on Figure 6-1.

- **Collect Groundwater quality monitoring data** – The District will collect water quality samples from production wells and selected monitoring wells according to the GMP Monitoring Plan. Emphasis will be on monitoring for regulated drinking water constituents following the CDPH and United States Environmental Protection Agency (USEPA) guidelines. Appropriate record keeping will be maintained for field records and lab reports. Relevant data will be kept in an electronic database so that the data can be readily used to support District decision-making needs. Locations of District wells are shown on Figure 6-1.

- **Incorporate GPP water quality monitoring data into monitoring database update** – The objective of the GPP monitoring is focused on defining spatial and temporal trends in nitrate, TDS and contaminants of emerging concern (CEC) associated with wastewater effluent from septic tanks. The GPP is being developed concurrently with this GMP update. Once a final GPP is approved by the Colorado River RWQCB (Region 7) and the monitoring plan is implemented, the data from the GPP monitoring will be incorporated into the District database.

- **Assess change in groundwater storage** – The District will include a regular assessment of the change in groundwater storage. The results of the groundwater model provide a historical assessment of the change in groundwater storage calibrated to measured changes in groundwater levels. An annual assessment based on the change in measured groundwater levels over the past year will be done to track the change in groundwater basins. The calibrated groundwater model may be updated periodically to verify the annual assessment. The proposed action for groundwater model updates is dependent on the District's obtaining outside grant funding.

- **Prepare annual report and monitoring database update** – The District will produce a concise annual report of groundwater conditions based on the monitoring data. The format of the annual report will be a brief management-level summary that contains up-to-date monitoring data, a brief analysis of the data, and description of groundwater conditions in each of the subbasins in order to track progress on the groundwater management process. The results will be presented at least once a year at a public meeting to the Board of Directors, keeping them up-to-date on groundwater issues.

- **Establish a baseline for evaluating potential future land subsidence** – Land subsidence has not been identified as an issue within the Twentynine Palms area; however, playa lake deposits such as those found in the Mesquite Lake and Mainside Subbasins have been noted as sources of land subsidence in Antelope Valley and other similar areas. The District will continue to employ practices to control subsidence in the Mesquite Lake Subbasin by locating wells away from the playa lakes areas when possible and minimizing drawdown to avoid the loss of aquifer storage. Therefore, the District will establish a baseline elevation assessment with historical US Geodetic Survey benchmark surveying data. Future assessments will be done periodically to verify whether land subsidence is occurring or not. Locations of benchmarks are shown on Figure 6-1.

- **Expand monitoring well network to evaluate recharge and other effects of pumping on groundwater** – The District will expand its groundwater monitoring well network to include additional monitoring wells that improve the ability to track changes in groundwater storage in each of the groundwater subbasins. The various purposes of these monitoring wells would include defining drawdown effects near active pumping wells, understanding groundwater recharge potential in key recharge areas, and providing better spatial coverage to define groundwater flow. The proposed action for the installation of additional monitoring wells is dependent on the District's obtaining outside grant funding.

6.6 BMO #5 – Promote Public Participation and Coordination with Other Local Agencies

The District will look to continue and expand communication and coordination with local, state and federal agencies to discuss regional water issues. The District is also committed to keeping customers up-to-date on groundwater issues. The GMP process encourages coordination with other local agencies and stakeholders. For BMO #5, the following actions are proposed:

- **Coordinate with the City of Twentynine Palms, Marine Base, neighboring water districts and other local water purveyors** – The District plans to coordinate with these agencies to discuss local water issues. A semi-annual meeting may be a helpful means of facilitating communication and providing a forum for discussing regional issues.

- **Participate in Integrated Regional Water Management Plan (IRWMP) Process** – The District will continue to participate in the IRWMP process within the Mojave region to coordinate with other regional water managers and to support obtaining outside funding to meet District needs. The updated Mojave Region IRWMP is due for completion by June 2014. The IRWMP provides a road map for a long-term, balanced water supply in the region and evaluates potential water supply projects and programs that provide regional benefit through collaboration with local stakeholders, such as water and wastewater agencies. The IRWMP also fulfills a requirement for acquiring State and federal funding for local water supply and management projects. The District has incorporated projects into the IRWMP.

- **Continue coordination with local land use planning agencies** – Land use in the City is governed by the City of Twentynine Palms General Plan under the Community Development Department. One of the policies of the City's General Plan is to "maintain a consistent level of quality water service by working with the TPWD while minimizing any impacts of land development on the existing system". Land use in the unincorporated portions of the District is governed by the County of San Bernardino General Plan. The County's General Plan addresses water supply issues and recognizes the jurisdiction and authority of all agencies providing water service within the County with consideration given to the County's diverse geographic region. The District coordinates with both the City and County by using General Plan information to provide the foundation for land use and population projections for planning purposes.

- **Maintain a working relationship with local and state regulatory agencies** – The District will continue to report to and communicate with these agencies, as required by law and to support mutual goals in the region. In addition, the District will continue and expand communication and coordination with local and state regulatory agencies to discuss groundwater issues especially pertaining to water quality. The management of District groundwater resources requires establishing and maintaining communication with the following state and federal regulatory agencies:

    - State Water Resources Control Board (SWRCB);
    - California Department of Public Health (CDPH)
    - Colorado River Regional Water Quality Control Board - Region 7 (RWQCB);
    - California Department of Water Resources (DWR); and
    - United States Environmental Protection Agency (USEPA).

- **Provide for regular public outreach opportunities** – The District will provide for regular public outreach and participation through one or more public meetings. Potential public outreach includes an annual presentation summarizing the annual report at a public meeting to keep the Board of Directors and public up-to-date on the management of the groundwater basin. The District newsletter is distributed every other month to the media, Chamber of Commerce and the City. The District will continue to provide

information on water issues and water conservation through brochures, new customer information packages, speaking at public events, and providing educational materials at local schools

6.7 BMO #6 – Address Planned or Potential Future Water Supply Needs and Issues

Water supply needs and issues for the District could change due to future growth in the region, changes in regulations, or other outside factors. The District will take measures to plan for these contingencies. For BMO #6, the following actions are proposed:

- **Develop a plan for addressing the expiration of the fluoride variance in 2023** – The District received a variance for the California MCL for fluoride that allows the removal of fluoride from the groundwater to levels below 3 mg/L rather than the State MCL of 2 mg/L. In accordance with AB 2681, the variance from the Primary Drinking Water Standard for fluoride shall be in effect for period up to 30 years from the date of permit issuance on January 21, 1993; therefore, this variance is set to expire in 2023. The District will both develop a contingency plan for addressing water treatment at 2 mg/Land will explore the possibility to obtain an extension of the variance. The contingency plan will include an engineering study to assess the cost to upgrade infrastructure to meet the 2 mg/L MCL for fluoride.

- **Monitor changes to drinking water standards** – Water quality regulations by the CDPH are subject to change which may include lowering an existing MCL or adding a new compound to the list of regulated compounds. This can have a significant impact on the customers of the District if these changes in the water quality regulation result in the addition of new water treatment in order to continue serving water from existing wells. If new treatment is required, this may result in significant capital and O&M costs to upgrade and maintain the additional water treatment.

  The 2008 change in the arsenic MCL resulted in changes in use of groundwater production wells and treatment that required capital expenditures to address. Pending changes to the hexavalent chromium MCL may have similar impacts on the District. However, since in 1993 the District received a 30-year waiver for the revised fluoride MCL, the possibility of a variance or exemption may also be explored. The District will continue to monitor changes in state and federal drinking water standards and evaluate how best to address these with respect to both providing a safe water supply to customers and maintaining cost-effective District operations.

- **Review criteria for assessing water supply availability for large developments** – The District will review and update its policy on meeting the long-term water supply needs for large developments that would request water from the District. The goal is to establish internal guidelines for consistency of evaluating SB610/SB221 requests for water supply and to assess the availability of total water supply within the District. This will include developing potential mitigation measures for developers that may include water conservation or other measures to offset the costs of increasing the water supply.

- **Evaluate the feasibility of groundwater replenishment projects** – The local desert environment limits the potential recharge in the region; therefore, measures to maximize the use of existing local water sources are necessary. The most likely potential source of existing water is stormwater runoff. Recharge enhancement could be accomplished by constructing facilities such as berms that will slow down runoff and increase infiltration rates, wetted surface area, and contact time of flood runoff. Recharge enhancements may be viable in both the Indian Cove and Fortynine Palms Subbasins, potentially increasing the yield and/or reducing the overdraft in these basins. The District will pursue grant funding to identify alternatives and evaluate the feasibility of groundwater replenishments projects.

- **Evaluate the feasibility of potential new water sources** – If future growth in the Twentynine Palms area increases significantly as it has in other nearby areas in Southern California, water demand may potentially exceed the ability of the groundwater basin to provide adequate water supply without overdrafting the groundwater basin. Therefore, the District will evaluate whether there are other potential new water sources that could be developed. Potential sources may include further development of low quality groundwater resources requiring treatment, water conservation, water reuse, groundwater storage and recovery, or importation of water. Development of new water sources is anticipated to be more expensive than the use of current water sources; therefore, it is important to begin planning. The proposed action is dependent on the District's obtaining outside funding preferably through a grant, which the District will pursue.

- **Update the groundwater management plan periodically to address changing needs or conditions** – The DWR guidelines include a provision for the regular review and updating of the groundwater management plan to keep the BMOs, actions and implementation plan up-to-date. The District practice has been to update the plan every five years with the original plan in 2003 and an update in 2008. The District will continue the practice to update the GMP about every five years and include an update on the state of the groundwater basin and review and updating of the BMOs, actions and implementation plan.

6.8 BMO #7 – Identify and Obtain Funding Sources for Groundwater Projects

BMO #7 recommends an evaluation to identify potential funding sources for future groundwater projects. For BMO #7, the following actions are proposed:

- **Define projects that could be eligible for outside funding** – Some funding opportunities require that the project be "shovel ready" which would require existing designs, CEQA and other work already be prepared. The District will evaluate the priority of projects that could be designed and put on a shelf until funding is available.

- **Develop background and supporting materials** – Many grants have a short turnaround time. The District will develop background and supporting materials to respond quickly and successfully to grant funding opportunities.

- **Identify potential funding sources** – The District will identify potential outside funding sources. The District will work through the IRWMP process and also keep track of funding opportunities through State agencies. The District will also contact the Marine Base to determine the potential of federal grants for any joint projects undertaken with the Marine Base.

6.9 Implementation Plan

This section outlines a schedule to assist with the implementation and assessment of this GMP. An important aspect of this section is the identification of the BMOs and actions that will be implemented by the District over time. The schedule for the implementation plan for the BMOs, plan components, and actions is presented in Table 6-1.

Standing procedures and ongoing practices consist of groundwater management related activities that the District is already implementing and will continue to implement. As presented in Table 6-1, this includes several proposed actions as part of the BMOs #1, #2, #3, #4, and #5. The District intends to continue these activities on an ongoing basis. The actions under these BMOs will focus on managing, maintaining, and monitoring groundwater quantity, quality, and land subsidence, coordinating with other local agencies, and addressing planned or potential future water supply options.

- **Standing procedures and ongoing practices** lists that the District is already performing and will continue to perform in the future.
- **The short-term implementation plan** lists those actions that the District will plan to implement over the next five years. As presented in Table 6-1, this includes several proposed actions under the BMOs #1, #2, #4, and #6. These BMOs and actions will focus on activities related to managing and maintaining groundwater quantity and quality, coordinating with other local agencies, and seeking funding opportunities for groundwater projects.
- **The long-term implementation plan** lists those actions that the District will plan to initiate within the next five years, but full implementation is anticipated to extend beyond the next five years. As presented in Table 6-1, the long-term implementation plan includes several proposed actions as part of the BMOs #2, #3, and #5. These actions will focus on maintaining and protecting groundwater quality, coordinating with other local agencies, and seeking funding opportunities for groundwater projects.
- **Projects dependent upon obtaining outside funding** envision that implementation of the GMP, as well as many other groundwater management related activities, will be funded from a variety of sources, including State and Federal grant programs. This is a list of actions the District has identified that would be best accomplished through an outside funding source. As presented in Table 6-1, this includes several proposed actions as part of the BMOs #1, #2, #3, and #5.

The GMP is intended to be a living document, and it will be important to evaluate actions and objectives over time to determine how well they are meeting the overall goal of the GMP. The District intends to evaluate and update the GMP on a regular basis.

TABLE 6-1
GMP IMPLEMENTATION PLAN SUMMARY

Standing Procedures and Ongoing Practices	
BMO #1 – Manage Groundwater Levels to Maintain Water Supply and Reliability	Continue adaptive management of balancing pumping between subbasins
	Continue and expand water conservation measures
	Continue assessment for future infrastructure improvements
BMO #2 – Maintain and Protect Groundwater Quality	Continue measures to control spread of highly saline groundwater
	Continue wellhead protection measures
	Continue the District's well abandonment policy
BMO #4 – Monitor and Track Groundwater Supply, Water Quality, and Land Subsidence	Collect groundwater supply monitoring data
	Collect groundwater quality monitoring data
BMO #5 – Coordinate with Other Local Agencies	Continue Coordination with local land use planning agencies
	Maintain a working relationship with local and state regulatory agencies
Short-Term Implementation Plan	
BMO #3 – Support Development of a Local Program for Septic Tank Management	Finalize the GPP and WWMP
	Explore development of a Local Area Management Plan
	Continue to work with City on developing a plan to address septic tank use
BMO #4 – Monitor and Track Groundwater Supply, Water Quality, and Land Subsidence	Assess change in groundwater storage
	Prepare annual report and monitoring database update
BMO #5 – Coordinate with Other Local Agencies	Coordinate with the City of Twentynine Palms, neighboring water districts and local land use planning
	Participate in Integrated Regional Water Management Plan (IRWMP) Process
	Provide for regular public outreach opportunities
BMO #6 – Address Planned or Potential Future Water Supply Needs and Issues	Monitor changes to drinking water standards
	Review criteria for assessing water supply availability for large developments
BMO #7 – Identify and Obtain Funding Sources for Groundwater Projects	Define projects that could be eligible for outside funding
	Develop background and supporting materials
	Identify potential funding sources
Long-Term Implementation Plan	
BMO #1 – Manage groundwater Levels to Maintain Water Supply and Reliability	Expand groundwater production in the Mesquite Lake Subbasin
BMO #2 – Maintain and Protect Groundwater Quality	Monitor activities at environmental investigation and remediation sites
BMO #3 – Support Local Regulation of Septic Tanks	Assess methods for recycled water use

Long-Term Implementation Plan (continued)	
BMO #4 – Monitor and Track Groundwater Supply, Water Quality, and Land Subsidence	Incorporate GPP water quality monitoring data into monitoring database update
	Establish a baseline for evaluating potential future land subsidence
BMO #6 – Address Planned or Potential Future Water Supply Needs and Issues	Develop plan for addressing the expiration of the fluoride variance in 2023
	Update the groundwater management plan periodically to address changing needs or conditions
Projects Dependent Upon Obtaining Outside Funding	
BMO #2 – Maintain and Protect Groundwater Quality	Conduct groundwater quality studies
BMO #3 – Support Local Regulation of Septic Tanks	Obtain funding to support abandonment of private wells
BMO #4 – Monitor and Track Groundwater Supply, Water Quality, and Land Subsidence	Expand monitoring well network to evaluate recharge and other key areas
BMO #6 – Address Planned or Potential Future Water Supply Needs and Issues	Evaluate feasibility of groundwater replenishment projects
	Evaluate feasibility of potential new water sources

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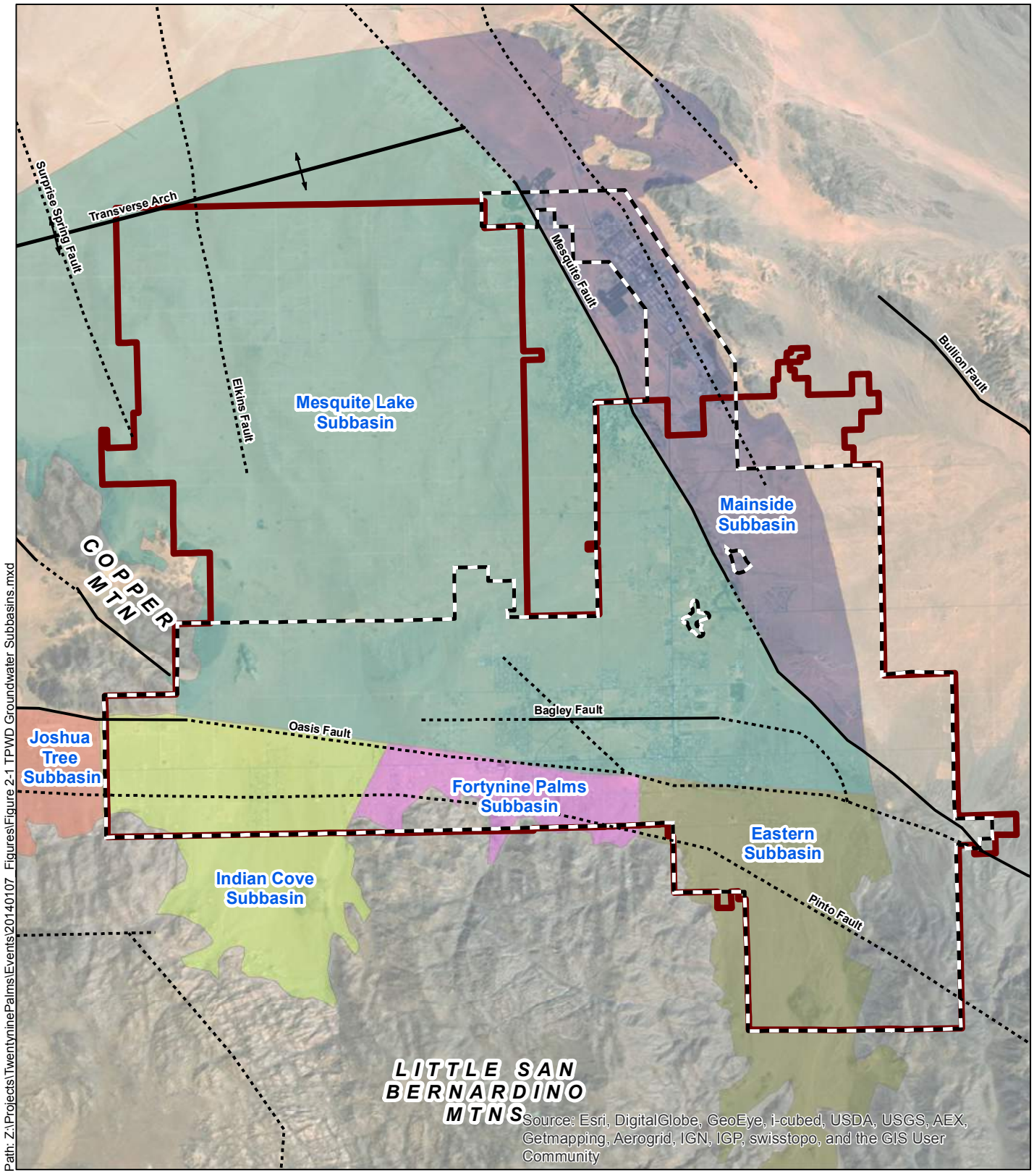
Figures



Path: Z:\Projects\TwentyninePalms\Events\20140107_Figures\Figure 2-1 TPWD Groundwater Subbasins.mxd

Legend

- City Limit
- Water District Boundary

Faults

- Known
- Inferred
- Anticline

N

0 1 2

Scale: Miles

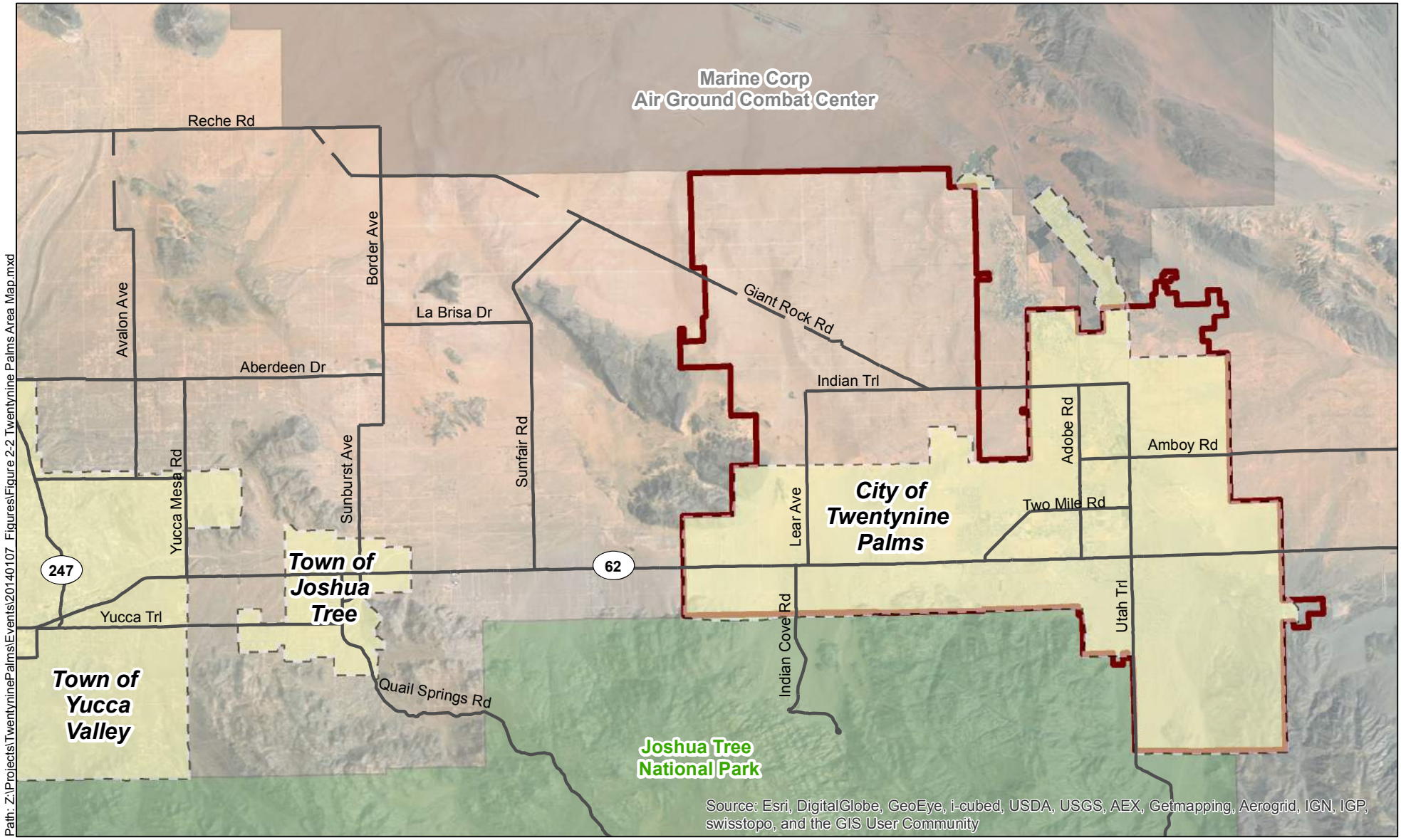
Kennedy/Jenks Consultants

Groundwater Management Plan
Twentynine Palms Water District

TPWD Groundwater Subbasins

K/J 1365022*00
May 2014

Figure 2-1



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Legend

- Road
- City Limit
- Water District Boundary
- Marine Corps Base
- National Park

N

0 1 2

Scale: Miles

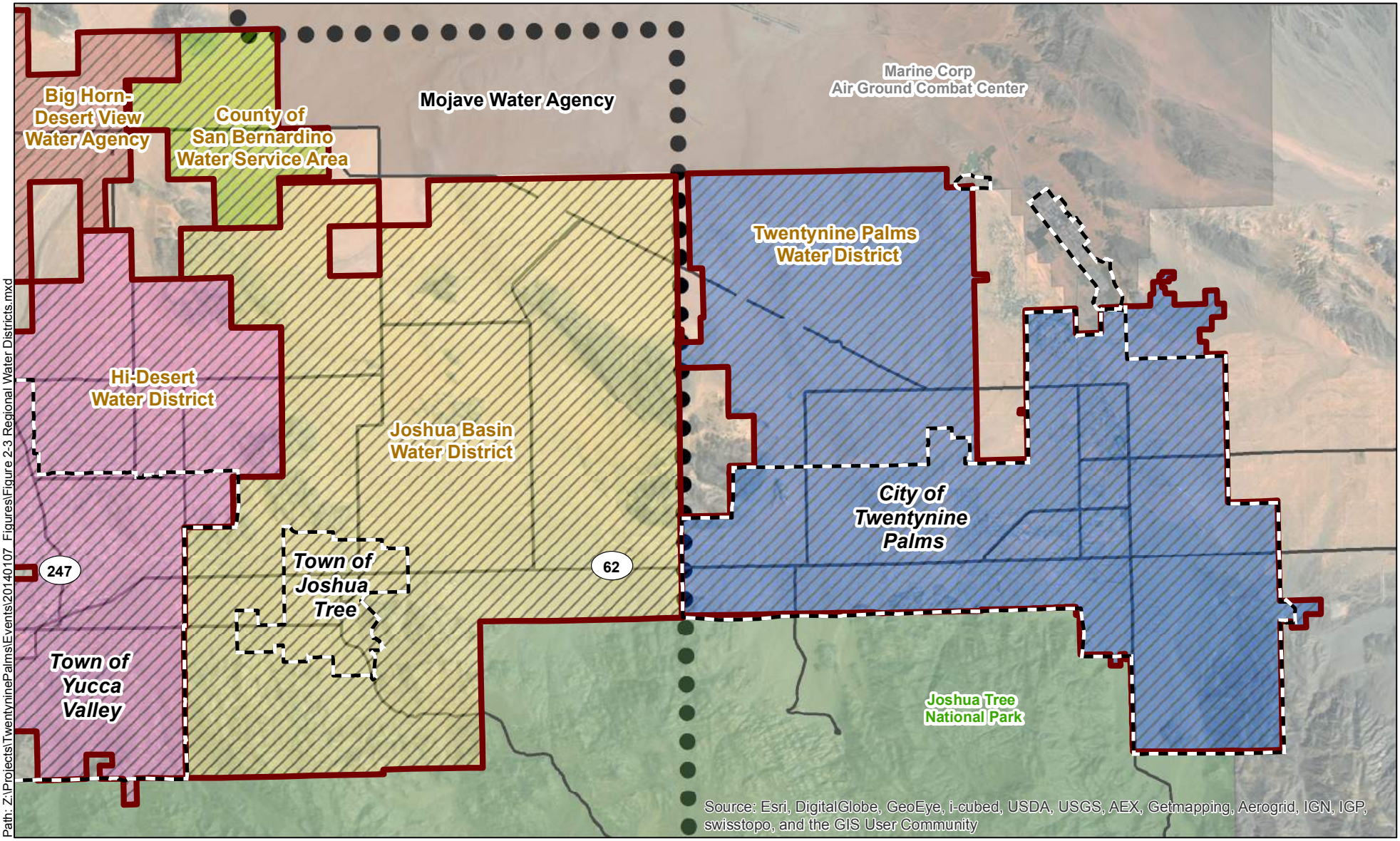
Kennedy/Jenks Consultants

Groundwater Management Plan
Twentynine Palms Water District

Twentynine Palms Area Map

K/J 1365022*00
May 2014

Figure 2-2



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Legend

- Road
- City Limit
- Water District Boundary
- Mojave Water Agency
- Marine Corps Base
- National Park

N

0 1 2

Scale: Miles

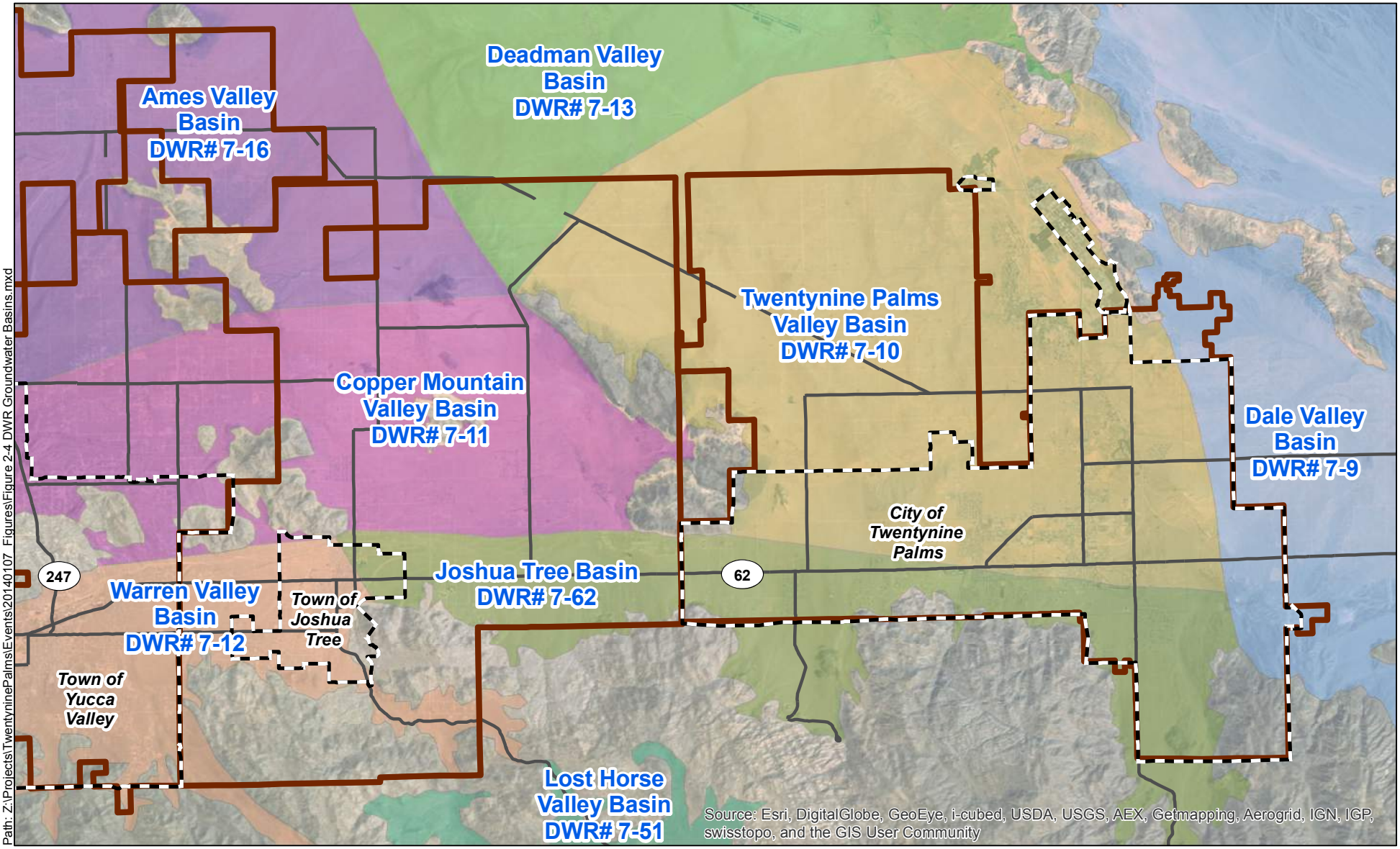
Kennedy/Jenks Consultants

Groundwater Management Plan
Twentynine Palms Water District

Regional Water Districts

K/J 1365022*00
May 2014

Figure 2-3



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Legend

- Road
- City Limit
- Water District Boundary

N

0 1 2

Scale: Miles

Kennedy/Jenks Consultants

Groundwater Management Plan
Twentynine Palms Water District

DWR Groundwater Basins

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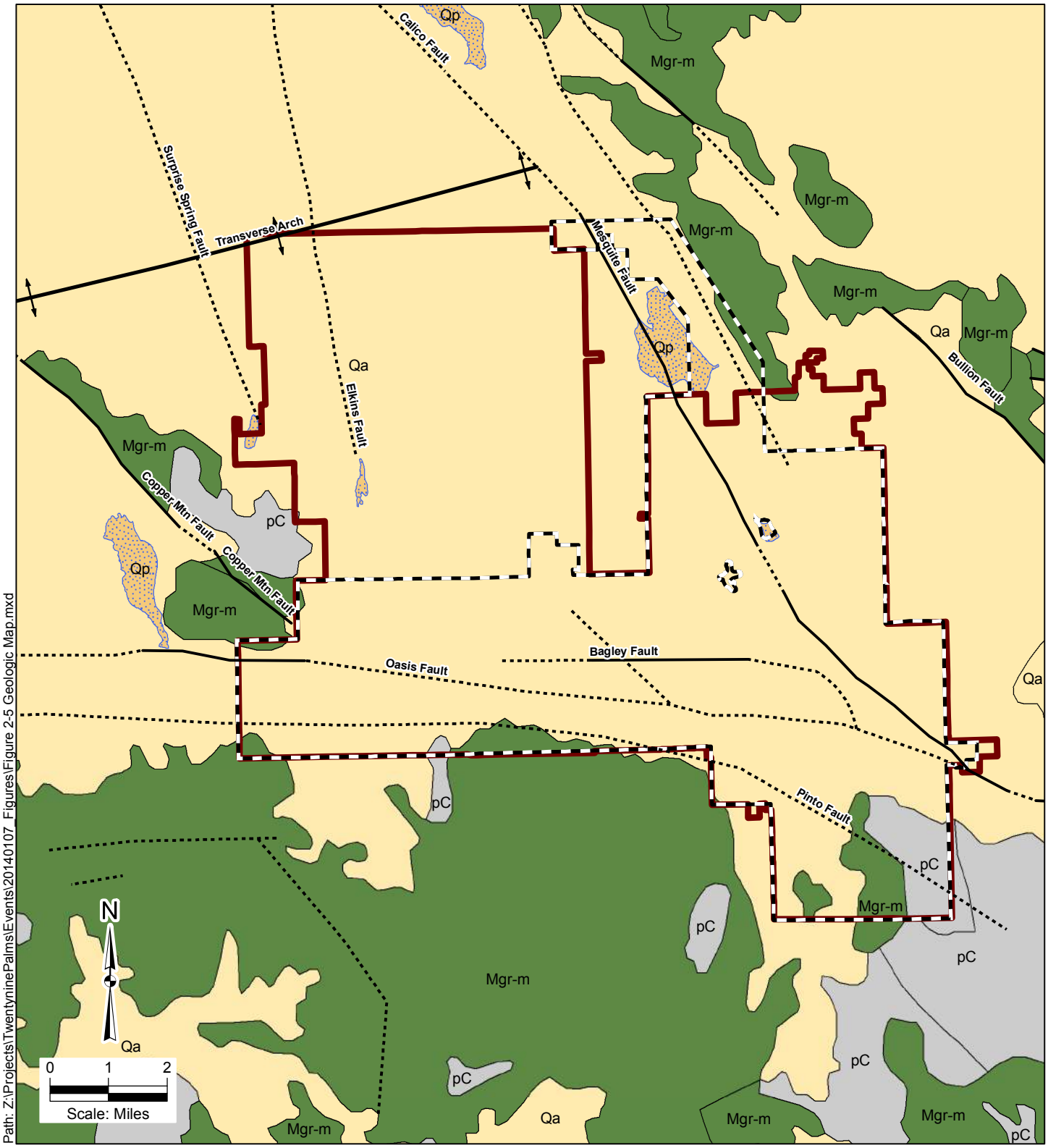
May 2014

Figure 2-4



Legend

City Limit

Water District Boundary

Faults

Known

Inferred

Anticline

Geologic Units

Qp: Playa lakes

Qa: Quaternary alluvium

Mgr-m: Mesozoic igneous and metamorphic rocks

pC: Precambrian igneous and metamorphic rocks

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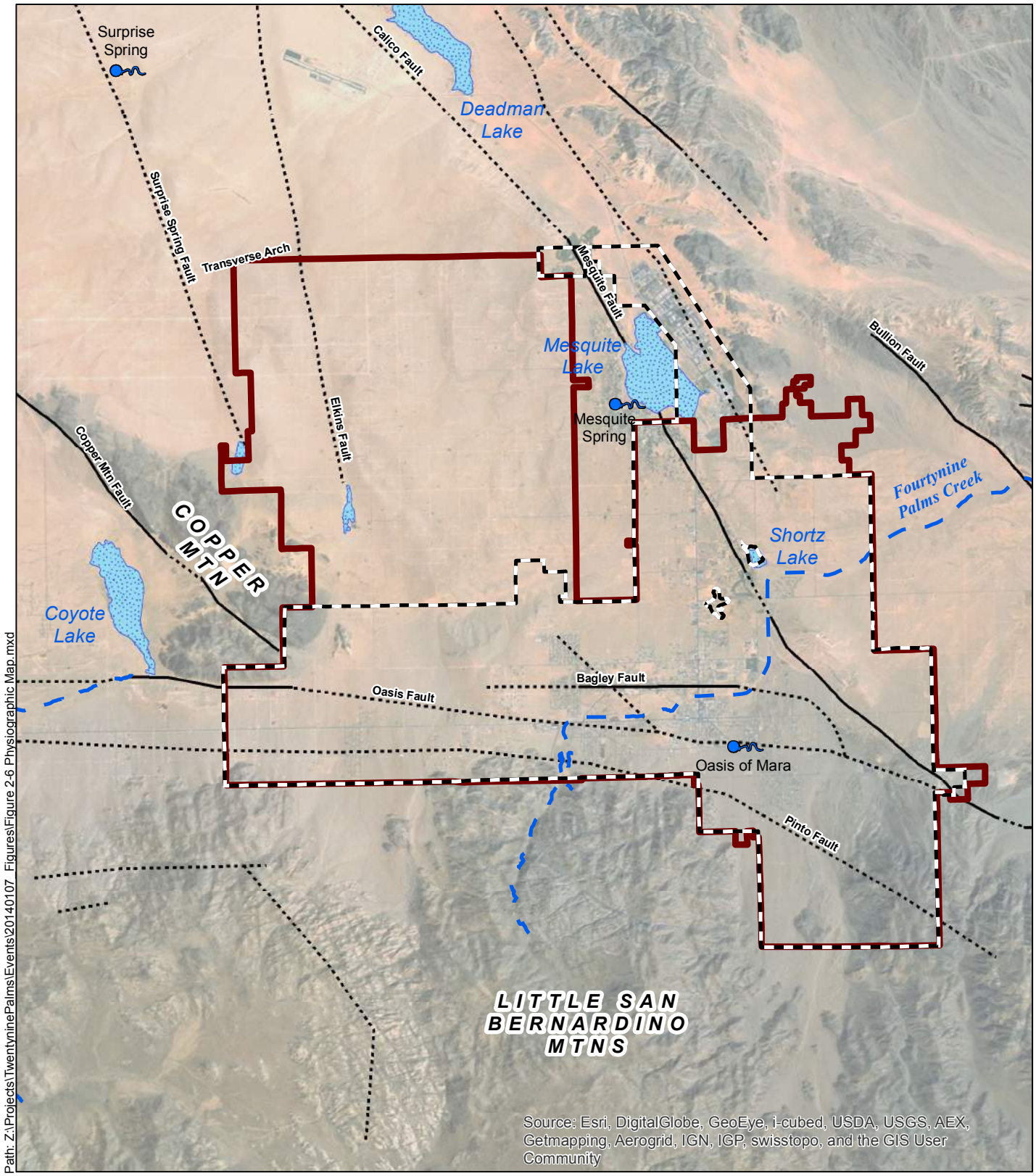
Groundwater Management Plan
Twentynine Palms Water District

Geologic Map

K/J 1365022*00
May 2014

Figure 2-5



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Legend

Surface Water Features

- Spring
- Stream
- Playa Lake
- City Limit
- Water District Boundary

Faults

- Known
- Inferred

N

0 1 2

Scale: Miles

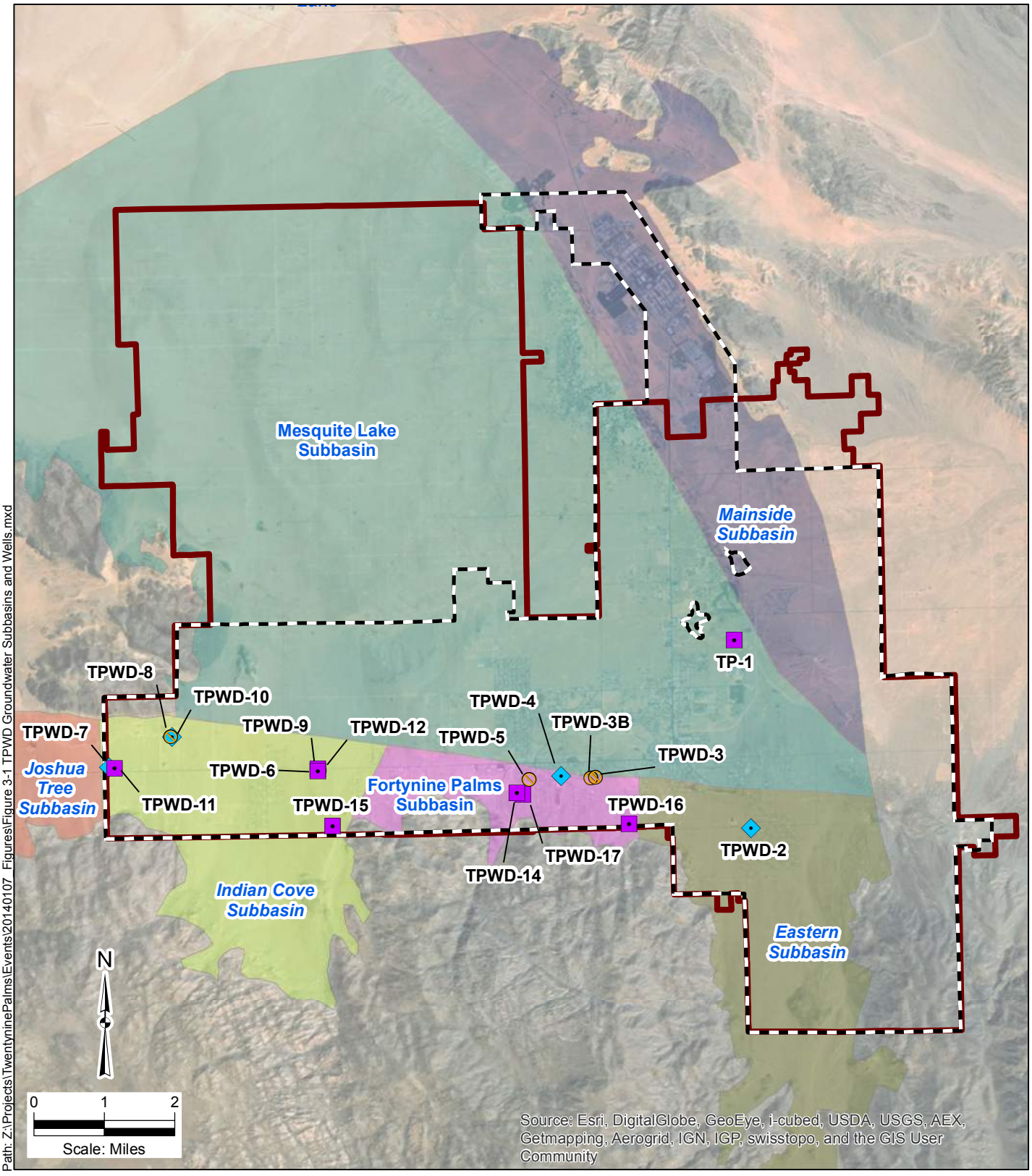
Kennedy/Jenks Consultants

Groundwater Management Plan
Twentynine Palms Water District

Physiographic Map

K/J 1365022*00
May 2014

Figure 2-6



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Legend

- TPWD Active Water Supply Well
- TPWD Inactive Water Supply Well
- TPWD Abandoned Well
- City Limit
- Water District Boundary

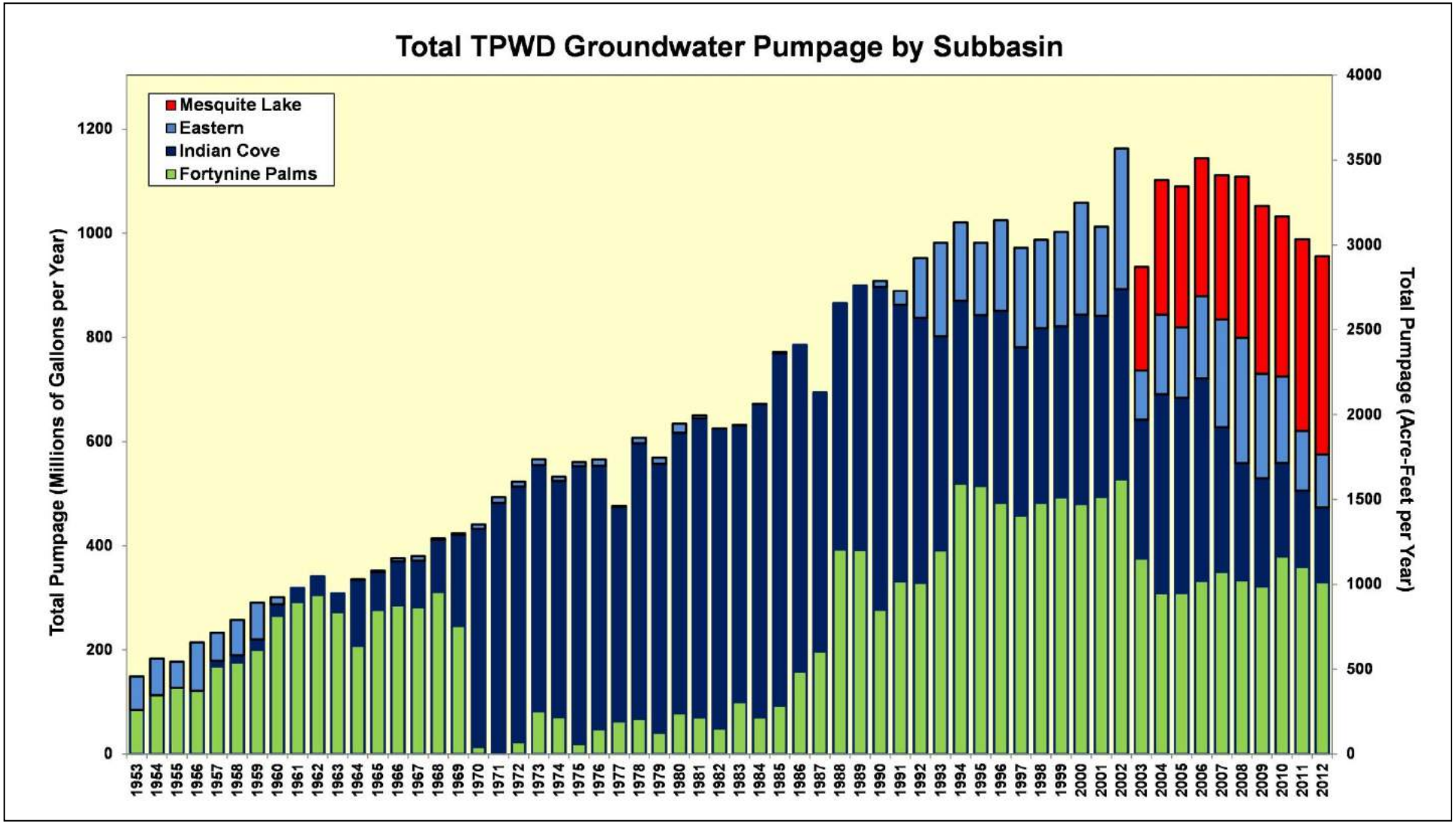
Kennedy/Jenks Consultants

Groundwater Management Plan
Twentynine Palms Water District

TPWD Groundwater Subbasins and Wells

K/J 1365022*00
May 2014

Figure 3-1



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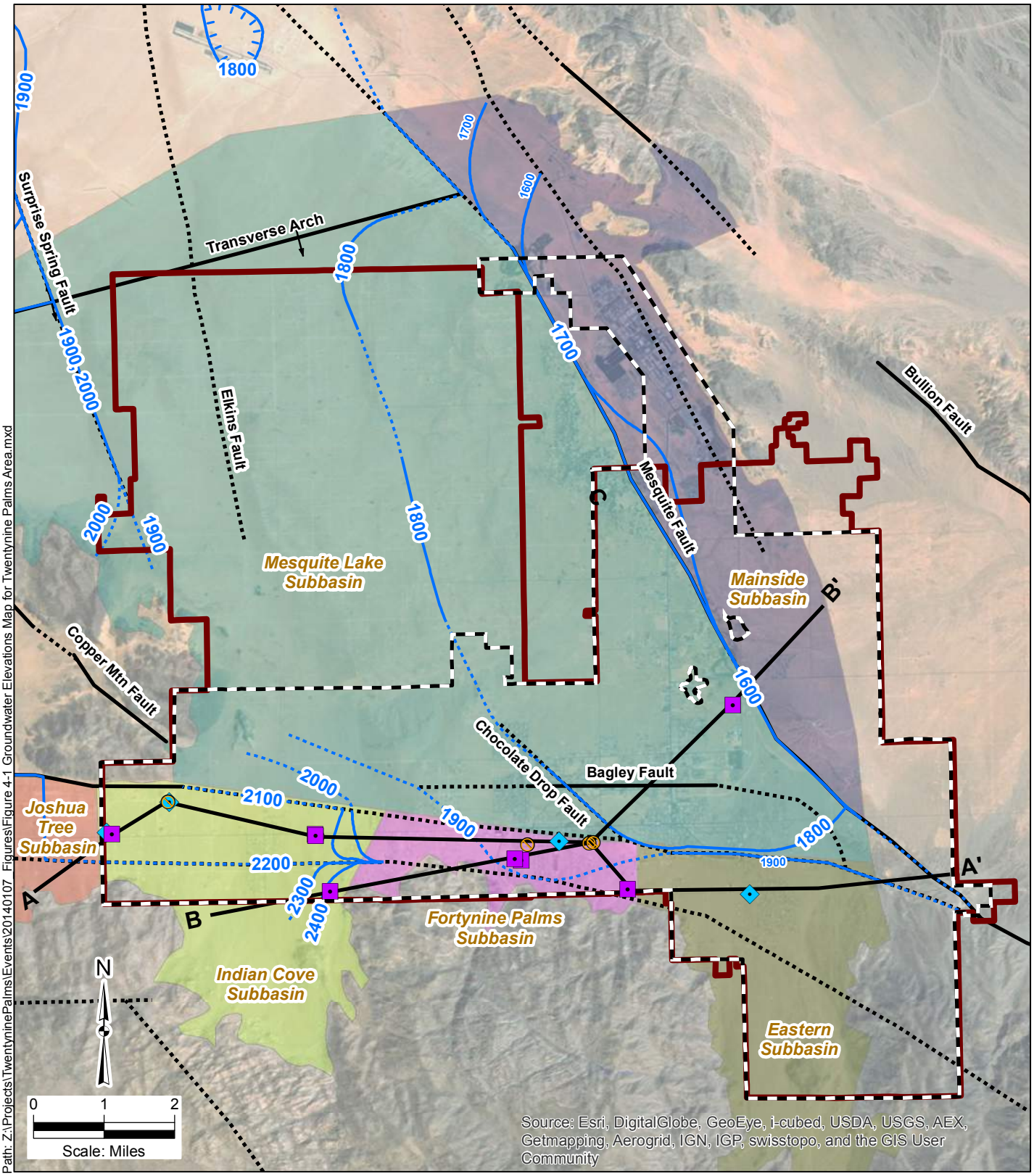
Groundwater Management Plan
Twentynine Palms Water District

Annual Pumping from TPWD Wells by Subbasin

K/J 1365022*00
May 2014

Figure 3-2



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Legend

- TPWD Active Water Supply Well
- TPWD Inactive Water Supply Well
- TPWD Abandoned Well
- City Limit
- Water District Boundary
- Cross Section Trace

2008 Groundwater Elevation Contours

- Known
- Inferred
- Closed Depression

Faults

- Known
- Inferred
- Anticline

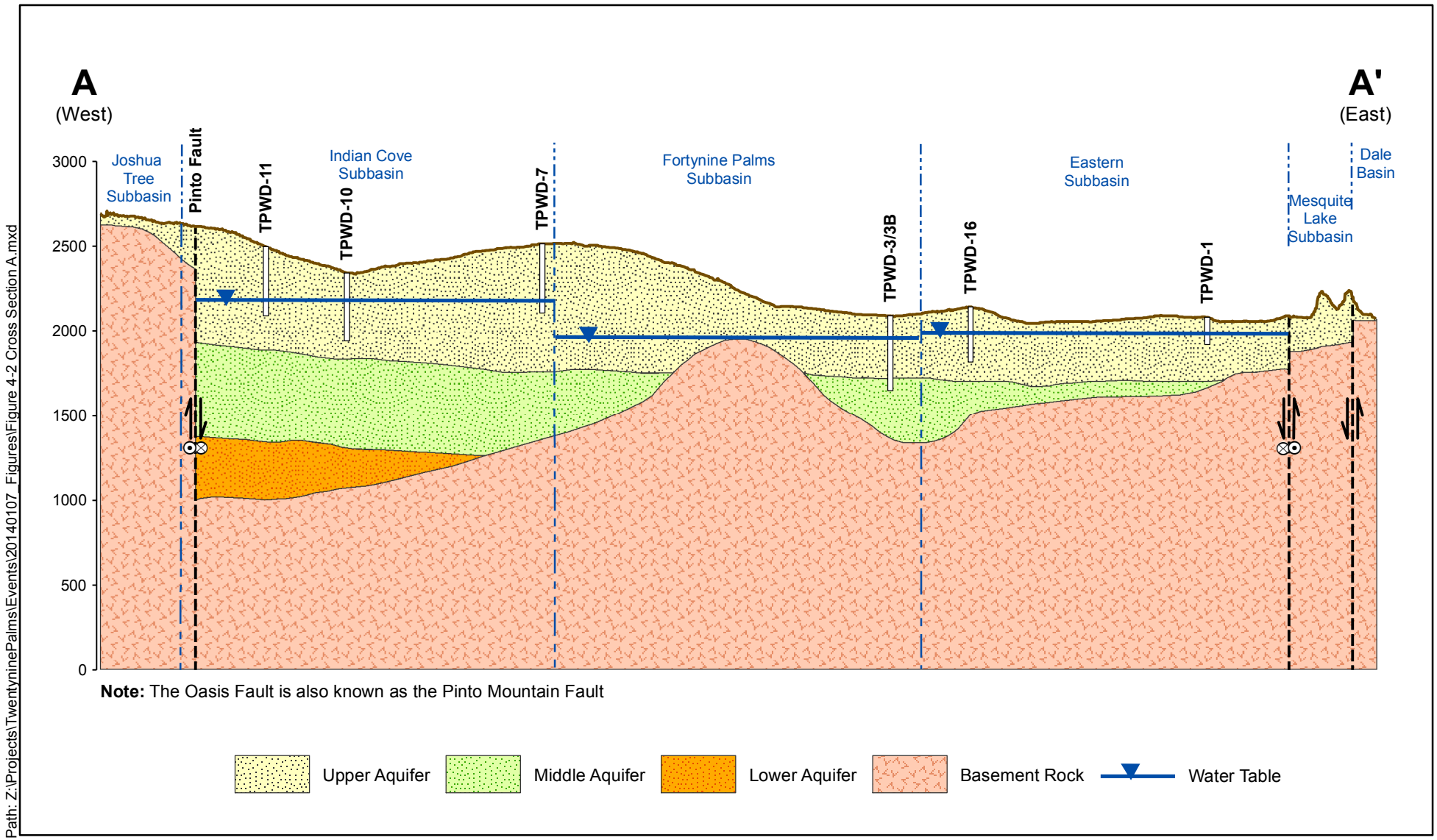
Kennedy/Jenks Consultants

Groundwater Management Plan
Twentynine Palms Water District

Groundwater Elevation Map with Cross Section Locations

K/J 1365022*00
May 2014

Figure 4-1



Path: Z:\Projects\TwentyninePalms\Events\20140107_Figures\Figure 4-2 Cross Section A.mxd

EXPLANATION

TPWD-1
Well and Identifier

Fault (Dashed where inferred)
Arrows indicate direction of movement
Cross Circle indicates movement away from observer
Dot Circle indicates movement toward observer

1000'
500'
Vertical Scale
0
5000'
10000'
Horizontal Scale
Exaggeration: 10x

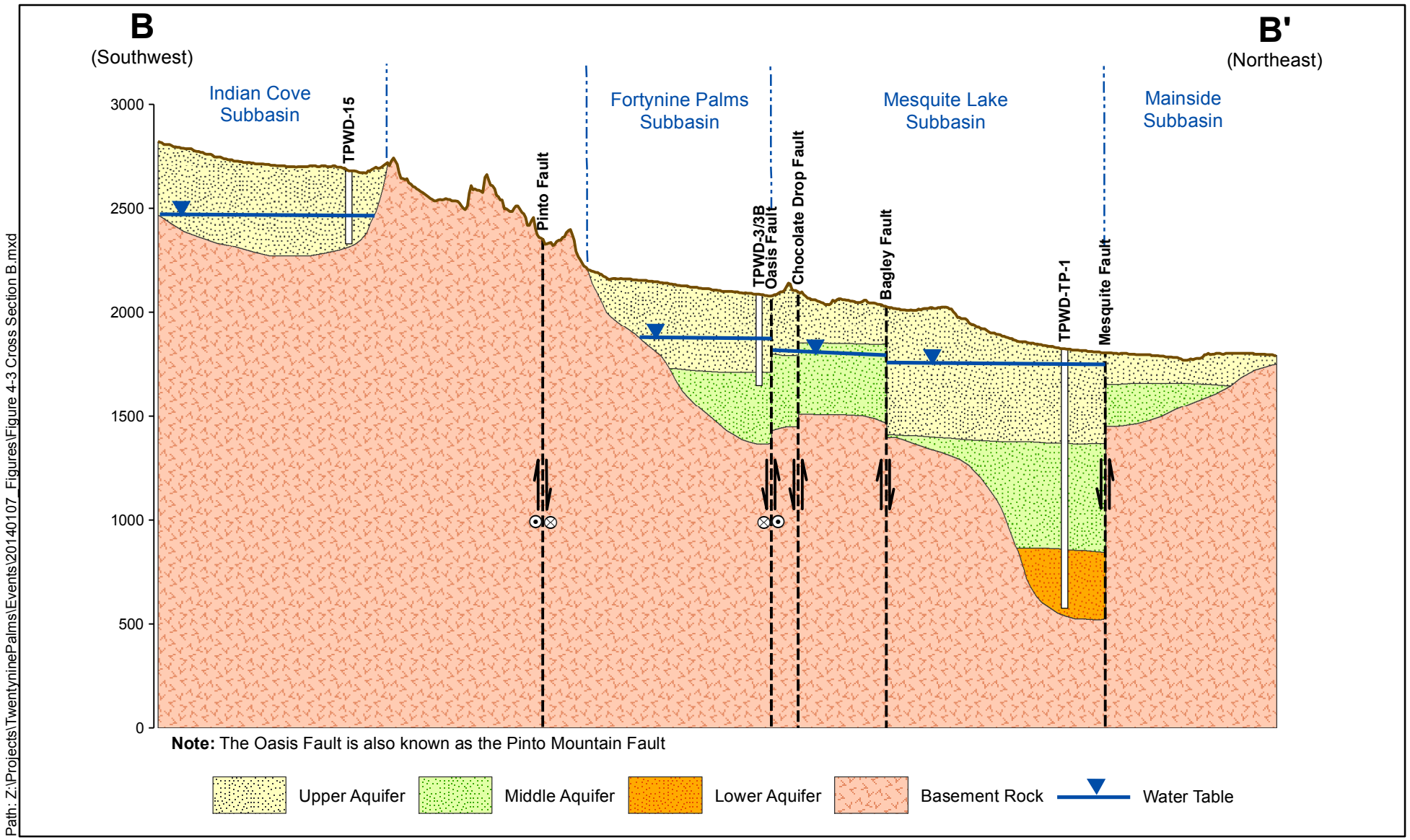
Kennedy/Jenks Consultants

Groundwater Management Plan
Twentynine Palms Water District

Cross Section A

K/J 1365022*00
May 2014

Figure 4-2



Path: Z:\Projects\TwentyninePalms\Events\20140107_Figures\Figure 4-3 Cross Section B.mxd

EXPLANATION

TPWD-1
Well and Identifier

Fault (Dashed where inferred)
Arrows indicate direction of movement
Cross Circle indicates movement away from observer
Dot Circle indicates movement toward observer

500'
250'
0
Vertical Scale
2500'
5000'
Horizontal Scale
Exaggeration: 10x

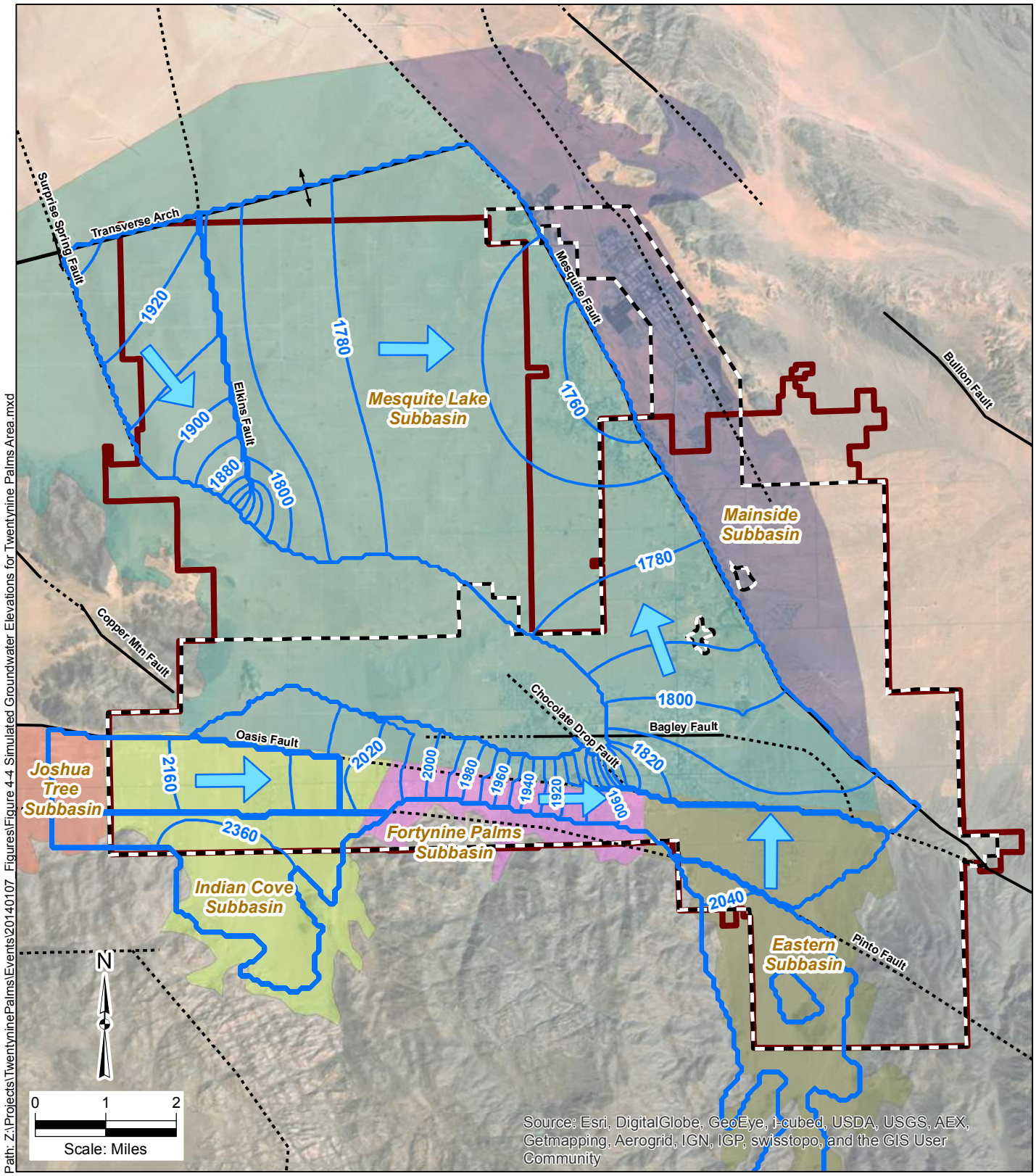
Kennedy/Jenks Consultants

Groundwater Management Plan
Twentynine Palms Water District

Cross Section B

K/J 1365022*00
May 2014

Figure 4-3



Path: Z:\Projects\TwentyninePalms\Events\20140107_Figures\Figure 4-4 Simulated Groundwater Elevations for Twentynine Palms Area.mxd

Legend

- Groundwater Flow Direction
- Groundwater Elevation Contour (feet)
- City Limit
- Water District Boundary

Faults

- Known
- Inferred
- Anticline

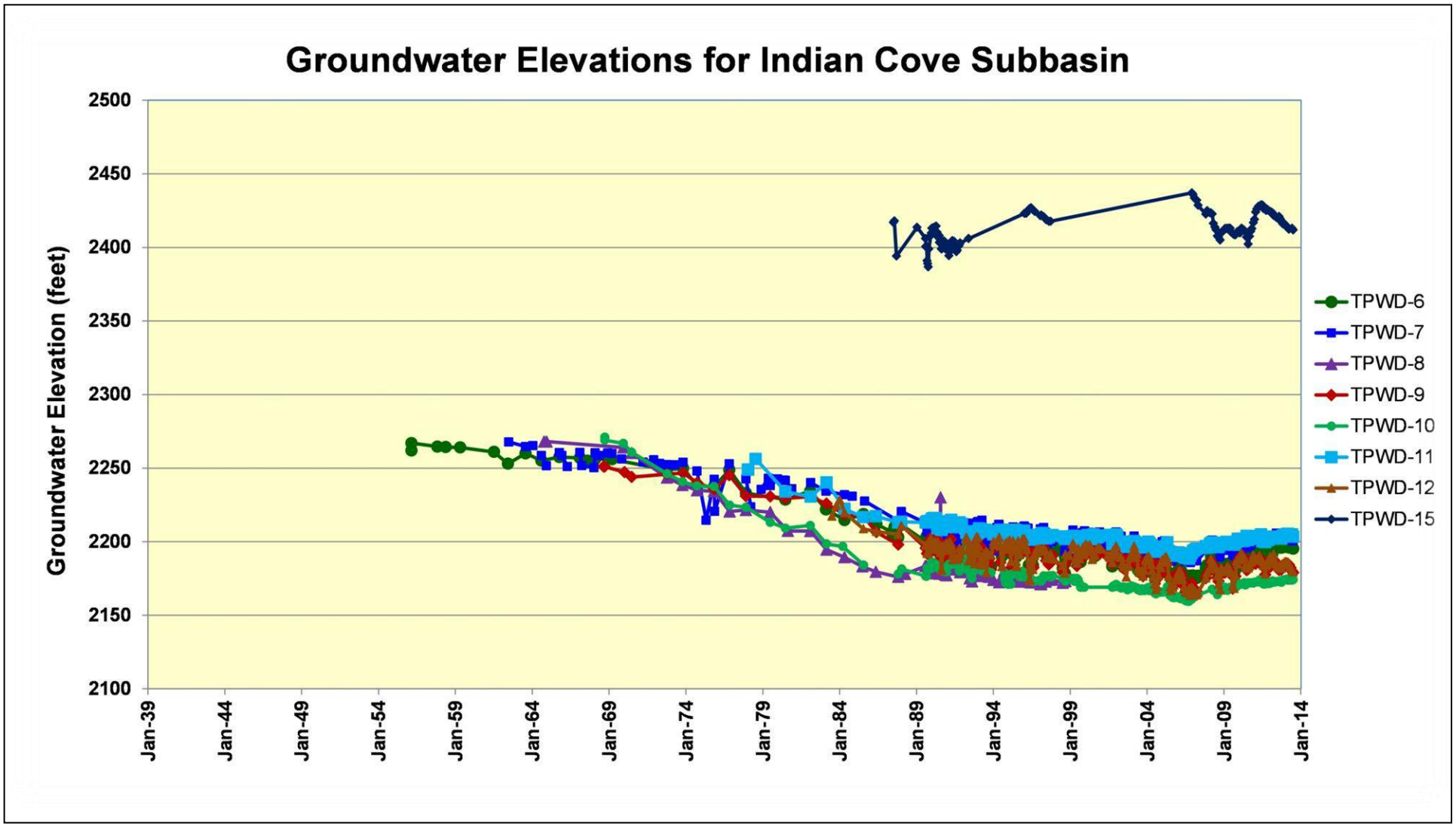
Kennedy/Jenks Consultants

Groundwater Management Plan
Twentynine Palms Water District

Simulated Groundwater Elevations for Twentynine Palms Area

K/J 1365022*00
May 2014

Figure 4-4



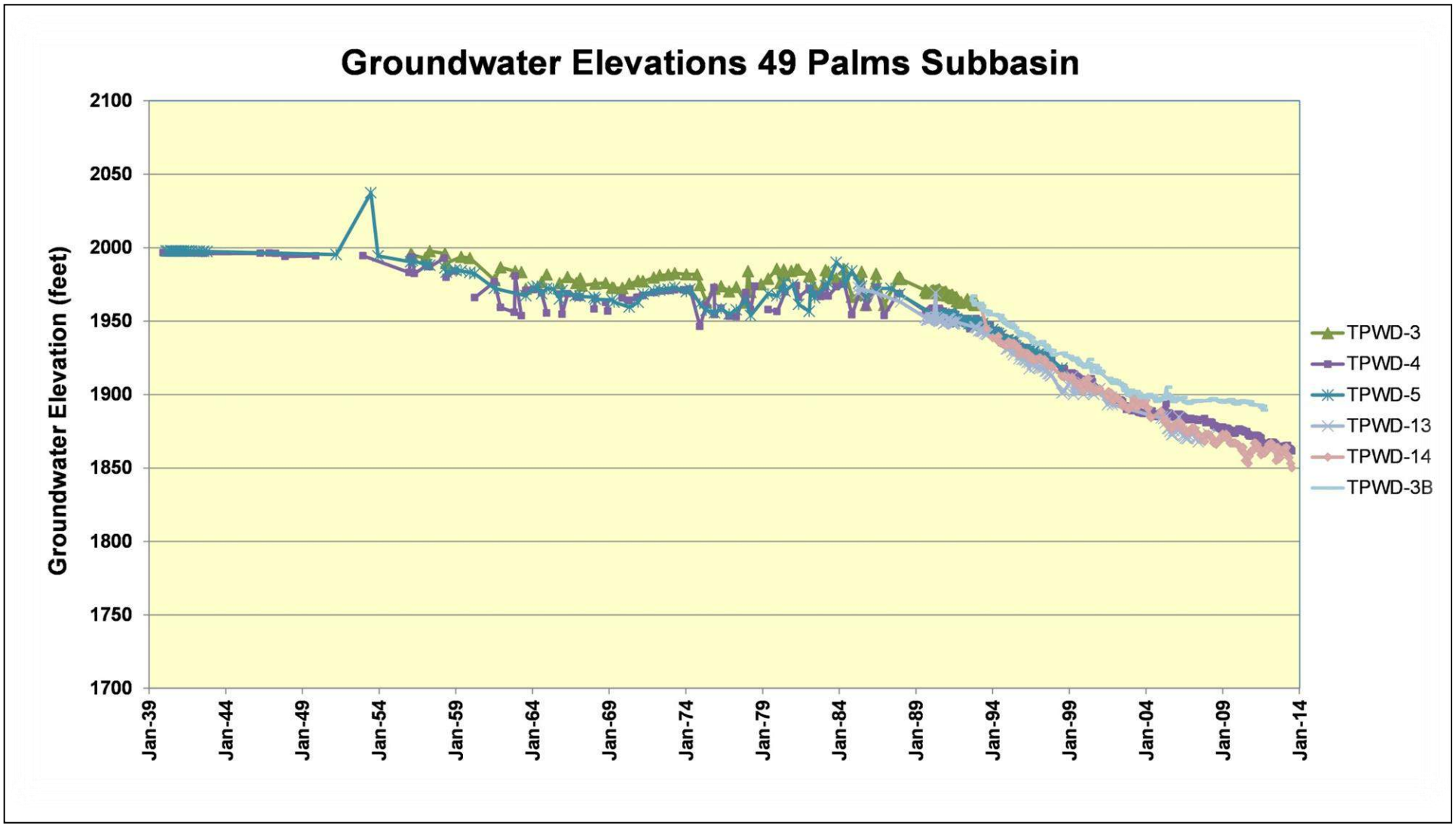
Kennedy/Jenks Consultants

Groundwater Management Plan
Twentynine Palms Water District

Groundwater Elevation History for Indian Cove Subbasin

K/J 1365022*00
May 2014

Figure 4-5



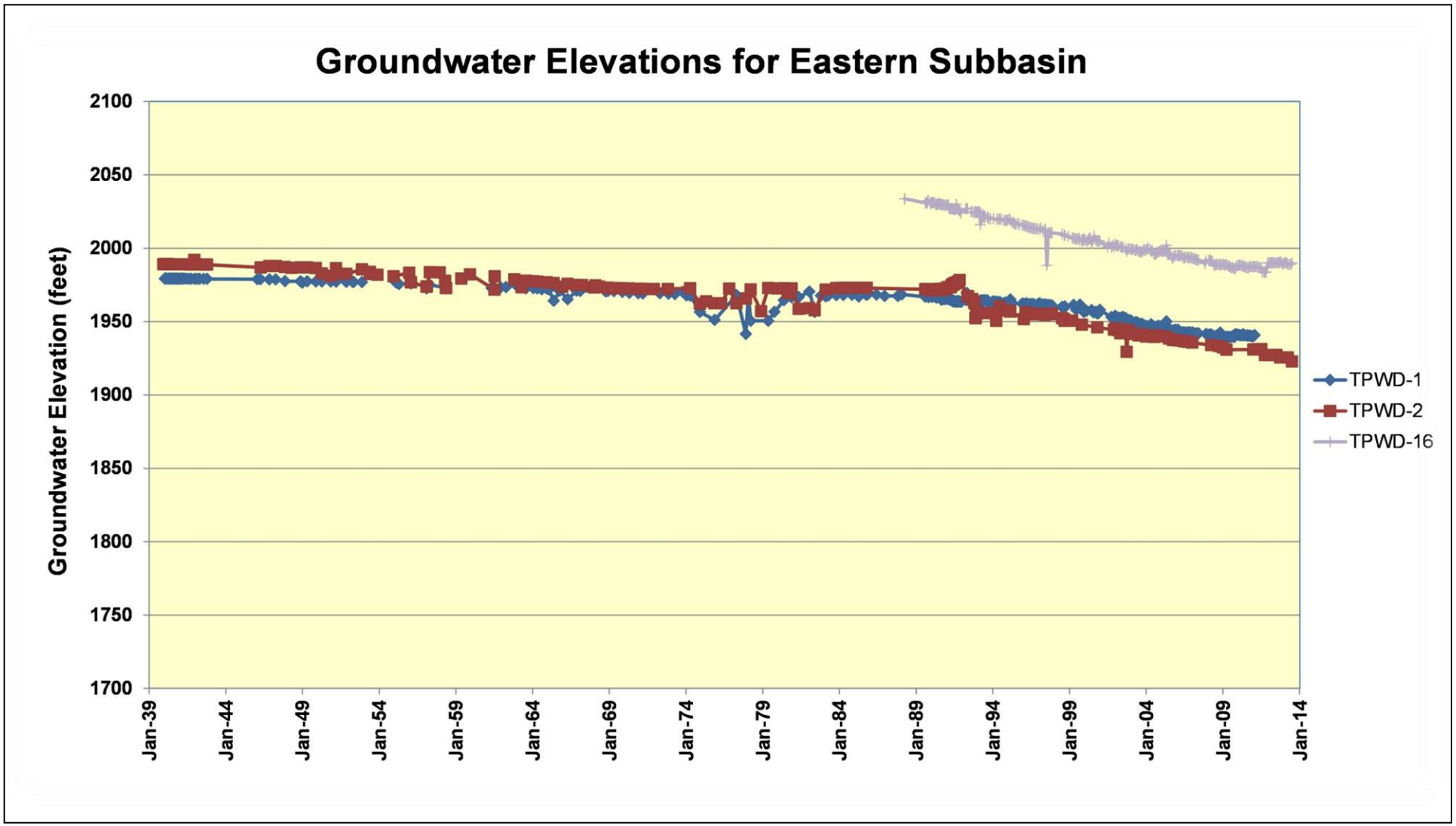
Kennedy/Jenks Consultants

Groundwater Management Plan
Twentynine Palms Water District

Groundwater Elevation History for 49 Palms Subbasin

K/J 1365022*00
May 2014

Figure 4-6



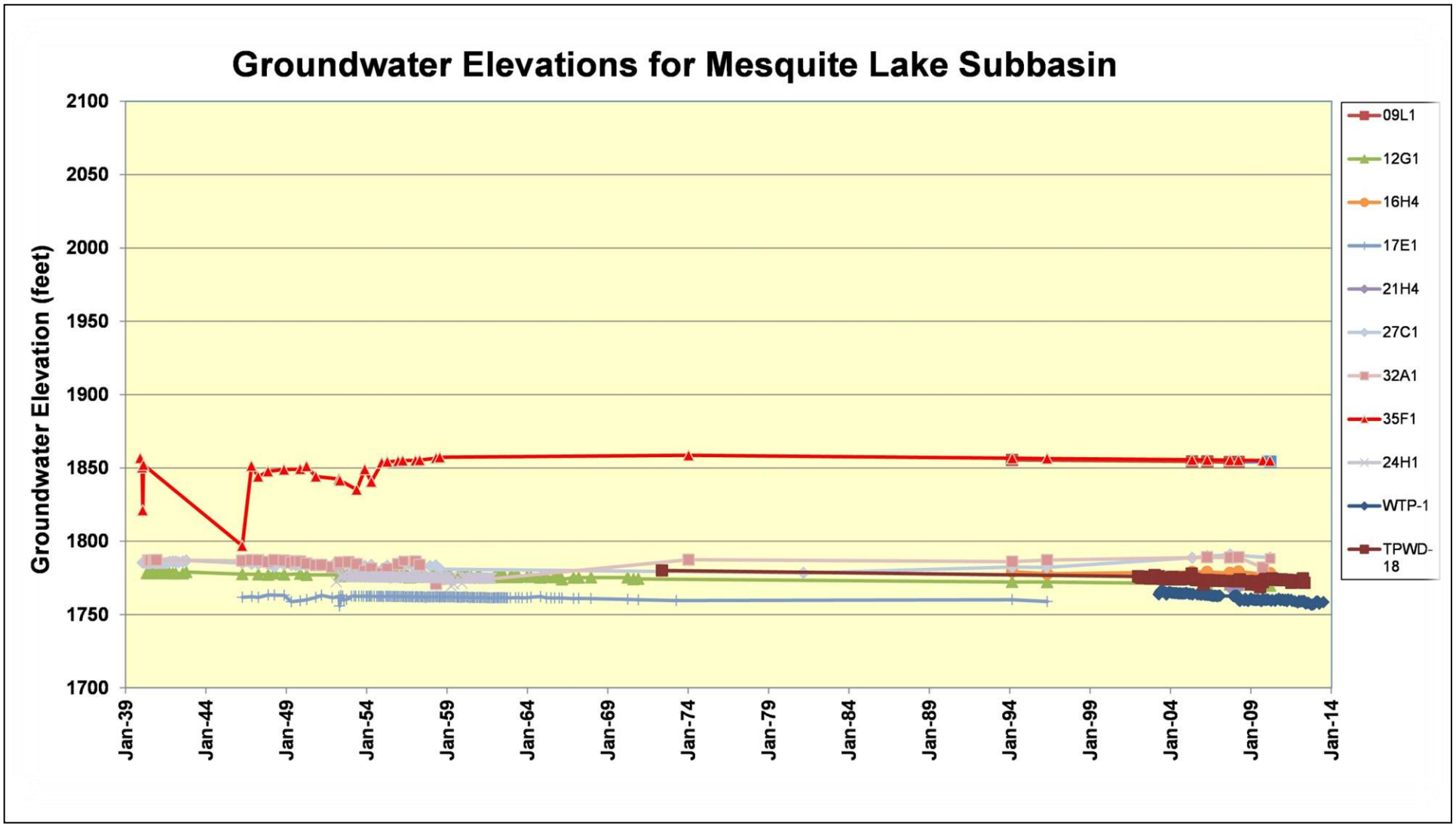
Kennedy/Jenks Consultants

Groundwater Management Plan
Twentynine Palms Water District

Groundwater Elevation History for Eastern Subbasin

K/J 1365022*00
May 2014

Figure 4-7



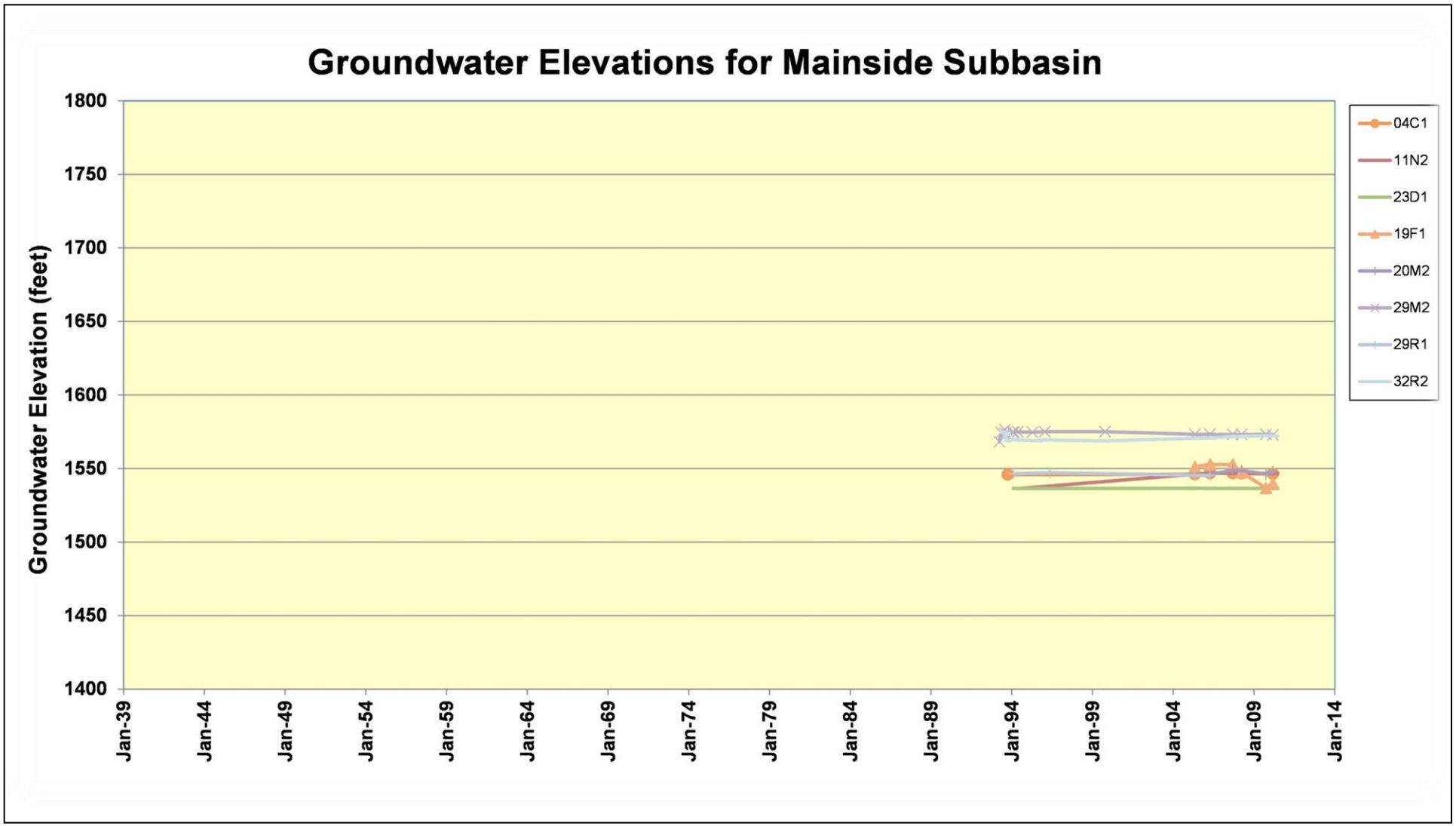
Kennedy/Jenks Consultants

Groundwater Management Plan
Twentynine Palms Water District

Groundwater Elevation History for Mesquite Lake Subbasin

K/J 1365022*00
May 2014

Figure 4-8



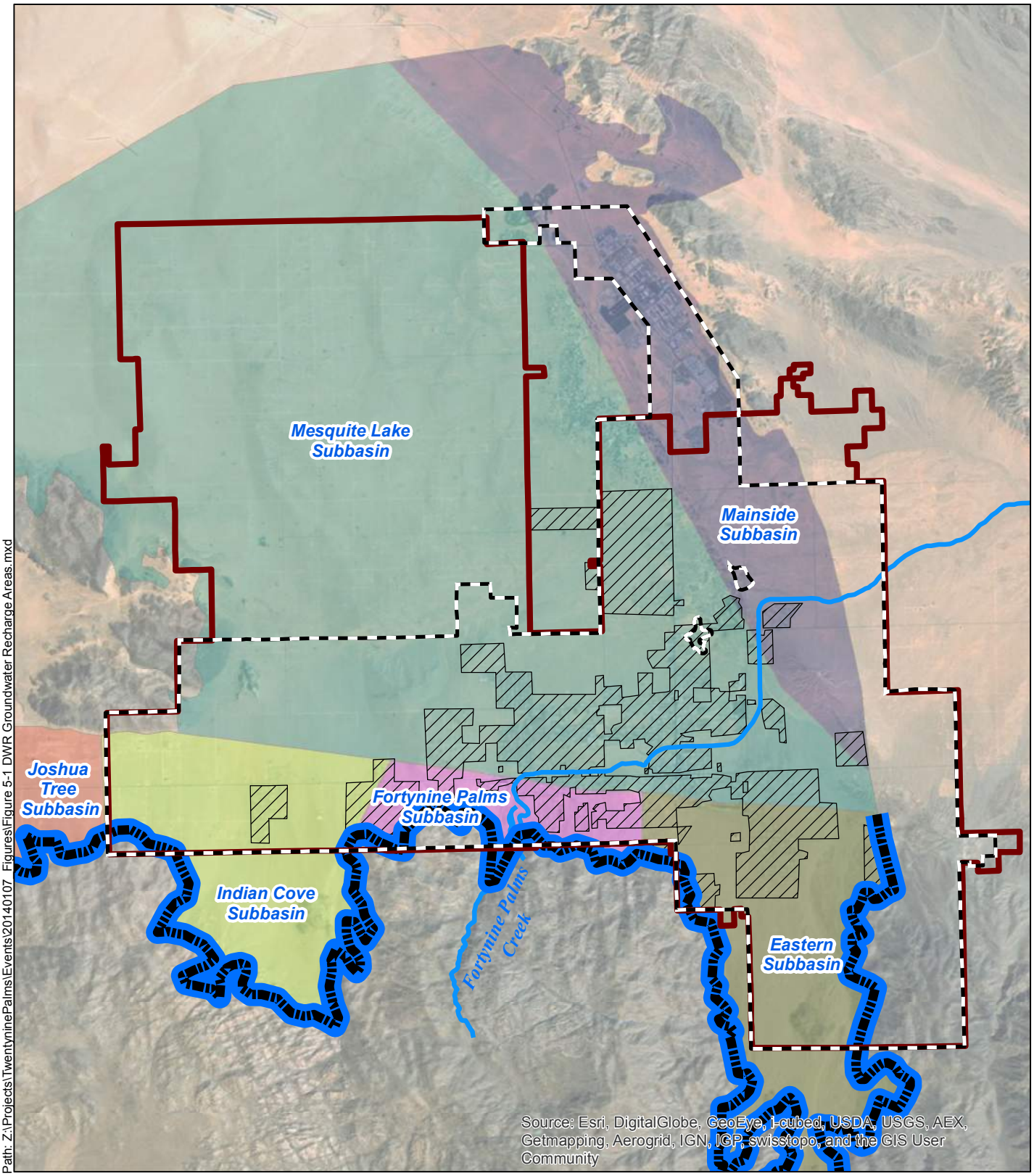
Kennedy/Jenks Consultants

Groundwater Management Plan
Twentynine Palms Water District

Groundwater Elevation History for Mainside Subbasin

K/J 1365022*00
May 2014

Figure 4-9



Path: Z:\Projects\TwentyninePalms\Events\20140107_Figures\Figure 5-1 DWR Groundwater Recharge Areas.mxd

Legend

- Urban Recharge Zone
- Stream Recharge Zone
- Natural Recharge Zone
- City Limit
- Water District Boundary

N

0 1 2

Scale: Miles

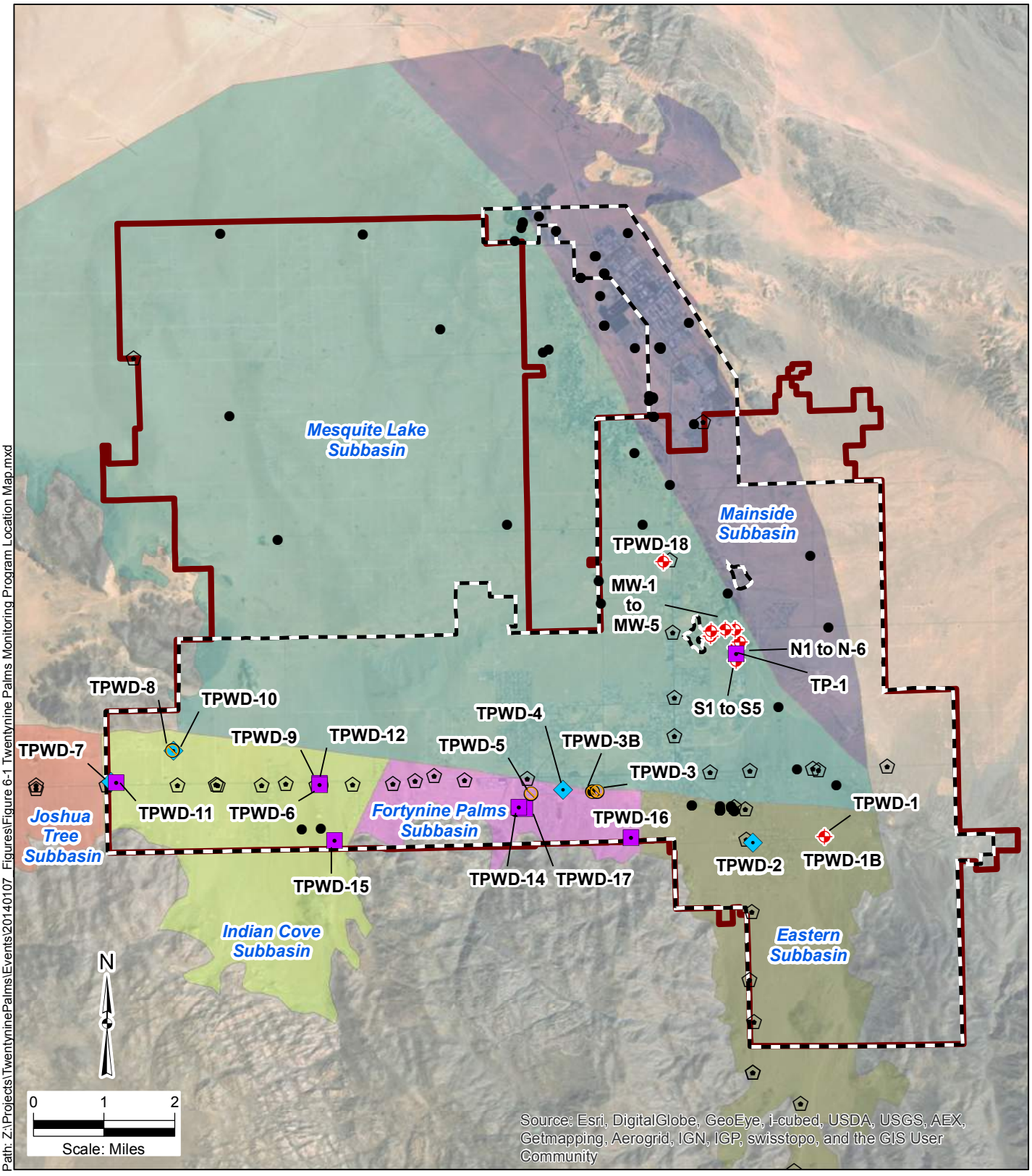
Kennedy/Jenks Consultants

Groundwater Management Plan
Twentynine Palms Water District

DWR Groundwater Recharge Areas

K/J 1365022*00
May 2014

Figure 5-1



Path: Z:\Projects\TwentyninePalms\Events\20140107_Figures\Figure 6-1 Twentynine Palms Monitoring Program Location Map.mxd

Legend

- TPWD Active Water Supply Well
- TPWD Inactive Water Supply Well
- TPWD Abandoned Well
- TPWD Monitoring Well
- USGS Monitored Well
- Survey Benchmark
- City Limit
- Water District Boundary

Kennedy/Jenks Consultants

Groundwater Management Plan
Twentynine Palms Water District

Twentynine Palms Monitoring Program Location Map

K/J 1365022*00
May 2014

Figure 6-1

Appendix A

Resolution of GMP Adoption

A REGULAR MEETING OF THE BOARD OF DIRECTORS
OF THE TWENTYNINE PALMS WATER DISTRICT
72401 HATCH ROAD, TWENTYNINE PALMS, CA 92277

SEPTEMBER 25, 2013 / 6:00 P.M.

AGENDA

This meeting will be televised on Time Warner Cable Channel 10
on Saturdays at 10:00 AM and Sundays at 5:00 PM

Next Resolution #13-18
Next Ordinance #95

Call to Order and Roll Call

Pledge of Allegiance

Additions/Deletions to the Agenda

Public Comments
Please complete a "Request to be Heard" form prior to the start of the meeting. The public may address the Board for 3 minutes on District-related matters. Government Code prohibits the Board from taking action on matters that are not on the agenda. However, the Board may refer matters for future consideration.

1. Public Hearing on Proposed Adoption of a Resolution of Intention to Amend the District's Groundwater Management Plan

   1.1 Board to Hear Public Testimony at This Time

2. Consider Adoption of Resolution 13-17 a Resolution of Intention to Draft a Groundwater Management Plan for the Purposes of Implementing a Plan and Updating the Groundwater Management Program

3. Review and Adjust Schedule of Board Meeting in November and December

4. Consent Calendar
   Matters under the Consent Calendar are to be considered routine and will be enacted in a single motion. There will be no separate discussion of these items unless the Board, staff or the public requests specific items be removed for separate discussion and action before the Board votes on the motion to adopt.

   - Minutes of the Regular Meeting held on August 28, 2013
   - Audit List

5. Items Removed from the Consent Calendar for Discussion or Separate Action

6. Management Reports

6.1 Operations

6.2 Finance

6.3 General Manager

7. Future Agenda Items and Staff Tasks/Directors' Comments and Reports

8. Adjournment

The Board reserves the right to discuss only or take action on any item on the agenda.

Notice of agenda was posted on or before 3:00 p.m., September 20, 2013.

Tamara Alaniz, Board Secretary

Upon request, this Agenda will be made available in appropriate alternative formats to persons with disabilities, as required by Section 202 of the Americans with Disabilities Act of 1990. Any person with a disability who requires a modification or accommodation in order to participate in a meeting should direct such request to Cindy Fowlkes at (760) 367-7546 at least 48 hours before the meeting, if possible.

Pursuant to Government Code Section 54957.5, any writing that: (1) is a public record; (2) relates to an agenda item for an open session of a regular meeting of the Board of Directors; and (3) is distributed less than 72 hours prior to that meeting, will be made available for public inspection at the time the writing is distributed to the Board of Directors. Any such writing will be available for public inspection at the District offices located at 72401 Hatch Road, Twentynine Palms, CA 92277. In addition, any such writing may also be posted on the District's website.

MINUTES OF A REGULAR MEETING OF THE BOARD OF DIRECTORS
OF THE TWENTYNINE PALMS WATER DISTRICT
72401 HATCH ROAD, TWENTYNINE PALMS, CA 92277

SEPTEMBER 25, 2013 / 6:00 P.M.

Call to Order and Roll Call
President Moore called the meeting to order at 6:00 p.m., 72401 Hatch Road, Twentynine Palms, California. Those responding to roll call were Directors Chancey Chambers, Philip Cisneros, Sam Moore, and Roger Shinaver. Director Bo Bourikas was absent. Also present were General Manager Tamara Alaniz, Operations Manager Ray Kolisz, Financial Consultant Cindy Byerrum, and District Secretary Cindy Fowlkes.

Pledge of Allegiance
Director Shinaver led the pledge.

Additions/Deletions to the Agenda
None

Public Comments
No public comments.

1. Public Hearing on Proposed Adoption of a Resolution of Intention to Amend the District's Groundwater Management Plan

   1.1 Board to Hear Public Testimony at This Time
   Director Moore opened the Public Hearing at 6:02 p.m. There being no public testimony to be heard, Director Moore closed the public hearing at 6:02 p.m.

2. Consider Adoption of Resolution 13-17 a Resolution of Intention to Draft a Groundwater Management Plan for the Purposes of Implementing a Plan and Updating the Groundwater Management Program
   Staff recommends the Board approve the routine adoption of the resolution.

   Director Cisneros moved to approve Resolution 13-17 a resolution of intention to draft a Groundwater Management Plan for the purposes of implementing a plan and updating the Groundwater Management program, seconded by Director Chambers and approved by the following roll call vote:

Ayes:	Directors Chambers, Cisneros, Moore, and Shinaver
Noes:	None
Abstain:	None
Absent:	Director Bourikas

3. Review and Adjust Schedule of Board Meeting in November and December
   Following discussion, it was the consensus of the Board to reschedule the regular Water and Fire Department Board meetings from the original dates of November 27, 2013 and December 25, 2013, to Wednesday, November 20, 2013, and Wednesday, December 18, 2013. Meetings will begin at their regular time, 6:00 p.m.

4. Consent Calendar
   - Minutes of the Regular Meeting held on August 28, 2013
   - Audit List

Director Chambers moved to approve the Minutes, seconded by Director Cisneros and approved unanimously.

5. Items Removed from the Consent Calendar for Discussion or Separate Action

Director Moore moved to remove the Audit List, questioning the Prudential Overall, Protection One, and Joshua Basin Water District annual water availability assessment items. Following a brief discussion, Director Cisneros moved to approve the Audit List as published, seconded by Director Shinaver and approved unanimously.

6. Management Reports

6.1 Operations

Mr. Kolisz reported that the District responded to 17 Underground Service Alerts, had (1) 8" water main leak due to tree roots, and performed 5 leak audits. The cathodic protection system contract for the Stockwell Reservoir was awarded to GMC Electrical Inc. Production was down 9% compared to the same time last year. Meter change-out procedures have been implemented.

6.2 Finance

Ms. Byerrum reported that the Audit has been completed and will be presented to the Board in October. The format of the Financials has been revised to show a comparison to the previous month and prior year to date. Water sales are down, as indicated by Mr. Kolisz' report on lower production rates.

6.3 General Manager

Ms. Alaniz reported that drafts of the Groundwater Management Plan and Wastewater Master Plan are moving forward. Ms. Alaniz met with City Manager, Joe Guzzetta, and discussed a joint meeting between the Water Board and City Council to discuss a Local Agency Management Plan. The meeting is tentatively scheduled for November 7, 2013. The Board agreed that the meeting should be held at the Community Center. Ms. Alaniz asked the Board to provide her with their availability to attend a Board Workshop some time during the first week in January. The Workshop will include discussion of The Brown Act and Robert's Rules of Order. The Board was reminded that requests to serve on ACWA and CSDA committees are nearing the closing date.

10. Future Agenda Items and Staff Tasks/Directors' Comments and Reports

Director Chambers would like to see voter turnout history and election costs on the next agenda for discussion.

11. Adjournment

On motion by Director Cisneros seconded by Director Shinaver and approved by the Board, the meeting was adjourned at 6:28 p.m.

Kerron E. Moore, President
Board of Directors

Attest:

Tamara Alaniz, Board Secretary
Twentynine Palms Water District

RESOLUTION 13-17

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE TWENTYNINE PALMS WATER DISTRICT DECLARING AN INTENTION TO AMEND THE DISTRICT GROUNDWATER MANAGEMENT PLAN

WHEREAS, the Twentynine Palms Water District ("District") is a County Water District Duly formed and operating pursuant to Section 31000 et seq. of the California Water Code and has the authority to provide water service to customers within its service area;

WHEREAS, groundwater is a valuable resource within the State of California and particularly within the boundaries of the District and such groundwater must be monitored and evaluated;

WHEREAS, in recognition of the value of groundwater as a resource, the California State Legislature passed AB 3030 which encourages local water purveying agencies to develop and implement groundwater management plans;

WHEREAS, in keeping with this state mandate and assuring that District water users are supplied with their water needs, the District adopted and implemented a groundwater management plan;

WHEREAS, the District has now determined that it is prudent to amend its groundwater management plan;

WHEREAS, as required by Water Code Section 10753.2(a) and Government Code Section 6066, notice of a public hearing was published in the Desert Trail on September 19, 2013 and September 21, 2013;

WHEREAS, a public hearing was conducted on September 25, 2013 by the Board of Directors of the District in order to receive oral and written testimony on whether or not to adopt a Resolution of Intention to Amend the Groundwater Management Plan.

NOW, THEREFORE, the Board of Directors of the Twentynine Palms Water District hereby resolves as follows:

1. Declaration of Intention. It is hereby declared that the District intends to prepare an amended groundwater management plan within two (2) years of the date of adoption of this Resolution of Intention, pursuant to Section 10750 et seq. of the California Water Code that will afford conservation, protection and enhancement of groundwater supplies within the District service area.

2. Publication of Notice. Pursuant to Section 10753.3 of the California Water Code, the Secretary of the District is hereby authorized and directed to publish this Resolution of Intention in a newspaper of general circulation within the affected area twice, in two (2) successive weeks. Upon written request, the Secretary

shall also provide any interested persons with a copy of this Resolution of Intention.

PASSED, APPROVED AND ADOPTED on this 25th day of September 2013, at a regular meeting of the Board of Directors of the Twentynine Palms Water District by the following vote:

Ayes:	Directors Chambers, Cisneros, Moore, and Shinaver
Noes:	None
Abstain:	None
Absent:	None

Kerron E. Moore, President
Board of Directors

Attest:

Tamara Alaniz, Board Secretary
Twentynine Palms Water District

A REGULAR MEETING OF THE BOARD OF DIRECTORS
OF THE TWENTYNINE PALMS WATER DISTRICT
72401 HATCH ROAD, TWENTYNINE PALMS, CA 92277

APRIL 23, 2014 / 6:00 P.M.

AGENDA

This meeting will be televised on Time Warner Cable Channel 10
on Saturdays at 10:00 AM and Sundays at 5:00 PM

Next Resolution #14-06
Next Ordinance #95

Call to Order and Roll Call

Pledge of Allegiance

Additions/Deletions to the Agenda

Public Comments
Please complete a "Request to be Heard" form prior to the start of the meeting. The public may address the Board for 3 minutes on District-related matters. Government Code prohibits the Board from taking action on matters that are not on the agenda. However, the Board may refer matters for future consideration.

1. Public Hearing on Proposed Adoption of a Resolution to Update the District Groundwater Management Plan

   1.1 Board to Hear Public Testimony at This Time

2. Consider Resolution 14-04 Rescinding Resolution 14-01 Requesting that the San Bernardino County Board of Supervisors Authorize and Change the Election of Board Members to the Statewide Consolidated Election Cycle of a Polling Place Election Type, Extending the Present Board Member Terms by One Year to Reflect the Date Change and Rescinding Resolution 09-02

3. Consider Resolution 14-05 Declaring May 2014 Water Awareness Month and Encouraging Water Conservation During the Statewide Drought

4. Consent Calendar
   Matters under the Consent Calendar are to be considered routine and will be enacted in a single motion. There will be no separate discussion of these items unless the Board, staff or the public requests specific items be removed for separate discussion and action before the Board votes on the motion to adopt.

   - Minutes of the Regular Meeting held on March 26, 2014
   - Audit List

5. Items Removed from the Consent Calendar for Discussion or Separate Action

6. Management Reports

   6.1 Operations

   6.2 Finance

   6.3 General Manager

7. Future Agenda Items and Staff Tasks/Directors' Comments and Reports

8. Adjournment

The Board reserves the right to discuss only or take action on any item on the agenda.

Notice of agenda was posted on or before 3:00 p.m., April 18, 2014.

Tamara Alaniz

Tamara Alaniz, Board Secretary

Upon request, this Agenda will be made available in appropriate alternative formats to persons with disabilities, as required by Section 202 of the Americans with Disabilities Act of 1990. Any person with a disability who requires a modification or accommodation in order to participate in a meeting should direct such request to Cindy Fowlkes at (760) 367-7546 at least 48 hours before the meeting, if possible.

Pursuant to Government Code Section 54957.5, any writing that: (1) is a public record; (2) relates to an agenda item for an open session of a regular meeting of the Board of Directors; and (3) is distributed less than 72 hours prior to that meeting, will be made available for public inspection at the time the writing is distributed to the Board of Directors. Any such writing will be available for public inspection at the District offices located at 72401 Hatch Road, Twentynine Palms, CA 92277. In addition, any such writing may also be posted on the District's website.

MINUTES OF A REGULAR MEETING OF THE BOARD OF DIRECTORS OF THE TWENTYNINE PALMS WATER DISTRICT 72401 HATCH ROAD, TWENTYNINE PALMS, CA 92277

APRIL 23, 2014 / 6:00 P.M.

Call to Order and Roll Call
President Moore called the meeting to order at 6:00 p.m., 72401 Hatch Road, Twentynine Palms, California. Those responding to roll call were Directors Bo Bourikas, Chancey Chambers, Suzi Horn, Sam Moore, and Roger Shinaver. Also present were General Manager Tamara Alaniz, Operations Manager Ray Kolisz, Financial Consultant Cindy Byerrum, and District Secretary Cindy Fowlkes.

Pledge of Allegiance
Director Moore led the pledge.

Additions/Deletions to the Agenda
None

Public Comments
None

1. Public Hearing on Proposed Adoption of a Resolution to Update the District Groundwater Management Plan
   Two phone calls were received from the public for clarification. Both callers did not express their opinion for or against the plan.

   1.1 Board to Hear Public Testimony at This Time
   Director Shinaver moved to open the Public Hearing at 6: 03 p.m. , seconded by Director Chambers, and unanimously approved. There being no public testimony to be heard, Director Shinaver moved to close the public hearing at 6:03 p.m., seconded by Director Chambers and unanimously approved.

2. Consider Resolution 14-04 Rescinding Resolution 14-01 Requesting that the San Bernardino County Board of Supervisors Authorize and Change the Election of Board Members to the Statewide Consolidated Election Cycle of a Polling Place Election Type, Extending the Present Board Member Terms by One Year to Reflect the Date Change and Rescinding Resolution 09-02
   As the County Board of Supervisors denied the Board's request for reconsideration, staff recommends that the Board adopt Resolution 14-04 thereby rescinding Resolution 14-01 and reestablishing Resolution 09-02, implementing policies for District elections.

   After discussion, Director Chambers moved to adopt Resolution 14-04, seconded by Director Shinaver and approved by the following roll call vote.

   Ayes: Directors Bourikas, Chambers, Horn, Moore, and Shinaver

Noes: None
Abstain: None
Absent: None

3. Consider Resolution 14-05 Declaring May 2014 Water Awareness Month and Encouraging Water Conservation During the Statewide Drought
Staff recommends the adoption of 14-05 to help educate the public on water conservation and the statewide drought.

Director Bourikas moved to approve Resolution 14-05 declaring May 2014 Water Awareness Month and encouraging water conservation during the statewide drought, seconded by Director Horn and approved by the following roll call vote.

Ayes: Directors Bourikas, Chambers, Horn, Moore, and Shinaver
Noes: None
Abstain: None
Absent: None

4. Consent Calendar
   - Minutes of the Regular Meeting held on March 26, 2014
   - Audit List

Director Chambers moved to approve the Consent Calendar, seconded by Director Shinaver and approved unanimously by Directors Bourikas, Chambers, Horn, Moore, and Shinaver.

5. Items Removed from the Consent Calendar for Discussion or Separate Action
None

6. Management Reports

6.1 Operations
Mr. Kolisz reported that the District responded to 57 Underground Service Alerts, 0 water main leaks, 2 blown meters, performed 3 leak audits, and had 1service line leak and 1 fire hydrant repair. The new valve exerciser arrived. The new emergency generator is expected to arrive in approximately10 weeks. Production continues to trend downward by 9% for the year. The proposed 10 part per billion standard for chromium VI has been forwarded to The Office of Administrative Law for approval. The Department of Health came out after a 10 year hiatus and inspected District wells resulting in an invoice for $25,000 for the mandatory Sanitary Survey.

6.2 Finance
Ms. Cindy Byerrum reported that Springbrook implementation and training is continuing. Water sales continue to decline by approximately $200,000 versus last year's sales. The 2014/2015 fiscal budget will include a possible rate study and in depth analysis to factor in costs for chromium 6 compliance.

6.3 General Manager

Ms. Alaniz clarified the procedure for payment plans. There were approximately 250 people who participated in the Water Education Day. The District will have a booth at the upcoming car show to discuss and promote healthy septic systems. Sprint/Nextel has vacated the cell site on Donnell Hill resulting in a $14,000 loss to the District. AT&T is asking for a reduction in their tower lease agreement.

7. Future Agenda Items and Staff Tasks/Directors' Comments and Reports

Director Shinaver would like staff to continue monitoring the adoption of the Chromium 6 standard.
Director Horn attended the USGS Aquifers 101 seminar.
Director Moore took a tour of CADIZ.

8. Adjournment

On motion by Director Shinaver seconded by Director Chambers and approved by the Board, the meeting was adjourned at 6:32 p.m.

Kerron E. Moore, President
Board of Directors

Attest:

Tamara Alaniz, Board Secretary
Twentynine Palms Water District

ORDINANCE NO. 95

AN ORDINANCE OF THE TWENTYNINE PALMS WATER DISTRICT ADOPTING A GROUNDWATER MANAGEMENT PLAN UPDATE PURSUANT TO WATER CODE SECTION 10750 ET SEQ. AND SUPERSEDING ORDINANCE 91

WHEREAS, the Board of Directors of the Twentynine Palms Water District ("District") has heretofore adopted Ordinance 82 on October 24, 2001, adopting a Groundwater Management Plan and establishing a Groundwater Management Program; and

WHEREAS, the District is a County Water District duly formed and operating pursuant to Section 31000 et seq. of the California Water Code and has the authority to provide water service to customers within its service area; and

WHEREAS, groundwater is a valuable resource within the State of California and particularly within the boundaries of the District and such groundwater must be monitored and evaluated; and

WHEREAS, in recognition of the value of groundwater as a resource, the California State Legislature enacted Water Code section 10750 et seq. ("AB 3030") which encourages local water purveying agencies to manage groundwater resources within their jurisdictions and to develop and implement groundwater management plans; and

WHEREAS, in keeping with the intent of AB 3030 to ensure the safe production, quality and storage of groundwater within its jurisdiction, the District has adopted and implemented a Groundwater Management Plan; and

WHEREAS, the District's Board of Directors has determined that it is prudent to update its Groundwater Management Plan; and

WHEREAS, as required by Water Code Section 10753.2(a) and Government Code Section 6066, notice of a public hearing was published in the Desert Trail September 19, 2013 and September 21, 2013 declaring the District's intent to amend its Groundwater Management Plan; and

WHEREAS, on September 25, 2013, the Board of Directors adopted Resolution No. 13-17 Declaring an Intent to Amend the District's Groundwater Management Plan and as required by Water Code Section 10753.3 and Government Code Section 6066, Resolution 13-17 was published in the Desert Trail on April 17, 2014 and April 24, 2014 and a Groundwater Management Plan Update was subsequently prepared; and

WHEREAS, as required by Water Code Section 10753.5 and Government Code Section 6066, notice of a second public hearing was published in the Desert Trail on April 17, 2014 and April 23, 2014 and a second public hearing was conducted on April 23, 2014 by the Board of Directors of the District in order to receive and consider any protests on whether or not to adopt the Groundwater Management Plan Update. Pursuant to Water Code Section 10753.6(c)(3), the Board of Directors has determined that a majority protest has not been filed and therefore, the Board wishes to take action to adopt the Groundwater Management Plan Update.

NOW, THEREFORE, BE IT ORDAINED by the Board of Directors of the Twentynine Palms Water District as follows:

1. Adoption of the Groundwater Management Plan Update. Pursuant to Water Code Sections 10753 and 10753.6, the District hereby adopts that certain Groundwater Management Plan Update set forth as Exhibit "A" attached hereto and incorporated herein by reference. Pursuant to the Groundwater Management Plan Update, the District hereby establishes a Groundwater Management Program as set forth in the Plan attached hereto as Exhibit "A."

2. Ordinance Shall be Superseding. All ordinances, resolutions, or administrative actions by the Board, or parts thereof that are inconsistent with any provision of this Ordinance are hereby superseded only to the extent of such inconsistency. As of the effective date of this Ordinance, Ordinance 91 shall be of no further force or effect.

3. Effective Date. This Ordinance shall be in full force and effect immediately upon adoption.

4. Publication of Ordinance. The Secretary of the District is hereby authorized and directed to publish this Ordinance in the Desert Trail within fifteen (15) days from the date of adoption. Upon written request, the Secretary shall also provide any interested persons with a copy of this Ordinance.

PASSED, APPROVED AND ADOPTED this 28th day of May 2014 by the following vote:

Ayes:	Directors Bourikas, Chambers, Horn, Moore, and Shinaver
Noes:	None
Abstain:	None
Absent:	None

Kerron E. Moore, President
Board of Directors

Attest:

Tamara Alaniz, Board Secretary
Twentynine Palms Water District

Appendix B

Monitoring Plan

Appendix B: Monitoring Plan

The appendix outlines the TPWD monitoring plan that includes components relating to the monitoring and management of groundwater levels, groundwater quality, and inelastic land surface subsidence. A map and description of monitoring sites indicating the type of data collected is provided.

B.1 Overview

The District currently has a groundwater monitoring program. The main purpose of this program is to provide long-term tracking of groundwater levels and quality, identify trends, and trigger management steps to protect groundwater quality and quantity.

TPWD collects groundwater data to evaluate changes in groundwater conditions in the area. The TPWD Groundwater Monitoring Program provides a systematic procedure for data collection to support the District in assessing the hydrologic conditions in the Twentynine Palms area. The data collected for the groundwater monitoring program are collected from multiple sources throughout the year. In general, these sources include:

- data collected by Twentynine Palms Water District;
- data compiled by other agencies (e.g., USGS); and,
- data for subsidence monitoring.

These data are compiled into the District's groundwater management database, and are summarized and presented in the District's Annual Groundwater Management Report. The Annual Report does not contain a comprehensive listing of the District's database, but the complete updated database is made available for download in PDF format directly from the TPWD website. The database can be accessed at the following web address: www.TPWD.org/index/District_Reports.

B.2 Data Collection by TPWD

The locations, type and frequency of the data collected have changed over time to meet the needs of the District. Therefore, the Groundwater Monitoring Program is reviewed and updated regularly as part of the annual groundwater management reporting process. The data collected under this program does not fall under any regulatory requirements. Therefore, the data collection recommendations will be adhered to a closely as possible; however, variations from the recommended frequency may occur due to scheduling, budgetary, access or other issues.

B.2.1 Groundwater Levels

The District currently operates nine production wells and 17 monitoring wells. Groundwater static levels and pumping levels are monitored on a monthly basis for all production wells. TPWD maintains records of historical groundwater elevations from the 1940s to the present. These have included the TPWD production wells and monitoring wells and are provided to the CASGEM reporting database.

Groundwater levels are measured at least monthly in all TPWD production wells. Water levels are measured in all production wells under both pumping (dynamic) and non-pumping (static) conditions. Production well water level measurements provide important information on: 1) drawdown in response to pumping; 2) water level recovery when pumping stops; and, 3) trends over time in static water levels. Therefore, continuation of monthly measurements in all production wells will continue. These wells are listed on Table B-1 and shown on Figure 6-1.

B.2.2 Groundwater Pumping

Tracking groundwater pumping from the TPWD groundwater production wells is an important component in assessing the water supply. The locations of TPWD production wells are shown on Figure 6-1. Groundwater pumping is metered by TPWD and recorded daily. For the Groundwater Management Summary, a monthly total is recorded in the database.

B.2.3 Water Quality

TPWD monitors the active groundwater producing wells for a number of constituents with a frequency that complies with the Safe Drinking Water Act requirements as outlined in the California Code of Regulations, Title 22 requirements. Groundwater quality monitoring for fluoride and arsenic is conducted monthly and monitoring for other constituents occurs according to the requirements set by California Department of Public Health (DPH) Drinking Water Monitoring Schedule for all production wells. The Fluoride Removal Water Treatment Plant monitoring wells are also monitored on a monthly basis and various District-wide monitoring wells are monitored on a quarterly basis. These levels are collected on a timed schedule each month to ensure consistent data collection. All groundwater level records are kept at the District Office.

TPWD actively incorporates new constituents into the monitoring program as a result of new regulatory actions or trends in the water quality industry (e.g., hexavalent chromium was added to the monitoring list in 2013). All water quality results are reported to the CDPH Division of Drinking Water and Environmental Management.

TPWD's monitoring program consists of sampling both the raw and treated water from production wells, monitoring of shallow groundwater, and monitoring of surface water in the region. TPWD also collects and analyzes samples for general minerals, physical characteristics, select metals, and organic chemicals often associated with industrial or commercial sites.

B.3 Data Collected by Others

TPWD records are supplemented by data obtained from other agencies. These data are often available through internet sites that allow for the public access of these data. Several of these data sets have been incorporated into the TPWD Groundwater Monitoring Program. New data will be incorporated as it is made available.

The USGS currently collects groundwater level monitoring primarily associated with the Marine Base that includes several wells in the Twentynine Palms area. These are posted on the DWR Water Data Library web and can be downloaded from the following web link: http://www.water.ca.gov/waterdatalibrary/. These data are also posted on the CASGEM web site and can be downloaded from http://www.water.ca.gov/groundwater/casgem/.

Precipitation data are available from several sources in the area. The Desert Research Institute (DRI) Western Regional Climate Center (WRCC) publishes monthly average maximum and minimum temperatures for National Climate Data Center (NCDC) cooperative network stations in the area. Data for the Twentynine Palms Station (049099) is found at the web site http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca9099. San Bernardino County (SBCO) maintains records from many stations within the county, with many more precipitation records than temperature records with over 30 stations in or near the management area.

Standard Monthly Average ETo determined from CIMIS Station No. 118 Cathedral City. These data serve as a reference for TPWD evapotranspiration data and are available online at www.cimis.water.ca.gov/cimis/welcome.jsp. The District will pursue the possibility of establishing a CIMIS station within its service area to generate more accurate ET data.

B.4 Data for Subsidence Monitoring

Land subsidence has not been identified as an issue within the Twentynine Palms area; however, playa lake deposits such as those found in the Mesquite Lake and Mainside Subbasins have been noted as sources of land subsidence in Antelope Valley and other similar areas. In the Indian Cove, Fortynine Palms and Eastern Subbasins, no compressible sediment layers are known to exist; therefore, there it is unlikely that subsidence would occur in these locations.

Therefore, the District will establish a baseline elevation assessment of historical US Geodetic Survey benchmark surveying data. Available benchmark data within and adjacent to the District was downloaded from the National Geodetic Survey website (http://www.ngs.noaa.gov/). It is recommended that the District have a competent land surveyor evaluate the historical benchmark data with respect to potential subsidence. Future assessments will be done periodically to verify whether land subsidence is occurring or not. Methods for future assessments will continue as benchmark surveying, but the District will evaluate other potential methods that may provide monitoring for land subsidence in a more cost-effective manner.

B.5 Review and Revision

The locations, type and frequency of the data collected have changed over time to meet the needs of the District. Therefore, the Groundwater Monitoring Program is reviewed and updated regularly as part of the ongoing groundwater management reporting process. An annual review of this Groundwater Level Monitoring Plan is recommended to confirm that:

- the data being collected by the Program is still meeting the groundwater management needs of TPWD;
- the wells and sampling locations included continue to provide reliable data and remain readily accessible to TPWD;
- clear protocols exist to ensure the accuracy of collected data; and,
- no unnecessary or extraneous data are collected.

TABLE B.1 – Groundwater Monitoring Program well locations and sampling frequencies.

Well	Type	Subbasin	Monitoring Frequency			
			Water Level	Fluoride	Nitrate	Title 22
WTP-1	Active	Mesquite Lake	Monthly	Monthly	Annual	Per Drinking Water Monitoring Schedule
1B	Monitoring	Eastern	Monthly	N/S	N/S	N/S
2	Monitoring	Eastern	Quarterly	N/S	N/S	N/S
4	Inactive	Fortynine Palms	Monthly	N/S	Annual	Per Drinking Water Monitoring Schedule
6	Inactive	Indian Cove	Monthly	N/S	N/S	Per Drinking Water Monitoring Schedule
7	Monitoring	Indian Cove	Monthly	N/S	N/S	N/S
9	Active	Indian Cove	Monthly	Monthly	Annual	Per Drinking Water Monitoring Schedule
10	Inactive	Indian Cove	Monthly	N/S	N/S	Per Drinking Water Monitoring Schedule
11	Active	Indian Cove	Monthly	Monthly	Annual	Per Drinking Water Monitoring Schedule
12	Active	Indian Cove	Monthly	Monthly	Annual	Per Drinking Water Monitoring Schedule
14	Active	Fortynine Palms	Monthly	Monthly	Annual	Per Drinking Water Monitoring Schedule
15	Active	Indian Cove	Monthly	Monthly	Annual	Per Drinking Water Monitoring Schedule
16	Active	Eastern	Monthly	Monthly	Annual	Per Drinking Water Monitoring Schedule
17	Active	Fortynine Palms	Monthly	Monthly	Annual	Per Drinking Water Monitoring Schedule
18	Monitoring	Mesquite Lake	Quarterly	N/S	N/S	N/S
M#1	Monitoring	Mesquite Lake	Monthly	N/S	N/S	N/S
M#2	Monitoring	Mesquite Lake	Monthly	N/S	N/S	N/S
M#3	Monitoring	Mesquite Lake	Monthly	N/S	N/S	N/S
M#4	Monitoring	Mesquite Lake	Monthly	N/S	N/S	N/S
M#5	Monitoring	Mesquite Lake	Monthly	N/S	N/S	N/S
N-1	Monitoring	Mesquite Lake	Monthly	N/S	N/S	N/S
N-2	Monitoring	Mesquite Lake	Monthly	N/S	N/S	N/S
N-3	Monitoring	Mesquite Lake	Monthly	N/S	N/S	N/S
N-4	Monitoring	Mesquite Lake	Monthly	N/S	N/S	N/S
N-5	Monitoring	Mesquite Lake	Monthly	N/S	N/S	N/S
N-6	Monitoring	Mesquite Lake	Monthly	N/S	N/S	N/S
S-1	Monitoring	Mesquite Lake	Monthly	N/S	N/S	N/S
S-2	Monitoring	Mesquite Lake	Monthly	N/S	N/S	N/S
S-3	Monitoring	Mesquite Lake	Monthly	N/S	N/S	N/S
S-4	Monitoring	Mesquite Lake	Monthly	N/S	N/S	N/S
S-5	Monitoring	Mesquite Lake	Monthly	N/S	N/S	N/S

Appendix C

Hydrologic Water Balance

Appendix C: Hydrologic Water Balance

Appendix C provides a more detailed discussion of each of the components of the hydrologic water balance. This shows the level of understanding that is currently available for determining groundwater inflows and outflows.

C.1 Water Balance Summary

The water balance was performed for the groundwater basins underlying the District service area, including the portions of the Indian Cove, Fortynine Palms, Eastern, Mesquite Lake and Mainside Subbasins. The following discussion provides background information and assumptions used for quantifying each water balance component. Also described is the background on the various components of the water balance, including the sources of data and how each component was estimated. A more detailed description of the data sources can be also found in the Groundwater Study for the Mesquite Lake Subbasin (Kennedy/Jenks, 2010).

The water balance components were estimated based on various data sources, including the hydrogeologic knowledge of the basins from previous studies. Each component is evaluated based on the long-term average values over 30 years for the period from 1984 to 2013. The long-term average characterizes variations of the groundwater system over various hydrological years. The following discussion provides more detail of each of the water budget components.

C.2 Climate

Climatic factors including precipitation, temperature and evapotranspiration are the key controlling factors for the natural hydrologic water balance components. Table C-1 provides a climatic summary per month based on data from the National Weather Service and state agencies.

The Twentynine Palms area is quite dry, with average annual precipitation of less than 5 inches, most of which occurs during the winter months (Table C-1). Most of this precipitation is lost through evaporation; the total average monthly evapotranspiration (ETo) rate of a desert area is 57 inches per year (Table C-1). Precipitation follows a generally bimodal distribution, with most annual precipitation falling during the summer monsoon and the winter wet season. Summer storms are intense and of relatively short duration, and may lead to flash floods but are unlikely to contribute to recharge due in large part to the high potential evapotranspiration (ET) during the hot summer months and the lack of storm water retention. Winter storms are gentler and of longer duration, and are more likely to contribute to recharge.

Temperatures range from 20 to 60°F during the winter and from 80 to 110°F degrees during the summer. Throughout the area, high temperatures tend to decrease with increasing elevation, while low temperatures do not vary greatly with elevation.

TABLE C-1
CLIMATE DATA

Months	Standard Monthly Average ETo[(a)] (inches)	Average Rainfall[(b)] (inches)	Average Max. Temperature[(b)] (Fahrenheit)	Average Min. Temperature[(b)] (Fahrenheit)
January	1.6	0.5	63	36
February	2.2	0.4	68	39
March	3.7	0.4	74	43
April	5.1	0.1	82	49
May	6.8	0.1	91	57
June	7.8	0.0	101	65
July	8.7	0.5	105	72
August	7.8	0.7	103	70
September	5.7	0.4	98	64
October	4.0	0.3	86	53
November	2.1	0.3	72	42
December	1.6	0.5	63	35
Annual	57.1	4.2	84	52

Notes: (a) Standard Monthly Average ETo determined from CIMIS Station No. 118 Cathedral City.
(b) Twentynine Palms NWS Cooperative Network Station (049099).

C.3 Groundwater Inflows

Inflows replenish water to the aquifer system through various routes and processes. This section defines and discusses the different types of inflow. The total inflow is discussed below.

C.3.1 Direct Precipitation Recharge

Direct recharge accounts for recharge of precipitation that falls on the basin floor, percolates downward through the vadose (unsaturated) zone, and eventually reaches the water table. Because the Twentynine Palms area is very arid, potential evapotranspiration (ET_0) far outstrips the actual amount of precipitation; Nishikawa et al. (2004) noted that ET_0 is about 66.5 inches per year (in/yr) in the Joshua Tree area, while precipitation is about 4.8 in/yr (e.g. ET_0 is nearly 14 times precipitation).

Direct recharge has been estimated in several different studies. Nishikawa et al. (2004) used a variety of methods to try to constrain direct recharge in the Joshua Tree area to the west of the study area, including temperature, matric potential, soil water chemistry, and a watershed model. The results of their physical measurements indicated that recharge probably does not occur on the basin floor away from stream channels. Their watershed model produced recharge rates of 0 to 0.0001 in/yr on the basin floor away from the stream channels, and 0.0001 to 0.01 in/yr at the Coyote Lake playa.

Kennedy/Jenks (2010) used a modified Maxey-Eakin approach to estimate recharge throughout the study area. This analysis reached the same conclusion as did Nishikawa et al.: direct recharge on the basin floor is, for all intents and purposes, zero. However, the method used is a very coarse one, and sets recharge to zero wherever precipitation is less than 8 inches per year, an area that includes almost the entire region aside from the highest mountains. Li and Martin (2011) reached a

similar conclusion to the above two studies regarding direct recharge, stating that the amount of precipitation that falls on the basin floor is too small to induce recharge. Kennedy/Jenks (2013) lumped basin floor recharge and mountain front recharge by using water budget numbers from the earlier Groundwater Study (Kennedy/Jenks, 2010). The amount contributed to recharge from precipitation on the basin floor is zero.

For this study, direct recharge was calculated based on the range in precipitation recharge typical of the basin floor according to the watershed model of Nishikawa et al. (2004), 0 to 0.0001 in/yr. The total area of basin floor in the five subbasins considered for this study is approximately 66,000 acres, so the range in basin floor recharge is 0 to 0.5 afy.

C.3.2 Irrigation Return Flows

Return flow from agricultural or landscape irrigation can be a significant contributor to the water budget of a basin. Within the study area, agriculture is not present, but there are a few sites with regular and significant irrigation (Luckie Park in the Mesquite Lake Subbasin, Knott Sky Park in the Fortynine Palms Subbasin, and the Desert Winds Combat Center Golf near the intersection of the Mesquite Lake, Mainside, and Deadman Subbasins). Return flows from these locations of irrigation have not been included in any of the models to date. Li and Martin (2011) note that ignoring these return flows is a limitation in their numerical model. They also note that, until around 2000, there was no indication that return flows had yet passed through the unsaturated zone and reached the water table in the regional aquifer, meaning that the return flows must be maintained for many years before they actually can pass through the thick unsaturated zones of the study area and lead to recharge to the water table. Irrigation return flow was assumed to be effectively zero.

C.3.3 Septic Return Flows

Some of the groundwater produced and delivered to customers, returns to the subbasins through infiltration and percolation of irrigation water and of septic tank discharges. As the majority of water use is from the residential development and the outdoor water use is generally small, residential indoor water use (and in turn residential wastewater) is a large contributor to septic systems. Total residential and non-residential septic return flow for the current conditions, based an assumption of an 80 percent water to sewer conversion, is estimated at 1,917 afy. Using the assumptions for the 2035 projected water use (Kennedy/Jenks, 2011); the estimated total septic return flow is 2,981 afy. Li and Martin (2011) and Kennedy/Jenks (2010) did not consider septic return flow in their models.

C.3.4 Surface Water

Surface water recharge is the recharge that occurs as infiltration of streamflow through streambeds cutting across the basin floor. There are no perennial streams within the study area, but there are several large dry streambeds that experience intermittent flows. Previous studies have taken different approaches to estimating this stream infiltration.

The stream channels are ephemerally flowing streams with runoff originating in the adjoining mountains in response to the largest storms. However, very little surface flow leaves this area (Troxell *et al*, 1954). Nishikawa *et al* (2004) evaluated stream gage data in the region including the Fortynine Palms Creek. Over the period of record, Fortynine Palms Creek had measurable flow on an average of 2.4 days per year, totaling 74.3 afy. These four gauges show streamflow to be highly intermittent, with the duration of surface flows limited to only 1 to 2 days in response to storms that

primarily occurred in the summer months in response to monsoonal thunderstorms (Nishikawa *et al*, 2004).

Because Kennedy/Jenks (2010) used the modified Maxey-Eakin approach to estimate total recharge, there is no specific estimate available for streamflow infiltration. Theoretically, the Maxey-Eakin method includes streamflow infiltration in its total basin recharge, in addition to direct recharge, mountain front recharge, and mountain block recharge.

Li and Martin (2010) used the watershed model of Nishikawa et al. (2004) to estimate streamflow infiltration into the Mesquite Lake Subbasin; this area was included in the original model, but was not published in the 2004 report. Streamflow infiltration was estimated to be 165 afy within the Mesquite Lake Subbasin, mostly along the Mesquite Lake Wash and Twentynine Palms Channel. This study implies that recharge largely results from summer streamflow. Given the seasonal discrepancy described above for the watershed model, the bulk of the recharge occurring in the summer may be more realistic.

Stream gauge data are available for the Fortynine Palms Creek gauge (USGS #10253350) from October 1962 to September 1971. Measured flow occurred in 7 of the 9 water years with available data, with average annual flow of about 95 afy for those years. Flows varied from 7 to 155 afy. These data were compared to water-year precipitation totals from the National Climatic Data Center (NCDC) station #49099 at Twentynine Palms over the same period. The correlation between the two is not strong ($r^2 = 0.273$, $p = 0.15$), but it was believed to be useful as an initial tool for estimating streamflow over the period covered by the groundwater model. The correlation equation was applied to the available annual precipitation record, covering the period from 1936 to 2012; any estimated streamflow less than zero was set to zero. Average streamflow was estimated to be 81 afy, with a median streamflow of 66 afy, and varied from 0 to 314 afy (6 out of 77 years had no streamflow).

C.3.5 Mountain Front Recharge

Mountain front recharge (MFR) is recharge that occurs at the boundary between the alluvial basin sediments and the crystalline bedrock of the basin-bounding mountains. It must be noted that there are several different ways to define MFR, and the conceptual understanding of MFR for the purpose of this water balance is equivalent to MFR in Wilson and Guan (2004). Under this definition, MFR is made up of that water that runs off the mountains as surface runoff and enters the alluvium upon leaving the mountains.

Nishikawa et al. (2004) does not provide specific estimates of MFR from their numerical model, instead grouping it with the other recharge components. However, they do state that “simulated recharge rates between 0.1 and 0.5 in/yr occurs [sic] along the flanks of the Little San Bernardino Mountains.” They calculated recharge throughout the topographic contributing area to their groundwater model, demonstrating that higher recharge rates are present at the bedrock-alluvium interface than exist on either the exposed bedrock or basin floor. They speculate that any recharge that occurs outside of the numerical model domain (the main part of the groundwater basin) is eventually lost to evapotranspiration (ET) rather than reaching the groundwater basin, but there is no particular evidence presented for this.

As stated above, Kennedy/Jenks (2010) estimated recharge using a modified Maxey-Eakin method. The conceptual understanding of recharge for this analysis was that the recharge represents MFR as defined above. Calculated MFR varied from 0 to 54 afy in the Indian Cove Subbasin, 7 to 212 afy

in the Fortynine Palms Subbasin, 2 to 190 afy in the Eastern Subbasin, 0 to 8 afy in the Mesquite Lake Subbasin, and 0 to 10 afy in the Mainside Subbasin, for a total of 9 to 474 afy for the subbasins.

Li and Martin (2011) do not directly address MFR because their groundwater model does not abut the major basin-bounding mountain ranges. However, they calculated that 510 afy of groundwater inflow passes from the Indian Cove, Fortynine Palms, and Eastern Subbasins into the Mesquite Lake Subbasin, and presumably this would mostly be made up of MFR. Kennedy/Jenks (2013) estimates a low recharge total of 8 afy based on the numerical groundwater model of Kennedy/Jenks (2010). As with the earlier study, this total can be assumed to represent MFR.

C.3.6 Mountain Block Recharge

Mountain block recharge (MBR) is that portion of recharge that occurs through the bedrock of the basin-bounding mountain ranges. It discharges from the bedrock itself into the basin alluvium, rather than flowing off the bedrock on or near the surface. For this report, MBR is conceptually similar to the definition of MBR in Wilson and Guan (2004). MBR has not been specifically considered in any of the previous reports discussed above. In fact, Nishikawa et al. (2004) speculated that the recharge they simulated to occur outside of the alluvial basins was largely lost to ET before it could discharge to the alluvium as MBR. However, some of this mountain block water must make its way to the alluvial basin.

Fugro West and Cleath (2002) used a Darcy's Law approach to estimate groundwater inflow from the basin-bounding mountains surrounding the Paso Robles Groundwater Basin, which can be considered to be MBR under the definition used in this report. As a first approximation, we assume that the Little San Bernardino and Pinto Mountains can be considered hydraulically equivalent to the fractured granite bounding the Paso Robles Groundwater Basin, which Fugro West and Cleath (2002) give a hydraulic conductivity of 0.1 gallons per day per square foot (gpd/ft^2), a moderate value in their estimates. Their results indicated approximately 50 ft^3 of MBR per linear foot of mountain front length. Using this value, MBR into the three southern subbasins was calculated to be 56 afy into the Indian Cove Subbasin, 34 afy into the Fortynine Palms Subbasin, and 49 afy into the Eastern Subbasin, for a total of 139 afy.

C.3.7 Groundwater Inflow

Groundwater inflow represents water that enters a subbasin by flowing laterally within the saturated zone from another subbasin. Groundwater inflow in the study area is restricted somewhat by the presence of low-permeability faults and other barriers that help to compartmentalize the various subbasins.

Nishikawa et al. (2004) created a numerical model that included the Joshua Tree and Copper Mountain Subbasins, which border the Indian Cove and Mesquite Lake Subbasins, respectively, to the west. They allowed groundwater to leave their model along the eastern boundary of the Joshua Tree Subbasin and the far northern boundary of the Copper Mountain Subbasin. Their model indicated that 199 afy (207 under pre-development conditions) leaves the two subbasins as groundwater outflow, and that it all flows out the northern boundary of the Copper Mountain Subbasin. They state that this groundwater flows into the Surprise Spring Subbasin, but it is unclear whether or not this would actually occur, as the Transverse Arch is still present to the north of this point. The groundwater flow could also pass east through the space between Copper Mountain and

the Transverse Arch into the Mesquite Lake Subbasin, although to do so it would have to cross the Copper Mountain Fault.

Kennedy/Jenks (2010) based their water budgets on all of the available USGS reports for the area. Conceptually, the Indian Cove Subbasin receives groundwater inflow from the Joshua Tree Subbasin to the west, while the Fortynine Palms and Eastern Subbasins do not receive inflow from other basins. The Mesquite Lake Subbasin receives inflow from the Indian Cove, Fortynine Palms, Eastern, Deadman Lake, Surprise Spring, and Copper Mountain Subbasins. Using a Darcy's Law approach, they estimated that the Indian Cove Subbasin receives about 36 afy of inflow from the Joshua Tree Subbasin, while the Mesquite Lake Subbasin receives a total of about 730 afy of inflow from the various surrounding subbasins.

Li and Martin (2011) also estimated groundwater inflow to the Mesquite Lake Subbasin. In contradiction to Nishikawa et al. (2004), they stated that 207 afy of groundwater leaves the Copper Mountain Subbasin and flows into the Mesquite Lake Subbasin between Copper Mountain and the Transverse Arch. They also give a groundwater inflow of 8 afy from the Deadman Lake Subbasin (and no inflow from the Surprise Spring Subbasin), much lower than the 577 afy estimated by Kennedy/Jenks (2010) for inflow from the Deadman Lake and Surprise Spring Subbasins. Groundwater inflow to the Mesquite Lake Subbasin from the three southern subbasins (Indian Cove, Fortynine Palms, and Eastern) was calculated to be about 510 afy based on their estimates of inflow from other subbasins (Copper Mountain and Deadman) and published estimates of total ET at Mesquite Lake, and is far higher than the estimates of Kennedy/Jenks (2010) from the same three subbasins (18 afy).

C.4 Groundwater Outflows

Outflows remove water from the aquifer system through various routes and processes. This section defines and discusses the different types of outflow individually. The outflow components are discussed below.

C.4.1 Pumping Wells

As development in the study area has continued, groundwater extraction by wells has become the chief outflow component in the aquifer water balance. This component should be the easiest to estimate, but much of the groundwater extraction in the study area is unmetered, and hence unknown. The District provides pumping volumes, but many other groundwater users exist in the study area, and do not measure or report their pumping.

Kennedy/Jenks (2010) used records and information from TPWD to estimate well pumping in the four subbasins covered by their report. Over their study period (1984 to 2008), they estimated average pumping at 1,286 afy in the Indian Cove Subbasin, 1,117 afy in the Fortynine Palms Subbasin, 366 afy in the Eastern Subbasin, and 774 afy in the Mesquite Lake Subbasin. TPWD did not produce drinking water from the Mesquite Lake Subbasin until 2003, so the average pumping does not accurately reflect current conditions (a steady production rate of 580 afy was assumed for the Roadrunner Dunes Golf Course and Luckie Park). In 2008, the last year included in the water balance, total pumping in the Mesquite Lake Subbasin was 1,530 acre-feet. In their water balance, domestic well pumping is ignored.

Li and Martin (2011) note the TPWD pumping in the Mesquite Lake Subbasin, but not any other pumping in the subbasin. They do mention that the Golf Course Well operated by the Marine Corps

is located at the northern edge of the Mainside Subbasin, and has been pumping since the early 2000s. The Golf Course Well was estimated to have produced about 540 acre-feet in 2008. Kennedy/Jenks (2013) based groundwater pumping in their water balance on the earlier groundwater model (Kennedy/Jenks, 2010). The estimated pumping of 290 afy each for the Roadrunner Dunes Golf Course and Luckie Park are included, as is the estimated pumping of 540 afy in the Mainside Subbasin.

C.4.2 Evapotranspiration

Evapotranspiration (ET) is the transformation of liquid water to water vapor through either transpiration by plants or evaporation of standing or soil water. Where the water table is close to the land surface, ET can be supplied by the saturated zone of the aquifer; where the water table is out of reach of the root zone; ET is derived only from soil moisture, and has no bearing on the groundwater budget.

As noted above, water tables in the study area tend to be far beneath the land surface, so ET from the water table is limited. Kennedy/Jenks (2010) used existing reports to estimate ET within the study area. They determined that ET was about 550 afy at Mesquite Lake before development, and has likely decreased to around 340 afy due to lowering of the water table. ET at the Oasis of Mara was estimated to be up to about 75 afy, but there has been no rigorous estimate. Concentrations of phreatophytic vegetation (vegetation directly taps the water table to survive) at the Oasis of Mara and Mesquite Dry Lake (and Mesquite Springs) within the District (Riley and Worts, 1953).

Li and Martin (2011) used earlier estimates as the basis for their conceptual understanding of ET in the Mesquite Lake Subbasin, giving a total of 890 afy from transpiration and soil evaporation. This total was used to calibrate boundary conditions in their groundwater model, so the model cannot be used to provide an independent estimate. Kennedy/Jenks (2013) included ET in their water balance, and based it on the results of the groundwater model of Kennedy/Jenks (2010). This resulted in about 20 afy of ET in the Eastern Subbasin and 1,630 afy in the Mesquite Lake Subbasin. Based on these previous studies, ET varies from 20 to 75 afy at the Oasis of Mara and 340 to 1,630 afy at Mesquite Lake.

C.4.3 Groundwater Outflow

Groundwater exchanges between the southern subbasins and the Mesquite Lake Subbasin were discussed in the Groundwater Inflow section above (Section 6.4.1.6). This section only covers groundwater exchanges that leave the set of subbasins included in the study area.

Under the conceptual model of Kennedy/Jenks (2010), groundwater from the three southern subbasins flowed out to the Mesquite Lake Subbasin, and groundwater from this subbasin flows out into the Dale Basin to the east. Under their water balance approach, 114 afy flowed from the Mesquite Lake Subbasin to the Dale Basin. Their numerical model simulated a flow of 519 afy across this boundary. Note that the Mainside Subbasin is not included in either the water budget or the numerical model.

Under the conceptual model of Li and Martin (2011), groundwater flows from the Mesquite Lake Subbasin into the Mainside Subbasin, from where it may enter the Dale Basin. However, they state that only a minor amount of groundwater flows from the Mesquite Lake Subbasin to the Mainside Subbasin.

C.4.4 Springs

Springs are locations where the water table intersects the ground and groundwater is discharged to the surface. Once there, this water can re-infiltrate, be utilized as a water source, or be lost to ET. Because the study area is very dry, water tables are typically well below the ground surface, so springs are very rare within the alluvial basins. Prior to development, springflow occurred at the Oasis of Mara and Mesquite Springs, where faults force groundwater upward to the surface. However, there have been no rigorous estimates of flow at these springs. Because of lowered water tables, one can assume that there is no longer any flow occurring at these springs.

Appendix D

Groundwater Model Update

Appendix D: Groundwater Model Update

This section describes the changes that were made to the existing model of Kennedy/Jenks (2010) and discusses the updated model calibration.

D.1 Changes to the Existing Model

The existing groundwater model of Kennedy/Jenks (2010) was updated for this analysis to revise the components of the water budget and to include information from the USGS model of the Mesquite Lake Subbasin (Li and Martin, 2011). The sources used in updating these parameters include USGS numerical models that cover or abut parts of the study area (Nishikawa et al., 2004 and Li and Martin, 2011), the Mesquite Lake Groundwater Study (Kennedy/Jenks, 2010), and the Twentynine Palms Groundwater Protection Plan (Kennedy/Jenks, 2013); estimates of various water budget components from the numerous previous USGS studies in the area are collected in the Mesquite Lake Groundwater Study and the two USGS numerical model reports.

The primary change was to update the recharge coverage to combine five different components: direct recharge, mountain front recharge, mountain block recharge, streamflow infiltration, and septic return flow (see Appendix C for estimates of these components). A steady direct recharge rate of 0.5 in/yr was assumed everywhere. Mountain front recharge rates (varies over time) and mountain block recharge rates (steady over time) were applied to a narrow zone along the Little San Bernardino and Pinto Mountains in the Indian Cove, Fortynine Palms, and Eastern Subbasins. Streamflow infiltration (varies over time) is applied along the bed of Fortynine Palms Creek within the Mesquite Lake Subbasin. Septic return flow (steady over time) is based on land use maps and calculations to support the GPP.

The Mesquite Dry Lake was updated to simulate evapotranspiration in the area of the using both the evapotranspiration package and groundwater discharge due to evaporation using a drain (DRN) boundary condition. This type of boundary condition allows for the setting of a drain stage elevation and conductance value. In the case of the drain boundaries added to the updated model, the stage was set to an elevation near the ground surface, and the conductance was set to a sufficiently large value (5,000 square feet per day, ft^2/d) that groundwater was allowed to flow freely out of the aquifer and into the drain. The DRN package does not allow for water to be routed; instead, it is simply removed from the model. This approach was also taken in the Mesquite Dry Lake area by Li and Martin (2011).

With respect to physical changes to the model, the far northwestern section of the Mesquite Lake Subbasin (west of the Surprise Spring Fault) was deactivated in the updated model. This was done because much of this area was simulated as being dry, and it was difficult to introduce groundwater flowing from the Copper Mountain Subbasin to the Mesquite Lake Subbasin, as cells were widely inactive. This groundwater flow was instead introduced further into the Mesquite Lake Subbasin, east of the Surprise Spring Fault and west of the Elkins fault.

Groundwater inflow to the model was simulated using specified flux boundaries, assuming the estimates given in Appendix C. These boundaries were introduced along the interface between the Joshua Tree and Indian Cove Subbasins, between the Copper Mountain and Mesquite Lake Subbasins, and between the Deadman and Mesquite Lake Subbasins.

D.2 Groundwater Model Setup

Aquifer parameters (horizontal and vertical hydraulic conductivity, specific yield, and storage coefficient) for the Indian Cove, Fortynine Palms, and Eastern Subbasins were updated to those of the Joshua Tree Subbasin to the west in the groundwater model of Nishikawa et al. (2004). Those for the Mesquite Lake Subbasin used the parameters of the Li and Martin (2011) model (Table D-1).

TABLE D-1
GROUNDWATER MODEL AQUIFER PARAMETER SUMMARY

Subbasin	Model Layer	K_h (ft/d)	K_z (ft/d)	S_y (-)	S_s (ft^{-1})
Indian Cove	1	60	0.60	0.25	3×10^{-6}
	2	5	0.05	0.16	1×10^{-6}
	3	0.5	0.005	0.05	1×10^{-6}
Fortynine Palms	1	60	0.60	0.25	3×10^{-6}
	2	5	0.05	0.16	1×10^{-6}
	3	--	--	--	--
Eastern	1	60	0.60	0.25	3×10^{-6}
	2	5	0.05	0.16	1×10^{-6}
	3	--	--	--	--
Mesquite Lake	1	44	0.44	0.25	3×10^{-6}
	2	24	0.24	0.16	3×10^{-6}
	3	0.2	0.002	0.05	1×10^{-6}

Notes:
Kh = Horizontal hydraulic conductivity
Kz = Vertical hydraulic conductivity
Sy = Specific yield
Ss = Specific storage
-- = Layer not active in this subbasin

The alluvial fan deposits are the principal water-bearing unit in the region. Li and Martin (2011) divide the upper alluvial fan deposits into two units based on their characteristics. The lower unit (QTf1) consists of silty sand and gravel, which are interbedded with moderate amounts of silt and clay that were deposited on the lower slopes of the alluvial fans. The lower unit is irregularly cemented with calcium carbonate and is moderately consolidated. The upper unit (QTf2) consists of unconsolidated pebbly sand, pebble-cobble gravel, and minor silt and clay that were mainly stream deposits. In general, QTf2 is more permeable than QTf1 because of the predominance of the coarser-grained deposits and the lack of cementation. The thickness of the upper alluvial fan deposits reaches about 400 feet in the Joshua Tree Subbasin, with a saturated thickness of 300 feet. K for this unit varies from 5 to 60 ft/d, and T varies from 600 to 56,000 ft^2/d. S_y varies from 0.08 to 0.23.

The thickness of the lower Quaternary alluvium varies from zero along the basin margins to a maximum of 400 feet in the western Indian Cove and eastern Mesquite Lake Subbasins and throughout much of the Joshua Tree Subbasin. K for this unit varies from 0.5 to 60 ft/d, and T varies from about 200 to 36,000 ft^2/d. S_y of these sediments varies from 0.12 to 0.14, while S_s is about $1 \times 10\text{-}6$ ft^{-1}.

The maximum saturated thickness of the Tertiary alluvium in the Twentynine Palms area is about 1,700 feet along the western edge of the Indian Cove Subbasin and reaches up to 3,000 feet, according to Nishikawa *et al.* (2004). Sediments that have become deeply buried tend to be more consolidated, compacted, and cemented with depth. Therefore, the deepest sediments tend to be less transmissive of water than the upper sediments. The hydraulic conductivity, *K*, is around 0.5 to

1 feet per day (ft/d), while the transmissivity, *T*, is on the order of 750 square feet per day (ft^2/d). The specific yield (S_y) of this unit is 0.05, while the specific storage (S_s) is estimated to be 1×10^{-6} ft^{-1}. Because of the low transmissivity and specific storage of this unit, it is generally considered fairly unimportant as a source of water (Londquist and Martin, 1991).

D.3 Historical Model Calibration Summary

The updated model was re-calibrated with the updated boundary conditions and parameter estimates noted above. Calibration was achieved largely by varying the conductance of horizontal flow barriers (i.e. faults) within the model. The calibration was performed using a statistical analysis to compare the difference or residual between measured and simulated groundwater elevations. A summary of this analysis includes:

- The correlation coefficient to simulate groundwater elevations is 0.9623 based on 554 groundwater elevation measurements over the 25-year base period from 50 different wells. The correlation coefficient ranges from 0 to 1 and a correlation of 1 is a perfect correlation. The correlation coefficient of 0.9623 indicates a very strong correlation between simulated and observed groundwater elevations.

- The residual mean is computed by dividing the sum of the residuals by the number of residual data values. The closer this value is to zero, the better the calibration. The residual mean for the model is 3.0 feet.

- The residual standard deviation evaluates the scatter of the data. A lower standard deviation indicates a closer fit between the simulated and observed data. The standard deviation for the calibrated model is 35 feet.

- The absolute residual mean is a measure of the overall error in the model. The absolute residual mean is computed by taking the square root of the square of the residuals and dividing that by the number of measurements. The absolute residual mean for the model is 27 feet.

- Another statistical measure of calibration is the ratio of the standard deviation of the mean error divided by the range of observed groundwater elevations. This ratio shows how the model error relates to the overall hydraulic gradient across the model. Typically, a calibration is considered good when this ratio is below 0.15 (ESI 2001). The ratio for the Paso Robles Groundwater Model is 0.05, which is well below the threshold.

Based on the statistical analysis, the model is well calibrated and slightly better than was achieved in the original model. The variation is primarily due to the large area of the basin and overall limited groundwater elevation data and uncertainty on key natural recharge and discharge components. These results are similar to those achieved for basins similar to Twentynine Palms.

D.4 Future Groundwater Model Scenarios

Four future groundwater model scenarios were simulated using the historical groundwater model. These model scenarios are designed to demonstrate the effect of continued growth of demand on the aquifer system and the transition of septic systems to sewerage. The duration of each of these scenarios was 25 years.

Initial head conditions for the future scenarios are taken from the end of the historical simulation, i.e., the end of calendar year 2008. The only differences between the historical model and the future scenarios is the treatment of pumping and septic recharge (see the individual scenario descriptions below). The same time series of MFR and streamflow infiltration were used; this assumes that the 25-year period of the historical model can be considered to be reasonably representative of average conditions for the future scenarios. MBR was not varied over time, and used the same average rates assumed for the historical model.

D.4.1 Baseline with Constant 2010 Water Demand

Scenario 1 simulated baseline conditions, with water demand not changing from 2010 conditions. The baseline scenario assumes that pumping does not change over time, nor does septic recharge (which is assumed to depend directly on pumping). This is not expected to be representative of actual conditions, but instead provides a set of conditions against which the other scenarios can be compared.

D.4.2 Scenario 1 – 2035 Water Demand with Current Distribution of Pumping to Subbasins

Scenario 1 uses a linear growth rate of 2.58 percent per year (not compounding; that is, growth is 2.58 percent of the 2010 total every year) to predict pumping and septic recharge over the 25-year simulation duration. In this case, the increased pumping is distributed to the existing wells exactly proportional to their pumping in 2010. That is, if a well provided 5 percent of total demand in 2010, it would also experience 5% of the increased demand every year. Similarly, the septic recharge in all land use types increased by 2.58% per year over 2010 rates.

Table D-2 summarizes the relative change in the hydrologic budget relative to the Baseline Scenario. Storage continues to decline over time. Groundwater pumping increases by 1,370 acre-feet in Year 25, resulting in an average increase in pumping of 685 afy over the 25 years simulation period. The resulting increase in septic tank return flows of 548 afy is based on the assumption of 80 percent of the additional pumping is included in the scenario. The scenario results show a decrease in groundwater storage of 283 afy and increase in groundwater discharge at Mesquite Lake of 145 afy. The groundwater inflow and outflows balance reflects changes in flow between the subbasins across the Oasis Fault.

TABLE D-2
HYDROLOGIC BUDGET SUMMARY

	Groundwater Inflow (AFY)			Groundwater Outflow (AFY)			(AFY)
Subbasin	**Septic Return Flow**	**GW Inflow**	**Natural Recharge[)]**	**Wells[)]**	**Natural Discharge**	**GW Outflow**	**Change in Storage**
Indian Cove	60	0	0	274	0	-27	-186
Fortynine Palms	57	26	0	240	0	-111	-46
Eastern	43	-15	0	103	0	-28	-47
Mesquite Lake	387	-128	0	69	145	49	-4
Total	**548**	**-117**	**0**	**685**	**145**	**-117**	**-283**

D.4.3 Scenario 2 – 2035 Water Demand with Management Strategy

Scenario 2 uses the same linear growth rate in groundwater pumping that was used in Scenario 2. The only difference between Scenarios 2 and 3 is that Scenario 2 assumes that all of the increased pumping over time occurs in the Mesquite Lake Subbasin. Pumping in WTP-1 was held uniform over the simulation duration at its 2010 rate (about 940 afy). A single new well was added at the start of the simulation to provide all of the increased demand. When the pumping rate for this new well surpassed 450 afy (simulation year 9), another new well was added and the increased demand was divided evenly between the two wells. The same approach was used to add a third well in simulation year 17 and a fourth in simulation year 25.

Table D-3 summarizes the relative change in the hydrologic budget relative to the Baseline Scenario. Although storage continues to decline over time, it does so at a lower rate than Scenario 1. This is because the Indian Cove, Fortynine Palms and Eastern Subbasins show a slight increase in storage over the period. The increased pumping in the Mesquite Lake Subbasin does not all come out of storage. Instead, a portion is from capturing of groundwater that would have ultimately discharged at Mesquite Lake. The wells capture water upgradient of the lake so as not to involve the migration of saline water from the area of the playa. Rather, it reduces the hydraulic gradient towards the lake resulting in lower discharge at the lake. As with Scenario 1, the groundwater inflow and outflows balance reflects changes in flow between the subbasins across the Oasis Fault.

TABLE D-3
HYDROLOGIC BUDGET SUMMARY

	Groundwater Inflow (AFY)			Groundwater Outflow (AFY)			
Subbasin	**Septic Return Flow**	**GW Inflow**	**Natural Recharge)**	**Wells)**	**Natural Discharge**	**GW Outflow**	**Change in Storage**
Indian Cove	60	-1	0	0	0	-2	61
Fortynine Palms	57	-5	0	0	0	38	14
Eastern	43	19	0	0	0	18	44
Mesquite Lake	387	39	0	685	-82	-3	-174
Total	**548**	**51**	**0**	**685**	**-82**	**51**	**-55**

D.4.4 Scenario 3 – 2035 Water Demand Without Septic Return Flow

Scenario 3 uses the same pumping assumptions as Scenario 2, but septic return flow is eliminated immediately and totally at the beginning of the simulation. This represents the assumption that the septic systems present in the basin are converted to sewerage. This scenario was run to illustrate that simply removing the septic tanks and not considering the impact of the return flow may have consequences on groundwater levels in the basin. The result is that there is a substantial decrease in groundwater storage that would result in large decreases in groundwater levels. In several areas, groundwater levels drop so that the model makes the area inactive which had some impact on the scenario. This could be addressed by applying more sophisticated modeling techniques, but for this application, the primary objective of the scenario was to evaluate the impact of removing return flows on the basin, and the result is that those changes would be significant. This result is also based on the assumption that 80 percent of the overall water demand makes it back to groundwater. Further investigations are proposed in the GPP that would look to obtain site specific data on the percent of return flows that do make it to groundwater.

TABLE D-4
HYDROLOGIC BUDGET SUMMARY

Subbasin	Groundwater Inflow (AFY)			Groundwater Outflow (AFY)			
	Septic Return Flow	GW Inflow	Natural Recharge[)]	Wells[)]	Natural Discharge	GW Outflow	Change in Storage
Indian Cove	-193	4	0	0	0	14	-203
Fortynine Palms	-204	38	0	0	0	-68	-99
Eastern	-201	-32	0	0	0	-17	-216
Mesquite Lake	-1,294	-59	0	685	-773	21	-1,286
Total	**-1,892**	**-50**	**0**	**685**	**-773**	**-50**	**-1,804**

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Appendix H: DMM

RESOLUTION 11-02

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE TWENTYNINE PALMS WATER DISTRICT CONCURRING WITH A MODEL WATER EFFICIENT LANDSCAPE ORDINANCE AND CALIFORNIA GREEN BUILDING STANDARDS

WHEREAS, the Twentynine Palms Water District ("District") is a County Water District formed under the County Water District Law set forth in Water Code Section 30000 et seq. Under the Water Code, the District has the authority to store, conserve, appropriate, and acquire water and water rights for any useful purpose. In addition, the District has the authority to operate water rights, works, and property useful or necessary to convey, supply, store, or make use of water. The District also has the right to sell water and establish rules and regulations for the sale, distribution and use of water; and

WHEREAS, the District is subject to the requirements of the Urban Water Management Planning Act which requires the District to prepare an Urban Water Management Plan and required updates, amendments and revisions in order to plan for the conservation and efficient use of water; and

WHEREAS, as of the date of this Resolution, the District is in the process of engaging in the review, amendment, revision and updating of its Urban Water Management Plan. In connection with said update, the District has determined that it would be beneficial to make reference to, and otherwise concur with, the conservation and related measures which are available pursuant to that certain Model Water Efficient Landscape Ordinance ("Landscape Ordinance") which became the effective Landscape Ordinance for water efficiency within Twentynine Palms by way of action documented by the City of Twentynine Palms on or about February 2, 2010. For example, and not by way of limitation, the California Department of Water Resources ("DWR") has released its Draft Guidebook for 2010 Urban Water Management Plans which includes a suggestion that a Landscape Ordinance may assist a public agency in complying with the Water Demand Management Measure requirements of the Act, which also ties into an agency's eligibility for loan and grant funding opportunities; and

WHEREAS, the District has determined that it would be beneficial to make reference to, and otherwise concur with, the conservation and related measures which are available pursuant to those certain California Green Building Standards as adopted by the City of Twentynine Palms by way of its Ordinance No. 232, dated October 26, 2010. For example, and not by way of limitation, DWR's Draft Guidebook provides that the California Green Building Code update ("Cal Green") reinforces and in some cases exceeds the goal of water use efficiency in urban landscapes.

NOW, THEREFORE, the Board of Directors does hereby **RESOLVE** and **ORDER** as follows:

Section 1: The Recitals set forth above are incorporated herein and made an operative part of this Resolution.

Section 2: The District hereby makes reference to, and otherwise concurs with, the conservation and related measures which are available pursuant to the Landscape Ordinance which became the effective Landscape Ordinance for water efficiency within the City of Twentynine Palms, effective January 1, 2010.

Section 3: The District hereby makes reference to, and otherwise concurs with, the conservation and related measures which are available pursuant to the California Green Building Standards Code, 2010 Edition, published by the California Building Standards Commission, as adopted by the City of Twentynine Palms by way of its Ordinance No. 232, dated October 26, 2010.

Section 4: If any provision in this Resolution or the application thereof to any person or circumstances is for any reason held invalid, the validity of the remainder of this Resolution or the application of such provisions to other persons or circumstances shall not be affected thereby. The Board hereby declares that it would have passed this Resolution and each provision thereof, irrespective of the fact that one or more sections, subsections, sentences, clauses or phrases or the application thereof to any person or circumstance be held invalid.

Section 5: This Resolution shall become effective upon the date of adoption as set forth herein.

PASSED, APPROVED AND ADOPTED this 23rd day of February 2011 by the following roll call vote:

Ayes:	Directors Bourikas, Chambers, Cisneros and Moore
Noes:	None
Abstain:	None
Absent:	Director Shinaver

_____
Philip C. Cisneros, President
Board of Directors

Attest:

_____
Mike Wright, Board Secretary
Twentynine Palms Water District

RESOLUTION 11-05

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE TWENTYNINE PALMS WATER DISTRICT INCREASING THE NON-POTABLE WATER SERVICE RATE

WHEREAS, the Twentynine Palms Water District ("District") is a County Water District formed under the County Water District Law set forth in Water Code Section 30000 et seq. Under the Water Code, the District has the authority to store, conserve, appropriate, and acquire water and water rights for any useful purpose. In addition, the District has the authority to operate water rights, works, and property useful or necessary to convey, supply, store, or make use of water. The District also has the right to sell water and establish rules and regulations for the sale, distribution and use of water; and

WHEREAS, the Board of Directors adopted Ordinance No. 87 which set forth rules and regulations for the provision of retail water service and provided other District services. In addition, the Board adopted Resolution 03-16 which set fees and rates for water service as established by Ordinance No. 87 and which set forth those fees separately and independently by resolution to simplify the reading and understanding of said Ordinance. Said Resolution 03-16 provided that certain fees shall be charged and may be set from time to time by the Board of Directors including the Non-Potable Water Service Rate, as originally set forth in Section 10(B)(2) of said Ordinance. Pursuant to said Ordinance, the Non-Potable Water Service Rate will be charged at an established rate for 100 cubic feet as the Quantity/Commodity Charge.

WHEREAS, the District has determined that, due to fiscal impacts of increasing costs of service and operations, the Non-Potable Water Service Rate needs to be increased. In addition, a Rate Analysis For Non-Potable Water was performed which substantiates the need for, and the amount of, the increased Non-Potable Water Service Rate to be established; and

WHEREAS, a notice of a public hearing on the proposed rate increase was published in the Desert Trail, a newspaper of general circulation on April 21, 2011; and

WHEREAS, the Board desires to increase the Non-Potable Water Service Rate due to the fiscal impacts referenced above.

NOW, THEREFORE, the Board of Directors does hereby **RESOLVE** and **ORDER** as follows:

Section 1: All of the foregoing Recitals are true and correct and the Board so finds and determines. The Recitals set forth above are incorporated herein and made an operative part of this Resolution.

Section 2 The Board conducted a public hearing on April 27, 2011 at 6:00 pm at 72401 Hatch Road, Twentynine Palms, CA 92277 in order to receive oral and written testimony regarding this Resolution.

Section 3 The Board hereby adopts the Non-Potable Water Service Rate as set forth below:

NON-POTABLE WATER QUANTITY/COMMODITY CHARGE RATE FOR METERED NON-POTABLE WATER SERVICE:

$.80 per 100 cubic feet of water

Section 4 The Board finds that the costs of service, operations, and improvements of the District water system, which are to be funded by the increased water rate set forth herein, are necessary to maintain service within the District's existing service area. The Board further finds that costs of service and operation as referenced herein and in the Rate Analysis mentioned above, to be funded by the increased rate, will not expand the District's system. The District further finds that the adoption of the rate is necessary and reasonable to fund the costs of service and operation of the applicable District water system. Based on these findings, the Board determines that the adoption of the rate established by this Resolution is exempt from the requirements of the California Environmental Quality Act pursuant to section 21080(b)(8) of the Public Resources Code and section 15273(a) of the State CEQA Guidelines.

Section 5 All resolutions or other actions by the Board of Directors, or parts thereof that are inconsistent with any provision of this Resolution are hereby superseded only to the extent of such inconsistency.

Section 6 If any provision in this Resolution or the application thereof to any person or circumstances is for any reason held invalid, the validity of the remainder of this Resolution or the application of such provisions to other persons or circumstances shall not be affected thereby. The Board hereby declares that it would have passed this Resolution and each provision thereof, irrespective of the fact that one or more sections, subsections, sentences, clauses or phrases or the application thereof to any person or circumstance be held invalid.

Section 7: This Resolution shall become effective upon the date of adoption as set forth herein.

PASSED, APPROVED AND ADOPTED this 27th day of April 2011 by the following roll call vote:

Ayes: Directors Bourikas, Chambers, Cisneros, Moore and Shinaver
Noes: None

_____
Philip C. Cisneros, President
Board of Directors

Attest:

_____
Mike Wright, Board Secretary
Twentynine Palms Water District

ORDINANCE 92

AN ORDINANCE OF THE BOARD OF DIRECTORS OF THE TWENTYNINE PALMS WATER DISTRICT ESTABLISHING RATES AND CHARGES FOR WATER SERVICE AND REAFFIRMING CERTAIN PRIOR RATES AND CHARGES AS ESTABLISHED BY DISTRICT RESOLUTION 03-16

WHEREAS, on August 20, 2003, the Board of Directors of the Twentynine Palms Water District (the "District") adopted Ordinance 87, setting forth rules and regulations for the provision of retail water service and providing among other things, that water service rates and charges and other water fees and charges may be set from time to time by the Board; and

WHEREAS, in accordance with Ordinance 87, on August 20, 2003, the Board of Directors of the District adopted Resolution 03-16 Setting Water Service Fees and Rates for Water Service; and

WHEREAS, the District's Financial Consultant, during consideration and preparation of the Fiscal Year 2009/2010 budget and in preparation of a three-year estimated budget, determined that at the current rates and projected levels of water sales and expenses, the District's annual operating and maintenance expenses, and the District's capital facilities program are expected to significantly exceed revenues; and

WHEREAS, due to the need to improve and expand services, and to provide the capital facilities necessary to operate the District in a financially prudent and safe manner, the District has experienced, and anticipates it will continue to experience, increases in its operating and maintenance costs and capital facilities costs; and

WHEREAS, the District must generate revenues in an amount sufficient to cover the District's ongoing costs of operations, maintenance, and capital facilities; and

WHEREAS, the Board of Directors directed the General Manager and Financial Consultant to review the schedule of water service rates and charges established pursuant to Resolution 03-16 and determine what increases to such schedule of rates and charges are necessary to generate revenues sufficient to cover the District's ongoing costs of operations, maintenance, and capital facilities; and

WHEREAS, the General Manager and Financial Consultant determined that increases to the schedule of rates for water service charges, including the rates for water pay station tokens (together, the water service charges and water pay station tokens are referred to herein as "Service Charges") are necessary for a three-year period to generate revenues sufficient to cover the District's ongoing costs of operations, maintenance, and capital facilities; and

WHEREAS, the schedule of proposed Service Charges is attached hereto as Exhibit A, and by this reference incorporated herein; and

WHEREAS, the General Manager and the Financial Consultant determined that other than the rates for the Service Charges, the rates for the District's fire service charges (the "Fire Service Charges") and the rates for all other fees and charges set forth in Resolution 03-16 (such other fees and charges, together with the Fire Service Charges are referred to herein as the "Other Fees and Charges") do not need to be increased at this time and should remain in full force and effect; and

WHEREAS, the revenues derived from the proposed Service Charges will not exceed the funds required to provide the water services and shall be used exclusively for the District's water system (the "System"); and

WHEREAS, the amount of the proposed Service Charges will not exceed the proportional cost of the service attributable to each parcel upon which they are proposed for imposition; and

WHEREAS, the proposed Service Charges will not be imposed on a parcel unless the water services are actually used by, or immediately available to, the owner of the parcel; and

WHEREAS, the District, as the lead agency under the California Environmental Quality Act (CEQA), in consultation with the District's Legal Counsel, prepared a Preliminary Exemption Assessment for the adoption of this Ordinance in order to evaluate its potential impacts. The District determined that this Ordinance is exempt from CEQA review under Public Resources Code section 21080(b)(8) and State CEQA Guidelines section 15273 because the Service Charges and Other Fees and Charges are necessary and reasonable to fund the administration, operation, maintenance, and improvements of the System and will not result in the expansion of the System; and

WHEREAS, California Constitution article XIII D, section 6 ("Article XIII D") requires that prior to imposing any increase to the Service Charges, the District shall provide written notice (the "Notice") by mail of the proposed increases to such rates and charges to the record owner of each parcel upon which the rates and charges are proposed for imposition and any tenant directly liable for payment of the rates and charges, the amount of the rates and charges proposed to be imposed on each parcel, the basis upon which the rates and charges were calculated, the reason for the rates and charges, and the date time and location of a public hearing (the "Hearing") on the proposed rates and charges; and

WHEREAS, pursuant to Article XIII D such Notice is required to be provided to the affected property owners and any tenant directly liable for the payment of the rates and charges not less than forty-five days prior to the Hearing on the proposed rates and charges; and

WHEREAS, the District did provide such Notice to the affected property owners and tenants of the proposed Service Charges in compliance with Article XIII D; and

WHEREAS, the Hearing was held on this day, May 27, 2009; and

WHEREAS, at the Hearing the Board of Directors of the District heard and considered all oral testimony, written materials, and written protests concerning the establishment and imposition of the proposed Service Charges, and at the close of the Hearing the District did not receive written protests against the establishment and imposition of the proposed Service Charges from a majority of the affected property owners and tenants directly liable for the payment of the Service Charges; and

WHEREAS, the Board of Directors of the District now desires to establish and impose the proposed Service Charges and to reaffirm the rates for the Service Charges and Fire Service Charges established pursuant to Resolution 03-16; and

WHEREAS, the Board of Directors of the District has determined that the rates for the Other Fees and Charges do not need to be increased and shall remain in full force and effect as set forth in Resolution 03-16; and

WHEREAS, this Ordinance shall supersede all other previous resolutions and ordinances that may conflict with, or be contrary to, this Ordinance respecting the rates for Service Charges described more particularly herein;

NOW THEREFORE, BE IT ORDAINED, by the Board of Directors of the Twentynine Palms Water District as follows:

1. The Board of Directors of the District finds and determines that the foregoing Recitals are true and correct and incorporates the Recitals herein.

2. As the decision making body for the District, the Board of Directors has reviewed and considered the information contained in the Preliminary Exemption Assessment and administrative record. The Board of Directors finds that the Preliminary Exemption Assessment contains a complete and accurate reporting of the environmental impacts associated with the adoption of this Ordinance and reflects the independent judgment of the Board.

3. The Board of Directors hereby reaffirms the prior rates for the Service Charges and the Fire Service Charges established pursuant to Resolution 03-16.

4. The Board of Directors hereby finds that the rates for the Other Fees and Charges do not need to be increased at this time and shall remain in full force and effect as more fully set forth in Resolution 03-16.

5. The Board of Directors hereby establishes and imposes the Service Charges set forth in Exhibit A, effective on the dates, at the rates, and in the amounts set forth therein.

6. The Board of Directors hereby finds that the administration, operation, maintenance, and improvements of the System, which are to be funded by the Service Charges and the Other Fees and Charges set forth herein and in Resolution 03-16, are necessary to maintain service within the District's existing service area. The Board of Directors further finds that the administration, operation, maintenance, and improvements of the System, to be funded by the Service Charges set forth herein and the Other Fees and Charges set forth in Resolution 03-16, will not expand the System. The Board of Directors further finds that such Service Charges and the Other Fees and Charges are necessary and reasonable to fund the administration, operation, maintenance, and improvements of the System. Based on these findings, the Board of Directors hereby determines that this Ordinance is exempt from the requirements of CEQA pursuant to California Public Resources Code section 21080(b)(8) and State CEQA Guidelines section 15273(a).

7. The documents and materials that constitute the record of proceedings on which these findings have been based are located at Twentynine Palms Water District, 72401 Hatch Road, Twentynine Palms, CA 92277. The custodian for these records is the General Manager of the District.

8. The Board of Directors hereby authorizes and directs the General Manager to implement and take all actions necessary to effectuate the rates for the Service Charges set forth herein and to file a Notice of Exemption with the County Clerk for the County of San Bernardino within five (5) working days of the date of the adoption of this Ordinance.

9. If any section, subsection, subdivision, sentence, clause, or phrase in this Ordinance or any part thereof is for any reason held to be unconstitutional or invalid, ineffective by any court of competent jurisdiction, such decision shall not affect the validity or effectiveness of the remaining portions of this Ordinance or any part thereof. The Board of Directors hereby declares that it would have adopted each section irrespective of the fact that any one or more subsections, subdivisions, sentences, clauses, or phrases be declared unconstitutional, invalid, or ineffective.

10. This Ordinance shall become effective immediately upon its adoption by the Board of Directors.

PASSED, APPROVED AND ADOPTED this 27th day of May 2009 by the following vote.

AYES: Directors Anthony, Cisneros, Gallagher, Moore and Yockey
NOES: None

_____
Philip C. Cisneros, President
Board of Directors

Attest:

_____
Mike Wright, Board Secretary
Twentynine Palms Water District

EXHIBIT A
SERVICE CHARGES

The following fees are authorized and identified in Section 10 of District Ordinance No. 87, adopted on August 20, 2003.

1. READY TO SERVE/SERVICE CHARGE RATES:

WATER BILLING CHARGES

Meter Size	Rates Effective August 1, 2009
5/8"	$ 11.00
1"	$ 27.50
1-1/2"	$ 55.00
2"	$ 88.00
3"	$247.50
4"	$550.00
6"	$825.00

Rates are shown as monthly charges; however, they are billed bimonthly.

2. POTABLE WATER QUANTITY/COMMODITY CHARGE RATES FOR METERED POTABLE WATER SERVICE (Per 100 cubic feet of water):

Effective Date	August 1, 2009	July 1, 2010	July 1, 2011
Metered Potable Water	$ 1.86	$ 2.15	$ 2.33

Rates are shown as monthly charges; however, they are billed bimonthly.

3. NON-POTABLE WATER QUANTITY/COMMODITY CHARGE RATE FOR METERED NON-POTABLE WATER SERVICE:

$0.47/100 cubic feet of water

4. PAY METER TOKEN RATES:

Token Size	Tokens Purchased On or After		
	August 1, 2009	July 1, 2010	July 1, 2011
Small (125 gal)	$ 0.80	$ 0.85	$ 0.95
Large (500 gal)	$ 3.20	$ 3.40	$ 3.80

RESOLUTION 03-16

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE TWENTYNINE PALMS WATER DISTRICT SETTING FEES AND RATES FOR WATER SERVICE AS ESTABLISHED BY ORDINANCE 87 AND RESCINDING RESOLUTION 03-11

WHEREAS, the Board of Directors has heretofore adopted Resolution 03-11 Setting Water Service Fees and that said resolution needs to be rescinded in its entirety; and

WHEREAS, the Board of Directors of the Twentynine Palms Water District has adopted Ordinance 87 providing for fees for water service and associated developments; and

WHEREAS, the Board of Directors wishes to set forth these fees separately and independently by resolution to simplify the reading and understanding of said ordinance.

NOW, THEREFORE, BE IT RESOLVED, that the following schedule of fees is hereby adopted:

SCHEDULE OF FEES

The following fees shall be charged and may be set from time to time by the Board of Directors. Section numbers quoted refer to the applicable sections of Ordinance 87.

SERVICE APPLICATION FEES		
5.A.1.	APPLICATION FEE	$10.00
5.A.2.	OPENING FEE	$15.00
5.A.3.	AFTER HOURS CONNECTION FEE	$35.00
6.A.	DEPOSIT	
	Meter Size	
	5/8"	$60.00
	1"	$100.00
	11/2"	$200.00
	2"	$300.00
	3"	$800.00
	4"	$1,500.00

SERVICE INSTALLATIONS AND METERS		
9.A.1.	NEW SERVICE INSTALLATION CHARGES:	
	5/8" Short Side Service	$616.00
	1" Short Side Service	$703.00
	1-1/2" Short Side Service	$1,328.00

SERVICE INSTALLATIONS AND METERS (CONT.)

2"	Short Side Service	$1,438.00
5/8"	Open Cut Service	$1,166.00
1"	Open Cut Service	$1,253.00
1-1/2"	Open Cut Service	$1,835.00
2"	Open Cut Service	$1,945.00
5/8"	Bored Service	$833.00
1"	Bored Service	$921.00

Service installations larger than 2" will be charged on a time and materials basis and require a deposit based on estimated District costs.

9.A.2. STATE HIGHWAY ROAD CROSSING DEPOSIT
(Applies to all meter sizes) Time & Materials

9.A.3. NEW METER ON EXISTING SERVICE

5/8"	$65.00
1"	$150.00
1-1/2" & larger	$320.00
2"	$445.00

A deposit based on District estimate of costs will be required on all installations larger than 2".

9.B.1. RELOCATION OF SAME SIZE METER DEPOSIT
(At customer's request)
75% of the cost specified in 9.A.1

WATER BILLING CHARGES

10.A READY TO SERVE/SERVICE CHARGE:
Monthly rate is shown; charges are billed bimonthly.
Meter Size

5/8"	$9.00
1"	$22.50
1-1/2"	$45.00
2"	$72.00
3"	$202.50
4"	$450.00
6"	$675.00

An out of District meter is charged double the ready to serve for the meter size.

WATER BILLING CHARGES (CONT.)

10.B.1.	POTABLE WATER QUANTITY CHARGE (Per 100 cubic feet)	$1.54
10.B.2.	NON-POTABLE WATER QUANTITY (Per 100 cubic feet)	$0.47
10.B.3.	PAY METER TOKENS	Small (125 gal) $0.65 Large (500gal) $2.60

WATER FOR FIRE PROTECTION

11.C.3. FIRE SERVICE CHARGE

Monthly rate is shown; charges are billed bimonthly.

Fire Service Line Size	
2"	$23.00
3"	$46.00
4"	$86.00
6"	$184.00
8"	$338.00
10"	$522.00

CONSTRUCTION SERVICE

12.B	CONSTRUCTION READY TO SERVE/SERVICE CHARGE	Current RTS fee (per day) times # of days used
12.B	WATER USAGE	Current rate per unit used
12.C.1.	INSTALLATION CHARGE	Time & Materials
12.C.2	DEPOSIT CONSTRUCTION METER	$650.00 up to 4" meter. Over 4" is calculated on size of meter in accordance with Ordinance.

CAPITAL IMPACT FEES

13.A. PRIMARY CAPITAL IMPACT FEES

Meter Size	Capacity in GPM	
5/8"	20	$650.00
1"	50	$1,625.00
1-1/2"	100	$3,250.00
2"	160	$5,200.00

All other meter sizes based on $32.50 GPM rate as shown in Resolution 03-15.

CAPITAL IMPACT FEES (CONT.)

13.B. SECONDARY CAPITAL IMPACT FEES

The actual cost to provide the required secondary infrastructure;

or

A calculated fee that is based on the linear footage of the property requiring new and/or enlarged/expanded service.

PERMANENT OFF SITE FEE

14.B. PERMANENT OFF SITE FEES

Determined by the Board on a case by case basis.

DEVELOPMENT FEES

15.A.1. ENGINEERING DESIGN	Based on estimate of District costs.	
15.A.2. PLAN CHECK	(Per sheet)	$50.00
15.A.3. INSPECTION	$300.00 for first 500 feet, and $0.50/foot thereafter.	
15.A.4. ADMINISTRATIVE	15% of District=s Engineering costs.	

DOCUMENT PROCESSING FEE

16.A. DOCUMENT PROCESSING FEE $75.00 per document.

BILLS: PAYMENT, DELINQUENCY AND DISCONTINUANCE OF SERVICE

18.A.2.	MINIMUM READY TO SERVE		None
18.C.4.	SERVICE RECONNECTION FEE	$30.00	
18.C.5.	TAMPERING FEE		$35.00
18.E.	RETURNED CHECK		$25.00

METER ERROR

METER TEST FEES

19.A.2.	Meter Size	
	5/8" and 1"	$67.00
	1-1/2" and 2"	$90.00

Meters larger than 2", compound meters and hydrant meters will require a deposit based on District cost estimate.

DISCONTINUANCE OF SERVICE FOR OTHER THAN DELINQUENCY

20.F.	RESTORATION-RECONNECTION CHARGE	$30.00

PASSED, APPROVED AND ADOPTED this 20th day of August 2003.

AYES: Directors Anthony, Carter, Cisneros, Moore and Yockey
NOES: None

_____
Milford J. Yockey, President
Board Of Directors

Attest:

_____
Tina Johnson, Board Secretary
Twentynine Palms Water District

ORDINANCE 97

AN ORDINANCE OF THE BOARD OF DIRECTORS OF THE TWENTYNINE PALMS WATER DISTRICT ESTABLISHING RATES FOR PAY METER STATION WATER SERVICE FEES

WHEREAS, the Twentynine Palms Water District (the "District") operates and is organized under Water Code section 30000 et seq.; and

WHEREAS, the District is authorized to fix and collect charges for the provision of water services pursuant to Water Code section 31001, 31007, and 31025; and

WHEREAS, while the District continually strives for cost reductions and better utilization of the assets it holds, it also needs to keep pace with inflation, and other cost increases, many of which it cannot control; and

WHEREAS, the District imposes a pay meter station water service fee (the "Fee") on persons who purchase water from a District pay meter water station; and

WHEREAS, the amount of the Fee paid is determined on the basis of the amount of metered gallons of water pumped at a pay meter water station; and

WHEREAS, the District must generate revenues in an amount sufficient to cover the District's ongoing costs of operations, maintenance, and capital facilities; and

WHEREAS, the District hired an independent rate consultant to determine how best to recover projected increases in these costs over a five-year period and based on this evaluation, and as described below, the District has determined that rate increases in the Fee are necessary to: enable it to recover the current and projected increases in these costs; avoid operational deficits and depletion of reserves; and operate the District in a financially prudent manner; and

WHEREAS, the Board of Directors of the District now desires to establish the new rates for the Fee for a five-year period; and

WHEREAS, this Ordinance shall supersede all other previous resolutions and ordinances that may conflict with, or be contrary to, this Ordinance respecting the rates for Fee described more particularly herein;

NOW THEREFORE, BE IT ORDAINED, by the Board of Directors of the Twentynine Palms Water District as follows:

1. The Board of Directors of the District finds and determines that the foregoing Recitals are true and correct and incorporates the Recitals herein.

2. The Board of Directors hereby establishes and imposes the Fee, effective on the dates, at the rates, and in the amounts set forth in the table below:

PAY METER STATION WATER SERVICE FEES ($/GALLON)				
1-1-2016	1-1-2017	1-1-2018	1-1-2019	1-1-2020
$0.0097	$0.0103	$0.0109	$0.0115	$0.0122

3. The Board of Directors hereby finds that the administration, operation, maintenance, and improvements of the water system (the "System"), which are to be funded by the Fee set forth herein, are necessary to maintain service within the District's existing service area. The Board of Directors further finds that the administration, operation, maintenance, and improvements of the System, to be funded by the Fee set forth herein, will not expand the System. The Board of Directors further finds that such Fee is necessary and reasonable to fund the administration, operation, maintenance, and improvements of the System. Based on these findings, the Board of Directors hereby determines that this Ordinance is exempt from the requirements of CEQA pursuant to California Public Resources Code section 21080(b)(8) and State CEQA Guidelines section 15273(a) of the.

4. The Board of Directors hereby authorizes and directs the General Manager to implement and take all actions necessary to effectuate the rates for the Fee set forth herein.

5. If any section, subsection, subdivision, sentence, clause, or phrase in this Ordinance or any part thereof is for any reason held to be unconstitutional or invalid, ineffective by any court of competent jurisdiction, such decision shall not affect the validity or effectiveness of the remaining portions of this Ordinance or any part thereof. The Board of Directors hereby declares that it would have adopted each section irrespective of the fact that any one or more subsections, subdivisions, sentences, clauses, or phrases be declared unconstitutional, invalid, or ineffective.

6. This Ordinance shall become effective immediately upon its adoption by the Board of Directors.

PASSED, APPROVED AND ADOPTED this 16th day of December 2015 by the following vote.

Ayes:	Directors Giannini, Horn, Moore, and Shinaver
Noes:	None
Abstain:	None
Absent:	Director Chambers

Kerron E. Moore, President
Board of Directors

Attest:

Ray Kolisz, Board Secretary
Twentynine Palms Water District

ORDINANCE 96

AN ORDINANCE OF THE BOARD OF DIRECTORS OF THE TWENTYNINE PALMS WATER DISTRICT ESTABLISHING RATES AND CHARGES FOR WATER SERVICE

WHEREAS, the Twentynine Palms Water District (the "District") operates and is organized under Water Code section 30000 et seq.; and

WHEREAS, the District is authorized to fix and collect charges for the provision of water services pursuant to Water Code section 31001, 31007, and 31025; and

WHEREAS, the District must generate revenues in an amount sufficient to cover the District's ongoing costs of operations, maintenance, and capital facilities; and

WHEREAS, while the District continually strives for cost reductions and better utilization of the assets it holds, it also needs to keep pace with inflation, drinking water regulations, and other cost increases, many of which it cannot control; and

WHEREAS, the District hired an independent rate consultant to determine how best to recover these projected cost increases over a five-year period and based on this evaluation, and as described below, the District has determined that rate adjustments and increases are necessary to enable it to: recover current and projected increases in the costs of operations and maintenance, including water treatment costs, and capital infrastructure improvements needed to provide safe and reliable drinking water; comply with State mandated regulatory requirements; avoid operational deficits and depletion of reserves; and operate the District in a financially prudent manner; and

WHEREAS, the rate structure for the District's bi-monthly water service charges is comprised of three components — (1) a fixed service charge (the "Ready to Serve Charge") for both potable (i.e., treated) and non-potable (i.e., untreated) water customers; (2) a variable water commodity charge (the "Commodity Charge"); and (3) a fixed monthly fire meter service charge ("Fire Meter Service Charge") (collectively, the "Service Charges"); and

WHEREAS, the Ready to Serve Charge is a fixed charge established on the basis of the size of the water meter (in inches) serving a property and is calculated to recover most of the District's annual fixed costs of providing water service, such as utilities, equipment, materials, billing, collections, customer service, meter reading, and meter maintenance; and

WHEREAS, the Commodity Charge has a uniform rate, but the amount of the charge imposed varies based on the number of units of water delivered to a property (One unit of water equals one hundred cubic feet ("HCF"), or 748 gallons); the Commodity Charge is calculated to recover the District's costs of providing water and a portion of its fixed costs.

WHEREAS, the District imposes a Fire meter Charge on certain commercial properties as a condition of extending or initiating water service by (1) the installation of a private fire suppression system, and (2) upon the request of the consumer or property owner for the

delivery of water to the property for the purpose of fire service protection. The rates for the monthly commercial Fire Meter Service Charges are established on the basis of the size of the meter (in inches) serving a property and are calculated to recover the costs of providing water to such properties for private fire service protection; and

WHEREAS, the schedule of proposed Service Charges is attached hereto as Exhibit A, and by this reference incorporated herein; and

WHEREAS, the revenues derived from the proposed Service Charges will not exceed the funds required to provide the water services and shall be used exclusively for the District's water system (the "System"); and

WHEREAS, the amount of the proposed Service Charges will not exceed the proportional cost of the service attributable to each parcel upon which they are proposed for imposition; and

WHEREAS, the proposed Service Charges will not be imposed on a parcel unless the water services are actually used by, or immediately available to, the owner of the parcel; and

WHEREAS, the District, as the lead agency under the California Environmental Quality Act (CEQA), in consultation with the District's Legal Counsel, prepared a Preliminary Exemption Assessment for the adoption of this Ordinance in order to evaluate its potential impacts. The District determined that this Ordinance is exempt from CEQA review under Public Resources Code section 21080(b)(8) and State CEQA Guidelines section 15273 because the Service Charges are necessary and reasonable to fund the administration, operation, maintenance, and improvements of the System and will not result in the expansion of the System; and

WHEREAS, California Constitution article XIII D, section 6 ("Article XIII D") requires that prior to imposing any increase to the Service Charges, the District shall provide written notice (the "Notice") by mail of the proposed increases to such rates and charges to the record owner of each parcel upon which the rates and charges are proposed for imposition and any tenant directly liable for payment of the rates and charges, the amount of the rates and charges proposed to be imposed on each parcel, the basis upon which the rates and charges were calculated, the reason for the rates and charges, and the date time and location of a public hearing (the "Hearing") on the proposed rates and charges; and

WHEREAS, pursuant to Article XIII D such Notice is required to be provided to the affected property owners and any tenant directly liable for the payment of the rates and charges not less than forty-five days prior to the Hearing on the proposed rates and charges; and

WHEREAS, the District did provide such Notice to the affected property owners and tenants of the proposed Service Charges in compliance with Article XIII D; and

WHEREAS, the Hearing was held on this day, December 16, 2015; and

WHEREAS, at the Hearing the Board of Directors of the District heard and considered all

oral testimony, and considered all written materials, and written protests concerning the establishment and imposition of the proposed Service Charges, and at the close of the Hearing the District did not receive written protests against the establishment and imposition of the proposed Service Charges from a majority of the affected property owners and tenants directly liable for the payment of the Service Charges; and

WHEREAS, the Board of Directors of the District now desires to establish and impose the proposed Service Charges; and

WHEREAS, this Ordinance shall supersede all other previous resolutions and ordinances that may conflict with, or be contrary to, this Ordinance respecting the rates for Service Charges described more particularly herein;

NOW THEREFORE, BE IT ORDAINED, by the Board of Directors of the Twentynine Palms Water District as follows:

1. The Board of Directors of the District finds and determines that the foregoing Recitals are true and correct and incorporates the Recitals herein.

2. As the decision making body for the District, the Board of Directors has reviewed and considered the information contained in the Preliminary Exemption Assessment and administrative record. The Board of Directors finds that the Preliminary Exemption Assessment contains a complete and accurate reporting of the environmental impacts associated with the adoption of this Ordinance and reflects the independent judgment of the Board.

3. The Board of Directors hereby establishes and imposes the Service Charges set forth in Exhibit A, effective on the dates, at the rates, and in the amounts set forth therein.

4. The Board of Directors hereby finds that the administration, operation, maintenance, and improvements of the System, which are to be funded by the Service Charges set forth herein, are necessary to maintain service within the District's existing service area. The Board of Directors further finds that the administration, operation, maintenance, and improvements of the System, to be funded by the Service Charges set forth herein, will not expand the System. The Board of Directors further finds that such Service Charges are necessary and reasonable to fund the administration, operation, maintenance, and improvements of the System. Based on these findings, the Board of Directors hereby determines that this Ordinance is exempt from the requirements of CEQA pursuant to California Public Resources Code section 21080(b)(8) and State CEQA Guidelines section 15273(a) of the.

5. The documents and materials that constitute the record of proceedings on which these findings have been based are located at Twentynine Palms Water District, 72401 Hatch Road, Twentynine Palms, CA 92277. The custodian for these records is the General Manager of the District.

6. The Board of Directors hereby authorizes and directs the General Manager to implement and take all actions necessary to effectuate the rates for the Service Charges

set forth herein and to file a Notice of Exemption with the County Clerk for the County of San Bernardino within five (5) working days of the date of the adoption of this Ordinance.

7. If any section, subsection, subdivision, sentence, clause, or phrase in this Ordinance or any part thereof is for any reason held to be unconstitutional or invalid, ineffective by any court of competent jurisdiction, such decision shall not affect the validity or effectiveness of the remaining portions of this Ordinance or any part thereof. The Board of Directors hereby declares that it would have adopted each section irrespective of the fact that any one or more subsections, subdivisions, sentences, clauses, or phrases be declared unconstitutional, invalid, or ineffective.

8. This Ordinance shall become effective immediately upon its adoption by the Board of Directors.

PASSED, APPROVED AND ADOPTED this 16th day of December 2015 by the following vote.

Ayes:	Directors Giannini, Horn, Moore, and Shinaver
Noes:	None
Abstain:	None
Absent:	Director Chambers

Kerron E. Moore, President
Board of Directors

Attest:

Ray Kolisz, Board Secretary
Twentynine Palms Water District

EXHIBIT A
SERVICE CHARGES

The following fees are authorized pursuant to Section 3 of District Ordinance No. 96, adopted on December 16, 2015.

BI-MONTHLY RATES FOR READY TO SERVE CHARGE – POTABLE WATER ($/METER SIZE)

	Proposed Rates and Effective Dates				
Meter Size (in inches)	**1/1/ 2016**	**1/1/ 2017**	**1/1/ 2018**	**1/1/2019**	**1/1/2020**
5/8"	$21.94	$23.26	$24.65	$26.13	$27.70
3/4"	$21.94	$23.26	$24.65	$26.13	$27.70
1" (dual service residential)	$21.94	$23.26	$24.65	$26.13	$27.70
1"	$30.65	$32.49	$34.44	$36.50	$38.69
1 1/2"	$52.42	$55.57	$58.90	$62.44	$66.18
2"	$78.55	$83.27	$88.26	$93.56	$99.17
3"	$161.29	$170.97	$181.23	$192.10	$203.63
4"	$283.23	$300.22	$318.24	$337.33	$357.57
6"	$575.01	$609.51	$646.08	$684.84	$725.93

BI-MONTHLY RATES FOR READY TO SERVE CHARGE – NON-POTABLE WATER ($/METER SIZE)

	Proposed Rates and Effective Dates				
Meter Size (in inches)	**1/1/ 2016**	**1/1/ 2017**	**1/1/ 2018**	**1/1/2019**	**1/1/2020**
2"	$813.75	$862.57	$914.32	$969.18	$1,027.33

RATES FOR COMMODITY CHARGES ($/HCF)

	Proposed Rates and Effective Dates				
	1/1/ 2016	**1/1/2017**	**1/1/2018**	**1/1/2019**	**1/1/2020**
Potable	$2.63	$2.79	$2.96	$3.14	$3.33
Non-Potable Water	$0.49	$0.52	$0.55	$0.58	$0.61

MONTHLY RATES FOR FIRE SERVICE METER CHARGE ($/METER SIZE)

	Proposed Rates and Effective Dates				
Meter Size (in inches)	**1/1/ 2016**	**1/1/ 2017**	**1/1/ 2018**	**1/1/2019**	**1/1/2020**
2"	$51.18	$54.25	$57.51	$60.96	$64.61
3"	$101.47	$107.56	$114.02	$120.86	$128.11
4"	$141.18	$149.65	$158.63	$168.15	$178.24
6"	$273.53	$289.95	$307.34	$325.78	$345.33
8"	$432.36	$458.30	$485.80	$514.95	$545.84
10"	$1,173.54	$1,243.95	$1,318.59	$1,397.70	$1,481.57

RESOLUTION 11-02

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE TWENTYNINE PALMS WATER DISTRICT CONCURRING WITH A MODEL WATER EFFICIENT LANDSCAPE ORDINANCE AND CALIFORNIA GREEN BUILDING STANDARDS

WHEREAS, the Twentynine Palms Water District ("District") is a County Water District formed under the County Water District Law set forth in Water Code Section 30000 et seq. Under the Water Code, the District has the authority to store, conserve, appropriate, and acquire water and water rights for any useful purpose. In addition, the District has the authority to operate water rights, works, and property useful or necessary to convey, supply, store, or make use of water. The District also has the right to sell water and establish rules and regulations for the sale, distribution and use of water; and

WHEREAS, the District is subject to the requirements of the Urban Water Management Planning Act which requires the District to prepare an Urban Water Management Plan and required updates, amendments and revisions in order to plan for the conservation and efficient use of water; and

WHEREAS, as of the date of this Resolution, the District is in the process of engaging in the review, amendment, revision and updating of its Urban Water Management Plan. In connection with said update, the District has determined that it would be beneficial to make reference to, and otherwise concur with, the conservation and related measures which are available pursuant to that certain Model Water Efficient Landscape Ordinance ("Landscape Ordinance") which became the effective Landscape Ordinance for water efficiency within Twentynine Palms by way of action documented by the City of Twentynine Palms on or about February 2, 2010. For example, and not by way of limitation, the California Department of Water Resources ("DWR") has released its Draft Guidebook for 2010 Urban Water Management Plans which includes a suggestion that a Landscape Ordinance may assist a public agency in complying with the Water Demand Management Measure requirements of the Act, which also ties into an agency's eligibility for loan and grant funding opportunities; and

WHEREAS, the District has determined that it would be beneficial to make reference to, and otherwise concur with, the conservation and related measures which are available pursuant to those certain California Green Building Standards as adopted by the City of Twentynine Palms by way of its Ordinance No. 232, dated October 26, 2010. For example, and not by way of limitation, DWR's Draft Guidebook provides that the California Green Building Code update ("Cal Green") reinforces and in some cases exceeds the goal of water use efficiency in urban landscapes.

NOW, THEREFORE, the Board of Directors does hereby **RESOLVE** and **ORDER** as follows:

Section 1: The Recitals set forth above are incorporated herein and made an operative part of this Resolution.

Section 2: The District hereby makes reference to, and otherwise concurs with, the conservation and related measures which are available pursuant to the Landscape Ordinance which became the effective Landscape Ordinance for water efficiency within the City of Twentynine Palms, effective January 1, 2010.

Section 3: The District hereby makes reference to, and otherwise concurs with, the conservation and related measures which are available pursuant to the California Green Building Standards Code, 2010 Edition, published by the California Building Standards Commission, as adopted by the City of Twentynine Palms by way of its Ordinance No. 232, dated October 26, 2010.

Section 4: If any provision in this Resolution or the application thereof to any person or circumstances is for any reason held invalid, the validity of the remainder of this Resolution or the application of such provisions to other persons or circumstances shall not be affected thereby. The Board hereby declares that it would have passed this Resolution and each provision thereof, irrespective of the fact that one or more sections, subsections, sentences, clauses or phrases or the application thereof to any person or circumstance be held invalid.

Section 5: This Resolution shall become effective upon the date of adoption as set forth herein.

PASSED, APPROVED AND ADOPTED this 23rd day of February 2011 by the following roll call vote:

Ayes:	Directors Bourikas, Chambers, Cisneros and Moore
Noes:	None
Abstain:	None
Absent:	Director Shinaver

_____
Philip C. Cisneros, President
Board of Directors

Attest:

_____
Mike Wright, Board Secretary
Twentynine Palms Water District

RESOLUTION 11-05

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE TWENTYNINE PALMS WATER DISTRICT INCREASING THE NON-POTABLE WATER SERVICE RATE

WHEREAS, the Twentynine Palms Water District ("District") is a County Water District formed under the County Water District Law set forth in Water Code Section 30000 et seq. Under the Water Code, the District has the authority to store, conserve, appropriate, and acquire water and water rights for any useful purpose. In addition, the District has the authority to operate water rights, works, and property useful or necessary to convey, supply, store, or make use of water. The District also has the right to sell water and establish rules and regulations for the sale, distribution and use of water; and

WHEREAS, the Board of Directors adopted Ordinance No. 87 which set forth rules and regulations for the provision of retail water service and provided other District services. In addition, the Board adopted Resolution 03-16 which set fees and rates for water service as established by Ordinance No. 87 and which set forth those fees separately and independently by resolution to simplify the reading and understanding of said Ordinance. Said Resolution 03-16 provided that certain fees shall be charged and may be set from time to time by the Board of Directors including the Non-Potable Water Service Rate, as originally set forth in Section 10(B)(2) of said Ordinance. Pursuant to said Ordinance, the Non-Potable Water Service Rate will be charged at an established rate for 100 cubic feet as the Quantity/Commodity Charge.

WHEREAS, the District has determined that, due to fiscal impacts of increasing costs of service and operations, the Non-Potable Water Service Rate needs to be increased. In addition, a Rate Analysis For Non-Potable Water was performed which substantiates the need for, and the amount of, the increased Non-Potable Water Service Rate to be established; and

WHEREAS, a notice of a public hearing on the proposed rate increase was published in the Desert Trail, a newspaper of general circulation on April 21, 2011; and

WHEREAS, the Board desires to increase the Non-Potable Water Service Rate due to the fiscal impacts referenced above.

NOW, THEREFORE, the Board of Directors does hereby **RESOLVE** and **ORDER** as follows:

Section 1: All of the foregoing Recitals are true and correct and the Board so finds and determines. The Recitals set forth above are incorporated herein and made an operative part of this Resolution.

Section 2 The Board conducted a public hearing on April 27, 2011 at 6:00 pm at 72401 Hatch Road, Twentynine Palms, CA 92277 in order to receive oral and written testimony regarding this Resolution.

Section 3 The Board hereby adopts the Non-Potable Water Service Rate as set forth below:

NON-POTABLE WATER QUANTITY/COMMODITY CHARGE RATE FOR METERED NON-POTABLE WATER SERVICE:

$.80 per 100 cubic feet of water

Section 4 The Board finds that the costs of service, operations, and improvements of the District water system, which are to be funded by the increased water rate set forth herein, are necessary to maintain service within the District's existing service area. The Board further finds that costs of service and operation as referenced herein and in the Rate Analysis mentioned above, to be funded by the increased rate, will not expand the District's system. The District further finds that the adoption of the rate is necessary and reasonable to fund the costs of service and operation of the applicable District water system. Based on these findings, the Board determines that the adoption of the rate established by this Resolution is exempt from the requirements of the California Environmental Quality Act pursuant to section 21080(b)(8) of the Public Resources Code and section 15273(a) of the State CEQA Guidelines.

Section 5 All resolutions or other actions by the Board of Directors, or parts thereof that are inconsistent with any provision of this Resolution are hereby superseded only to the extent of such inconsistency.

Section 6 If any provision in this Resolution or the application thereof to any person or circumstances is for any reason held invalid, the validity of the remainder of this Resolution or the application of such provisions to other persons or circumstances shall not be affected thereby. The Board hereby declares that it would have passed this Resolution and each provision thereof, irrespective of the fact that one or more sections, subsections, sentences, clauses or phrases or the application thereof to any person or circumstance be held invalid.

Section 7: This Resolution shall become effective upon the date of adoption as set forth herein.

PASSED, APPROVED AND ADOPTED this 27th day of April 2011 by the following roll call vote:

Ayes: Directors Bourikas, Chambers, Cisneros, Moore and Shinaver
Noes: None

_____
Philip C. Cisneros, President
Board of Directors

Attest:

_____
Mike Wright, Board Secretary
Twentynine Palms Water District

ORDINANCE 92

AN ORDINANCE OF THE BOARD OF DIRECTORS OF THE TWENTYNINE PALMS WATER DISTRICT ESTABLISHING RATES AND CHARGES FOR WATER SERVICE AND REAFFIRMING CERTAIN PRIOR RATES AND CHARGES AS ESTABLISHED BY DISTRICT RESOLUTION 03-16

WHEREAS, on August 20, 2003, the Board of Directors of the Twentynine Palms Water District (the "District") adopted Ordinance 87, setting forth rules and regulations for the provision of retail water service and providing among other things, that water service rates and charges and other water fees and charges may be set from time to time by the Board; and

WHEREAS, in accordance with Ordinance 87, on August 20, 2003, the Board of Directors of the District adopted Resolution 03-16 Setting Water Service Fees and Rates for Water Service; and

WHEREAS, the District's Financial Consultant, during consideration and preparation of the Fiscal Year 2009/2010 budget and in preparation of a three-year estimated budget, determined that at the current rates and projected levels of water sales and expenses, the District's annual operating and maintenance expenses, and the District's capital facilities program are expected to significantly exceed revenues; and

WHEREAS, due to the need to improve and expand services, and to provide the capital facilities necessary to operate the District in a financially prudent and safe manner, the District has experienced, and anticipates it will continue to experience, increases in its operating and maintenance costs and capital facilities costs; and

WHEREAS, the District must generate revenues in an amount sufficient to cover the District's ongoing costs of operations, maintenance, and capital facilities; and

WHEREAS, the Board of Directors directed the General Manager and Financial Consultant to review the schedule of water service rates and charges established pursuant to Resolution 03-16 and determine what increases to such schedule of rates and charges are necessary to generate revenues sufficient to cover the District's ongoing costs of operations, maintenance, and capital facilities; and

WHEREAS, the General Manager and Financial Consultant determined that increases to the schedule of rates for water service charges, including the rates for water pay station tokens (together, the water service charges and water pay station tokens are referred to herein as "Service Charges") are necessary for a three-year period to generate revenues sufficient to cover the District's ongoing costs of operations, maintenance, and capital facilities; and

WHEREAS, the schedule of proposed Service Charges is attached hereto as Exhibit A, and by this reference incorporated herein; and

WHEREAS, the General Manager and the Financial Consultant determined that other than the rates for the Service Charges, the rates for the District's fire service charges (the "Fire Service Charges") and the rates for all other fees and charges set forth in Resolution 03-16 (such other fees and charges, together with the Fire Service Charges are referred to herein as the "Other Fees and Charges") do not need to be increased at this time and should remain in full force and effect; and

WHEREAS, the revenues derived from the proposed Service Charges will not exceed the funds required to provide the water services and shall be used exclusively for the District's water system (the "System"); and

WHEREAS, the amount of the proposed Service Charges will not exceed the proportional cost of the service attributable to each parcel upon which they are proposed for imposition; and

WHEREAS, the proposed Service Charges will not be imposed on a parcel unless the water services are actually used by, or immediately available to, the owner of the parcel; and

WHEREAS, the District, as the lead agency under the California Environmental Quality Act (CEQA), in consultation with the District's Legal Counsel, prepared a Preliminary Exemption Assessment for the adoption of this Ordinance in order to evaluate its potential impacts. The District determined that this Ordinance is exempt from CEQA review under Public Resources Code section 21080(b)(8) and State CEQA Guidelines section 15273 because the Service Charges and Other Fees and Charges are necessary and reasonable to fund the administration, operation, maintenance, and improvements of the System and will not result in the expansion of the System; and

WHEREAS, California Constitution article XIII D, section 6 ("Article XIII D") requires that prior to imposing any increase to the Service Charges, the District shall provide written notice (the "Notice") by mail of the proposed increases to such rates and charges to the record owner of each parcel upon which the rates and charges are proposed for imposition and any tenant directly liable for payment of the rates and charges, the amount of the rates and charges proposed to be imposed on each parcel, the basis upon which the rates and charges were calculated, the reason for the rates and charges, and the date time and location of a public hearing (the "Hearing") on the proposed rates and charges; and

WHEREAS, pursuant to Article XIII D such Notice is required to be provided to the affected property owners and any tenant directly liable for the payment of the rates and charges not less than forty-five days prior to the Hearing on the proposed rates and charges; and

WHEREAS, the District did provide such Notice to the affected property owners and tenants of the proposed Service Charges in compliance with Article XIII D; and

WHEREAS, the Hearing was held on this day, May 27, 2009; and

WHEREAS, at the Hearing the Board of Directors of the District heard and considered all oral testimony, written materials, and written protests concerning the establishment and imposition of the proposed Service Charges, and at the close of the Hearing the District did not receive written protests against the establishment and imposition of the proposed Service Charges from a majority of the affected property owners and tenants directly liable for the payment of the Service Charges; and

WHEREAS, the Board of Directors of the District now desires to establish and impose the proposed Service Charges and to reaffirm the rates for the Service Charges and Fire Service Charges established pursuant to Resolution 03-16; and

WHEREAS, the Board of Directors of the District has determined that the rates for the Other Fees and Charges do not need to be increased and shall remain in full force and effect as set forth in Resolution 03-16; and

WHEREAS, this Ordinance shall supersede all other previous resolutions and ordinances that may conflict with, or be contrary to, this Ordinance respecting the rates for Service Charges described more particularly herein;

NOW THEREFORE, BE IT ORDAINED, by the Board of Directors of the Twentynine Palms Water District as follows:

1. The Board of Directors of the District finds and determines that the foregoing Recitals are true and correct and incorporates the Recitals herein.

2. As the decision making body for the District, the Board of Directors has reviewed and considered the information contained in the Preliminary Exemption Assessment and administrative record. The Board of Directors finds that the Preliminary Exemption Assessment contains a complete and accurate reporting of the environmental impacts associated with the adoption of this Ordinance and reflects the independent judgment of the Board.

3. The Board of Directors hereby reaffirms the prior rates for the Service Charges and the Fire Service Charges established pursuant to Resolution 03-16.

4. The Board of Directors hereby finds that the rates for the Other Fees and Charges do not need to be increased at this time and shall remain in full force and effect as more fully set forth in Resolution 03-16.

5. The Board of Directors hereby establishes and imposes the Service Charges set forth in Exhibit A, effective on the dates, at the rates, and in the amounts set forth therein.

6. The Board of Directors hereby finds that the administration, operation, maintenance, and improvements of the System, which are to be funded by the Service Charges and the Other Fees and Charges set forth herein and in Resolution 03-16, are necessary to maintain service within the District's existing service area. The Board of Directors further finds that the administration, operation, maintenance, and improvements of the System, to be funded by the Service Charges set forth herein and the Other Fees and Charges set forth in Resolution 03-16, will not expand the System. The Board of Directors further finds that such Service Charges and the Other Fees and Charges are necessary and reasonable to fund the administration, operation, maintenance, and improvements of the System. Based on these findings, the Board of Directors hereby determines that this Ordinance is exempt from the requirements of CEQA pursuant to California Public Resources Code section 21080(b)(8) and State CEQA Guidelines section 15273(a).

7. The documents and materials that constitute the record of proceedings on which these findings have been based are located at Twentynine Palms Water District, 72401 Hatch Road, Twentynine Palms, CA 92277. The custodian for these records is the General Manager of the District.

8. The Board of Directors hereby authorizes and directs the General Manager to implement and take all actions necessary to effectuate the rates for the Service Charges set forth herein and to file a Notice of Exemption with the County Clerk for the County of San Bernardino within five (5) working days of the date of the adoption of this Ordinance.

9. If any section, subsection, subdivision, sentence, clause, or phrase in this Ordinance or any part thereof is for any reason held to be unconstitutional or invalid, ineffective by any court of competent jurisdiction, such decision shall not affect the validity or effectiveness of the remaining portions of this Ordinance or any part thereof. The Board of Directors hereby declares that it would have adopted each section irrespective of the fact that any one or more subsections, subdivisions, sentences, clauses, or phrases be declared unconstitutional, invalid, or ineffective.

10. This Ordinance shall become effective immediately upon its adoption by the Board of Directors.

PASSED, APPROVED AND ADOPTED this 27th day of May 2009 by the following vote.

AYES: Directors Anthony, Cisneros, Gallagher, Moore and Yockey
NOES: None

_____
Philip C. Cisneros, President
Board of Directors

Attest:

_____
Mike Wright, Board Secretary
Twentynine Palms Water District

EXHIBIT A
SERVICE CHARGES

The following fees are authorized and identified in Section 10 of District Ordinance No. 87, adopted on August 20, 2003.

1. READY TO SERVE/SERVICE CHARGE RATES:

WATER BILLING CHARGES

Meter Size	Rates Effective August 1, 2009
5/8"	$ 11.00
1"	$ 27.50
1-1/2"	$ 55.00
2"	$ 88.00
3"	$247.50
4"	$550.00
6"	$825.00

Rates are shown as monthly charges; however, they are billed bimonthly.

2. POTABLE WATER QUANTITY/COMMODITY CHARGE RATES FOR METERED POTABLE WATER SERVICE (Per 100 cubic feet of water):

Effective Date	August 1, 2009	July 1, 2010	July 1, 2011
Metered Potable Water	$ 1.86	$ 2.15	$ 2.33

Rates are shown as monthly charges; however, they are billed bimonthly.

3. NON-POTABLE WATER QUANTITY/COMMODITY CHARGE RATE FOR METERED NON-POTABLE WATER SERVICE:

$0.47/100 cubic feet of water

4. PAY METER TOKEN RATES:

Token Size	Tokens Purchased On or After		
	August 1, 2009	July 1, 2010	July 1, 2011
Small (125 gal)	$ 0.80	$ 0.85	$ 0.95
Large (500 gal)	$ 3.20	$ 3.40	$ 3.80

RESOLUTION 03-16

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE TWENTYNINE PALMS WATER DISTRICT SETTING FEES AND RATES FOR WATER SERVICE AS ESTABLISHED BY ORDINANCE 87 AND RESCINDING RESOLUTION 03-11

WHEREAS, the Board of Directors has heretofore adopted Resolution 03-11 Setting Water Service Fees and that said resolution needs to be rescinded in its entirety; and

WHEREAS, the Board of Directors of the Twentynine Palms Water District has adopted Ordinance 87 providing for fees for water service and associated developments; and

WHEREAS, the Board of Directors wishes to set forth these fees separately and independently by resolution to simplify the reading and understanding of said ordinance.

NOW, THEREFORE, BE IT RESOLVED, that the following schedule of fees is hereby adopted:

SCHEDULE OF FEES

The following fees shall be charged and may be set from time to time by the Board of Directors. Section numbers quoted refer to the applicable sections of Ordinance 87.

SERVICE APPLICATION FEES		
5.A.1.	APPLICATION FEE	$10.00
5.A.2.	OPENING FEE	$15.00
5.A.3.	AFTER HOURS CONNECTION FEE	$35.00
6.A.	DEPOSIT	
	Meter Size	
	5/8"	$60.00
	1"	$100.00
	11/2"	$200.00
	2"	$300.00
	3"	$800.00
	4"	$1,500.00

SERVICE INSTALLATIONS AND METERS		
9.A.1.	NEW SERVICE INSTALLATION CHARGES:	
	5/8" Short Side Service	$616.00
	1" Short Side Service	$703.00
	1-1/2" Short Side Service	$1,328.00

SERVICE INSTALLATIONS AND METERS (CONT.)

2"	Short Side Service	$1,438.00
5/8"	Open Cut Service	$1,166.00
1"	Open Cut Service	$1,253.00
1-1/2"	Open Cut Service	$1,835.00
2"	Open Cut Service	$1,945.00
5/8"	Bored Service	$833.00
1"	Bored Service	$921.00

Service installations larger than 2" will be charged on a time and materials basis and require a deposit based on estimated District costs.

9.A.2. STATE HIGHWAY ROAD CROSSING DEPOSIT
(Applies to all meter sizes) Time & Materials

9.A.3. NEW METER ON EXISTING SERVICE

5/8"	$65.00
1"	$150.00
1-1/2" & larger	$320.00
2"	$445.00

A deposit based on District estimate of costs will be required on all installations larger than 2".

9.B.1. RELOCATION OF SAME SIZE METER DEPOSIT
(At customer's request)
75% of the cost specified in 9.A.1

WATER BILLING CHARGES

10.A READY TO SERVE/SERVICE CHARGE:
Monthly rate is shown; charges are billed bimonthly.
Meter Size

5/8"	$9.00
1"	$22.50
1-1/2"	$45.00
2"	$72.00
3"	$202.50
4"	$450.00
6"	$675.00

An out of District meter is charged double the ready to serve for the meter size.

WATER BILLING CHARGES (CONT.)

10.B.1.	POTABLE WATER QUANTITY CHARGE (Per 100 cubic feet)	$1.54
10.B.2.	NON-POTABLE WATER QUANTITY (Per 100 cubic feet)	$0.47
10.B.3.	PAY METER TOKENS	Small (125 gal) $0.65 Large (500gal) $2.60

WATER FOR FIRE PROTECTION

11.C.3. FIRE SERVICE CHARGE

Monthly rate is shown; charges are billed bimonthly.

Fire Service Line Size	
2"	$23.00
3"	$46.00
4"	$86.00
6"	$184.00
8"	$338.00
10"	$522.00

CONSTRUCTION SERVICE

12.B	CONSTRUCTION READY TO SERVE/SERVICE CHARGE	Current RTS fee (per day) times # of days used
12.B	WATER USAGE	Current rate per unit used
12.C.1.	INSTALLATION CHARGE	Time & Materials
12.C.2	DEPOSIT CONSTRUCTION METER	$650.00 up to 4" meter. Over 4" is calculated on size of meter in accordance with Ordinance.

CAPITAL IMPACT FEES

13.A. PRIMARY CAPITAL IMPACT FEES

Meter Size	Capacity in GPM	
5/8"	20	$650.00
1"	50	$1,625.00
1-1/2"	100	$3,250.00
2"	160	$5,200.00

All other meter sizes based on $32.50 GPM rate as shown in Resolution 03-15.

CAPITAL IMPACT FEES (CONT.)

13.B. SECONDARY CAPITAL IMPACT FEES

The actual cost to provide the required secondary infrastructure;

or

A calculated fee that is based on the linear footage of the property requiring new and/or enlarged/expanded service.

PERMANENT OFF SITE FEE

14.B. PERMANENT OFF SITE FEES

Determined by the Board on a case by case basis.

DEVELOPMENT FEES

15.A.1. ENGINEERING DESIGN	Based on estimate of District costs.	
15.A.2. PLAN CHECK	(Per sheet)	$50.00
15.A.3. INSPECTION	$300.00 for first 500 feet, and $0.50/foot thereafter.	
15.A.4. ADMINISTRATIVE	15% of District=s Engineering costs.	

DOCUMENT PROCESSING FEE

16.A. DOCUMENT PROCESSING FEE $75.00 per document.

BILLS: PAYMENT, DELINQUENCY AND DISCONTINUANCE OF SERVICE

18.A.2.	MINIMUM READY TO SERVE		None
18.C.4.	SERVICE RECONNECTION FEE	$30.00	
18.C.5.	TAMPERING FEE		$35.00
18.E.	RETURNED CHECK		$25.00

METER ERROR

METER TEST FEES

19.A.2.	Meter Size	
	5/8" and 1"	$67.00
	1-1/2" and 2"	$90.00

Meters larger than 2", compound meters and hydrant meters will require a deposit based on District cost estimate.

DISCONTINUANCE OF SERVICE FOR OTHER THAN DELINQUENCY

20.F.	RESTORATION-RECONNECTION CHARGE	$30.00

PASSED, APPROVED AND ADOPTED this 20th day of August 2003.

AYES: Directors Anthony, Carter, Cisneros, Moore and Yockey
NOES: None

_____
Milford J. Yockey, President
Board Of Directors

Attest:

_____
Tina Johnson, Board Secretary
Twentynine Palms Water District

ORDINANCE 97

AN ORDINANCE OF THE BOARD OF DIRECTORS OF THE TWENTYNINE PALMS WATER DISTRICT ESTABLISHING RATES FOR PAY METER STATION WATER SERVICE FEES

WHEREAS, the Twentynine Palms Water District (the "District") operates and is organized under Water Code section 30000 et seq.; and

WHEREAS, the District is authorized to fix and collect charges for the provision of water services pursuant to Water Code section 31001, 31007, and 31025; and

WHEREAS, while the District continually strives for cost reductions and better utilization of the assets it holds, it also needs to keep pace with inflation, and other cost increases, many of which it cannot control; and

WHEREAS, the District imposes a pay meter station water service fee (the "Fee") on persons who purchase water from a District pay meter water station; and

WHEREAS, the amount of the Fee paid is determined on the basis of the amount of metered gallons of water pumped at a pay meter water station; and

WHEREAS, the District must generate revenues in an amount sufficient to cover the District's ongoing costs of operations, maintenance, and capital facilities; and

WHEREAS, the District hired an independent rate consultant to determine how best to recover projected increases in these costs over a five-year period and based on this evaluation, and as described below, the District has determined that rate increases in the Fee are necessary to: enable it to recover the current and projected increases in these costs; avoid operational deficits and depletion of reserves; and operate the District in a financially prudent manner; and

WHEREAS, the Board of Directors of the District now desires to establish the new rates for the Fee for a five-year period; and

WHEREAS, this Ordinance shall supersede all other previous resolutions and ordinances that may conflict with, or be contrary to, this Ordinance respecting the rates for Fee described more particularly herein;

NOW THEREFORE, BE IT ORDAINED, by the Board of Directors of the Twentynine Palms Water District as follows:

1. The Board of Directors of the District finds and determines that the foregoing Recitals are true and correct and incorporates the Recitals herein.

2. The Board of Directors hereby establishes and imposes the Fee, effective on the dates, at the rates, and in the amounts set forth in the table below:

PAY METER STATION WATER SERVICE FEES ($/GALLON)				
1-1-2016	1-1-2017	1-1-2018	1-1-2019	1-1-2020
$0.0097	$0.0103	$0.0109	$0.0115	$0.0122

3. The Board of Directors hereby finds that the administration, operation, maintenance, and improvements of the water system (the "System"), which are to be funded by the Fee set forth herein, are necessary to maintain service within the District's existing service area. The Board of Directors further finds that the administration, operation, maintenance, and improvements of the System, to be funded by the Fee set forth herein, will not expand the System. The Board of Directors further finds that such Fee is necessary and reasonable to fund the administration, operation, maintenance, and improvements of the System. Based on these findings, the Board of Directors hereby determines that this Ordinance is exempt from the requirements of CEQA pursuant to California Public Resources Code section 21080(b)(8) and State CEQA Guidelines section 15273(a) of the.

4. The Board of Directors hereby authorizes and directs the General Manager to implement and take all actions necessary to effectuate the rates for the Fee set forth herein.

5. If any section, subsection, subdivision, sentence, clause, or phrase in this Ordinance or any part thereof is for any reason held to be unconstitutional or invalid, ineffective by any court of competent jurisdiction, such decision shall not affect the validity or effectiveness of the remaining portions of this Ordinance or any part thereof. The Board of Directors hereby declares that it would have adopted each section irrespective of the fact that any one or more subsections, subdivisions, sentences, clauses, or phrases be declared unconstitutional, invalid, or ineffective.

6. This Ordinance shall become effective immediately upon its adoption by the Board of Directors.

PASSED, APPROVED AND ADOPTED this 16th day of December 2015 by the following vote.

Ayes: Directors Giannini, Horn, Moore, and Shinaver
Noes: None
Abstain: None
Absent: Director Chambers

Kerron E. Moore, President
Board of Directors

Attest:

Ray Kolisz, Board Secretary
Twentynine Palms Water District

ORDINANCE 96

AN ORDINANCE OF THE BOARD OF DIRECTORS OF THE TWENTYNINE PALMS WATER DISTRICT ESTABLISHING RATES AND CHARGES FOR WATER SERVICE

WHEREAS, the Twentynine Palms Water District (the "District") operates and is organized under Water Code section 30000 et seq.; and

WHEREAS, the District is authorized to fix and collect charges for the provision of water services pursuant to Water Code section 31001, 31007, and 31025; and

WHEREAS, the District must generate revenues in an amount sufficient to cover the District's ongoing costs of operations, maintenance, and capital facilities; and

WHEREAS, while the District continually strives for cost reductions and better utilization of the assets it holds, it also needs to keep pace with inflation, drinking water regulations, and other cost increases, many of which it cannot control; and

WHEREAS, the District hired an independent rate consultant to determine how best to recover these projected cost increases over a five-year period and based on this evaluation, and as described below, the District has determined that rate adjustments and increases are necessary to enable it to: recover current and projected increases in the costs of operations and maintenance, including water treatment costs, and capital infrastructure improvements needed to provide safe and reliable drinking water; comply with State mandated regulatory requirements; avoid operational deficits and depletion of reserves; and operate the District in a financially prudent manner; and

WHEREAS, the rate structure for the District's bi-monthly water service charges is comprised of three components — (1) a fixed service charge (the "Ready to Serve Charge") for both potable (i.e., treated) and non-potable (i.e., untreated) water customers; (2) a variable water commodity charge (the "Commodity Charge"); and (3) a fixed monthly fire meter service charge ("Fire Meter Service Charge") (collectively, the "Service Charges"); and

WHEREAS, the Ready to Serve Charge is a fixed charge established on the basis of the size of the water meter (in inches) serving a property and is calculated to recover most of the District's annual fixed costs of providing water service, such as utilities, equipment, materials, billing, collections, customer service, meter reading, and meter maintenance; and

WHEREAS, the Commodity Charge has a uniform rate, but the amount of the charge imposed varies based on the number of units of water delivered to a property (One unit of water equals one hundred cubic feet ("HCF"), or 748 gallons); the Commodity Charge is calculated to recover the District's costs of providing water and a portion of its fixed costs.

WHEREAS, the District imposes a Fire meter Charge on certain commercial properties as a condition of extending or initiating water service by (1) the installation of a private fire suppression system, and (2) upon the request of the consumer or property owner for the

delivery of water to the property for the purpose of fire service protection. The rates for the monthly commercial Fire Meter Service Charges are established on the basis of the size of the meter (in inches) serving a property and are calculated to recover the costs of providing water to such properties for private fire service protection; and

WHEREAS, the schedule of proposed Service Charges is attached hereto as Exhibit A, and by this reference incorporated herein; and

WHEREAS, the revenues derived from the proposed Service Charges will not exceed the funds required to provide the water services and shall be used exclusively for the District's water system (the "System"); and

WHEREAS, the amount of the proposed Service Charges will not exceed the proportional cost of the service attributable to each parcel upon which they are proposed for imposition; and

WHEREAS, the proposed Service Charges will not be imposed on a parcel unless the water services are actually used by, or immediately available to, the owner of the parcel; and

WHEREAS, the District, as the lead agency under the California Environmental Quality Act (CEQA), in consultation with the District's Legal Counsel, prepared a Preliminary Exemption Assessment for the adoption of this Ordinance in order to evaluate its potential impacts. The District determined that this Ordinance is exempt from CEQA review under Public Resources Code section 21080(b)(8) and State CEQA Guidelines section 15273 because the Service Charges are necessary and reasonable to fund the administration, operation, maintenance, and improvements of the System and will not result in the expansion of the System; and

WHEREAS, California Constitution article XIII D, section 6 ("Article XIII D") requires that prior to imposing any increase to the Service Charges, the District shall provide written notice (the "Notice") by mail of the proposed increases to such rates and charges to the record owner of each parcel upon which the rates and charges are proposed for imposition and any tenant directly liable for payment of the rates and charges, the amount of the rates and charges proposed to be imposed on each parcel, the basis upon which the rates and charges were calculated, the reason for the rates and charges, and the date time and location of a public hearing (the "Hearing") on the proposed rates and charges; and

WHEREAS, pursuant to Article XIII D such Notice is required to be provided to the affected property owners and any tenant directly liable for the payment of the rates and charges not less than forty-five days prior to the Hearing on the proposed rates and charges; and

WHEREAS, the District did provide such Notice to the affected property owners and tenants of the proposed Service Charges in compliance with Article XIII D; and

WHEREAS, the Hearing was held on this day, December 16, 2015; and

WHEREAS, at the Hearing the Board of Directors of the District heard and considered all

oral testimony, and considered all written materials, and written protests concerning the establishment and imposition of the proposed Service Charges, and at the close of the Hearing the District did not receive written protests against the establishment and imposition of the proposed Service Charges from a majority of the affected property owners and tenants directly liable for the payment of the Service Charges; and

WHEREAS, the Board of Directors of the District now desires to establish and impose the proposed Service Charges; and

WHEREAS, this Ordinance shall supersede all other previous resolutions and ordinances that may conflict with, or be contrary to, this Ordinance respecting the rates for Service Charges described more particularly herein;

NOW THEREFORE, BE IT ORDAINED, by the Board of Directors of the Twentynine Palms Water District as follows:

1. The Board of Directors of the District finds and determines that the foregoing Recitals are true and correct and incorporates the Recitals herein.

2. As the decision making body for the District, the Board of Directors has reviewed and considered the information contained in the Preliminary Exemption Assessment and administrative record. The Board of Directors finds that the Preliminary Exemption Assessment contains a complete and accurate reporting of the environmental impacts associated with the adoption of this Ordinance and reflects the independent judgment of the Board.

3. The Board of Directors hereby establishes and imposes the Service Charges set forth in Exhibit A, effective on the dates, at the rates, and in the amounts set forth therein.

4. The Board of Directors hereby finds that the administration, operation, maintenance, and improvements of the System, which are to be funded by the Service Charges set forth herein, are necessary to maintain service within the District's existing service area. The Board of Directors further finds that the administration, operation, maintenance, and improvements of the System, to be funded by the Service Charges set forth herein, will not expand the System. The Board of Directors further finds that such Service Charges are necessary and reasonable to fund the administration, operation, maintenance, and improvements of the System. Based on these findings, the Board of Directors hereby determines that this Ordinance is exempt from the requirements of CEQA pursuant to California Public Resources Code section 21080(b)(8) and State CEQA Guidelines section 15273(a) of the.

5. The documents and materials that constitute the record of proceedings on which these findings have been based are located at Twentynine Palms Water District, 72401 Hatch Road, Twentynine Palms, CA 92277. The custodian for these records is the General Manager of the District.

6. The Board of Directors hereby authorizes and directs the General Manager to implement and take all actions necessary to effectuate the rates for the Service Charges

set forth herein and to file a Notice of Exemption with the County Clerk for the County of San Bernardino within five (5) working days of the date of the adoption of this Ordinance.

7. If any section, subsection, subdivision, sentence, clause, or phrase in this Ordinance or any part thereof is for any reason held to be unconstitutional or invalid, ineffective by any court of competent jurisdiction, such decision shall not affect the validity or effectiveness of the remaining portions of this Ordinance or any part thereof. The Board of Directors hereby declares that it would have adopted each section irrespective of the fact that any one or more subsections, subdivisions, sentences, clauses, or phrases be declared unconstitutional, invalid, or ineffective.

8. This Ordinance shall become effective immediately upon its adoption by the Board of Directors.

PASSED, APPROVED AND ADOPTED this 16th day of December 2015 by the following vote.

Ayes:	Directors Giannini, Horn, Moore, and Shinaver
Noes:	None
Abstain:	None
Absent:	Director Chambers

Kerron E. Moore, President
Board of Directors

Attest:

Ray Kolisz, Board Secretary
Twentynine Palms Water District

EXHIBIT A
SERVICE CHARGES

The following fees are authorized pursuant to Section 3 of District Ordinance No. 96, adopted on December 16, 2015.

BI-MONTHLY RATES FOR READY TO SERVE CHARGE – POTABLE WATER ($/METER SIZE)

	Proposed Rates and Effective Dates				
Meter Size (in inches)	**1/1/ 2016**	**1/1/ 2017**	**1/1/ 2018**	**1/1/2019**	**1/1/2020**
5/8"	$21.94	$23.26	$24.65	$26.13	$27.70
3/4"	$21.94	$23.26	$24.65	$26.13	$27.70
1" (dual service residential)	$21.94	$23.26	$24.65	$26.13	$27.70
1"	$30.65	$32.49	$34.44	$36.50	$38.69
1 1/2"	$52.42	$55.57	$58.90	$62.44	$66.18
2"	$78.55	$83.27	$88.26	$93.56	$99.17
3"	$161.29	$170.97	$181.23	$192.10	$203.63
4"	$283.23	$300.22	$318.24	$337.33	$357.57
6"	$575.01	$609.51	$646.08	$684.84	$725.93

BI-MONTHLY RATES FOR READY TO SERVE CHARGE – NON-POTABLE WATER ($/METER SIZE)

	Proposed Rates and Effective Dates				
Meter Size (in inches)	**1/1/ 2016**	**1/1/ 2017**	**1/1/ 2018**	**1/1/2019**	**1/1/2020**
2"	$813.75	$862.57	$914.32	$969.18	$1,027.33

RATES FOR COMMODITY CHARGES ($/HCF)

	Proposed Rates and Effective Dates				
	1/1/ 2016	**1/1/2017**	**1/1/2018**	**1/1/2019**	**1/1/2020**
Potable	$2.63	$2.79	$2.96	$3.14	$3.33
Non-Potable Water	$0.49	$0.52	$0.55	$0.58	$0.61

MONTHLY RATES FOR FIRE SERVICE METER CHARGE ($/METER SIZE)

	Proposed Rates and Effective Dates				
Meter Size (in inches)	**1/1/ 2016**	**1/1/ 2017**	**1/1/ 2018**	**1/1/2019**	**1/1/2020**
2"	$51.18	$54.25	$57.51	$60.96	$64.61
3"	$101.47	$107.56	$114.02	$120.86	$128.11
4"	$141.18	$149.65	$158.63	$168.15	$178.24
6"	$273.53	$289.95	$307.34	$325.78	$345.33
8"	$432.36	$458.30	$485.80	$514.95	$545.84
10"	$1,173.54	$1,243.95	$1,318.59	$1,397.70	$1,481.57

RESOLUTION 11-02

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE TWENTYNINE PALMS WATER DISTRICT CONCURRING WITH A MODEL WATER EFFICIENT LANDSCAPE ORDINANCE AND CALIFORNIA GREEN BUILDING STANDARDS

WHEREAS, the Twentynine Palms Water District ("District") is a County Water District formed under the County Water District Law set forth in Water Code Section 30000 et seq. Under the Water Code, the District has the authority to store, conserve, appropriate, and acquire water and water rights for any useful purpose. In addition, the District has the authority to operate water rights, works, and property useful or necessary to convey, supply, store, or make use of water. The District also has the right to sell water and establish rules and regulations for the sale, distribution and use of water; and

WHEREAS, the District is subject to the requirements of the Urban Water Management Planning Act which requires the District to prepare an Urban Water Management Plan and required updates, amendments and revisions in order to plan for the conservation and efficient use of water; and

WHEREAS, as of the date of this Resolution, the District is in the process of engaging in the review, amendment, revision and updating of its Urban Water Management Plan. In connection with said update, the District has determined that it would be beneficial to make reference to, and otherwise concur with, the conservation and related measures which are available pursuant to that certain Model Water Efficient Landscape Ordinance ("Landscape Ordinance") which became the effective Landscape Ordinance for water efficiency within Twentynine Palms by way of action documented by the City of Twentynine Palms on or about February 2, 2010. For example, and not by way of limitation, the California Department of Water Resources ("DWR") has released its Draft Guidebook for 2010 Urban Water Management Plans which includes a suggestion that a Landscape Ordinance may assist a public agency in complying with the Water Demand Management Measure requirements of the Act, which also ties into an agency's eligibility for loan and grant funding opportunities; and

WHEREAS, the District has determined that it would be beneficial to make reference to, and otherwise concur with, the conservation and related measures which are available pursuant to those certain California Green Building Standards as adopted by the City of Twentynine Palms by way of its Ordinance No. 232, dated October 26, 2010. For example, and not by way of limitation, DWR's Draft Guidebook provides that the California Green Building Code update ("Cal Green") reinforces and in some cases exceeds the goal of water use efficiency in urban landscapes.

NOW, THEREFORE, the Board of Directors does hereby **RESOLVE** and **ORDER** as follows:

Section 1: The Recitals set forth above are incorporated herein and made an operative part of this Resolution.

Section 2: The District hereby makes reference to, and otherwise concurs with, the conservation and related measures which are available pursuant to the Landscape Ordinance which became the effective Landscape Ordinance for water efficiency within the City of Twentynine Palms, effective January 1, 2010.

Section 3: The District hereby makes reference to, and otherwise concurs with, the conservation and related measures which are available pursuant to the California Green Building Standards Code, 2010 Edition, published by the California Building Standards Commission, as adopted by the City of Twentynine Palms by way of its Ordinance No. 232, dated October 26, 2010.

Section 4: If any provision in this Resolution or the application thereof to any person or circumstances is for any reason held invalid, the validity of the remainder of this Resolution or the application of such provisions to other persons or circumstances shall not be affected thereby. The Board hereby declares that it would have passed this Resolution and each provision thereof, irrespective of the fact that one or more sections, subsections, sentences, clauses or phrases or the application thereof to any person or circumstance be held invalid.

Section 5: This Resolution shall become effective upon the date of adoption as set forth herein.

PASSED, APPROVED AND ADOPTED this 23rd day of February 2011 by the following roll call vote:

Ayes:	Directors Bourikas, Chambers, Cisneros and Moore
Noes:	None
Abstain:	None
Absent:	Director Shinaver

_____
Philip C. Cisneros, President
Board of Directors

Attest:

_____
Mike Wright, Board Secretary
Twentynine Palms Water District

RESOLUTION 11-05

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE TWENTYNINE PALMS WATER DISTRICT INCREASING THE NON-POTABLE WATER SERVICE RATE

WHEREAS, the Twentynine Palms Water District ("District") is a County Water District formed under the County Water District Law set forth in Water Code Section 30000 et seq. Under the Water Code, the District has the authority to store, conserve, appropriate, and acquire water and water rights for any useful purpose. In addition, the District has the authority to operate water rights, works, and property useful or necessary to convey, supply, store, or make use of water. The District also has the right to sell water and establish rules and regulations for the sale, distribution and use of water; and

WHEREAS, the Board of Directors adopted Ordinance No. 87 which set forth rules and regulations for the provision of retail water service and provided other District services. In addition, the Board adopted Resolution 03-16 which set fees and rates for water service as established by Ordinance No. 87 and which set forth those fees separately and independently by resolution to simplify the reading and understanding of said Ordinance. Said Resolution 03-16 provided that certain fees shall be charged and may be set from time to time by the Board of Directors including the Non-Potable Water Service Rate, as originally set forth in Section 10(B)(2) of said Ordinance. Pursuant to said Ordinance, the Non-Potable Water Service Rate will be charged at an established rate for 100 cubic feet as the Quantity/Commodity Charge.

WHEREAS, the District has determined that, due to fiscal impacts of increasing costs of service and operations, the Non-Potable Water Service Rate needs to be increased. In addition, a Rate Analysis For Non-Potable Water was performed which substantiates the need for, and the amount of, the increased Non-Potable Water Service Rate to be established; and

WHEREAS, a notice of a public hearing on the proposed rate increase was published in the Desert Trail, a newspaper of general circulation on April 21, 2011; and

WHEREAS, the Board desires to increase the Non-Potable Water Service Rate due to the fiscal impacts referenced above.

NOW, THEREFORE, the Board of Directors does hereby **RESOLVE** and **ORDER** as follows:

Section 1: All of the foregoing Recitals are true and correct and the Board so finds and determines. The Recitals set forth above are incorporated herein and made an operative part of this Resolution.

Section 2 The Board conducted a public hearing on April 27, 2011 at 6:00 pm at 72401 Hatch Road, Twentynine Palms, CA 92277 in order to receive oral and written testimony regarding this Resolution.

Section 3 The Board hereby adopts the Non-Potable Water Service Rate as set forth below:

NON-POTABLE WATER QUANTITY/COMMODITY CHARGE RATE FOR METERED NON-POTABLE WATER SERVICE:

$.80 per 100 cubic feet of water

Section 4 The Board finds that the costs of service, operations, and improvements of the District water system, which are to be funded by the increased water rate set forth herein, are necessary to maintain service within the District's existing service area. The Board further finds that costs of service and operation as referenced herein and in the Rate Analysis mentioned above, to be funded by the increased rate, will not expand the District's system. The District further finds that the adoption of the rate is necessary and reasonable to fund the costs of service and operation of the applicable District water system. Based on these findings, the Board determines that the adoption of the rate established by this Resolution is exempt from the requirements of the California Environmental Quality Act pursuant to section 21080(b)(8) of the Public Resources Code and section 15273(a) of the State CEQA Guidelines.

Section 5 All resolutions or other actions by the Board of Directors, or parts thereof that are inconsistent with any provision of this Resolution are hereby superseded only to the extent of such inconsistency.

Section 6 If any provision in this Resolution or the application thereof to any person or circumstances is for any reason held invalid, the validity of the remainder of this Resolution or the application of such provisions to other persons or circumstances shall not be affected thereby. The Board hereby declares that it would have passed this Resolution and each provision thereof, irrespective of the fact that one or more sections, subsections, sentences, clauses or phrases or the application thereof to any person or circumstance be held invalid.

Section 7: This Resolution shall become effective upon the date of adoption as set forth herein.

PASSED, APPROVED AND ADOPTED this 27th day of April 2011 by the following roll call vote:

Ayes: Directors Bourikas, Chambers, Cisneros, Moore and Shinaver
Noes: None

_____
Philip C. Cisneros, President
Board of Directors

Attest:

_____
Mike Wright, Board Secretary
Twentynine Palms Water District

ORDINANCE 92

AN ORDINANCE OF THE BOARD OF DIRECTORS OF THE TWENTYNINE PALMS WATER DISTRICT ESTABLISHING RATES AND CHARGES FOR WATER SERVICE AND REAFFIRMING CERTAIN PRIOR RATES AND CHARGES AS ESTABLISHED BY DISTRICT RESOLUTION 03-16

WHEREAS, on August 20, 2003, the Board of Directors of the Twentynine Palms Water District (the "District") adopted Ordinance 87, setting forth rules and regulations for the provision of retail water service and providing among other things, that water service rates and charges and other water fees and charges may be set from time to time by the Board; and

WHEREAS, in accordance with Ordinance 87, on August 20, 2003, the Board of Directors of the District adopted Resolution 03-16 Setting Water Service Fees and Rates for Water Service; and

WHEREAS, the District's Financial Consultant, during consideration and preparation of the Fiscal Year 2009/2010 budget and in preparation of a three-year estimated budget, determined that at the current rates and projected levels of water sales and expenses, the District's annual operating and maintenance expenses, and the District's capital facilities program are expected to significantly exceed revenues; and

WHEREAS, due to the need to improve and expand services, and to provide the capital facilities necessary to operate the District in a financially prudent and safe manner, the District has experienced, and anticipates it will continue to experience, increases in its operating and maintenance costs and capital facilities costs; and

WHEREAS, the District must generate revenues in an amount sufficient to cover the District's ongoing costs of operations, maintenance, and capital facilities; and

WHEREAS, the Board of Directors directed the General Manager and Financial Consultant to review the schedule of water service rates and charges established pursuant to Resolution 03-16 and determine what increases to such schedule of rates and charges are necessary to generate revenues sufficient to cover the District's ongoing costs of operations, maintenance, and capital facilities; and

WHEREAS, the General Manager and Financial Consultant determined that increases to the schedule of rates for water service charges, including the rates for water pay station tokens (together, the water service charges and water pay station tokens are referred to herein as "Service Charges") are necessary for a three-year period to generate revenues sufficient to cover the District's ongoing costs of operations, maintenance, and capital facilities; and

WHEREAS, the schedule of proposed Service Charges is attached hereto as Exhibit A, and by this reference incorporated herein; and

WHEREAS, the General Manager and the Financial Consultant determined that other than the rates for the Service Charges, the rates for the District's fire service charges (the "Fire Service Charges") and the rates for all other fees and charges set forth in Resolution 03-16 (such other fees and charges, together with the Fire Service Charges are referred to herein as the "Other Fees and Charges") do not need to be increased at this time and should remain in full force and effect; and

WHEREAS, the revenues derived from the proposed Service Charges will not exceed the funds required to provide the water services and shall be used exclusively for the District's water system (the "System"); and

WHEREAS, the amount of the proposed Service Charges will not exceed the proportional cost of the service attributable to each parcel upon which they are proposed for imposition; and

WHEREAS, the proposed Service Charges will not be imposed on a parcel unless the water services are actually used by, or immediately available to, the owner of the parcel; and

WHEREAS, the District, as the lead agency under the California Environmental Quality Act (CEQA), in consultation with the District's Legal Counsel, prepared a Preliminary Exemption Assessment for the adoption of this Ordinance in order to evaluate its potential impacts. The District determined that this Ordinance is exempt from CEQA review under Public Resources Code section 21080(b)(8) and State CEQA Guidelines section 15273 because the Service Charges and Other Fees and Charges are necessary and reasonable to fund the administration, operation, maintenance, and improvements of the System and will not result in the expansion of the System; and

WHEREAS, California Constitution article XIII D, section 6 ("Article XIII D") requires that prior to imposing any increase to the Service Charges, the District shall provide written notice (the "Notice") by mail of the proposed increases to such rates and charges to the record owner of each parcel upon which the rates and charges are proposed for imposition and any tenant directly liable for payment of the rates and charges, the amount of the rates and charges proposed to be imposed on each parcel, the basis upon which the rates and charges were calculated, the reason for the rates and charges, and the date time and location of a public hearing (the "Hearing") on the proposed rates and charges; and

WHEREAS, pursuant to Article XIII D such Notice is required to be provided to the affected property owners and any tenant directly liable for the payment of the rates and charges not less than forty-five days prior to the Hearing on the proposed rates and charges; and

WHEREAS, the District did provide such Notice to the affected property owners and tenants of the proposed Service Charges in compliance with Article XIII D; and

WHEREAS, the Hearing was held on this day, May 27, 2009; and

WHEREAS, at the Hearing the Board of Directors of the District heard and considered all oral testimony, written materials, and written protests concerning the establishment and imposition of the proposed Service Charges, and at the close of the Hearing the District did not receive written protests against the establishment and imposition of the proposed Service Charges from a majority of the affected property owners and tenants directly liable for the payment of the Service Charges; and

WHEREAS, the Board of Directors of the District now desires to establish and impose the proposed Service Charges and to reaffirm the rates for the Service Charges and Fire Service Charges established pursuant to Resolution 03-16; and

WHEREAS, the Board of Directors of the District has determined that the rates for the Other Fees and Charges do not need to be increased and shall remain in full force and effect as set forth in Resolution 03-16; and

WHEREAS, this Ordinance shall supersede all other previous resolutions and ordinances that may conflict with, or be contrary to, this Ordinance respecting the rates for Service Charges described more particularly herein;

NOW THEREFORE, BE IT ORDAINED, by the Board of Directors of the Twentynine Palms Water District as follows:

1. The Board of Directors of the District finds and determines that the foregoing Recitals are true and correct and incorporates the Recitals herein.

2. As the decision making body for the District, the Board of Directors has reviewed and considered the information contained in the Preliminary Exemption Assessment and administrative record. The Board of Directors finds that the Preliminary Exemption Assessment contains a complete and accurate reporting of the environmental impacts associated with the adoption of this Ordinance and reflects the independent judgment of the Board.

3. The Board of Directors hereby reaffirms the prior rates for the Service Charges and the Fire Service Charges established pursuant to Resolution 03-16.

4. The Board of Directors hereby finds that the rates for the Other Fees and Charges do not need to be increased at this time and shall remain in full force and effect as more fully set forth in Resolution 03-16.

5. The Board of Directors hereby establishes and imposes the Service Charges set forth in Exhibit A, effective on the dates, at the rates, and in the amounts set forth therein.

6. The Board of Directors hereby finds that the administration, operation, maintenance, and improvements of the System, which are to be funded by the Service Charges and the Other Fees and Charges set forth herein and in Resolution 03-16, are necessary to maintain service within the District's existing service area. The Board of Directors further finds that the administration, operation, maintenance, and improvements of the System, to be funded by the Service Charges set forth herein and the Other Fees and Charges set forth in Resolution 03-16, will not expand the System. The Board of Directors further finds that such Service Charges and the Other Fees and Charges are necessary and reasonable to fund the administration, operation, maintenance, and improvements of the System. Based on these findings, the Board of Directors hereby determines that this Ordinance is exempt from the requirements of CEQA pursuant to California Public Resources Code section 21080(b)(8) and State CEQA Guidelines section 15273(a).

7. The documents and materials that constitute the record of proceedings on which these findings have been based are located at Twentynine Palms Water District, 72401 Hatch Road, Twentynine Palms, CA 92277. The custodian for these records is the General Manager of the District.

8. The Board of Directors hereby authorizes and directs the General Manager to implement and take all actions necessary to effectuate the rates for the Service Charges set forth herein and to file a Notice of Exemption with the County Clerk for the County of San Bernardino within five (5) working days of the date of the adoption of this Ordinance.

9. If any section, subsection, subdivision, sentence, clause, or phrase in this Ordinance or any part thereof is for any reason held to be unconstitutional or invalid, ineffective by any court of competent jurisdiction, such decision shall not affect the validity or effectiveness of the remaining portions of this Ordinance or any part thereof. The Board of Directors hereby declares that it would have adopted each section irrespective of the fact that any one or more subsections, subdivisions, sentences, clauses, or phrases be declared unconstitutional, invalid, or ineffective.

10. This Ordinance shall become effective immediately upon its adoption by the Board of Directors.

PASSED, APPROVED AND ADOPTED this 27th day of May 2009 by the following vote.

AYES: Directors Anthony, Cisneros, Gallagher, Moore and Yockey
NOES: None

_____
Philip C. Cisneros, President
Board of Directors

Attest:

_____
Mike Wright, Board Secretary
Twentynine Palms Water District

EXHIBIT A
SERVICE CHARGES

The following fees are authorized and identified in Section 10 of District Ordinance No. 87, adopted on August 20, 2003.

1. READY TO SERVE/SERVICE CHARGE RATES:

WATER BILLING CHARGES

Meter Size	Rates Effective August 1, 2009
5/8"	$ 11.00
1"	$ 27.50
1-1/2"	$ 55.00
2"	$ 88.00
3"	$247.50
4"	$550.00
6"	$825.00

Rates are shown as monthly charges; however, they are billed bimonthly.

2. POTABLE WATER QUANTITY/COMMODITY CHARGE RATES FOR METERED POTABLE WATER SERVICE (Per 100 cubic feet of water):

Effective Date	August 1, 2009	July 1, 2010	July 1, 2011
Metered Potable Water	$ 1.86	$ 2.15	$ 2.33

Rates are shown as monthly charges; however, they are billed bimonthly.

3. NON-POTABLE WATER QUANTITY/COMMODITY CHARGE RATE FOR METERED NON-POTABLE WATER SERVICE:

$0.47/100 cubic feet of water

4. PAY METER TOKEN RATES:

Token Size	Tokens Purchased On or After		
	August 1, 2009	July 1, 2010	July 1, 2011
Small (125 gal)	$ 0.80	$ 0.85	$ 0.95
Large (500 gal)	$ 3.20	$ 3.40	$ 3.80

RESOLUTION 03-16

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE TWENTYNINE PALMS WATER DISTRICT SETTING FEES AND RATES FOR WATER SERVICE AS ESTABLISHED BY ORDINANCE 87 AND RESCINDING RESOLUTION 03-11

WHEREAS, the Board of Directors has heretofore adopted Resolution 03-11 Setting Water Service Fees and that said resolution needs to be rescinded in its entirety; and

WHEREAS, the Board of Directors of the Twentynine Palms Water District has adopted Ordinance 87 providing for fees for water service and associated developments; and

WHEREAS, the Board of Directors wishes to set forth these fees separately and independently by resolution to simplify the reading and understanding of said ordinance.

NOW, THEREFORE, BE IT RESOLVED, that the following schedule of fees is hereby adopted:

SCHEDULE OF FEES

The following fees shall be charged and may be set from time to time by the Board of Directors. Section numbers quoted refer to the applicable sections of Ordinance 87.

SERVICE APPLICATION FEES		
5.A.1.	APPLICATION FEE	$10.00
5.A.2.	OPENING FEE	$15.00
5.A.3.	AFTER HOURS CONNECTION FEE	$35.00
6.A.	DEPOSIT	
	Meter Size	
	5/8"	$60.00
	1"	$100.00
	11/2"	$200.00
	2"	$300.00
	3"	$800.00
	4"	$1,500.00

SERVICE INSTALLATIONS AND METERS		
9.A.1.	NEW SERVICE INSTALLATION CHARGES:	
	5/8" Short Side Service	$616.00
	1" Short Side Service	$703.00
	1-1/2" Short Side Service	$1,328.00

SERVICE INSTALLATIONS AND METERS (CONT.)

2"	Short Side Service	$1,438.00
5/8"	Open Cut Service	$1,166.00
1"	Open Cut Service	$1,253.00
1-1/2"	Open Cut Service	$1,835.00
2"	Open Cut Service	$1,945.00
5/8"	Bored Service	$833.00
1"	Bored Service	$921.00

Service installations larger than 2" will be charged on a time and materials basis and require a deposit based on estimated District costs.

9.A.2. STATE HIGHWAY ROAD CROSSING DEPOSIT
(Applies to all meter sizes) Time & Materials

9.A.3. NEW METER ON EXISTING SERVICE

5/8"	$65.00
1"	$150.00
1-1/2" & larger	$320.00
2"	$445.00

A deposit based on District estimate of costs will be required on all installations larger than 2".

9.B.1. RELOCATION OF SAME SIZE METER DEPOSIT
(At customer's request)
75% of the cost specified in 9.A.1

WATER BILLING CHARGES

10.A READY TO SERVE/SERVICE CHARGE:
Monthly rate is shown; charges are billed bimonthly.
Meter Size

5/8"	$9.00
1"	$22.50
1-1/2"	$45.00
2"	$72.00
3"	$202.50
4"	$450.00
6"	$675.00

An out of District meter is charged double the ready to serve for the meter size.

WATER BILLING CHARGES (CONT.)

10.B.1.	POTABLE WATER QUANTITY CHARGE (Per 100 cubic feet)	$1.54
10.B.2.	NON-POTABLE WATER QUANTITY (Per 100 cubic feet)	$0.47
10.B.3.	PAY METER TOKENS	Small (125 gal) $0.65 Large (500gal) $2.60

WATER FOR FIRE PROTECTION

11.C.3. FIRE SERVICE CHARGE

Monthly rate is shown; charges are billed bimonthly.

Fire Service Line Size	
2"	$23.00
3"	$46.00
4"	$86.00
6"	$184.00
8"	$338.00
10"	$522.00

CONSTRUCTION SERVICE

12.B	CONSTRUCTION READY TO SERVE/SERVICE CHARGE	Current RTS fee (per day) times # of days used
12.B	WATER USAGE	Current rate per unit used
12.C.1.	INSTALLATION CHARGE	Time & Materials
12.C.2	DEPOSIT CONSTRUCTION METER	$650.00 up to 4" meter. Over 4" is calculated on size of meter in accordance with Ordinance.

CAPITAL IMPACT FEES

13.A. PRIMARY CAPITAL IMPACT FEES

Meter Size	Capacity in GPM	
5/8"	20	$650.00
1"	50	$1,625.00
1-1/2"	100	$3,250.00
2"	160	$5,200.00

All other meter sizes based on $32.50 GPM rate as shown in Resolution 03-15.

CAPITAL IMPACT FEES (CONT.)

13.B. SECONDARY CAPITAL IMPACT FEES

The actual cost to provide the required secondary infrastructure;

or

A calculated fee that is based on the linear footage of the property requiring new and/or enlarged/expanded service.

PERMANENT OFF SITE FEE

14.B. PERMANENT OFF SITE FEES

Determined by the Board on a case by case basis.

DEVELOPMENT FEES

15.A.1. ENGINEERING DESIGN	Based on estimate of District costs.	
15.A.2. PLAN CHECK	(Per sheet)	$50.00
15.A.3. INSPECTION	$300.00 for first 500 feet, and $0.50/foot thereafter.	
15.A.4. ADMINISTRATIVE	15% of District=s Engineering costs.	

DOCUMENT PROCESSING FEE

16.A. DOCUMENT PROCESSING FEE $75.00 per document.

BILLS: PAYMENT, DELINQUENCY AND DISCONTINUANCE OF SERVICE

18.A.2.	MINIMUM READY TO SERVE		None
18.C.4.	SERVICE RECONNECTION FEE	$30.00	
18.C.5.	TAMPERING FEE		$35.00
18.E.	RETURNED CHECK		$25.00

METER ERROR

METER TEST FEES

19.A.2.	Meter Size	
	5/8" and 1"	$67.00
	1-1/2" and 2"	$90.00

Meters larger than 2", compound meters and hydrant meters will require a deposit based on District cost estimate.

DISCONTINUANCE OF SERVICE FOR OTHER THAN DELINQUENCY

20.F.	RESTORATION-RECONNECTION CHARGE	$30.00

PASSED, APPROVED AND ADOPTED this 20th day of August 2003.

AYES: Directors Anthony, Carter, Cisneros, Moore and Yockey
NOES: None

_____
Milford J. Yockey, President
Board Of Directors

Attest:

_____
Tina Johnson, Board Secretary
Twentynine Palms Water District

ORDINANCE 97

AN ORDINANCE OF THE BOARD OF DIRECTORS OF THE TWENTYNINE PALMS WATER DISTRICT ESTABLISHING RATES FOR PAY METER STATION WATER SERVICE FEES

WHEREAS, the Twentynine Palms Water District (the "District") operates and is organized under Water Code section 30000 et seq.; and

WHEREAS, the District is authorized to fix and collect charges for the provision of water services pursuant to Water Code section 31001, 31007, and 31025; and

WHEREAS, while the District continually strives for cost reductions and better utilization of the assets it holds, it also needs to keep pace with inflation, and other cost increases, many of which it cannot control; and

WHEREAS, the District imposes a pay meter station water service fee (the "Fee") on persons who purchase water from a District pay meter water station; and

WHEREAS, the amount of the Fee paid is determined on the basis of the amount of metered gallons of water pumped at a pay meter water station; and

WHEREAS, the District must generate revenues in an amount sufficient to cover the District's ongoing costs of operations, maintenance, and capital facilities; and

WHEREAS, the District hired an independent rate consultant to determine how best to recover projected increases in these costs over a five-year period and based on this evaluation, and as described below, the District has determined that rate increases in the Fee are necessary to: enable it to recover the current and projected increases in these costs; avoid operational deficits and depletion of reserves; and operate the District in a financially prudent manner; and

WHEREAS, the Board of Directors of the District now desires to establish the new rates for the Fee for a five-year period; and

WHEREAS, this Ordinance shall supersede all other previous resolutions and ordinances that may conflict with, or be contrary to, this Ordinance respecting the rates for Fee described more particularly herein;

NOW THEREFORE, BE IT ORDAINED, by the Board of Directors of the Twentynine Palms Water District as follows:

1. The Board of Directors of the District finds and determines that the foregoing Recitals are true and correct and incorporates the Recitals herein.

2. The Board of Directors hereby establishes and imposes the Fee, effective on the dates, at the rates, and in the amounts set forth in the table below:

PAY METER STATION WATER SERVICE FEES ($/GALLON)				
1-1-2016	1-1-2017	1-1-2018	1-1-2019	1-1-2020
$0.0097	$0.0103	$0.0109	$0.0115	$0.0122

3. The Board of Directors hereby finds that the administration, operation, maintenance, and improvements of the water system (the "System"), which are to be funded by the Fee set forth herein, are necessary to maintain service within the District's existing service area. The Board of Directors further finds that the administration, operation, maintenance, and improvements of the System, to be funded by the Fee set forth herein, will not expand the System. The Board of Directors further finds that such Fee is necessary and reasonable to fund the administration, operation, maintenance, and improvements of the System. Based on these findings, the Board of Directors hereby determines that this Ordinance is exempt from the requirements of CEQA pursuant to California Public Resources Code section 21080(b)(8) and State CEQA Guidelines section 15273(a) of the.

4. The Board of Directors hereby authorizes and directs the General Manager to implement and take all actions necessary to effectuate the rates for the Fee set forth herein.

5. If any section, subsection, subdivision, sentence, clause, or phrase in this Ordinance or any part thereof is for any reason held to be unconstitutional or invalid, ineffective by any court of competent jurisdiction, such decision shall not affect the validity or effectiveness of the remaining portions of this Ordinance or any part thereof. The Board of Directors hereby declares that it would have adopted each section irrespective of the fact that any one or more subsections, subdivisions, sentences, clauses, or phrases be declared unconstitutional, invalid, or ineffective.

6. This Ordinance shall become effective immediately upon its adoption by the Board of Directors.

PASSED, APPROVED AND ADOPTED this 16th day of December 2015 by the following vote.

Ayes: Directors Giannini, Horn, Moore, and Shinaver
Noes: None
Abstain: None
Absent: Director Chambers

Kerron E. Moore, President
Board of Directors

Attest:

Ray Kolisz, Board Secretary
Twentynine Palms Water District

ORDINANCE 96

AN ORDINANCE OF THE BOARD OF DIRECTORS OF THE TWENTYNINE PALMS WATER DISTRICT ESTABLISHING RATES AND CHARGES FOR WATER SERVICE

WHEREAS, the Twentynine Palms Water District (the "District") operates and is organized under Water Code section 30000 et seq.; and

WHEREAS, the District is authorized to fix and collect charges for the provision of water services pursuant to Water Code section 31001, 31007, and 31025; and

WHEREAS, the District must generate revenues in an amount sufficient to cover the District's ongoing costs of operations, maintenance, and capital facilities; and

WHEREAS, while the District continually strives for cost reductions and better utilization of the assets it holds, it also needs to keep pace with inflation, drinking water regulations, and other cost increases, many of which it cannot control; and

WHEREAS, the District hired an independent rate consultant to determine how best to recover these projected cost increases over a five-year period and based on this evaluation, and as described below, the District has determined that rate adjustments and increases are necessary to enable it to: recover current and projected increases in the costs of operations and maintenance, including water treatment costs, and capital infrastructure improvements needed to provide safe and reliable drinking water; comply with State mandated regulatory requirements; avoid operational deficits and depletion of reserves; and operate the District in a financially prudent manner; and

WHEREAS, the rate structure for the District's bi-monthly water service charges is comprised of three components — (1) a fixed service charge (the "Ready to Serve Charge") for both potable (i.e., treated) and non-potable (i.e., untreated) water customers; (2) a variable water commodity charge (the "Commodity Charge"); and (3) a fixed monthly fire meter service charge ("Fire Meter Service Charge") (collectively, the "Service Charges"); and

WHEREAS, the Ready to Serve Charge is a fixed charge established on the basis of the size of the water meter (in inches) serving a property and is calculated to recover most of the District's annual fixed costs of providing water service, such as utilities, equipment, materials, billing, collections, customer service, meter reading, and meter maintenance; and

WHEREAS, the Commodity Charge has a uniform rate, but the amount of the charge imposed varies based on the number of units of water delivered to a property (One unit of water equals one hundred cubic feet ("HCF"), or 748 gallons); the Commodity Charge is calculated to recover the District's costs of providing water and a portion of its fixed costs.

WHEREAS, the District imposes a Fire meter Charge on certain commercial properties as a condition of extending or initiating water service by (1) the installation of a private fire suppression system, and (2) upon the request of the consumer or property owner for the

delivery of water to the property for the purpose of fire service protection. The rates for the monthly commercial Fire Meter Service Charges are established on the basis of the size of the meter (in inches) serving a property and are calculated to recover the costs of providing water to such properties for private fire service protection; and

WHEREAS, the schedule of proposed Service Charges is attached hereto as Exhibit A, and by this reference incorporated herein; and

WHEREAS, the revenues derived from the proposed Service Charges will not exceed the funds required to provide the water services and shall be used exclusively for the District's water system (the "System"); and

WHEREAS, the amount of the proposed Service Charges will not exceed the proportional cost of the service attributable to each parcel upon which they are proposed for imposition; and

WHEREAS, the proposed Service Charges will not be imposed on a parcel unless the water services are actually used by, or immediately available to, the owner of the parcel; and

WHEREAS, the District, as the lead agency under the California Environmental Quality Act (CEQA), in consultation with the District's Legal Counsel, prepared a Preliminary Exemption Assessment for the adoption of this Ordinance in order to evaluate its potential impacts. The District determined that this Ordinance is exempt from CEQA review under Public Resources Code section 21080(b)(8) and State CEQA Guidelines section 15273 because the Service Charges are necessary and reasonable to fund the administration, operation, maintenance, and improvements of the System and will not result in the expansion of the System; and

WHEREAS, California Constitution article XIII D, section 6 ("Article XIII D") requires that prior to imposing any increase to the Service Charges, the District shall provide written notice (the "Notice") by mail of the proposed increases to such rates and charges to the record owner of each parcel upon which the rates and charges are proposed for imposition and any tenant directly liable for payment of the rates and charges, the amount of the rates and charges proposed to be imposed on each parcel, the basis upon which the rates and charges were calculated, the reason for the rates and charges, and the date time and location of a public hearing (the "Hearing") on the proposed rates and charges; and

WHEREAS, pursuant to Article XIII D such Notice is required to be provided to the affected property owners and any tenant directly liable for the payment of the rates and charges not less than forty-five days prior to the Hearing on the proposed rates and charges; and

WHEREAS, the District did provide such Notice to the affected property owners and tenants of the proposed Service Charges in compliance with Article XIII D; and

WHEREAS, the Hearing was held on this day, December 16, 2015; and

WHEREAS, at the Hearing the Board of Directors of the District heard and considered all

oral testimony, and considered all written materials, and written protests concerning the establishment and imposition of the proposed Service Charges, and at the close of the Hearing the District did not receive written protests against the establishment and imposition of the proposed Service Charges from a majority of the affected property owners and tenants directly liable for the payment of the Service Charges; and

WHEREAS, the Board of Directors of the District now desires to establish and impose the proposed Service Charges; and

WHEREAS, this Ordinance shall supersede all other previous resolutions and ordinances that may conflict with, or be contrary to, this Ordinance respecting the rates for Service Charges described more particularly herein;

NOW THEREFORE, BE IT ORDAINED, by the Board of Directors of the Twentynine Palms Water District as follows:

1. The Board of Directors of the District finds and determines that the foregoing Recitals are true and correct and incorporates the Recitals herein.

2. As the decision making body for the District, the Board of Directors has reviewed and considered the information contained in the Preliminary Exemption Assessment and administrative record. The Board of Directors finds that the Preliminary Exemption Assessment contains a complete and accurate reporting of the environmental impacts associated with the adoption of this Ordinance and reflects the independent judgment of the Board.

3. The Board of Directors hereby establishes and imposes the Service Charges set forth in Exhibit A, effective on the dates, at the rates, and in the amounts set forth therein.

4. The Board of Directors hereby finds that the administration, operation, maintenance, and improvements of the System, which are to be funded by the Service Charges set forth herein, are necessary to maintain service within the District's existing service area. The Board of Directors further finds that the administration, operation, maintenance, and improvements of the System, to be funded by the Service Charges set forth herein, will not expand the System. The Board of Directors further finds that such Service Charges are necessary and reasonable to fund the administration, operation, maintenance, and improvements of the System. Based on these findings, the Board of Directors hereby determines that this Ordinance is exempt from the requirements of CEQA pursuant to California Public Resources Code section 21080(b)(8) and State CEQA Guidelines section 15273(a) of the.

5. The documents and materials that constitute the record of proceedings on which these findings have been based are located at Twentynine Palms Water District, 72401 Hatch Road, Twentynine Palms, CA 92277. The custodian for these records is the General Manager of the District.

6. The Board of Directors hereby authorizes and directs the General Manager to implement and take all actions necessary to effectuate the rates for the Service Charges

set forth herein and to file a Notice of Exemption with the County Clerk for the County of San Bernardino within five (5) working days of the date of the adoption of this Ordinance.

7. If any section, subsection, subdivision, sentence, clause, or phrase in this Ordinance or any part thereof is for any reason held to be unconstitutional or invalid, ineffective by any court of competent jurisdiction, such decision shall not affect the validity or effectiveness of the remaining portions of this Ordinance or any part thereof. The Board of Directors hereby declares that it would have adopted each section irrespective of the fact that any one or more subsections, subdivisions, sentences, clauses, or phrases be declared unconstitutional, invalid, or ineffective.

8. This Ordinance shall become effective immediately upon its adoption by the Board of Directors.

PASSED, APPROVED AND ADOPTED this 16th day of December 2015 by the following vote.

Ayes:	Directors Giannini, Horn, Moore, and Shinaver
Noes:	None
Abstain:	None
Absent:	Director Chambers

Kerron E. Moore, President
Board of Directors

Attest:

Ray Kolisz, Board Secretary
Twentynine Palms Water District

EXHIBIT A
SERVICE CHARGES

The following fees are authorized pursuant to Section 3 of District Ordinance No. 96, adopted on December 16, 2015.

BI-MONTHLY RATES FOR READY TO SERVE CHARGE – POTABLE WATER ($/METER SIZE)

	Proposed Rates and Effective Dates				
Meter Size (in inches)	**1/1/ 2016**	**1/1/ 2017**	**1/1/ 2018**	**1/1/2019**	**1/1/2020**
5/8"	$21.94	$23.26	$24.65	$26.13	$27.70
3/4"	$21.94	$23.26	$24.65	$26.13	$27.70
1" (dual service residential)	$21.94	$23.26	$24.65	$26.13	$27.70
1"	$30.65	$32.49	$34.44	$36.50	$38.69
1 1/2"	$52.42	$55.57	$58.90	$62.44	$66.18
2"	$78.55	$83.27	$88.26	$93.56	$99.17
3"	$161.29	$170.97	$181.23	$192.10	$203.63
4"	$283.23	$300.22	$318.24	$337.33	$357.57
6"	$575.01	$609.51	$646.08	$684.84	$725.93

BI-MONTHLY RATES FOR READY TO SERVE CHARGE – NON-POTABLE WATER ($/METER SIZE)

	Proposed Rates and Effective Dates				
Meter Size (in inches)	**1/1/ 2016**	**1/1/ 2017**	**1/1/ 2018**	**1/1/2019**	**1/1/2020**
2"	$813.75	$862.57	$914.32	$969.18	$1,027.33

RATES FOR COMMODITY CHARGES ($/HCF)

	Proposed Rates and Effective Dates				
	1/1/ 2016	**1/1/2017**	**1/1/2018**	**1/1/2019**	**1/1/2020**
Potable	$2.63	$2.79	$2.96	$3.14	$3.33
Non-Potable Water	$0.49	$0.52	$0.55	$0.58	$0.61

MONTHLY RATES FOR FIRE SERVICE METER CHARGE ($/METER SIZE)

	Proposed Rates and Effective Dates				
Meter Size (in inches)	**1/1/ 2016**	**1/1/ 2017**	**1/1/ 2018**	**1/1/2019**	**1/1/2020**
2"	$51.18	$54.25	$57.51	$60.96	$64.61
3"	$101.47	$107.56	$114.02	$120.86	$128.11
4"	$141.18	$149.65	$158.63	$168.15	$178.24
6"	$273.53	$289.95	$307.34	$325.78	$345.33
8"	$432.36	$458.30	$485.80	$514.95	$545.84
10"	$1,173.54	$1,243.95	$1,318.59	$1,397.70	$1,481.57

Appendix I: WSCP

Appendix J: Emergency Response Plan

EMERGENCY RESPONSE PLAN (ERP)
Water System

TWENTYNINE PALMS WATER DISTRICT
72401 Hatch Road
Twentynine Palms, CA 92277
(760) 367-7546

TABLE OF CONTENTS

I. INTRODUCTION

A. DEFINITION

An Emergency Response Plan (ERP) is an organized way of responding to an event(s) or set of circumstances that goes beyond those normally found or associated with Twentynine Palms Water District in its normal day-to-day functioning in water delivery and services. The responses outlined in this document are designed to assist in taking action for those instances or circumstances that are NOT normally encountered or are NOT reasonably expected to occur in the normal course of business. This type of an event(s) or set of circumstances may occur with little or no warning and may or may not involve criminal activity.

B. PURPOSE

The purpose of this plan is to outline responsibilities, actions, precautions and policies for specific employees to provide a framework for maintaining operations and on-going or resumption of service to the community.

C. GOAL

The goal of Twentynine Palms Water District is to have an effective and efficient response to these unrelated operation circumstances, which could interfere with the normal service to customers and to minimize their impact.

II. RESPONSE TEAM ORGANIZATION

A. GENERAL ACTION TO BE TAKEN

1. Initial Assessment and Notification

   The notification matrix chart must be activated for the type of emergency situation occurring. Activation of the Emergency Operations Center (EOC) must occur immediately in order to direct and control operations. Communications through the EOC are essential so as to provide the proper coordination of response efforts.

2. Damage Assessment

   An immediate assessment of damages is essential to ascertain the extent of the situation and the initiating factor (security or non-security related). Some immediate factors to consider are:

   a. What and how much of the system is affected?
   b. Can it be isolated and how?
   c. Is this a security related event?
   d. What type of assistance do we need?

3. Work Assignments

   As soon as field reports are received, develop a plan of action and make certain everyone understands their work assignment.

4. Coordination With Other Agencies/Contractors

   If assistance is required and authorized, activate the appropriate mutual aid assistance program or request the assistance of private contractors as authorized.

5. Public Information

   The general public must be given prompt and factual information as appropriate:

   a. Nature of problem.
   b. Actions currently being taken and planned for immediate future.
   c. Estimated time of restoration of service.
   d. Determination of type of action required to inform the public.

B. EMERGENCY OPERATIONS CENTER

The Primary EOC is located in the Board Room of the Administration Office at 72401 Hatch Road, Twentynine Palms, CA. This office is equipped with unlisted telephone lines, updated records, and CAD drawings of all facilities. This site is readily accessible to all portions of distribution systems. It is the primary nerve center for controlling our supply, treatment, pumps and storage facilities.

The Secondary EOC is the storage building at the rear of the Administration Office. This location also has ready access to our supply source, and our distribution system. Activation of the EOC can occur by management or anyone in the field or office who discovers a situation that warrants it.

C. MANAGEMENT REPORTING STATIONS

General Manager	Emergency Operations Center
Operations Manager	Emergency Operations Center
Operations Superintendent	Emergency Operations Center
Financial Management	Emergency Operations Center
Service Worker III	Emergency Operations Center
Office Manager	Emergency Operations Center
District Secretary	Emergency Operations Center
Customer Service Rep	Emergency Operations Center
All Other Service Workers	Emergency Operations Center

Water Treatment Plant Operator	Incident location OR Priority One - Route ONE
Water Treatment Plant Operator	Incident location OR Priority One - Route TWO
Water Treatment Plant Operator	Incident location OR Priority One - Route THREE

D. EMERGENCY REPORTING STATIONS

Due to the probability or the inability of many employees to reach assigned emergency stations promptly, available management and office personnel will be assigned as necessary. Following preliminary damage assessment, employees may be reassigned as priorities and employee work experience dictate.

The type of emergency and whether it is directed at one location or multiple locations determines the deployment of personnel.

1. Treatment Plant Employees will need to remain at this critical site to monitor storage tanks in order to maintain adequate treatment and proper pump levels to the system. They may also be assigned to the Incident Location or Priority Routes One, Two or Three.

2. Service Workers have been designated as couriers and will, therefore, provide the means of communication at the direction of the Incident Commander.

3. Field Operators and Maintenance Employees will be assigned to monitor well stations, storage tanks and pump stations under the direction of the Incident Commander. Assigned servicemen will relate any abnormal conditions directly to the command center and to the plant as directed.

E. DUTIES OF MANAGEMENT PERSONNEL

1. GENERAL MANAGER shall serve as liaison between City, County and State officials. Assessment of priorities will be designated by the General Manager to personnel concerned. Progress reports and assignments will be promptly forwarded to the Manager to insure that he/she is fully informed at all times. News releases will be made by the Manager. All personnel are cautioned against making statements concerning District operations unless they are authorized, during or after emergencies.

2. OPERATIONS MANAGER will be designated as the INCIDENT COMMANDER and shall assist the General Manager in implementing the plan of action to be taken. The Chief Plant Operator shall dispatch department personnel to monitor treatment facilities, wells, reservoirs, booster stations and storage tanks. In case of loss of both telephone and radio communications, Service Workers will assume the duties of couriers. If the emergency is of local origin, the Incident Commander will contact other area water systems (see Notification Call List) to secure additional personnel, materials or equipment as required.

3. OPERATIONS SUPERINTENDENT shall fulfill duties requested by the Manager. The individual will normally be stationed at the treatment plant and will serve as liaison between the plant and EOC. The individual will assume complete charge of water operations. Plant personnel shall monitor the water quality and conduct bacteriological testing to determine quality and potability of water in affected areas of the distribution systems.

The Operations Superintendent is in charge of water treatment and pumping facilities. He/She will be stationed at the Treatment Plant and will direct the work of plant operators as required. In the event of limited work force, he/she will fill in whenever and wherever required.

4. WATER TREATMENT PLANT OPERATORS I-II will normally be stationed at the treatment plant. In case the Chief Plant Operator is not available, the Water Treatment Plant Operator II will be assigned to this position at the Treatment Plant and assume all responsibility of the production operations. The other Plant Operators, at the direction of the Manager, shall assign personnel and equipment to the disaster area and/or cause the Priority One, Priority Two, and Priority Three Sites and Routes (SEE APPENDIX A) to be reviewed. Maintenance personnel shall be trained in determining the location of water mains, valves and pump stations from maps and CAD drawings, which are located at the Administration and/or Operations Building and in the cab of each maintenance vehicle, in order to effectively isolate problem areas in the distribution grid.

The Engineering Department shall revise distribution maps periodically and distribute the revisions to all distribution authorized personnel.

5. DESIGNATED DISTRIBUTION WORKERS shall have the primary responsibility of overseeing field operations other than the Treatment Plant under the direction of the Incident Commander.

6. OFFICE MANAGER shall be primarily responsible for all communications at the Command Post. The Office Manager will dispatch personnel as necessary to insure a complete line of communication at all times. This person will maintain a record log of all activities, radio and phone communications.

NOTE: All of the above listed management team shall maintain an up-to-date list of all Twentynine Palms Water District personnel, their residence address and phone numbers. Managers shall be responsible for contacting the personnel in his/her section during an after hours emergency.

When any of the above are absent due to sickness or vacation, another member of the management staff will be assigned as required. The management staff is required to list an address and/or phone number (where they can be contacted while absent from our service area).

F. EMERGENCY FUNDS

There is no amount specifically budgeted for major contingency expenditures. However, the Manager is authorized to order immediate emergency expenditures to insure restoration of water service to the general public. If major expenditures are anticipated, the Manager is directed to notify the President of the Board of Directors and proceed with their advice and consent. Should the President be unavailable, the next ranking officer shall be contacted.

G. IDENTIFICATION CARDS

All personnel have been issued an identification card, which is to be carried at all times. In the event of an emergency this will assist in your identification and access to water areas temporarily closed to the general public.

H. DISTRIBUTION SYSTEM MAPS AND VALVE LOCATION RECORDS

Copies of distribution system maps are distributed as follows: All Maintenance Vehicles; EOC Command Post; Water Treatment Plant.

III. NOTIFICATION and ALERT PROCESS

A. NOTIFICATION

a. If discovery of an issue or event is made by a Twentynine Palms Water District employee while performing their regular duties, they shall immediately report this by the fastest means possible to a "Central Point of Contact". The report will include their name, type of occurrence, where they are and other appropriate information.

Secondly, depending on the occurrence and possible life threatening conditions to themselves or any others, make a mutual determination with the person at "Central Point of Contact" as to their next course of action. SEE NOTIFICATION CALL LIST. Some examples of next course(s) of action could include:

1. Dispatching a Twentynine Palms Water District employee to evaluate the situation further or make contact with individual(s) at the scene. If security issues are suspected or involved, special care must be exercised so as not to "disrupt" what may be a "crime scene".
2. Continue to monitor and further check on individual and/or the developing situation. This shall occupy the full attention of the "Central Point of Contact" during this time period.
3. Central Point of Contact shall direct Twentynine Palms Water District employees reporting, to remain at the scene and continue to monitor the situation.
4. Notify Business Unit Manager of affected area.
5. Notify the Managerial person in charge at Twentynine Palms Water District.
6. Notify local law enforcement via 911 call.
7. Activate the Emergency Action Plan (EAP) for related occurrence.
8. Initiate notifications in accordance with EAP.

b. If discovery comes from a Non-Twentynine Palms Water District employee, it shall be immediately relayed by the fastest means possible to the "Central Point of Contact". The report will include the source of the notification (Name, Organization, Phone Number) and type of occurrence and any other information stated.

Secondly, depending on the occurrence and possible life threatening conditions, the person at "Central Point of Contact" will make a determination as to the next course of action that may need to be taken. SEE NOTIFICATION CALL LIST. Some examples of next course(s) of action could include:

1. Dispatching a Twentynine Palms Water District employee to evaluate the situation further or make contact with individual(s) at the scene. If security issues are suspected or involved, special care must be exercised so as not to "disrupt" what may be a "crime scene".
2. Continue to monitor and check on individual and situation. This shall occupy the full attention of the "Central Point of Contact" during this time period.
3. Notify Business Unit Manager of affected area.
4. Notifying the Managerial person in charge at Twentynine Palms Water District.
5. Notify local law enforcement via a 911 call.

6. Activate the Emergency Action Plan for related occurrence.
7. Initiate notifications in accordance with EAP.

c. Activation of the Emergency Action Plan (EAP) for the various issues or occurrences needs to happen in a timely and efficient manner. The protocol to physically make this happen shall take advantage of modern communications and electronics as this can be an extremely involved and timely task.

d. A point to be aware of and remember is that the "news media" monitors radio frequencies utilized by the law enforcement community and may arrive at the scene before any EAP is up and running. Therefore, preparations for "Public Disclosure and Twentynine Palms Action Plan" need to be ready with a spokesperson simultaneously with any public notification.

NOTE: This is where prior planning and preparation will assist in making this "Twentynine Palms Emergency" one that can be managed with the care and sensitivity it needs. Directions to all Twentynine Palms Water District employees shall be reaffirmed as to "who" will speak for Twentynine Palms Water District and to whom the "news media" will be directed.

B. COMMUNICATIONS FAILURE

If a natural or man-made disaster immediately disrupts all forms of automatic communications, management and employees should report to their "assigned emergency station" as quickly as possible. If their primary assigned station is inaccessible, employees should immediately report to the EOC.

IV. GENERAL SECURITY POLICY PROTOCOLS

A. STATUS

The response to a security event requires due care. In addition to the threat, damage or possible damage present, the event may be considered a criminal act and the area, a crime scene. As such, the physical area surrounding the entry point or breach of the system is normally considered or may be designated a "crime scene". The crime scene needs to be protected in its original state as to when the crime occurred until it can be processed for evidence leading to the perpetrators and/or methods utilized in the act. Care must be taken not to disturb what occurred, yet action may be taken to avert any <u>immediate</u> threat to life or significant damage to the water system. This area may become restricted to "law enforcement personnel only" once they arrive. This action may preclude water personnel from entering unless they are specifically authorized to by the police.

B. EPA ALERT LEVELS

CONDITION	CONSIDER ADOPTING THESE MEASURES	
LOW (GREEN) Low Risk of Terrorist Attack Signifies a low risk of terrorist attacks. Protective measures should focus on ongoing facility assessments; and the development, testing, and implementation of emergency plans. In addition to THREAT LEVEL GREEN, there are four higher threat levels: blue, yellow, orange, and red. (Please refer to the other fact sheets for information on suggested steps to be taken during other threat condition levels.)	**Detection**	• Monitor water quality at the source water, leaving the plant, and in distribution and storage systems. Establish baseline results. Review operational and analytical data to detect unusual variations. • Follow-up on customer complaints concerning water quality and/or suspicious behavior on the facilities. • Confirm communication protocol with public health officials concerning potential waterborne illnesses.
	Preparedness	• Post emergency evacuation plans in accessible, but secure, location near entrance for immediate access by law enforcement, fire response, and other first responders. • Inventory spare parts and on-hand chemicals. Check if sufficient. • Identify sensitive populations within the service area (e.g., hospitals, nursing homes, daycare centers, schools, etc.) for notification, as appropriate, in the event of a specific threat against the utility. • Back-up critical files such as plans and drawings, as-builts, sampling results, billing, and other critical information. • Conduct appropriate background investigations of staff, contractors, operators, and others with access to the facility. • Prepare vulnerability assessments and revise to incorporate changes made (e.g., assets added/replaced or new countermeasures implemented). • Ensure that employees understand appropriate emergency notification procedures.
	Prevention	• Train staff in safety procedures, such as handling hazardous materials and maintaining and using self-contained breathing apparatus. • Secure equipment such as vehicles and spare parts. • Monitor requests for potentially sensitive information.
	Protection	• Check all chemical deliveries for driver identification and verification of load. • Maintain vigilance and be alert to suspicious activity. Inspect buildings in regular use for suspicious packages and evidence of unauthorized entry. Report any suspicious activity to appropriate authorities. • Prosecute intruders, trespassers, and those detained for tampering to the fullest possible under applicable laws. • Review requests for tours and identify protocols for managing the tour. • Implement controls for construction activities at critical sites. • Maintain disinfectant residuals as required by regulations. • Implement best management practices for optimizing drinking water treatment.

CONDITION	CONSIDER ADOPTING THESE MEASURES (and those at lower threat levels)	
GUARDED (BLUE) General Risk of Terrorist Attack Signifies a guarded risk of terrorist attacks. Protective measurers should focus on activating employee and public information plans; exercising communication channels with response teams and local agencies; and reviewing and exercising emergency plans.	**Detection**	• Test security alarms and systems for reliability.
	Preparedness	• Reaffirm communication and coordination protocols (embedded in the utility's emergency response plan) with local authorities such as police and fire departments, HAZMAT teams, hospitals, and other first responders. • Prepare and/or revise emergency response plans associated communication protocols. Include appropriate local officials concerned with law enforcement, emergency response and public health. • On a regular basis post employee reminders about events that constitute security violations and ensure employees understand notification protocol in the event of a security breach. • Prepare draft releases, public notices and other communications for a variety of incidents. Route through appropriate channels of review to ensure pieces are clear and consistent.
	Prevention	• Secure buildings, rooms, and storage areas not in regular use. Maintain a list of secured areas or facilities and monitor activity in these areas.
	Protection	• Control access to mission critical facilities.

CONDITION	CONSIDER ADOPTING THESE MEASURES (and those at lower threat levels)	
ELEVATED (YELLOW) Significant Risk of Terrorist Attack Signifies an elevated risk of terrorist attacks. Protective measures should focus on increasing surveillance of critical facilities; coordinating response plans with allied utilities and response teams and local agencies; and implementing emergency plans, as appropriate.	**Detection**	• To the extent possible, increase the frequency and extent of monitoring activities and review results against baseline. • Increase review of operational and analytical data (including customer complaints) with an eye toward detecting unusual variability (as an indicator of unexpected changes in the product). Variations due to natural or routine operational variability should be considered first. • Increase surveillance activities in source and finished water areas.
	Preparedness	• Review and update emergency response procedures and communication protocols. • Establish unannounced security spot checks (e.g., verification of personal identification and door security) at access control points for critical facilities. • Increase frequency for posting employee reminders of the threat situation and about events that constitute security violations. • Ensure employees understand notification protocol in the event of a security breach. • Conduct security audit of physical security assets, such as fencing and lights, and repair or replace missing/broken assets. Remove debris from along fence-lines that could be stacked to facilitate scaling. • Maximize physical control of all equipment and vehicles inoperable when not in-use (e.g., lock steering wheels, secure keys, chain and padlock on front-end loaders, etc.). • Review draft communications on potential incidents, brief media relations personnel of potential for press contact and/or issuance of release. • Review and update list of sensitive populations within the service area, such as hospitals, nursing homes, daycare centers, schools, etc., for notification, as appropriate, in the event of a specific threat against the utility. • Contact neighboring water utilities to review coordinated response plans and mutual aid during emergencies. • Review whether critical replacement parts are available and accessible.
	Prevention	• Carefully review all facility tour requests before approving. If allowed, implement security measures to include list of names prior to tour, request identification of each attendee prior to tour, prohibit backpacks/duffle bags, cameras and identify parking restrictions. • On a daily basis, inspect the interior and exterior of buildings in regular use for suspicious activity or packages, signs of tampering, or indications of unauthorized entry. • Implement mailroom security procedures. Follow guidance provided by the United States Postal Service.
	Protection	• Verify the identity of all personnel entering the water utility. Mandate visible use of identification badges. Randomly check identification badges and cards of those on the premises. • At the discretion of the facility manager or security director, remove all vehicles and objects (e.g., trash containers) located near mission critical facility security perimeters and other sensitive areas. • Verify the security of critical information systems (e.g., Supervisory Control and Data Acquisition (SCADA), Internet, email, etc.) and review safe computer and internet access procedures with employees to prevent cyber intrusion. • Consider steps needed to control access to all areas under the jurisdiction of the water utility.

CONDITION	CONSIDER ADOPTING THESE MEASURES (and those at lower threat levels)	
HIGH (ORANGE) High Risk of Terrorist Attack Signifies a high risk of terrorist attacks. Protective measures should focus on limiting facility access to essential staff and contractors, and security efforts with local law enforcement offices and the armed forces, as appropriate.	**Detection**	• Increase the frequency and extent of monitoring activities. Review results against baseline. • Confirm that county and state health officials are on high alert and will inform water utilities of any potential waterborne illnesses. • If a neighborhood watch-type program is in place, notify the community and request increased awareness.
	Preparedness	• Confirm emergency response and laboratory analytical support network are ready for deployment 24 hours per day, 7 days a week. • Reaffirm liaison with local police, intelligence, and security agencies to determine likelihood of an attack on the water utility personnel and facility and consider appropriate protective measures (e.g., road closing, extra surveillance, etc.). • Practice communications protocol with local authorities and others cited in the facility's emergency response plan. • Post frequent reminders for staff and contractors of the threat level, along with a reminder of what events constitute security violations. • Ensure employees are fully aware of emergency response communication protocols and have access to contact information for relevant law enforcement, public health, environmental protection, and emergency response organizations. • Inspect and practice activation of available emergency interconnections with neighboring water agencies. • Have alternative water supply plan ready to implement (e.g., bottled water delivery).
	Prevention	• Discontinue tours and prohibit public access to all operational facilities. • Consider requesting increased law enforcement surveillance, particularly of critical assets and otherwise unprotected areas.
	Protection	• Evaluate need to staff water treatment/production facility at all times. • Consider the need to prohibit recreational use of surface water reservoirs. • Increase security patrol activity to the maximum level sustainable and ensure tight security in the vicinity of mission critical facilities. Vary the timing of security patrols. • Request employees change password on critical information management systems.

CONDITION	CONSIDER ADOPTING THESE MEASURES (and those at lower threat levels)	
SEVERE (RED) Severe Risk of Terrorist Attack Signifies a severe risk of terrorist attacks. Protective measures should focus on the decision to close specific facilities and the redirection of staff resources to critical operations.	**Detection**	• Ensure that list of sensitive of populations (e.g., hospitals, nursing homes, daycare centers, schools, etc.) within the service area is accurate and shared with appropriate public health officials. • Reconfirm that county and state health officials are on high alert and will inform water utilities of any potential waterborne illnesses.
	Preparedness	• Post daily notices to staff regarding threat level and appropriate security practices. • Where appropriate, place back-up operational capacity on-line (water treatment plant filters, turbines, etc.). • Ensure key utility personnel are on duty. • Where appropriate, provide public notification for citizens to store emergency water supply or to implement other preparatory measures. • Evaluate the need for opening an emergency operations center.
	Prevention	• As appropriate, request increased law enforcement and/or security agency surveillance, particularly of critical assets and otherwise unprotected areas (e.g., consider if National Guard assistance is needed and make appropriate request). • Limit access to facilities and activities to essential personnel. • Consider whether mail and packages should go to a central, secure location and be inspected before distribution. Remind mailroom personnel of the need for heightened awareness when sorting and distributing all incoming mail.
	Protection	• Ensure existing security policies, procedures, and equipment are effectively implemented. • Recheck security of all on-site chemical storage and utilization areas. • Implement frequent and staggered inspections of the exterior of buildings (to include roof areas) and parking areas. • Re-check the security of critical information systems (e.g., SCADA, Internet, email, etc.) and have staff change computer passwords. • Consider placing staff at remote (typically unmanned) facilities.

V. TYPES of EMERGENCIES (Non-security & Security Related)

A. MEDICAL EMERGENCIES (Non-security related)

1. GENERAL

Medical emergencies can occur at any time. The medical emergency may be for one person or groups of individuals and may directly or indirectly affect the water system property or the water system (at any point within the system). Most medical emergencies can be handled with first aid procedures but others, depending on the seriousness, may require immediate attention by medically trained professionals.

Time and proper response is of the essence in addressing emergency medical situations.

The stockpiling of emergency first aid kits and supplies should be considered at all locations or nearby sites. Automatic External Defibrillators (AED) should be considered at all main locations. All individuals should be trained in First Aid, CPR and the use of AED.

Upon becoming aware that any part of the DISTRICT Water System has been affected by this type of medical situation, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

2. INITIAL NOTIFICATION

a. Evaluate and apply basic first aid as appropriate.

b. If emergency is beyond first aid treatment, call for assistance by notifying Twentynine Palms Water District Supervisor OR calling 911 immediately, depending on the emergency.

c. Activate Twentynine Palms Water District Response Personnel to their respective assignments.

d. Activate Twentynine Palms Water District notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

a. Injury to an individual - Conduct an immediate review of the medical emergency situation. If it appears that it is a minor emergency that can be attended to by you with very basic first aid, do so. If it appears beyond your capability, call for assistance (911), and notify your supervisor.

b. If there are multiple injuries IMMEDIATELY call for assistance (911), and notify your supervisor. Apply basic first aid and keep individuals safe from additional hazards while waiting for emergency services.

c. Take action to alert others to dangers that may be present and to stay and assist or stay clear.

d. Based on activities individual(s) was performing, evaluate impact on current water system operations.

e. Coordinate activities to maintain water system stability as needed.

4. RECOVERY ACTIONS

Twentynine Palms Water District personnel should begin recovery actions as soon as practical after the medical emergency. If necessary, a damage assessment of the process, facility or activity should occur. Necessary actions need to be identified and communicated.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event, which may require outside resources.

6. APPROPRIATE UTILITY ELEMENTS

a. Dependent on the feedback from damage assessment teams.

b. Implement damage recovery plan including prioritized processes as determined by management.

7. REMEDIATION ACTIONS

a. Repair damage.

b. Assess need for additional procedural, equipment/facility and/or training for future occurrences.

B. VEHICLE ACCIDENTS (Non-security related)

1. GENERAL

Vehicle accidents can occur at any time. A vehicle accident may involve a single vehicle or multiple vehicles. In addition to the physical damage caused by the vehicle(s) other issues may be involved which can include medical situations and/or fire. Vehicle(s) damaged may be specialized equipment utilized in the maintenance of the water system and may directly or indirectly affect the water system property or the water system (at any point within the system).

Time and proper response is of the essence in addressing this emergency.

Upon becoming aware that any part of the DISTRICT Water System has been affected by this type of accident, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

2. INITIAL NOTIFICATION

a. Evaluate and apply basic first aid as appropriate.

b. If emergency is beyond first aid treatment, call for assistance by notifying Twentynine Palms Water District Supervisor OR calling 911 immediately depending on the emergency.

c. Activate Twentynine Palms Water District Response Personnel to their respective assignments.

d. Activate Twentynine Palms Water District notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

a. Conduct an immediate review of the situation to see if a medical emergency situation exists. If it appears that it is a minor emergency that can be attended to with very basic first aid, do so. If it appears beyond your capability, call for assistance (911), and notify your supervisor.

b. If there are multiple injuries IMMEDIATELY call for assistance (911), and notify your supervisor. Apply basic first aid and keep individuals safe from additional hazards while waiting for emergency services.

c. Take action to alert others to dangers that may be present and to stay and assist or stay clear.

d. Photograph and document the accident. Have the driver and any occupants make a statement as to what occurred. If the accident occurred off the Twentynine Palms Water District property, call the local police to take an accident report.

e. Based on activity or damage done by the vehicle(s); evaluate impact on current water system operations.

f. Coordinate activities to maintain water system stability as needed.

4. RECOVERY ACTIONS

Twentynine Palms Water District personnel should begin recovery actions as soon as practical after the medical emergency. If necessary, a damage assessment of the process, facility or activity should occur. Necessary actions need to be identified and communicated.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event, which may require outside resources.

6. APPROPRIATE UTILITY ELEMENTS

a. Dependent on the feedback from damage assessment teams.

b. Implement damage recovery plan including prioritized processes as determined by management.

7. REMEDIATION ACTIONS

a. Repair damage.

b. Assess need for additional procedural, equipment/facility and/or training for future occurrences.

C. FLOODS (Non-security related)

1. GENERAL

Flood events are normally based on weather conditions that create an over-abundance of water for the land or storm system to handle maybe affecting the water system property or the water system (at any point within the system). Not all of this area is prone to this type of weather; however, flooding of low lands can result in severe injury or damage to individuals, property, structures and delivery systems.

The stockpiling of sand and sand bags, portable pumps, power chainsaws and portable power generators should be considered at critical locations or nearby sites.

Upon becoming aware that any part of the DISTRICT Water System has been affected by this type of weather condition, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

2. INITIAL NOTIFICATION

a. Notify Twentynine Palms Water District Supervisor.

b. Activate Twentynine Palms Water District Response Personnel to their respective assignments.

c. Activate Twentynine Palms Water District notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

a. Injury to people - Due care must be taken while responding to provide all possible efforts in giving assistance and emergency first aid to the injured and notifying emergency services (911).

b. Damage to property - Due care must be taken while responding in these types of weather conditions to avoid becoming a victim of injury or to be struck by falling wires, trees, weakened or unstable structures. Implementation of standard repair processes and operations will commence after the appropriate assessment has been completed by response personnel.

c. Attention must be given to electrical circuits and protection against electrocution during flooding conditions.

d. Based on extent or type of damage, consider alternate (interim) processes in order to maintain at least some level of continued service if applicable.

e. Coordinate alternative water supply, as needed.

f. Consider activating public notice notification.

4. RECOVERY ACTIONS

Twentynine Palms Water District personnel should begin recovery actions as soon as practical after the damage assessment and/or process, facility or activity has been isolated from the rest of the utility facilities or determined that this threat is no longer present.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event, which may require outside resources.

6. APPROPRIATE UTILITY ELEMENTS

a. Dependent on the feedback from damage assessment teams.

b. Implement damage recovery plan including prioritized processes as determined by management.

7. REMEDIATION ACTIONS

a. Repair damage.

b. Assess need for additional procedural, equipment/facility and/or training for future occurrences.

D. SNOW/ICE DAMAGE (Non-security related)

1. GENERAL

These events are based on the weather conditions that result in snow and/or ice conditions affecting the water system property or the water system (at any point within the system). Since this area is not normally prone to this type of weather, the occurrence of such conditions can result in severe injury or damage to individuals, property, structures and delivery systems.

The stockpiling of salt to be used to reduce the freezing effect of ice and snow, power chainsaws and power generators should be considered at critical locations or nearby sites.

Upon becoming aware that any part of the DISTRICT Water System has been affected by this type of weather condition, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

2. INITIAL NOTIFICATION

a. Notify Twentynine Palms Water District Supervisor.

b. Activate Twentynine Palms Water District Response Personnel to their respective assignments.

c. Activate Twentynine Palms Water District notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

a. Injury to people - Due care must be taken while responding to provide all possible efforts in providing assistance and emergency first aid to the injured and notifying emergency services (911).

b. Damage to property - Due care must be taken while responding in these types of weather conditions to avoid becoming a victim of injury or to be struck by falling wires, trees, weakened or unstable structures. Inspect Priority One, Two and Three sites and Routes (SEE APPENDIX A). Implementation of standard repair processes and operations will commence after the appropriate assessment has been completed by response personnel.

c. Based on extent or type of damage, consider alternate (interim) processes in order to maintain at least some level of continued service if applicable.

d. Coordinate alternative water supply, as needed.

e. Consider activating public notice notification.

4. RECOVERY ACTIONS

Twentynine Palms Water District personnel should begin recovery actions as soon as practical after the damaged assessment and/or process, facility or activity has been isolated from the rest of the utility facilities or determined that this threat is no longer present.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event, which may require outside resources.

6. APPROPRIATE UTILITY ELEMENTS

a. Dependent on the feedback from damage assessment teams.

b. Implement damage recovery plan including prioritized processes as determined by management.

7. REMEDIATION ACTIONS

a. Repair damage.

b. Assess need for additional procedural, equipment/facility and/or training for future occurrences.

E. EARTHQUAKES (Non-security related)

1. GENERAL

This event is based on geographical and seismic conditions that occur everyday throughout the world that can have varying effects on the water system property or the water system (at any point within the system). The effects can range from no noticeable implications to catastrophic destruction. Due to the actions involved in earthquakes and the shifting of the ground mass, damage to the infrastructure of the delivery system, earthen or structural, can readily occur. Earthquakes come with a series of "aftershocks" following the main event that can continue to cause damage. The secondary effects of earthquakes are fires caused by broken gas mains and the resulting fire spread due to broken and disrupted water supply normally used for extinguishing them. All of these affects from an earthquake require immediate coordination of all portions of the water delivery system.

The stockpiling of piping and valves, contractual heavy equipment, portable pumps, power chainsaws and portable power generators should be considered at critical locations or nearby sites.

Upon becoming aware that any part of the service area for the DISTRICT Water System has been affected by an earthquake, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

2. INITIAL NOTIFICATION

a. Notify Twentynine Palms Water District Supervisor.

b. Activate Twentynine Palms Water District Response Personnel to their respective assignments.

c. Activate Twentynine Palms Water District notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

a. Injury to people - Due care must be taken while responding to provide all possible efforts in giving assistance and emergency first aid to the injured and notifying emergency services (911).

b. The potential damage due to flooding from reservoirs must be immediately evaluated and monitored.

c. Depending on the size of earthquake, see APPENDIX A for mobilization response.

d. Inspect Priority One, Two and Three sites and Routes (SEE APPENDIX B).

e. Damage to property - Due care must be taken while responding in an earthquake situation due to the "aftershocks" and damage they may cause. The need to avoid becoming a victim of injury or being struck by falling wires, trees, weakened or unstable structures should be foremost in everyone's thought process. Consideration to aid firefighting will need to be coordinated with the Twentynine Palms Fire Department. Implementation of standard repair processes and operations will commence after the appropriate assessment has been completed by response personnel.

f. Based on extent or type of damage, consider alternate (interim) processes in order to maintain at least some level of continued service if applicable.

g. Coordinate alternative water supply, as needed.

h. Activating public notice notification.

4. RECOVERY ACTIONS

Twentynine Palms Water District personnel should begin recovery actions as soon as practical after the damaged assessment and/or the process, facility or activity has been isolated from the rest of the utility facilities or it has been determined that this threat is no longer present.

All efforts should be made to keep the public and news media informed of the steps that are being taken and things the public could do to assist in the process.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event, which may require outside resources.

6. APPROPRIATE UTILITY ELEMENTS

a. Dependent on the feedback from damage assessment teams.

b. Implement damage recovery plan including prioritized processes as determined by management.

7. REMEDIATION ACTIONS

a. Repair damage.

b. Assess need for additional procedural, equipment/facility and/or training for future occurrences.

F. HURRICANES and TORNADOES (Non-security related)

1. GENERAL

These events are based on the weather conditions that result in extremely high winds and rain affecting the water system property or the water system (at any point within the system). The strong winds may result in structural damage to buildings and may generate flooding of many areas including treatment facilities. The occurrence of such conditions can be anticipated and normally 24 to 48 hour warning is provided. However, the results can still be severe injury or damage to individuals, property, structures and the water delivery systems.

The stockpiling of power chainsaws, portable pumps and portable power generators should be considered at critical locations or nearby sites.

Upon becoming aware that any part of the DISTRICT Water System has been affected by this type of weather condition, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

2. INITIAL NOTIFICATION

a. Notify Twentynine Palms Water District Supervisor.

b. Activate Twentynine Palms Water District Response Personnel to their respective assignments.

c. Activate Twentynine Palms Water District notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

a. Injury to people - Due care must be taken while responding to provide all possible efforts in giving assistance and emergency first aid to the injured and notifying emergency services (911).

b. Inspect Priority One, Two and Three sites and Routes (SEE APPENDIX B).

c. Damage to property - Due care must be taken while responding in these types of weather conditions to avoid becoming a victim of injury or to be struck by falling wires, trees, weakened or unstable structures. Implementation of standard repair processes and operations will commence after the appropriate assessment has been completed by response personnel.

d. Based on extent or type of damage, consider alternate (interim) processes in order to maintain at least some level of continued service if applicable.

e. Coordinate alternative water supply, as needed.

f. Consider activating public notice notification.

4. RECOVERY ACTIONS

Twentynine Palms Water District personnel should begin recovery actions as soon as practical after the damaged assessment and/or process, facility or activity has been isolated from the rest of the utility facilities or determined that this threat is no longer present.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event, which may require outside resources.

6. APPROPRIATE UTILITY ELEMENTS

a. Dependent on the feedback from damage assessment teams.

b. Implement damage recovery plan including prioritized processes as determined by management.

7. REMEDIATION ACTIONS

a. Repair damage.

b. Assess need for additional procedural, equipment/facility and/or training for future occurrences.

G. FIRE (Treat all fires as Security related until proven otherwise)

NOTICE:

"The response to a security event requires due care. In addition to the damage or possible damage present, the event may be considered a criminal act and the area a crime scene. As such, the physical area surrounding the entry point or breach of the system is normally considered a "crime scene". The crime scene needs to be protected in its original state as to when the crime occurred until it can be processed for evidence leading to the perpetrators and/or methods utilized in the act. Care must be taken not to disturb what occurred, yet action may be taken to avert any <u>immediate</u> threat to life or significant damage to the water system. This area will become restricted to "law enforcement personnel only" once they arrive. This action may preclude TWENTYNINE PALMS WATER DISTRICT personnel from entering unless they are specifically authorized to by the police."

1. GENERAL

A fire event is based on accidental or negligent situations, act of God, or intentional activity. Each one usually results in property damage and/or injury including death to individuals. The secondary effect is diminished or no service to the consumer by the delivery of product - water. The first goal is to save life and then property and maintain service. Immediate response to extinguish or contain the fire is paramount. It is very important to determine the cause of the fire as it may affect the future use of certain equipment, insurance coverage, and civil and/or criminal action. Good housekeeping, regular preventative maintenance, proper storage of combustibles, portable extinguishers and sprinkler equipped buildings reduce the potential for fires.

Fires can be small (extinguishment can be accomplished by use of a handheld extinguisher) and large fires (any fire that cannot be contained with a handheld fire extinguisher).

THE FIRST STEP IN ANY FIRE IS TO SOUND THE ALERT AND GET ASSISTANCE!

All individuals should be trained in the proper use of handheld fire extinguishers.

Upon becoming aware that any part of the DISTRICT Water System is or has been affected by a LARGE fire event, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

2. INITIAL NOTIFICATION

a. Notify Twentynine Palms Water District Supervisor.

b. Activate Twentynine Palms Water District Response Personnel to their respective assignments.

c. Activate Twentynine Palms Water District notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

a. THE FIRST RESPONSE TO ANY FIRE IS TO SOUND THE ALERT AND GET ASSISTANCE.

b. IF after sounding the alarm and getting assistance, you are knowledgeable in the use of the fire extinguisher AND the fire is small, you may extinguish it with the handheld extinguisher OR assist in evacuating the area and wait for the fire department to arrive.

c. Injury to people - Due care must be taken while responding to provide all possible efforts in giving assistance and emergency first aid to the injured and notifying emergency services (911).

d. Damage to property - Due care must be taken while responding as fire can destroy the structural integrity of structures and collapsing may occur. You must avoid becoming a victim of injury or being struck by falling wires, trees, weakened or unstable structures. Implementation of standard repair processes and operations will commence after the appropriate assessment has been completed by response personnel.

e. Based on extent or type of damage, consider alternate (interim) processes in order to maintain at least some level of continued service if applicable.

f. Coordinate alternative water supply, as needed.

g. Consider activating public notice notification.

4. RECOVERY ACTIONS

Twentynine Palms Water District personnel should begin recovery actions as soon as practical after the damaged assessment and/or process, facility or activity has been isolated from the rest of the utility facilities or determined that this threat is no longer present.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event, which may require outside resources.

6. APPROPRIATE UTILITY ELEMENTS

a. Dependent on the feedback from damage assessment teams.

b. Implement damage recovery plan including prioritized processes as determined by management.

7. REMEDIATION ACTIONS

a. Repair damage.

b. Assess need for additional procedural, equipment/facility and/or training for future occurrences.

H. TRESPASS, VANDALS and SABOTAGE (Security related)

Man-Made and/or Technological Emergencies

NOTICE:

"The response to a security event requires due care. In addition to the damage or possible damage present, the event may be considered a criminal act and the area a crime scene. As such, the physical area surrounding the entry point or breach of the system is normally considered a "crime scene". The crime scene needs to be protected in its original state as to when the crime occurred until it can be processed for evidence leading to the perpetrators and/or methods utilized in the act. Care must be taken not to disturb what occurred, yet action may be taken to avert any <u>immediate</u> threat to life or significant damage to the water system. This area will become restricted to "law enforcement personnel only" once they arrive. This action may preclude TWENTYNINE PALMS WATER DISTRICT personnel from entering unless they are specifically authorized to by the police."

1. GENERAL

These events are based on the threat of or actual, intentional trespass, vandalism and/or sabotage of water system property or the water system (at any point within the system).

Under Presidential Decision Directive (PDD) 63 issued on May 22, 1998, the United States Environmental Protection Agency (USEPA) was designated as the lead federal agency to assess and address the vulnerabilities of the Nation's water supply infrastructure. Following the terrorist attacks of September 11, 2001, the President signed the Public Health Security and Bio-Terrorism Preparedness and Response Act of 2002 into law (PL 107-188) (June 12, 2002). Per this Act, community water systems had to conduct vulnerability assessments (VAs) within mandated deadlines and prepare emergency response plans (ERPs).

To aid this effort, USEPA directed efforts to reduce the vulnerability of water systems to terrorist attacks, to enhance their security and ability to respond to emergency situations.

Upon notification or of becoming aware that any part of the DISTRICT Water System has been intentionally trespassed, vandalized and/or sabotaged, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

Trespass, vandalism and possible sabotage are handled to a large extent by planning and prevention. Most of the facilities are fenced, gated, locked and constructed to minimize trespass or damage by vandalism. Concerted efforts to stop trespassing and/or damage to facilities, however, cannot be economically prevented. Preventive actions obtained by applying certain

physical and electronic security applications, law enforcement agencies and an alert operating force are also strong deterrents to reducing acts of trespass, vandalism and sabotage as well as the consequent damage. Staff should be aware of suspicious parties that may be loitering near facilities, notify the proper contact(s) or Law Enforcement, make a written note of license plates, descriptions, etc., of suspicious parties, and wait for assistance to arrive, or if appropriate, approach the individuals to ascertain their purpose and identity.

2. INITIAL NOTIFICATION

a. Notify Twentynine Palms Water District Supervisor.

b. Activate Twentynine Palms Water District Response Personnel to their respective assignments.

c. Activate Twentynine Palms Water District notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

a. TRESPASSER(s) - Notify Twentynine Palms Water District Supervisor. If conditions warrant (late at night, secluded areas, other than normally public areas), the immediate dispatching of law enforcement to scene should occur. Twentynine Palms Water District employees should standby to meet and assist law enforcement or be available to handle any water related issues. In all cases of trespassers, appropriate identification, vehicle license, etc. should be obtained and then, as appropriate to circumstances, direct them to leave or be prepared to file criminal trespass charges.

b. VANDALISM and SABOTAGE - Notify Twentynine Palms Water District Supervisor. Immediately notify law enforcement and request presence at the scene. Twentynine Palms Water District employee should standby to meet and assist law enforcement or be available to handle any water related issues.

c. If damage has occurred, deploy emergency response team, treat as crime scene. Standby and be available to assist local/county/state law enforcement and/or FBI to process crime scene for evidence preservation.

d. Coordinate alternative water supply, as needed.

e. Consider increasing security measures.

f. Based on extent or type of damage, consider alternate (interim) processes in order to maintain at least some level of continued service if applicable.

4. RECOVERY ACTIONS

Twentynine Palms Water District personnel should begin recovery actions as soon as practical after trespasser(s) is removed, damage assessed and/or process, facility or activity has been isolated from the rest of the utility facilities or determined that the threat is no longer present.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event.

6. APPROPRIATE UTILITY ELEMENTS

a. Dependent on the feedback from damage assessment teams.

b. Implement damage recovery plan.

7. REMEDIATION ACTIONS

a. Repair damage.

b. Assess need for additional protection/ security measures for the property or damaged equipment/facility.

I. MAJOR THEFT of EQUIPMENT or CHEMICALS (Security related)

Man-Made and/or Technological Emergencies

NOTICE:

"The response to a security event requires due care. In addition to the damage or possible damage present, the event may be considered a criminal act and the area a crime scene. As such, the physical area surrounding the entry point or breach of the system is normally considered a "crime scene". The crime scene needs to be protected in its original state as to when the crime occurred until it can be processed for evidence leading to the perpetrators and/or methods utilized in the act. Care must be taken not to disturb what occurred, yet action may be taken to avert any <u>immediate</u> threat to life or significant damage to the water system. This area will become restricted to "law enforcement personnel only" once they arrive. This action may preclude TWENTYNINE PALMS WATER DISTRICT personnel from entering unless they are specifically authorized to by the police."

1. GENERAL

These events are based on the threat of or actual theft of major equipment or chemicals on water system property or the water system (at any point within the system).

Under Presidential Decision Directive (PDD) 63 issued on May 22, 1998, the United States Environmental Protection Agency (USEPA) was designated as the lead federal agency to assess and address the vulnerabilities of the Nation's water supply infrastructure. Following the terrorist attacks of September 11, 2001, the President signed the Public Health Security and Bio-Terrorism Preparedness and Response Act of 2002 into law (PL 107-188) (June 12, 2002). Per this Act, community water systems had to conduct vulnerability assessments (VAs) within mandated deadlines and prepare emergency response plans (ERPs).

To aid this effort, USEPA directed efforts to reduce the vulnerability of water systems to terrorist attacks, to enhance their security and ability to respond to emergency situations.

Upon notification or of becoming aware that any part of the DISTRICT Water System has been the victim of a major theft of equipment or chemicals, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

Theft of equipment and chemicals may and can occur at almost any time. Most of the facilities are fenced, gated, locked and constructed to minimize theft. Concerted efforts to stop theft of equipment and chemicals, however, cannot be economically prevented.

Preventive actions obtained by applying certain physical and electronic security applications, law enforcement agencies and an alert operating force are also strong deterrents to reducing acts of theft. Staff should be aware of suspicious parties that may be loitering near facilities, notify the proper contact(s) or Law Enforcement, make a written note of license plates, descriptions, etc., of suspicious parties, and wait for assistance to arrive, or if appropriate, approach the individuals to ascertain their purpose and identity.

2. INITIAL NOTIFICATION

a. Notify Twentynine Palms Water District Supervisor.

b. Activate Twentynine Palms Water District Response Personnel to their respective assignments.

c. Activate Twentynine Palms Water District notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

a. Upon the discovery of missing equipment or chemicals, immediately notify Twentynine Palms Water District Supervision and Management. Try to ascertain if equipment or chemicals were moved in an authorized manner. Time is of the essence.

b. If a reasonable search and inquiry (short period of time) do not provide an answer for the disappearance, immediately notify law enforcement and request presence at the scene. Twentynine Palms Water District employee should standby to meet and assist law enforcement or be available to handle any water related issues.

c. Activate the damage assessment team.

d. Consider increasing security measures.

e. Based on extent or type of theft, consider alternate (interim) processes in order to maintain at least some level of continued service if applicable.

f. Determine with Water Management and law enforcement the type of news release that should be given out to the public, <u>if any</u>.

g. Obtain statements from all personnel as to the last time they saw the item(s) prior to their becoming missing.

h. Notify insurance carrier.

4. RECOVERY ACTIONS

Twentynine Palms Water District personnel should begin recovery actions as soon as practical after theft items have been isolated from the rest of the utility facilities or determined that the threat is no longer present or can be dealt with by some other means.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event.

6. APPROPRIATE UTILITY ELEMENTS

a. Dependent on the feedback from damage assessment teams.

b. Implement damage recovery plan.

7. REMEDIATION ACTIONS

a. Replace equipment and chemicals.

b. Assess need for additional protection/security measures for the property or damaged equipment/facility.

J. CONTAMINATION (Security related)

Man-Made and/or Technological Emergencies

NOTICE:

"The response to a security event requires due care. In addition to the threat, danger or possible damage present, the event may be considered a criminal act and the area a crime scene. As such, the physical area surrounding the entry point or breach of the system is normally considered a "crime scene". The crime scene needs to be protected in its original state as to when the crime occurred until it can be processed for evidence leading to the perpetrators and/or methods utilized in the act. Care must be taken not to disturb what occurred, yet action may be taken to avert any immediate threat to life or significant damage to the water system. This area may become restricted to "law enforcement personnel only" once they arrive. This action may preclude TWENTYNINE PALMS WATER DISTRICT personnel from entering unless they are specifically authorized to by the police."

1. GENERAL

1. Any event that impacts distribution water quality to the point that public health is immediately threatened, is based on the water utility being notified by proper authority, or discovering that there may be a water contamination occurrence, will activate this section.

   Under Presidential Decision Directive (PDD) 63 issued on May 22, 1998, the United States Environmental Protection Agency (USEPA) was designated as the lead federal agency to assess and address the vulnerabilities of the Nation's water supply infrastructure. Following the terrorist attacks of September 11, 2001, the President signed the Public Health Security and Bio-Terrorism Preparedness and Response Act of 2002 into law (PL 107-188) (June 12, 2002). Per this Act, community water systems had to conduct vulnerability assessments (VAs) within mandated deadlines and prepare emergency response plans (ERPs).

   To aid this effort, USEPA directed efforts to reduce the vulnerability of water systems to terrorist attacks, to enhance their security and ability to respond to emergency situations.

   Upon notification or of becoming aware that any part of the DISTRICT Water System has potential contamination, this emergency response plan will be immediately implemented.

   The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

2. Contamination Types can be generally categorized as disease causing organisms from bacterial, viral or parasites (biological); chemical; organic; radiological.

2. INITIAL NOTIFICATION

a. Activate DISTRICT Emergency Response Personnel to their respective assignments.

b. Activate notification plan for this particular event (see Notification Matrix).

c. Public Notice Types

A. "Boil Order" - Notice to boil water prior to use is issued by the California Department of Health Services and is called a Boil Water Order. It is used only in the event that the water supply is found to be contaminated or is likely to be contaminated with disease-causing organisms where boiling will neutralize the effects. As an alternative, chlorine bleach can be used with similar effect. See APPENDIX C for an example of the order language.

B. "Unsafe Water Alert" - Notice on non-potability of water is issued in order to prevent the public from drinking the water and is called an Unsafe Water Alert. It is required if toxic levels of metals, radiological, or organics are found in the water supply. It is issued by the California Department of Health Services (DHS) and contents must be approved by DHS. See APPENDIX D for an example of the alert language.

3. RESPONSE ACTIONS

NOTE: Patient symptoms should be used to narrow the list of potential contaminants.

a. Source Water

1. Increase sampling at or near water intakes.

2. Consider whether to isolate the water source if possible.

b. Drinking Water Treatment Facility

1. Preserve data from latest full battery background test "Run Sheet" (local Treatment Plant Operation Log) as baseline.

2. Increase sampling efforts to confirm contaminant.

3. Consider whether to continue normal operations (If reduction or stoppage is outcome, provide notification to customers/issue alerts). Discontinue treatment operations and discharge to waste if necessary.

c. Water Distribution/Storage

Isolate the water, drain and disinfect as necessary in the affected area, sample to confirm contaminant.

4. RECOVERY ACTIONS

NOTE: Recovery actions may be tailored to a specified (identified) material if the physical properties for the material are known.

DISTRICT personnel should begin recovery actions once contaminant is through the system.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event (see notification matrix).

6. APPROPRIATE UTILITY ELEMENTS

a. Sample appropriate system storage tanks, filters, sediment basins, solids handling, etc. to determine if residual contamination exists.

b. Flush system based on results of sampling.

c. Monitor health of employees pursuant to medical provider's advice.

d. Plan for the appropriate disposition of personal protection equipment (PPE) and other equipment.

7. REMEDIATION ACTIONS

NOTE: Remediation actions may be tailored to a specified (identified) material if the physical properties for the material are known.

a. Based on sampling results, assess need to remediate or modify processes regarding storage tanks, filters, sediment basins, solids handling.

b. Dispose of PPE and other equipment.

c. Identify recommendations for future facility protection.

K. CONTAMINATION at MAJOR EVENT (Security related)

Man-Made and/or Technological Emergencies

NOTICE:

"The response to a security event requires due care. In addition to the threat, danger or possible damage present, the event may be considered a criminal act and the area a crime scene. As such, the physical area surrounding the entry point or breach of the system is normally considered a "crime scene". The crime scene needs to be protected in its original state as to when the crime occurred until it can be processed for evidence leading to the perpetrators and/or methods utilized in the act. Care must be taken not to disturb what occurred, yet action may be taken to avert any immediate threat to life or significant damage to the water system. This area may become restricted to "law enforcement personnel only" once they arrive. This action may preclude TWENTYNINE PALMS WATER DISTRICT personnel from entering unless they are specifically authorized to by the police."

1. GENERAL

This event is based on the threat of, or actual, intentional introduction of a contaminant into the water system at a sports area, convention center or similar public facility.

Under Presidential Decision Directive (PDD) 63 issued on May 22, 1998, the United States Environmental Protection Agency (USEPA) was designated as the lead federal agency to assess and address the vulnerabilities of the Nation's water supply infrastructure. Following the terrorist attacks of September 11, 2001, the President signed the Public Health Security and Bio-Terrorism Preparedness and Response Act of 2002 into law (PL 107-188) (June 12, 2002). Per this Act, community water systems had to conduct vulnerability assessments (VAs) within mandated deadlines and prepare emergency response plans (ERPs).

To aid this effort, USEPA directed efforts to reduce the vulnerability of water systems to terrorist attacks, to enhance their security and ability to respond to emergency situations.

Upon notification or of becoming aware that any part of the DISTRICT Water System has been notified of a threat against or actual intentional contamination at a major event, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

2. INITIAL NOTIFICATION

a. Activate DISTRICT Response Personnel to their respective assignments.

b. Activate notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

a. Source Water

NO recommended action to take.

b. Drinking Water Treatment Facility

Preserve data from latest full battery background test "Run Sheet" (local Treatment Plant Operation Log) as baseline.

c. Water Distribution/Storage

1. Isolate water in the distribution system and at the particular site.

2. Sample the water to confirm the contamination.

3. Drain the contaminated water and disinfect.

4. Provide alternate water source.

4. RECOVERY ACTIONS

DISTRICT personnel should begin recovery actions once contaminant is through the system.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event.

6. WATER DISTRIBUTION/STORAGE

a. Do NOT flush distribution system via hydrants.

b. Move to prevent any risk of backflow. Install backflow prevention devices on all services to the event prior to recovering facility's water system.

7. REMEDIATION ACTIONS

Water Distribution/Storage

Assess need to decontaminate/replace distribution system components.

L. NOTIFICATION by HEALTH OFFICE of CONTAMINANT (Security related)

Man-Made and/or Technological Emergencies

NOTICE:

"The response to a security event requires due care. In addition to the threat, danger or possible damage present, the event may be considered a criminal act and the area a crime scene. As such, the physical area surrounding the entry point or breach of the system is normally considered a "crime scene". The crime scene needs to be protected in its original state as to when the crime occurred until it can be processed for evidence leading to the perpetrators and/or methods utilized in the act. Care must be taken not to disturb what occurred, yet action may be taken to avert any <u>immediate</u> threat to life or significant damage to the water system. This area may become restricted to "law enforcement personnel only" once they arrive. This action may preclude TWENTYNINE PALMS WATER DISTRICT personnel from entering unless they are specifically authorized to by the police."

1. GENERAL

This event is based on the water utility being notified by Public Health officials of potential contamination based on symptoms of patients.

Under Presidential Decision Directive (PDD) 63 issued on May 22, 1998, the United States Environmental Protection Agency (USEPA) was designated as the lead federal agency to assess and address the vulnerabilities of the Nation's water supply infrastructure. Following the terrorist attacks of September 11, 2001, the President signed the Public Health Security and Bio-Terrorism Preparedness and Response Act of 2002 into law (PL 107-188) (June 12, 2002). Per this Act, community water systems had to conduct vulnerability assessments (VAs) within mandated deadlines and prepare emergency response plans (ERPs).

To aid this effort, USEPA directed efforts to reduce the vulnerability of water systems to terrorist attacks, to enhance their security and ability to respond to emergency situations.

Upon notification or of becoming aware that any part of the DISTRICT Water System has a potential contamination, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

2. INITIAL NOTIFICATION

a. Activate DISTRICT Response Personnel to their respective assignments.

b. Activate notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

NOTE: Patient symptoms should be used to narrow the list of potential contaminants.

a. Source Water

1. Increase sampling at or near water intakes.

2. Consider whether to isolate the water source if possible.

b. Drinking Water Treatment Facility

1. Preserve data from latest full battery background test "Run Sheet" (local Treatment Plant Operation Log) as baseline.

2. Increase sampling efforts.

3. Consider whether to continue normal operations (If reduction or stoppage is outcome, provide notification to customers/issue alerts).

c. Water Distribution/Storage

1. Increase sampling in the area potentially affected and at locations where the contaminant could have migrated. It is important to consider the time between exposure and the onset of symptoms to select sampling sites.

2. Consider whether to isolate.

3. Consider whether to increase residual disinfectant level.

4. RECOVERY ACTIONS

DISTRICT personnel should begin recovery actions once contaminant is through the system.

5. RECOVERY NOTIFICATIONS

a. Activate notification plan for this particular event.

b. Assist health department.

6. APPROPRIATE UTILITY ELEMENTS

a. Sample appropriate system elements (storage tanks, filters, sediment basins, solids handling) to determine if residual contamination exists.

b. Flush system based on results of sampling.

c. Monitor health of employees.

d. Plan for the appropriate disposition of personal protection equipment (PPE) and other equipment.

7. REMEDIATION ACTIONS

a. Based on sampling results – assess need to remediate storage tanks, filters, sediment basins, solids handling.

b. Plan for appropriate disposition of PPE and other equipment.

c. If wastewater treatment plant was by-passed, sample and establish monitoring regime for receiving stream and potential remediation based on sampling results.

M. UNAUTHORIZED SCADA ACTIVITY (Security related)

Man-Made and/or Technological Emergencies

NOTICE:

"The response to a security event requires due care. In addition to the threat, danger, or possible damage present, the event may be considered a criminal act and the area a crime scene. As such, the physical area surrounding the entry point or breach of the system is normally considered a "crime scene". The crime scene needs to be protected in its original state as to when the crime occurred until it can be processed for evidence leading to the perpetrators and/or methods utilized in the act. Care must be taken not to disturb what occurred, yet action may be taken to avert any immediate threat to life or significant damage to the water system. This area may become restricted to "law enforcement personnel only" once they arrive. This action may preclude TWENTYNINE PALMS WATER DISTRICT personnel from entering unless they are specifically authorized to by the police."

1. GENERAL

This event is based on either internal or external unauthorized intrusion of the Supervisory Control and Data Acquisition (SCADA) system.

Under Presidential Decision Directive (PDD) 63 issued on May 22, 1998, the United States Environmental Protection Agency (USEPA) was designated as the lead federal agency to assess and address the vulnerabilities of the Nation's water supply infrastructure. Following the terrorist attacks of September 11, 2001, the President signed the Public Health Security and Bio-Terrorism Preparedness and Response Act of 2002 into law (PL 107-188) (June 12, 2002). Per this Act, community water systems had to conduct vulnerability assessments (VAs) within mandated deadlines and prepare emergency response plans (ERPs).

To aid this effort, USEPA directed efforts to reduce the vulnerability of water systems to terrorist attacks, to enhance their security and ability to respond to emergency situations.

Upon notification or of becoming aware of an unauthorized intrusion of any part of the DISTRICT Water System through SCADA, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

2. INITIAL NOTIFICATION

a. Activate DISTRICT Emergency Response Teams to their respective assignments.

b. Activate notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

a. Conduct an initial assessment of the SCADA to determine impact of the intrusion and potential for hazard. Based on findings, determine if additional steps are needed as described below.

b. Source Water

1. Increase sampling at or near water intakes.

2. Consider whether to isolate the water source if possible.

c. Drinking Water Treatment Facility

1. Preserve data from latest full battery background test "Run Sheet" (local Treatment Plant Operation Log) as baseline.

2. Temporarily shut down SCADA system and implement manual operation using established protocol.

d. Water Distribution/Storage

1. Monitor unmanned components (storage tanks and pumping stations).

2. Consider whether to isolate.

4. RECOVERY ACTIONS

DISTRICT personnel should begin recovery actions once the intrusion has been eliminated and the containment of unsafe water (if this occurs) is purged from the system.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event.

6. APPROPRIATE UTILITY ELEMENTS

a. WITH ASSISTANCE from the FBI, make an image copy of ALL systems logs to preserve evidence.

b. WITH ASSISTANCE from the FBI, check for implanted backdoors and other malicious code. Eliminate them before restarting SCADA.

c. Install safeguards before restarting SCADA.

d. Bring SCADA up and monitor system.

7. REMEDIATION ACTIONS

a. Assess/implement additional protections for SCADA.

b. Check for National Infrastructure Protection Center (NIPC) water sector warning based on the intrusion that may contain additional water protective actions to be considered. NIPC warnings can be found at www.NIPC.gov or at https://www.infrgard.org for secure access Infragard members.

N. INTENTIONAL DAMAGE to STRUCTURE (Security related)

Man-Made and/or Technological Emergencies

NOTICE:

"The response to a security event requires due care. In addition to the threat, danger, or possible damage present, the event may be considered a criminal act and the area a crime scene. As such, the physical area surrounding the entry point or breach of the system is normally considered a "crime scene". The crime scene needs to be protected in its original state as to when the crime occurred until it can be processed for evidence leading to the perpetrators and/or methods utilized in the act. Care must be taken not to disturb what occurred, yet action may be taken to avert any immediate threat to life or significant damage to the water system. This area may become restricted to "law enforcement personnel only" once they arrive. This action may preclude TWENTYNINE PALMS WATER DISTRICT personnel from entering unless they are specifically authorized to by the police."

1. GENERAL

This event is based on intentional structural damage to water system components to disrupt normal system operations.

Under Presidential Decision Directive (PDD) 63 issued on May 22, 1998, the United States Environmental Protection Agency (USEPA) was designated as the lead federal agency to assess and address the vulnerabilities of the Nation's water supply infrastructure. Following the terrorist attacks of September 11, 2001, the President signed the Public Health Security and Bio-Terrorism Preparedness and Response Act of 2002 into law (PL 107-188) (June 12, 2002). Per this Act, community water systems had to conduct vulnerability assessments (VAs) within mandated deadlines and prepare emergency response plans (ERPs).

To aid this effort, USEPA directed efforts to reduce the vulnerability of water systems to terrorist attacks, to enhance their security and ability to respond to emergency situations.

Upon notification or of becoming aware that any part of the DISTRICT Water System has sustained significant structural damage from an intentional act, this emergency response plan will be immediately implemented.

The emergency response plan for this type of situation will include specific initial notifications, response actions, recovery actions, recovery notifications, appropriate utility elements and remediation actions.

2. INITIAL NOTIFICATION

a. Activate DISTRICT Emergency Response Personnel to their respective assignments.

b. Activate notification plan for this particular event (see Notification Matrix).

3. RESPONSE ACTIONS

a. Deploy Emergency Response Teams, treat as crime scene – Consult local/state law enforcement and FBI on evidence preservation.

b. Inform law enforcement and FBI of potential hazardous materials.

c. Coordinate alternative water supply, as needed.

d. Consider increasing security measures.

e. Based on extent of damage, consider alternate (interim) treatment schemes to maintain at least some level of treatment**.**

4. RECOVERY ACTIONS

DISTRICT personnel should begin recovery actions as soon as practical after damaged facility is isolated from the rest of the utility facilities.

5. RECOVERY NOTIFICATIONS

Activate notification plan for this particular event.

6. APPROPRIATE UTILITY ELEMENTS

a. Dependent on the feedback from damage assessment teams.

b. Implement damage recovery plan.

7. REMEDIATION ACTIONS

a. Repair damage.

b. Assess need for additional protection/security measures for the damaged facility and other critical facilities within the utility.

APPENDIX A

The Twentynine Palms Water District's initial response to an earthquake emergency will be to determine the level of mobilization necessary to meet the immediate, primary objectives. The level of mobilization will be dictated by the initial preliminary inspection of facilities.

MOBILIZATION LEVELS DEFINED			
Level of Emergency	Richter Scale	Mercalli Scale	Level of Mobilization
Level 1 Mobilization	Less than 5.5	1-V1	Limited Mobilization required. (Duty person monitors radio and pager for damage reports from the public and activates initial response team and EOC as necessary.)
Level 2 Mobilization	5.5 to 6.0	V1 - V111	Mobilization required. (Initial Response Team is activated and all assessments reported to EOC.)
Level 3 Mobilization	6.1 to 10	V111 - X11	Full mobilization required, outside services and equipment needed. (EOC activated, action plan developed based on incoming assessments.)

APPENDIX B

INITIAL RESPONSE CHECKLIST
PRIORITY I
ROUTE 1

Date: **Time:** **Emergency:**

MAGNITUDE: **EPICENTER:**

FACILITY INSPECTED	CHECKED BY	TIME
1. Campbell Reservoir		
2. Treatment Plant/Well TP 1		
3. Hansen Reservoir		
4. Worthing Reservoir		
5. Cactus Booster		

Notify the System Dispatcher:
" Route 1, Priority I Inspection Complete."
Unless otherwise instructed, report to the EOC.

COMMENTS:

APPENDIX B continued

INITIAL RESPONSE CHECKLIST
PRIORITY I
ROUTE 2

Date: **Time:** **Emergency:**

MAGNITUDE: **EPICENTER:**

FACILITY INSPECTED	CHECKED BY	TIME
1. Donnell Reservoir		
2. Well 16 Chlorine		
3. Well 3B Chlorine		
4. Well 13/14 Chlorine		
5. Well 4 Chlorine		

Notify the System Dispatcher:
" Route 2, Priority I Inspection Complete."
Unless otherwise instructed, report to the EOC.

COMMENTS:

APPENDIX B continued

INITIAL RESPONSE CHECKLIST
PRIORITY I
ROUTE 3

Date: **Time:** **Emergency:**

MAGNITUDE: **EPICENTER:**

FACILITY INSPECTED	CHECKED BY	TIME
1. Stockwell Reservoir		
2. Well 11 Chlorine		
3. Well 10 Chlorine		
4. Lear Reservoir/Pnuematic		
5. Plant 11 Reservoir		
6. Plant 6 tank/Chlorine		

Notify the System Dispatcher:
" Route 3, Priority I inspection Complete."
Unless otherwise instructed, report to the EOC.

COMMENTS:

APPENDIX C

Date:

BOIL WATER ORDER

Este informe contiene información muy importante sobre su agua potable.
Tradúzcalo o hable con alguien que lo entienda bien.

BOIL YOUR WATER BEFORE USING

Failure to follow this advisory could result in stomach or intestinal illness.

Due to the recent event [e.g., water outage, power outage, flood, fire, earthquake or other emergency situation], the California Department of Health Services in conjunction with the [County Name] County Health Department, and Twentynine Palms Water System are advising residents of Twentynine Palms to use boiled tap water or bottled water for drinking and cooking purposes as a safety precaution.

DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. ***Bring all water to a boil,*** *let it boil for one (1) minute,* ***and let it cool before using, or use bottled water. Boiled or bottled water should be used for drinking and food preparation*** *until further notice.* ***Boiling kills bacteria and other organisms in the water. [or This is the preferred method to assure that the water is safe to drink.]***

Optional alternative to include for prolonged situations where it fits.

- **An alternative method of purification for residents that do not have gas or electricity available is to use fresh liquid household bleach (Chlorox, Purex, etc.). To do so, add 8 drops (or 1/4 teaspoon) of bleach per gallon of clear water or 16 drops (or 1/2 teaspoon) per gallon of cloudy water, mix thoroughly, and allow to stand for 30 minutes before using. A chlorine-like taste and odor will result from this purification procedure and is an indication that adequate disinfection has taken place.**
- **Water purification tablets may also be used by following the manufacturer's instructions.**
- **Optional: Potable water is available at the following locations: [List locations] Please bring a clean water container (5 gallons maximum capacity).**

We will inform you when tests show no bacteria and you no longer need to boil your water. We anticipate resolving the problem within [estimated time frame].

For more information call:
Water Utility contact: Ray Kolisz, Operations Superintendent, (760) 367-7546.
California Department of Health Services – Drinking Water Field Operations Branch- District Office at [(909) 383-4328].
Local Environmental Health Jurisdiction: [San Bernardino County at (909) 884-4056].

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

APPENDIX D

Date:

UNSAFE WATER ALERT

Twentynine Palms water is possibly contaminated
with [an unknown substance]

DO NOT USE YOUR WATER

Failure to follow this advisory could result in illness.

An unknown substance has been added to the drinking water supplied by the Twentynine Palms due to a recent [intrusion; break-in] at [one of the wells; our treatment plant; storage tank; specific facility]. The California Department of Health Services, San Bernardino County Health Department, and Twentynine Palms Water System are advising residents of Twentynine Palms to NOT USE THE TAP WATER FOR DRINKING [AND/,] COOKING [,HAND WASHING OR BATHING] UNTIL FURTHER NOTICE.

What should I do?

- *DO NOT DRINK OR USE TAP WATER---USE ONLY BOTTLED WATER.* ***Bottled water should be used for all drinking (including baby formula and juice), brushing teeth, washing dishes, and food preparation*** *until further notice.*

- *DO NOT TRY AND TREAT THE WATER YOURSELF.* ***Boiling, freezing, filtering, adding chlorine or other disinfectants, or letting water stand will not make the water safe.***

OPTIONS

- **Optional: Potable water is available at the following locations: [List locations] Please bring a clean water container (5 gallons maximum capacity).**

We will inform you when tests show that the water is safe again. We expect to resolve the problem within [estimated time frame].

For more information call:
Water Utility contact: Ray Kolisz, Operations Superintendent, (760) 367-7546.
California Department of Health Services at: San Bernardino, (909) 383-4328.
Local County Health Department: (909) 884-4056.

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RESOLUTION 21-07

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE TWENTYNINE PALMS WATER DISTRICT ADOPTING THE 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, the California Urban Water Management Planning Act, Water Code section 10610 et seq. (the Act) mandates that every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare and adopt an updated Urban Water Management Plan at least once every five years; and

WHEREAS, Twentynine Palms Water District (TPWD) is an urban water supplier for the purposes of the Act, and approved and adopted its most recent 2015 Urban Water Management Plan (UWMP) and submitted that UWMP to the California Department of Water Resources in July 2016; and

WHEREAS, TPWD, in accordance with applicable law including requirements of the Act and the Water Conservation Act of 2009 has prepared its 2020 UWMP and has undertaken certain agency coordination, public notice, public involvement and outreach, public comment, and other procedures in relation to its 2020 UWMP; and

WHEREAS, TPWD has prepared its 2020 UWMP with its own staff, with the assistance of consulting professionals, and in cooperation with other governmental agencies and has utilized and relied upon industry standards and the expertise of industry professionals in preparing its UWMP and has utilized and relied upon the Department of Water Resources 2020 Urban Water Management Plans Guidebook to Assist Urban Water Suppliers (March 2021); and

WHEREAS, California Water Code section 10632 requires water agencies to plan for water shortages of up to 50 percent as part of their Urban Water Management Plan; and

WHEREAS, TPWD has prepared an update to its Water Shortage Contingency Plan (WSCP); and

WHEREAS, the WSCP is consistent with the California Water Code sections 350 through 359 and section 10632, and guidance provided by the California Department of Water Resources Urban Drought Guidebook; and

WHEREAS, in accordance with applicable law, including Water Code sections 10608.26 and 10642, and Government Code section 6066, the TPWD made its Draft 2020 UWMP and WSCP available for public inspection and caused to be published within the jurisdiction of the TPWD at least two notices of public hearing

regarding the TPWD's 2020 UWMP and WSCP, which publication dates included June 9, 2021 and June 16, 2021.

WHEREAS, the TPWD held its public hearing on June 23, 2021 in the Board Room of the TPWD, located at 72401 Hatch Road, Twentynine Palms, California, regarding tis 2020 UWMP and WSCP, wherein, among other things, members of the public and other interested entities were provided with the opportunity to be heard in connection with the TPWD's 2020 UWMP and WSCP and the proposed adoption thereof; and

WHEREAS, pursuant to the public hearing on the 2020 UWMP and WSCP TPWD encouraged the active involvement of diverse social, cultural, and economic elements of the population within the TPWD service area with regard to the preparation and adoption of the 2020 UWMP and WSCP, encouraged input by members of the public and any other interested party regarding all aspects of the 2020 UWMP and WSCP, encouraged community input regarding the TPWD plan for complying with the Water Conservation Act of 2009, considered the economic impacts of complying with the Water Conservation Act of 2009; and

WHEREAS, the Board of Directors of TPWD has reviewed and considered the purposes and requirements of the Urban Water Management Planning Act and the Water Conservation Act of 2009, the contents of the 2020 UWMP and WSCP, the documentation contained in the administrative record in support of the 2020 UWMP and WSCP, and all public and agency input received with regard to the 2020 UWMP and WSCP, and has determined that the factual analyses and conclusions set forth in the 2020 UWMP and WSCP are supported by substantial evidence

NOW THEREFORE, BE IT RESOLVED by the Board of Directors of the Twentynine Palms Water District as follows:

1. The TPWD Board of Directors hereby approves and adopts the 2020 Urban Water Management for Twentynine Palms Water District and the Water Shortage Contingency Plan (2020) ordered filed with the Secretary of the Board.

2. The General Manager is hereby authorized and directed to include a copy of this Resolution in the 2020 Urban Water Management Plan for Twentynine Palms Water District and, in accordance with Water Code section 10644(a), to file the 2020 Urban Water Management Plan for Twentynine Palms Water District with the California Department of Water Resources, the California State Library, and any city or county within which the TPWD provides water supplies within thirty (30) days of this adoption date.

3. The General Manager is hereby authorized and directed, in accordance with Water Code section 10645, to make the 2020 Urban Water Management Plan for Twentynine Palms Water District

available for public review during normal business hours not later than thirty (30) days after filing a copy thereof with the California Department of Water Resources.

4. The General Manager is hereby authorized and directed, in accordance with Water Code section 10635(b), to provide that portion of the 2020 Urban Water Management Plan for Twentynine Palms Water District prepared pursuant to Water Code section 10635(a) to any city or county within which the TPWD provides water supplies not later than sixty (60) days after filing a copy thereof with the California Department of Water Resources.

5. The General Manager is hereby authorized and directed to implement the components of the 2020 Urban Water Management Plan for Twentynine Palms Water District in accordance with the Urban Water Management Planning Act and the Water Conservation Act of 2009, including but not limited to, the TPWD's Water Conservation Programs and its Water Shortage Contingency Plan.

6. The General Manager is hereby authorized and directed to recommend to the Board of Directors additional steps necessary or appropriate to effectively carry out the implementation of the 2020 Urban Water Management Plan for Twentynine Palms Water District, the Urban Water Management Planning Act and the Water Conservation Act of 2009.

PASSED, APPROVED AND ADOPTED this 23rd day of June 2021 by the following vote:

Ayes:	Directors Arthur, Coghill, Leazer, and Giannini
Noes:	None
Abstain:	None
Absent:	Director Horn

Carol Giannini, President
Board of Directors

Attest:

Ray Kolisz, Board Secretary
Twentynine Palms Water District