Comments on Section 2 of the Indian Wells Valley Groundwater Sustainability Plan

Judie Decker, Eastern Kern County Resource Conservation District PAC Representative

September 17, 2019

I have read through Section 2 and studied the figures and tables. I believe that this is the best written section that we have reviewed to date. I offer the following comments in an effort to either correct or clarify information for the reader.

Page 2-1 First Paragraph 5th line down. Add the word **intermittent to "Stream flow…"; so that the sentence reads Intermittent stream flow**

Page 2-5 Table 2.4 the category: Landscape Irrigation. I believe all wells in this category are owned by the City of Ridgecrest. The ownership of these wells should be noted. For clarity, Municipal Wells should be separated from Mutual Wells. The only Municipal Wells are those of the Indian Wells Valley Water District and those of the Inyokern Community Services District. These changes will give the reader precise information.

Page 2-6 2.3.2 This should be reworded to state that while the Indian Wells Valley Water District customers are in the eastern portion of the basin many of their wells are located in the southwestern portion of the basin.

Page 2-10 2.4.4 Integrated Regional Water Management for Inyo/ Mono Counties also should include the Eastern Kern County Resource Conservation District (EKCRCD) as one of its signatories. The Indian Wells Valley Water District is also a signatory to this same group.

There are several places where you discuss the Indian Wells Valley Co-operative Group as if it is still in existence. When the Indian Wells Valley Water District withdrew its support the group ceased to meet. The EKCRCD was an active participant in the group and was a signatory. They have been sent no communication about any future meetings.

Page 2-11 At the end of the section on the Co-operative group a notation needs to be added that this group is no longer functional.

Page 2-11 2.5.1 Land Use Change the "**may" to "will'**

Page 2-13 2.5.2 The area west of Ridgecrest also has Agriculture that is extracting considerable amounts of water. This agriculture should also be included in the statements made about the land use categories in the area west of Ridgecrest.

Page 2-21 2.7.3.1 Throughout this section the Indian Wells Valley Water District is referred to as the Water District. It should be referred to by its title the Indian Wells Valley Water District. Furthermore, the Inyokern Community Services District should also be referred to by its full title. This will clarify the discussion for the non local reader.

Page 2-21 Double check the 30% reduction in water that has been listed for the IWV Water District. Also, watering hours are 8 pm to 8 am which is the opposite of what is stated.

It is stated that Ordinance 100 was adopted in 2016 and then rescinded in 2017. Therefore, all of the items that are listed that are from Ordinance 100 are **now invalid**. They should be removed, or the items no longer valid should be noted.

Page 2-24 2.7.4 Identify the Water District as the Indian Wells Valley Water District for clarity.

Page 2-25 2.7.5 The topic is recycled water. The second line reads"…treatment of waste…" The word **water** needs to be added to waste so that it reads wastewater.

Page 2-27 2.7.5.3 The Tui Chub, an endangered fish. Note: The Tui Chub was brought from Death Valley (Saratoga Springs to be exact) by an individual who worked on the navy base at the time. She is the one who deposited them into Lark Seep.

Page 34 2.8.1 "The DMS…would be …**infeasible**…" Use another word; i**n**feasible is not a word.

Many things have been added in this section that is no longer valid. This is very misleading to the uninformed reader. These items should be removed or summarized and it should be clearly stated that they are something that no longer exists. I refer mainly to the Co-operative Groundwater Group and the conservation sections about the Indian Wells Valley Water District. The reader of this GSP needs to know only the facts of what is current at the time this document is written. It will only be a disservice to the people of this valley to do otherwise.

Figure 2-4 Surface flow in the IWV

This map is very misleading. It appears that there are streams all over the valley floor when, in fact, they are dry washes. You need to delineate where there is actual surface water in the two Sierra Canyons, Grapevine and Sand. You also need to note that the rest of the canyons/washes only flow during flood events, including Little Dixie Wash. Depending on the magnitude and location of the flooding all or only some of the washes may or may not flow

Eastern Kern County Resource Conservation District (EKCRCD) There is much written about the defunct IWV Groundwater Co-operative Group. I would strongly suggest that section be replaced by a section describing the EKCRCD. This organization was formed in the early 1950s. It covers both the Indian Wells Valley and the Fremont Valley groundwater basins that lie within Kern County, including parts of the Sierra canyons. It is a Special District of the State of California and has the ability to act as agent for the State and Federal governments. In the last several years the EKCRCD has conducted a number of public outreach programs to assist in the area of water and soil conservation. This outreach includes the installation of a CIMIS station in the Indian Wells Valley, annual drought tolerant plant lectures and plant sales, lectures on desert soils and how to work with them, lectures on landscape planning, and water efficient irrigation techniques and equipment.

The EKCRCD has been actively involved in the groundwater issues in the Indian Wells Valley for decades. It was an active participant in the Co-operative Groundwater Group and has actually funded groundwater studies. It has continual membership on both on both the Technical Advisory Committee and the Policy Advisory Committee which are part of the GSP process.

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PLANNING AND NATURAL RESOURCES DEPARTMENT

Planning
Community Development
Administrative Operations

September 30,2019

Indian Wells Valley Groundwater Authority
Policy Advisory Committee (PAC)
Attn: David Janiec
100 W. California Avenue
Ridgecrest, CA 93556

File: IWVG PAC

RE: Advisory Member
Comments on Groundwater Sustainability Plan - Draft Section 2 – Plan Area
Dated – September 3, 2019

Dear Mr. Janiec,

Thank you for the opportunity to provide comments on the Draft Groundwater Sustainability Plan (GSP) Section 2 – Plan Area (Dated September 3, 2019) The purpose of this Section is to "… provides background and discussion of 1) geographic area and jurisdictions; 2) management agencies; 3) land use; 4) existing monitoring and management programs; and 5) the data management system, as required in the GSP Emergency Regulations (§354.8)."

Kern County Planning and Natural Resources Department is the county agency responsible for land use in the unincorporated areas of Kern County as well as the zoning and general plan maps that are adopted by the Board of Supervisors.

Section 2.5.2.1 Kern County (pages 2-12 through 2-14) contains inaccurate information on the zoning and land use of the unincorporated area of the Indian Wells Valley. The following are our comments:

1. The lack of acknowledgement of the General Plan designations for any of the counties or cities lands lends an incomplete picture of the potential growth patterns of the communities. A variety of zone districts are normally consistent with general plan designations and these tables appear to only show what is currently zoned, not what is permitted under the various general plan consistency matrix's.

2. The use of the Kern County Geodat Open Data Portal is not recommended for compilation of complete data on zoning and general plan mapping. The statement included in the document appears to imply that over 26,000 acres are not zoned by Kern County. That is inaccurate.

3. Table 2-5 Zoning Districts in the Kern County lands overlying the IWVGB is inaccurate and uses descriptors that do not exist in the Kern County Zoning Ordinance. An example is Limited Agriculture/Mobile home. Further a zone that does exist (E – Estate) is not acknowledged.

Further details, discussion and even GIS assistance to provide an accurate table can be made upon request to this department from the consultant.

If you have any questions regarding these comments please don't hesitate to contact me at Loreleio@kerncounty.com. Or 661-862-8866. Thank you.

Sincerely,

Lorelei H. Oviatt, AICP, Director
Kern County Planning and Natural Resources Department

cc: Supervisor Gleason
County Counsel – Phillip Hall
CAO – Alan Christianson

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To: David Janiec, PAC Chair
From: Nick Panzer
Date: September 7, 2019
Subject: Comments on Stetson Slides (Projects and Management Actions; Sustainable Management Criteria) Presented to PAC on 9/5/19

Summary: The slides fail to "describe a reasonable path to… sustainability" within the meaning of Reg. 354.30.(e).

Discussion:

The slides do not provide nearly enough detail to allow for a thorough policy analysis; what follows may need significant modification as more details emerge.

This GSP proposal does not allocate our estimated safe yield of 7650 afy. Rather, it allocates 11,252 afy and proposes to bridge the 3602 afy gap (7,650-11,252) by assuming imports of about 5,000 afy before 2035 (3,602 gap +1,877 evapotranspiration + 39 flow to Salt Wells = 5,518?). This fails to describe a reasonable path to sustainability for two main reasons:

First, we cannot yet explain:

-The "…the source and reliability of [import] water…." Reg. 354.44(b)(6)

-The … "permitting and regulatory process required for [importing]…" Reg. 354.44(b)(3)

-The expected benefits of importing "…and how those benefits will be evaluated." Reg. 354.44(b)(5)

-A complete estimate of import costs and how the GA …"plans to meet those costs." Reg. 354.44.(b)(8)

-The "source and point of delivery…" for import water. Reg. 354.14(d)(6)

-"How recharge areas identified in the plan substantially contribute to the replenishment of the basin." CA 10727.2(d)(4)

-The criteria we will use to determine if imports "are feasible…." Reg. 355.4.(b)(5)

-The "….financial resources necessary to…." import water. Reg. 355.4.(b)(9)

Many of the above points also apply to the proposed ***recycle project***.

Second, to delay a final allocation of the 7,650 afy beyond the plan adoption deadline only delays the inevitable question of how the Domestic Group would divide the 7,650 among itself

in the event that imports prove not feasible. Hence, such a delay builds in substantial potential conflict and, thereby, threatens attainment of our sustainability goal by 2040.

Moreover, even if imports eventually prove feasible, the “owners” (buyers) of import water would likely differ proportionally among members of the Domestic Group due to the huge difference in cost per acre foot of natural recharge water versus import water. This further argues for allocation of natural recharge upon Plan adoption. This would not preclude members of the Domestic Group from continuing to pump at current rates so long as pre-set milestones along the road to importation are attained. Failing that, a “cliff” adjustment should be made to bring pumping in line with the pre-determined allocation of natural recharge.

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INDIAN WELLS VALLEY GROUNDWATER BASIN

GROUNDWATER SUSTAINABILITY PLAN

SECTION 2 – PLAN AREA

DRAFT

September 3, 2019

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SECTION 2: PLAN AREA

2.1 INTRODUCTION

This section provides background and discussion of 1) geographic area and jurisdictions; 2) management agencies; 3) land use; 4) existing monitoring and management programs; and 5) the data management system, as required in the GSP Emergency Regulations (§354.8).

2.2 GENERAL DESCRIPTION

2.2.1 Setting

The IWVGB is located in the northwestern part of the Mojave Desert in southern California, as shown on Figure 2-1, and underlies approximately 382,000 acres or approximately 600 square miles of land area in portions of the Counties of Kern, Inyo, and San Bernardino. The IWVGB is bordered on the west by the Sierra Nevada mountain range, on the north by the Coso Range, on the east by the Argus Range, and on the south by the El Paso Mountains. Surface water flow from the surrounding mountain ranges drains to China Lake, a large dry lake, or playa, located in the central north-east part of the basin. U.S. Route 395 and State Route 14 are the major vehicular arteries through the Indian Wells Valley. The IWVGB is in the vicinity of other Bulletin-118 groundwater basins including the Fremont Valley, Salt Wells Valley, Searles Valley, Coso Valley, Rose Valley, and Kern River Valley groundwater basins (see Figure 2-2).

The IWVGB is designated Basin Number 6-054 by DWR and is included in DWR Bulletin No. 118 entitled "California's Ground Water", dated September 1975. Bulletin 118 noted that recharge in the IWVGB averaged about 10,000 acre-feet per year (AFY) while extractions (as of 1968) were about 12,500 AFY, implying that overdraft conditions have existed for at least the past 50 years. DWR Bulletin 118 was updated in January 1980 and designated Bulletin 118-80. Table 8 of Bulletin 118-80 noted that there is evidence of groundwater overdraft in the IWVGB. Table 1 of Bulletin 118-16 (dated January 2016) indicates the IWVGB is subject to critical conditions of overdraft.

2.2.2 Jurisdictions

The Indian Wells Valley land overlying the IWVGB encompasses portions of the Counties of Kern, Inyo, and San Bernardino, with the majority (approximately 73%) being in Kern County as shown in Table 2-1. The City of Ridgecrest is the only incorporated community in the Indian Wells Valley and covers an area of approximately 20 square miles with a population of approximately 27,000 people. Unincorporated communities in the Indian Wells Valley include the communities of Inyokern in Kern County and Pearsonville in Inyo County, along with other smaller communities.

Table 2-1. IWVGB: Distribution of Overlying Land, by County

County Name	Overlying Land (acres)	Overlying Land (%)
Kern County	277,204	73%
Inyo County	66,519	17%
San Bernardino County	37,985	10%
Total	**381,708**	**100%**

As shown in Tables 2-2 and 2-3, approximately 302,000 acres of land overlying the IWVGB are federal property managed by either the US Navy's Naval Air Weapons Station China Lake (NAWS China Lake) or the US Department of Interior, Bureau of Land Management (BLM). The non-federal lands overlying the IWVGB consist of the incorporated city of Ridgecrest and unincorporated lands in the counties of Kern, Inyo, and San Bernardino (see Section 2.4). A map showing general jurisdictions and boundaries is provided in Figure 2-3.

Table 2-2. IWVGB: Distribution of Federal and Non-Federal Overlying Lands, by Entity

Entity	Overlying Land (acres)	Overlying Land (%)
U.S. Department of the Interior (Bureau of Land Management)	140,184	37%

U.S. Navy (Naval Air Weapons Station, China Lake)	161,911	42%
Non-Federal Entities	79,613	21%
Total	**381,708**	**100%**

Table 2-3. IWVGB: Distribution of Federal and Non-Federal Overlying Lands, by County

Entity	Overlying Land (acres)				Overlying Land (%)			
	NAWS China Lake	BLM	Non-Federal	Subtotal	NAWS China Lake	BLM	Non-Federal	Subtotal
Kern County	71,971	129,032	76,201	277,204	26%	47%	27%	100%
Inyo County	57,413	6,448	2,658	66,519	86%	10%	4%	100%
San Bernardino County	32,527	4,704	754	37,985	86%	12%	2%	100%
Total	**161,911**	**140,184**	**79,613**	**381,708**	-	-	-	-

2.2.3 Classification

In accordance with SGMA, DWR is required to classify groundwater basins by priority for achieving long-term sustainable groundwater management. DWR has published the "Sustainable Groundwater Management Act, 2018 Basin Prioritization Process and Results" document, dated January 2019, which provides the process, components, and rationale to develop the prioritization of California groundwater basins. In this document, DWR identifies and prioritizes 517 groundwater basins and subbasins as either

"High", "Medium", "Low," or "Very Low". DWR considered the following eight components when prioritizing the groundwater basins:

1) The population overlying the basin or subbasin.
2) The rate of current and projected growth of the population overlying the basin or subbasin.
3) The number of public supply wells that draw from the basin or subbasin.
4) The total number of wells that draw from the basin or subbasin.
5) The irrigated acreage overlying the basin or subbasin.
6) The degree to which persons overlying the basin or subbasin rely on groundwater as their primary source of water.
7) Any documented impacts on the groundwater within the basin or subbasin, including overdraft, subsidence, saline intrusion, and other water quality degradation.
8) Any other information determined to be relevant by the department, including determined to be relevant by the department, *including adverse impacts on local habitat and local streamflows*.

In addition to the IWVGB's designation as a basin subject to critical conditions of overdraft, the 2018 Basin Prioritization Report rates the IWVGB as a "High" Priority basin. Consequently, the IWVGA is required to submit this GSP by January 31, 2020 pursuant to SGMA.

2.2.4 Water Supply Source

In general, streams and other surface waters in the IWVGB are ephemeral due to low annual precipitation in the Indian Wells Valley, and basin recharge occurs as mountain block recharge. Consequently, although natural channels for surface water exist in the IWVGB (see Figure 2-4), surface water resources in the IWVGB are limited. Further discussion on surface water systems in the IWVGB is provided in Section 3.

The IWVGB serves as the sole supply of potable water for the Indian Wells Valley. Residents of the Indian Wells Valley are served groundwater through private domestic wells, small cooperative groups sharing wells, small mutual water companies, the Inyokern Community Services District, and the Indian Wells Water District. The Navy produces and distributes groundwater for use on the NAWS China Lake. Searles Valley Minerals produces groundwater from the IWVGB for use in its mineral mining and processing operations in the Searles Valley (located east of the IWVGB) and for potable use in the small communities of Trona, Westend, Argus, and Pioneer Point in the Searles Valley. In addition, a number of farms located

in the Indian Wells Valley rely on the IWVGB's water supplies for their agricultural operations, including Meadowbrook Dairy, Mojave Pistachios, Simmons Ranch, Quist Farms, and other smaller farms. The crops grown in the Indian Wells Valley are primarily alfalfa and pistachios.

The Kern County Public Health Services Department has provided the IWVGA with spatial data on wells located in the Kern County portion of the IWVGB. The data included well information such as approximate well location, point of contact, driller, and permit number. As of July 2018, the data provided such information (where available) for a total of 546 wells located in the Kern County portion of the IWVGB. The IWVGA has incorporated this spatial data into the development of this GSP. As shown on Figure 2-5, there are 932 estimated groundwater production wells located in the IWVGB with an average well density of approximately 1.6 wells per square mile. A summary of groundwater production wells by type of use is provided in Table 2-4.

Table 2-4. Summary of Groundwater Production Wells in the IWVGB

Well Use	Number of Wells
Domestic/Private	832
Dust Control	1
Industrial	5
Landscape Irrigation	5
Large Agriculture	18
Municipal	51
Small Agriculture	20
Total	**932**

2.3 LOCAL WATER AGENCIES

2.3.1 Background

The local water agencies within the IWVGB are shown on Figure 2-6 and are briefly summarized below. Additional information on the local water agencies and total current groundwater pumping is provided in Section 3.3.4.1.

2.3.2 Indian Wells Valley Water District

The Indian Wells Valley Water District (Water District) was formed in 1955 as the Ridgecrest County Water District by consolidating several smaller water companies serving the Ridgecrest area with domestic water. On January 19, 1970, the Water District's Board of Directors voted to change the name from the Ridgecrest County Water District to the Indian Wells Valley County Water District, reflecting its service area which covers areas beyond the City of Ridgecrest. In 1980, the Water District's Board of Directors formally dropped the word "County" from the name of the Water District. Since that date, the Water District has been known as the "Indian Wells Valley Water District".

The Water District serves approximately 30,000 customers through over 12,000 connections and encompasses an area of approximately 37.7 square miles within the eastern portion of the IWVGB. The Water District operates facilities (groundwater production wells, treatment systems, booster stations, storage tanks, and distribution pipelines) to provide potable groundwater from the IWVGB to its customers. Accordingly, the protection, conservation, and replenishment of groundwater supplies is of critical importance to the Water District.

2.3.3 Inyokern Community Services District

The Inyokern Community Services District (Inyokern CSD), established in 1983, provides water, wastewater, and street lighting services to the community of Inyokern, located approximately 7 miles west of Ridgecrest. The Inyokern CSD operates service facilities including approximately 265 water service connections, 4 groundwater production wells, distribution pipelines, and a wastewater treatment plant. The Inyokern CSD serves a primarily residential population of approximately 1,000 and an estimated 420 residential households (Alpert et al., 2014).

2.3.4 Antelope Valley – East Kern Water Agency

The Antelope Valley – East Kern Water Agency (AVEK) is a wholesale water agency serving nearly 2,400 square miles in northern Los Angeles and eastern Kern Counties, as well as a small portion of Ventura County. AVEK produces groundwater from the Antelope Valley groundwater basin and also obtains imported water from Northern California through a long-term contract with the State Water Project (SWP). As shown on Figure 2-6, the AVEK service area extends into the largely undeveloped land in the southernmost portion of the IWVGB, but no AVEK water infrastructure or water supply services exist in that portion of the IWVGB. The AVEK water transmission lines closest to the IWVGB are located in California City, located approximately 15 miles south of the IWVGB boundaries and 50 miles south of Ridgecrest.

2.3.5 Kern County Water Agency

The Kern County Water Agency (KCWA) is a public agency providing wholesale water services to its 13 member units along with water resources management and monitoring services throughout Kern County. As shown on Figure 2-6, the KCWA service area encompasses all portions of the IWVGB within Kern County, except for that portion of the IWVGB in the AVEK service area. KCWA obtains imported water from Northern California through a long-term contract with the SWP. At this time, no water agencies in the IWVGB serve as member units to KCWA, and no KCWA water infrastructure exists within the IWVGB boundaries.

Additional information on KCWA's water resources monitoring efforts in the IWVGB is provided in Section 2.6.2.

2.3.6 Mojave Water Agency

The Mojave Water Agency (MWA) is a wholesale water agency serving 4,900 square miles of the High Desert in San Bernardino County. MWA produces groundwater from the Mojave Basin Area, a series of Bulletin 118 groundwater basins and subbasins located along the Mojave River. MWA also obtains imported water from Northern California through a long-term contract with the SWP. As shown on Figure 2-6, the MWA service area extends into the easternmost portion of the IWVGB, but no MWA water infrastructure or water supply services exist in that portion of the IWVGB. The MWA water transmission

lines closest to the IWVGB are located in Barstow, located approximately 60 miles southeast of the IWVGB boundaries and Ridgecrest.

2.4 REGIONAL WATER MANAGEMENT AGENCIES

2.4.1 Background

The IWVGA is the exclusive Groundwater Sustainability Agency for the IWVGB, Bulletin 118 Basin No. 6-054. There are several other existing regional entities with water supply, management, planning, and/or regulatory authority whose boundaries encompass all or portions of IWVGB. These entities include the Kern County Water Agency (KCWA), the Lahontan Regional Water Quality Control Board (LRWQCB), the Inyo-Mono Integrated Regional Water Management Program (Inyo-Mono IRWMP), and the Indian Wells Valley Cooperative Groundwater Management Group (Cooperative Group). The following is a brief overview of these entities and their role in water supply management within the IWVGB.

Commented [dz1]: See the comment under 2.4.5

2.4.2 Kern County Water Agency

The Kern County Water Agency (KCWA) was created in 1961 by a special act of the California State Legislature and is the contracting entity in Kern County for the SWP. The KCWA participates in various water management activities including water quality control, flood control, and groundwater banking to preserve and enhance Kern County's water supply.

The KCWA is the second largest participant in the SWP, a water storage and delivery system for water supplies from Northern California. The KCWA has contracts with 13 local water districts, referred to by KCWA as Member Units for SWP water. Since 1968, about 33 million acre-feet of SWP water has been delivered to Kern County using SWP facilities. The KCWA does not have a contract with a local water agency in the IWVGB; therefore, the KCWA does not provide SWP water to the IWVGB.

Due to low rainfall in a semi-arid region, surface water supplies in Kern County must be augmented by groundwater supplies. The KCWA works to improve groundwater levels and to monitor groundwater quality throughout Kern County, especially in the areas surrounding groundwater banking projects.

The KCWA collects, interprets, and distributes groundwater data for the IWVGB. Since 1989, the KCWA has measured depth to groundwater in the IWVGB biannually during October (peak historical groundwater demand) and March (lowest historical groundwater demand). KCWA analyzes the resulting measurements to generate maps of groundwater elevation and depth to groundwater throughout the IWVGB. The KCWA is also a signatory to the Indian Wells Valley Cooperative Groundwater Management Group.

2.4.3 Lahontan Regional Water Quality Control Board

The Lahontan Regional Water Quality Control Board (LRWQCB) is a seven-member decision-making body appointed by the Governor of California for the purpose of protecting the water quality and ensuring the proper allocation and efficient use of water resources in the Lahontan Region. The Lahontan Region is divided into the North and South Lahontan Basins and includes over 700 lakes, 3,170 miles of streams, and 1,581 square miles of groundwater basins. The IWVGB is located within the South Lahontan Basin, which includes three major surface water systems (Mono Lake, Owens River, and the Mojave River watersheds) and multiple separated groundwater basins. A map of the LRWQCB boundaries is provided in Figure 2-7.

The LRWQCB's general duties include approving Water Quality Control Plans and Salt and Nutrient Management Plans; setting regional water quality standards; issuing waste discharge requirements; determining compliance with those standards and requirements; and taking appropriate enforcement actions. The LRWQCB has established the "Water Quality Control Plan for the Lahontan Region, North and South Basins" (Basin Plan) as the regulatory document that sets forth water quality standards and control measures for surface water and groundwater in the Lahontan Region (including the IWVGB). The LRWQCB has also approved the IWVGB Salt and Nutrient Management Plan in 2018 (see Section 2.6.4 for additional information).

2.4.4 Inyo-Mono Integrated Regional Water Management Program

The Inyo-Mono Integrated Regional Water Management Program (Inyo-Mono IRWMP) is a regional water resource planning organization which formed in 2008 as part of the statewide Integrated Regional Water Management collaborative effort. Over 30 organizations are members of the Inyo-Mono IRWMP, including the County of Kern, the County of Inyo, the Inyokern CSD, the Indian Wells Valley Water District,

the U.S. Bureau of Land Management, and the Cooperative Group. The Inyo-Mono IRWMP has obtained more than $2.5 million through DWR grants made available through Proposition 84 funding to assist essential water management projects and research efforts for Inyo, Mono, and Kern Counties, and includes the IWVGB. A map of the area included in the Inyo-Mono IRWMP is included in Figure 2-8.

The "Inyo-Mono Integrated Regional Water Management Plan" dated October 2014 states:

> "The purpose of the Inyo-Mono IRWM Program is to foster coordination, collaboration, and communication among water-related stakeholders in the region for the purpose of developing water management strategies and projects that will benefit multiple entities and enhance water supply, water quality, and watershed health."

2.4.5 Indian Wells Valley Cooperative Groundwater Management Group

Commented [dz2]: It should be noted the Cooperative Group is no longer relevant as several significant former signatories including Kern County, China Lake NAWS, BLM, the City of Ridgecrest, IWVWD resigned from the Group with formation of the IWVGA.

The Indian Wells Valley Cooperative Groundwater Management Group (Cooperative Group) was created in 1995 as a public water data-sharing group to consolidate and coordinate water management efforts in the Indian Wells Valley. The Cooperative Group collected and shared information regarding groundwater resources and uses of groundwater in the IWVGB. Members of the Cooperative Group include the NAWS China Lake, Searles Valley Minerals, Indian Wells Valley Water District, Bureau of Land Management, City of Ridgecrest, KCWA, Kern County, Inyokern Community Services District, East Kern County Resource Conservation District, and Inyokern Airport District. These members provided materials and services as in-kind donations to support the Cooperative Group's goals. In addition to in-kind services, the Cooperative Group received state funding from DWR for groundwater basin studies.

One of the founding purposes of the Cooperative Group is the exchange of information and management of data. The shared information supported development and implementation of improved management practices among the members and provided valuable information to the public about the state of the IWVGB's water supplies.

The Cooperative Group developed a "Cooperative Groundwater Management Plan for the Indian Wells Valley" (CGMP) and updated it in March 2006 ~~that established~~reiterating planning objectives to address conditions of overdraft and the resulting consequences for stakeholders in the Indian Wells Valley. The CGMP was not intended to alter or affect any existing water rights, but rather served as a set of guidelines

to encourage participation in water management efforts among the Cooperative Group members. The water management efforts listed in the CGMP include:

- Working towards and encouraging limitation of additional large scale pumping in areas that appear to be adversely impacted;
- Distributing new groundwater extractions within the Indian Wells Valley in a manner that will minimize adverse effects to existing groundwater conditions (levels and quality), and maximize the long-term supply within the Indian Wells Valley;
- Aggressively pursuing the development and implementation of water conservation policy and education programs;
- Encouraging the use of treated water, reclaimed water, recycled, gray, and lower quality water where appropriate and economically feasible;
- Exploring the potential for other types of water management programs that are beneficial to the Indian Wells Valley;
- Continuing cooperative efforts to develop information and data which contributes to further defining and better understanding the groundwater resources in the Indian Wells Valley;
- Developing an interagency management framework to implement and enforce the objectives of the CGMP.

2.5 LAND USE

2.5.1 Background

California Government Code Section 65040.2 requires cities and counties to establish a General Plan as a guideline to determine growth patterns, land use, land development, etc. A municipal General Plan addresses the following elements for its city or county: land use, circulation, housing, conservation, open space, noise, safety, environmental justice, and other optional topics of local interest. The General Plan elements of greatest relevance to this GSP and the IWVGA's water supply issues are land use, housing, conservation, and open space.

Implementation of this GSP may impact the water supply and water demand assumptions of existing General Plans due to changes in the quantities and locations of groundwater extractions and acquisition

of alternative water supplies. Accordingly, it is important for the IWVGA to coordinate with the relevant land use planning agencies.

2.5.2 Summary of General Plans and Other Land Use Plans

2.5.2.1 *Kern County*

The majority of land overlying the IWVGB is within Kern County. The Kern County General Plan, adopted September 22, 2009, is a policy document that, along with its amendments, guides the development and/or preservation of the county's natural resources not directly managed by the federal government. The Kern County General Plan was prepared by the Kern County Planning and Community Development Department.

Page viii of the Introduction to the Kern County General Plan states:

> "This planning document recognizes that the relationship between water supply and land use planning is important to promoting future growth and a strong economy for Kern County's future. Recent State laws require local governments to ensure that development approvals occur with substantive, realistic assessments of the availability of a reliable water supply. The new laws require the verification of sufficient water supplies as a condition for approving certain developments and compel urban water suppliers to provide more information on the reliability of groundwater for a long-term time frame. Long-term water supply planning is important to ensuring that rural and urban economic growth can be accommodated into the future."

The Kern County General Plan acknowledges that water supply is a critical issue for Kern County's residents and economy. For this reason, the Kern County General Plan requires that General Plan amendments subject to environmental review and not otherwise subject to California Water Code Section 10910 demonstrate through a water supply assessment that a long-term water supply for a 20-year timeframe is available. Additionally, all development proposals are required to be reviewed by County staff to ensure that adequate water supplies are available to accommodate projected growth. To sustain long-term economic stability in Kern County, Chapters 1.9 and 1.10.6 of the Kern County General Plan encourage effective groundwater resource management through the following actions:

- Promoting groundwater recharge activities in various zone districts;
- Supporting the development of Urban Water Management Plans and promoting Department of Water Resources grant funding for all water providers;
- Supporting the development of groundwater management plans;
- Supporting the development of future sources of additional surface water and groundwater including conjunctive use, recycled water, conservation, additional storage of surface water and groundwater, and desalination;
- Requiring water-conserving design and equipment in new construction;
- Encouraging water-conserving landscaping and irrigation methods;
- Encouraging the retrofitting of existing development with water-conserving devices.

A total of 277,204 acres of land overlying the IWVGB is located within Kern County. 201,003 acres (73%) of the overlying land within Kern County is federal land managed by the Bureau of Land Management (BLM) (129,0032 acres, or 47%), or controlled by the NAWS China Lake (71,971 acres, or 26%). Most of the BLM-managed land in the IWVGB is open space managed for natural and economic resources, including mineral resources and rights-of-way for powerlines and pipelines (Todd Engineers, 2014). The land controlled by the NAWS China Lake is used for weapons research, development, acquisition, testing, and evaluation through the U.S. Navy.

Near the westerly and southeasterly City of Ridgecrest boundaries, the permitted zoning consists of residential zoning generally with a minimum lot size at 2.5 acres per dwelling unit, light industrial zoning, open space zoning, etc. The area between the City of Ridgecrest boundaries and the community of Inyokern contains primarily residential zoning districts with varying densities, while the areas northwest of Inyokern are residential and resource (primarily agriculture) zoning districts.

Zoning in the southwest portion of the IWVGB, commonly referred to as the El Paso area, consists primarily of open space, recreation (forestry), limited agriculture, and mobile homes. Lands in the El Paso area are largely uninhabited and are managed by BLM. As a result, significant groundwater extraction does not occur in this area due to the lack of water demands (see Section 3).

A breakdown of the Kern County lands overlying the IWVGB and their associated land use designations is provided in Table 2-5 and is shown in Figure 2-9.

Table 2-5. Zoning Districts in the Kern County lands overlying the IWVGB

Zoning District	Area (acres)	Area (%)
Other (China Lake)	28,236	11.2%
Exclusive Agriculture	452	0.2%
General Commercial	167	0.1%
Highway Commercial	287	0.1%
Light Industrial	1,837	0.7%
Limited Agriculture	7,442	3.0%
Limited Agriculture/Mobilehome	64,954	25.8%
Low-density Residential	136	< 0.1%
Medium-density Residential	14	< 0.1%
Medium Industrial	1,020	0.4%
Military	533	0.2%
Mobilehome Park	23	< 0.1%
Open Space	105,340	41.8%
Recreation-Forestry	11,848	4.7%
Residential	29,873	11.9%
Total	**252,162**[1]	**100%**

2.5.2.2 *Inyo County*

The Inyo County General Plan was approved by the Inyo County Board of Supervisors in 2001. In accordance with the 2001 General Plan, the Inyo County Planning Department is currently updating its Zoning Code and has subsequently released draft General Plan updates associated with the proposed updates to the Zoning Code. The Inyo County General Plan Update dated May 2013 was used to complete

[1] Kern County zoning data was obtained from the County of Kern Geodat Open Data Portal. Updated as of May 9, 2017. Note that not all Kern County lands overlying the IWVGB were given zoning district categories in the dataset.

this GSP, which will be appropriately updated in accordance with all updates to the Inyo County General Plan.

Section 8.5 of the 2001 Inyo County General Plan provides planning goals related to water resources including:

- Providing an adequate and high quality water supply to all users within the County;
- Protecting and preserving water resources for the maintenance, enhancement, and restoration of environmental resources; and
- Protecting and restoring environmental resources from the effects of export and withdrawal of water resources.

The vast majority of land in Inyo County is owned by either the federal government (~92%), the City of Los Angeles (~4%), and the state of California (~2.5%) (Inyo County Planning Department, 2013). Approximately 96% of the Inyo County land overlying the IWVGB is either owned by the US Navy as part of NAWS China Lake, or managed by the BLM (see Table 2-3 above). Approximately 98% of the Inyo County land overlying the IWVGB is zoned as open space (see Table 2-6 below). The community of Pearsonville, occupying approximately four-square miles, is zoned for various residential densities as well as some commercial and industrial zoning to compliment the community's highway-oriented businesses.

A breakdown of the Inyo County lands overlying the IWVGB and their associated zoning is provided in Table 2-6 and shown in Figure 2-10.

Table 2-6. Zoning Districts in the Inyo County lands overlying the IWVGB

Zoning District	Area (acres)	Area (%)
Commercial Recreation	5	< 0.1%
General Industrial and Extractive	167	0.3%
Heavy Commercial	15	< 0.1%
Highway Services and Tourist Commercial	25	< 0.1%
Light Industrial	29	< 0.1%
Multi-Family Residential	23	< 0.1%

Open Space		65,038	98.2%
Public		65	0.1%
Rural Residential		848	1.3%
	Total	**66,215**[2]	**100%**

2.5.2.3 *San Bernardino County*

The General Plan for San Bernardino County was last updated in 2007 and is currently in the process of being revised. The land just adjacent to the City of Ridgecrest's eastern boundary is designated as Rural Living, allowing for a maximum of one dwelling unit per 2.5 acre lot. This area contains less than one square mile of residential lots. Areas with a Resource/Land Management designations span over several miles to the east of China Lake and north of the Inyo County line. A majority of the land overlying the IWVGB within San Bernardino County is within the NAWS China Lake boundaries, as shown above in Table 2-3.

A breakdown of the San Bernardino County lands overlying the IWVGB and their associated zoning is provided in Table 2-7 and shown in Figure 2-11.

Table 2-7. Zoning Districts in the San Bernardino County lands overlying the IWVGB

Zoning District	Area (acres)	Area (%)
Resource Conservation	37,411	98.5%
Rural Living	574	1.5%
Total	**37,985**[3]	**100%**

[2] Inyo County zoning data was obtained from the County of Inyo Public Geographic Information Systems Page. Updated as of January 31, 2019. Note that not all Inyo County lands overlying the IWVGB were given zoning district categories in the dataset.

[3] San Bernardino County zoning data was obtained from the ArcGIS Hub – Open Data, in conjunction with the San Bernardino County Land Services Department. Updated as of May 3, 2018.

2.5.2.4 *City of Ridgecrest*

The City of Ridgecrest has direct land use jurisdiction within its city limits with the exception of the small portion of the city within NAWS China Lake. The community within and surrounding the City of Ridgecrest is strongly linked to supporting NAWS China Lake by providing housing and services for personnel and contractors at NAWS China Lake; accordingly, the City of Ridgecrest General Plan emphasizes both achieving growth and sustainably supporting the military installation.

2.5.2.5 *Federal Lands*

The US Department of Interior Bureau of Land Management prepares Resource Management Plans (RMPs) that serve as land management blueprints. The majority of southern California, including the Indian Wells Valley, is within the California Desert Conservation Area (CDCA). The CDCA comprehensive land-use management plan was completed in 1980 and revised in 1999. Additionally, the Indian Wells Valley is within the BLM's West Mojave Plan area which established a Habitat Conservation Plan for sensitive plants and species in the region.

The US Department of Interior has assigned land management responsibility of NAWS China Lake to the Navy. Consequently, the Navy has developed a Comprehensive Land Use Management Plan (CLUMP) for land use management and environmental resources management for NAWS China Lake.

2.5.3 Agricultural Land Use

There are approximately 3,086 acres of actively farmed land overlying the IWVGB[4]. Typically, each farm has its own well system and water delivery system for its respective crops. The primary crops grown in the Indian Wells Valley are pistachios (2,027 acres) and alfalfa (985 acres), with other miscellaneous crops (74 acres) such as miscellaneous grain and hay constituting a minority of production. A map of actively farmed land overlying the IWVGB is provided in Figure 2-12.

[4] Actively farmed land in the IWVGB was determined using the California Department of Water Resources' Crop Mapping 2014 GIS dataset. Updated as of March 13, 2018.

2.5.4 Industrial Land Use

There are no large-scale industrial land uses in the Indian Wells Valley. Since the 1920's, Searles Valley Minerals Corporation (SVM) has exported groundwater from wells in the eastern part of Ridgecrest to Searles Valley (located outside of the Indian Wells Valley) to support both its industrial operations and the domestic needs of the unincorporated communities of Trona, Westend, Argus, and Pioneer Point. Section V.C of the San Bernardino County General Plan maintains a countywide goal of promoting conservation of water and maximizing the use of existing water resources by promoting activities and measures that facilitate the reclamation and reuse of water and wastewater, including for industrial uses. Implementation of this GSP will impact the potable water demands of industries in San Bernardino County (i.e. Searles Valley Minerals Corporation) that rely on the IWVGB for water supplies. This GSP will therefore impact the water supply assumptions for San Bernardino County industry set forth in the San Bernardino General Plan (see Section 4 for further details on impacts to industrial water demands).

Commented [dz3]: SVM's wells are not located in the "eastern part of Ridgecrest." With one exception (located centrally in town) the other four wells are either on the western edge of the city limits or in the unincorporated area west of Ridgecrest.

2.6 EXISTING WATER RESOURCES MONITORING PROGRAMS

2.6.1 Background

Multiple entities have been measuring depth to groundwater in the IWVGB since the 1920's. Monitoring programs were first initiated in the IWVGB by the United States Geological Survey (USGS) and have been primarily conducted by KCWA since 1989 with the assistance of the Water District, the United States Bureau of Reclamation (USBR), and the NAWS China Lake. Additionally, many of these entities have constructed wells dedicated solely to monitoring groundwater levels in the IWVGB.

Prior to formation of the IWVGA, monitoring efforts in the IWVGB were often duplicated due to a lack of communication among interested parties. In 1995, the Cooperative Group was formed to coordinate monitoring and management efforts, share data, and avoid the redundancy of groundwater study efforts. As a public data-sharing group consisting of the major water producers, government agencies, and concerned citizens in the IWVGB, the Cooperative Group compiled numerous study efforts in the IWVGB including a basin-wide recharge study, the construction of weather and stream gages, and a monitoring program involving over 100 monitoring wells. The Cooperative Group published its compiled monitoring data, including historical reported pumping and basin studies, on its website:

http://iwvgroundwater.org/

The Cooperative Group was designated as the California Statewide Groundwater Elevation Monitoring (CASGEM) monitoring entity for the IWVGB per a DWR letter dated November 18, 2011. With the formation of the IWVGA and subsequent withdrawal of several key signatories from the Cooperative Group, ~~T~~the status of CASGEM monitoring entity was transferred to the IWVGA in January 2018 as part of the IWVGA's initial SGMA compliance efforts.

The following sections summarize the existing water resources monitoring programs that are on-going within the IWVGB. These programs are conducted by a variety of agencies and are now being incorporated into the SGMA compliance efforts overseen and managed by the IWVGA. Data obtained through the existing water resource monitoring programs helped populate the IWVGA's Data Management System (see Section 2.8), and the data was used to develop alternative groundwater basin management strategies (see Section 4).

2.6.2 KCWA Groundwater Monitoring Programs

The KCWA measures depth to groundwater in over 200 monitoring wells in the IWVGB consisting of a network of private and public water production wells and monitoring wells. Field measurements of water levels are conducted semiannually in October and March at periods of historical groundwater demand peaks and minimums. The water level data is collected, analyzed, and plotted onto contour maps to depict groundwater depths, groundwater elevations, and changes in groundwater elevation over time. The contour maps portray how the IWVGB spatially reacts to groundwater extractions across the Indian Wells Valley. The contour maps and hydrographs are updated annually by KCWA and can be viewed at the IWVGA's Data Management System (see Section 2.8), which can be accessed at www.iwvgsp.com.

KCWA also collects water quality samples and monitoring wells for analysis. The water quality results can then be plotted on contour maps and a variety of other types of diagrams and graphs.

The data collected from monitoring groundwater levels and water quality are archived in the IWVGA's Data Management System, which contains groundwater level data dating back to 1946 and water quality data dating back to 1952.

The locations of the KCWA monitoring wells and other monitoring wells in the IWVGB are provided in Figure 2-13.

2.6.3 CASGEM

A subset of the data from approximately 40 of the over 200 wells monitored throughout the IWVGB are submitted to DWR as part of their CASGEM program. CASGEM requires each individual groundwater basin to develop a representative groundwater level monitoring program to assist with tracking change in groundwater levels, and consequently changes in the volume of water stored in the groundwater basin. The CASGEM program aides in identifying the seasonal and long-term trends in the IWVGB. The locations of the IWVGB CASGEM wells are provided in Figure 2-13. A selection of these CASGEM wells served as representative monitoring sites while evaluating impacts and management actions and subsequently served as the locations where sustainability criteria were set (see Section 5).

2.7 EXISTING WATER RESOURCES MANAGEMENT PROGRAMS

2.7.1 Background

It has been well documented that the IWVGB has been in overdraft since the 1960s and that current basin outflows exceed basin inflows by approximately four times (see Section 3.3.4.4). Water resources management programs in the IWVGB have been implemented by a variety of entities to address conditions of basin overdraft. In many instances, these water resources management programs have resulted in curtailment of historical pumping to reduce the impacts of over-pumping.

The water resources management programs that are **not** currently practiced in the IWVGB include replenishment of groundwater extractions; conjunctive use and underground storage; and diversions to storage. The following section summarizes the existing and on-going water resources management programs administered in the IWVGB. Proposed water resources projects and management actions that will be primarily managed by the IWVGA are discussed in Section 4.

2.7.2 Salt and Nutrient Management Plan

Through collective funding by the City of Ridgecrest and the Water District, ~~A~~a Salt and Nutrient Management Plan (SNMP) for the IWVGB was drafted by Woodward & Curran, finalized in March 2018, and accepted by the LRWQCB. The SNMP (RMC, et al., 2018) was prepared as a high-level planning document to inform the monitoring and implementation elements being developed for this GSP. The SNMP provides an overview of basin characteristics, groundwater conditions, historical groundwater production, and existing groundwater quality. In addition, the SNMP:

- Identifies sources of additions/withdrawals of both salts (such as Total Dissolved Solids) and nutrients (such as Nitrate);
- Analyzes current assimilative capacity for salts and nutrients;
- Projects trends in water quality and loading;
- Analyzes water quality conditions against the water quality objectives described in the Basin Plan;
- Discusses existing and potential water resources practices that do and may impact basin water quality; and
- Provides a proposed preliminary water quality monitoring program.

2.7.3 Conservation Programs

2.7.3.1 *Water District Demand Management Measures*

The Water District has implemented water conservation programs in an attempt to reduce annual groundwater extractions. The Water District has achieved a 30% reduction in total water demand as a result of implementing a four-tier water rate structure along with various water conservation Ordinances issued by the Water District and the City of Ridgecrest. The Water District Ordinances include:

- Water District Ordinances 90 and 91 (adopted in 2009; rescinded in 2015)
    - Landscaping restrictions for new single-family/multi-family residential, commercial, and institutional buildings
- Water District Ordinances 98 and 99 (adopted in 2015)
    - Implementation of an Approved Plant List for landscaping

  - Mandated use of low volume irrigation systems, high efficiency sprinkler heads, pressure regulators, and master shut-off valves
    - Subsurface drip irrigation required on areas less than 10 feet wide
- Water District Ordinance 100 (adopted in 2016; rescinded in 2017)
  - No water user shall waste water; prohibits washing down hard or paved surfaces for strictly aesthetic purposes
  - Prohibit vehicle washing except by use of a hand-held bucket or hand-held nose equipped with a shut-off nozzle or device
  - Irrigation only between 8:00 AM – 8:00 PM; irrigation limited to 3 days per week based on addresses (1 day per week from November through February)
  - Restaurants shall only serve water on request
  - Turf or ornamental landscapes shall not be irrigated within 48 hours after measureable precipitation
  - Hotel/motel operators shall provide guests the option of choosing not to have towels and linens laundered daily
  - Prohibits recreational fountains or decorative water features
- Water District Ordinance 101 (adopted in 2017)
  - Implementation of the 2017 Water Shortage Contingency Plan
    - Actions for two stages of local water shortages and a drought state of emergency
- Water District Ordinance 103 (adopted in 2017)
  - Irrigation limited to 3 days per week during all months

The Water District has hosted community outreach events (e.g. school education programs) to raise awareness of water conservation practices such as the use of appropriate desert landscaping. At these and other local events, the Water District has distributed water conservation fixtures including 3,746 low-flow showerheads; 5,256 low-flow hose nozzles; 880 shower timers; 2,480 faucet aerators; 3,514 water tumblers; and 2,339 moisture meters. The Water District's "Cash for Grass" Rebate Incentive Program, funded by a Prop. 84 grant from the State Water Resources Control Board through the Inyo-Mono IRWM, offers rebates to property owners who elect to replace lawns with eligible low water-use landscaping. To supplement its ongoing conservation practices, the Water District ~~manages~~is implementing a digital customer engagement portal that allows the Water District and its customers to track and analyze customer water use, conservation practices, ordinance violations, leakage incidents, etc.

2.7.3.2 *City of Ridgecrest Demand Management Measures*

Similar to the Water District, the City of Ridgecrest has adopted water conservation Ordinances to reduce demands. The Ordinances include:

- City of Ridgecrest Ordinance 09-05 (adopted in 2009)
  - Similar irrigation restrictions to Water District Ordinance 100
- City of Ridgecrest Ordinance 16-01 (adopted in 2016; supersedes Ordinance 09-05)
  - Water-efficient landscaping and irrigation scheduling
  - Promoted use of recycled water and greywater
  - Promoted stormwater management practices

2.7.3.3 *Navy Water Use*

The Cooperative Group's recorded production data indicates that the Navy has been a major pumper in the IWVGB historically (e.g. as much as 5,000 AFY in 1975). The Navy has since achieved a 53% reduction in groundwater pumping due to a combination of instituted conservation measures and a shift from on-base housing of Navy personnel to off-base housing within Ridgecrest.

~~As~~While a member of the Cooperative Group, the NAWS China Lake ~~has~~ committed to explore the potential for water resources management programs that benefit the IWVGB, including water conservation efforts. In its "Water Conservation Public Advisory" dated June 2008, the Cooperative Group (including the Navy) developed strategies to reduce unnecessary and/or excessive water uses to support the sustainable management of the IWVGB.

Commented [dz4]: The Navy is no longer a member.

The NAWS China Lake's Integrated Natural Resources Management Plan (INRMP) dated June 2014 describes the Navy's implementation of natural resources programs at NAWS China Lake, including water resources management. In its 2014 INRMP, the Navy emphasizes a water conservation program focused on xeriscaping, a landscaping method based on the use of native or drought-resistant plants, in addition to efficient irrigation practices that require less water. Principles of xeriscaping include using gravel or plastic/rubber-based products to preclude weed growth and enhance water retention; using ground cover to prevent blowing dust and soil erosion; watering using automatically controlled cycles during low evaporation periods; and using drip irrigation whenever possible. The 2014 INRMP discourages the

addition of new lawn areas except where functionally essential (i.e. in areas used for ceremonies, family housing, recreation fields, and children's playgrounds).

At the IWVGA Pumper Group Allocation meeting on October 1, 2018, the Navy indicated its short-term future water needs to be approximately 2,041 AFY, which includes a 25% increase in current water use. This estimation is **not** indicative of the Navy's federal reserve groundwater right, which has yet to be quantified and is not subject to the provisions of SGMA.

2.7.3.4 *Opportunities for Additional Conservation*

Opportunities for implementation of additional conservation measures are discussed in Section 4.

2.7.4 Efficient Water Management Practices

The Water District prepared its "2015 Urban Water Management Plan" (2015 UWMP), dated June 2016, which includes a discussion of efficient water management practices in Section 6.B.7 "Prohibitions, Penalties, and Consumption Reduction Methods". The following is a brief summary of these efficient water management practices.

2.7.4.1 *Mandatory Prohibitions on Wasting Water*

The Water District has adopted a Water Efficient Landscape Ordinance (Ordinance No. 93) and Ordinance No. 100 regarding emergency water conservation mandatory restrictions. The City of Ridgecrest adopted a Water Efficient Landscape Ordinance (Ordinance No. 16-01). These ordinances have common requirements, including but not limited to:

- Prohibiting runoff from landscape irrigation;
- Prohibiting wash down of hard or paved surfaces;
- Prohibiting water leaks;
- Prohibiting use of a hose without a shut-off nozzle;
- Prohibiting landscape irrigation on the surface, except for hand watering or the use of a drip irrigation system, between the hours of 8:00 a.m. and 8:00 p.m. during the months of May, June,

July, August, September, and October, unless a special permit is issued to accommodate newly planted material;

- Requiring new plumbing fixtures to conform to requirements of law as to flow capacity.

2.7.4.2 *Water Efficient Landscaping*

The Water District has implemented numerous water-efficient landscape requirements, which include:

- Prohibiting turf in the front yard;
- Limiting plants in front yards to those provided in a Water District-approved list;
- Prohibiting front yard irrigation systems that are not low-volume;
- Requiring use of high-efficiency irrigation sprinkler heads;
- Prohibiting irrigation runoff.

2.7.4.3 *Excessive Use Penalties*

The Water District has adopted a tiered water rate structure, based on the actual cost to produce and distribute the water, which rewards customers that conserve water through lower water rates. Furthermore, customers that consistently waste water may be subject to having flow restrictions placed on their meters.

2.7.5 Recycled Water Use

California Water Code Section 13050(n) defines "recycled water" as water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur. There are currently two wastewater treatment facilities (WWTFs) within the IWVGB: The City of Ridgecrest WWTF[5], and the Inyokern CSD WWTF. IWVGB residents that do not contribute flow to either of these WWTFs use septic tanks to dispose of wastewater.

[5] A Memorandum of Agreement dated April 1, 1993, between the Navy and the City states that the City owns and operates the WWTF, though there is a general lack of consensus among the IWVGB stakeholders regarding the ownership and operations of the WWTF. The term "City WWTF" is used in this GSP for the sole purpose of distinguishing between the two existing WWTFs in the IWVGB.

Prior to 1974, the City of Ridgecrest Sanitation District operated a small WWTF in the eastern portion of the City, near the eastern City limits. At that time, the Navy operated its own separate WWTF on the NAWS China Lake. To address capacity problems, the City abandoned its old WWTF and consolidated the two treatment facilities to treat combined flow from the City and from the NAWS at a common plant. The City has since operated the existing 3.6 million gallon per day (MGD) WWTF located on the NAWS base, approximately 3.5 miles northeast of the City center. Annual average day flows at the WWTF were approximately 2.44 MGD (2,739 AFY) in 2017. The City WWTF provides primary wastewater treatment through a series of headworks and sedimentation tanks. Secondary treatment occurs in a series of on-site facultative ponds with clay linings.

The City of Ridgecrest's WWTF is currently the only facility which generates a recycled water supply for direct beneficial or controlled use within the IWVGB. The City WWTF produces recycled water that is applied at a City site for alfalfa irrigation and at the NAWS China Lake for golf course irrigation. The remaining treated wastewater generated at the City WWTF is discharged to evaporation/percolation ponds at the City WWTF site.

Independent of this GSP, the City is currently planning to upgrade, expand, and potentially relocate the existing City WWTF. The City plans to abandon and demolish the existing City WWTF for construction of a new oxidation ditch secondary treatment plant with new evaporation/percolation ponds and new solids handling facilities (Provost & Pritchard, 2015). The City has evaluated constructing new recycled water facilities including tertiary treatment trains (filtration and disinfection) at the new WWTF, a recycled water storage tank, a recycled water pump station, and a purple pipe distribution system. The new recycled water facilities would provide up to 1.8 MGD (2,016 AFY) of recycled water for City use in landscape irrigation and/or groundwater recharge (Provost & Pritchard, 2015). The City is considering two (2) potential sites for the new WWTF: (1) the existing WWTF site, or (2) the old City WWTF site. The new WWTF location will depend on ongoing easement and land use negotiations between the City and the Navy.

The Inyokern CSD also operates a small WWTF with an approximate capacity of 0.035 MGD to treat wastewater from residents within its service area. The final effluent generated at the Inyokern WWTF is currently not of sufficient quality for any beneficial uses of recycled water and is instead disposed of through evaporation/percolation ponds located at the Inyokern WWTF site.

2.7.5.1 *Alfalfa Irrigation*

Approximately 220 AFY of recycled water (secondary-treated wastewater) from the City WWTF has been historically used to irrigate 30 acres of alfalfa located at the old City WWTF site. The alfalfa is commonly sold by the City for use in cattle feed. The July 2019 Searles Valley earthquakes caused disruptions to the City WWTF and prevented the City from irrigating its alfalfa for the 2019 growing season. The City plans to continue its alfalfa irrigation with recycled water until the new WWTF with recycled water facilities is constructed, at which point the City plans to instead apply recycled water (tertiary-treated wastewater) for landscape irrigation and/or groundwater recharge.

2.7.5.2 *NAWS China Lake Golf Course*

The Navy receives secondary-treated effluent from the City WWTF and provides additional treatment for beneficial use on a golf course. The Navy uses a chlorine contact basin to provide additional treatment of the effluent. A Negotiated Sewer Service Contract between the City and the Navy reserves up to 750 AFY of treated wastewater from the City WWTF for irrigation of the golf course located at the NAWS China Lake. However, it has been noted that the golf course only uses approximately 500 AFY of water (Provost & Pritchard 2015).

2.7.5.3 *Evaporation/Percolation Ponds*

The City WWTF site contains four (4) evaporation/percolation ponds which may receive secondary-treated effluent that is not supplied for alfalfa irrigation or golf course irrigation. Wastewater stored in these ponds evaporates or percolates into either the underlying shallow groundwater aquifer or the Mohave Tui Chub habitat located north of the City WWTF.

The Mohave Tui Chub are an endangered species of fish native to the Mohave River. Due to numerous alterations to its native habitat, the United States Fish and Wildlife Service and California Department of Fish and Wildlife relocated a population of the Tui Chub to the NAWS China Lake during the 1970s. The Tui Chub habitat at China Lake consists of two seeps, referred to as Lark Seep and G-1 Seep. The two seeps are connected through a series of man-made channels, which were originally constructed during the 1950s and 1960s to divert seeping groundwater away from nearby roads and facilities. The habitat inflows include seepage from the City WWTF ponds, irrigation percolation from the China Lake golf course, and

various contributions from the City of Ridgecrest area (e.g. irrigation percolation, wash-down, commercial water discharge, and transmission line leaks) (ERS 1991).

The Navy prepared a preliminary habitat management plan (HMP) for the Mohave Tui Chub (ERS, 1991) in response to a Biological Opinion issued by the U.S. Fish and Wildlife Service. The HMP proposed actions to protect and maintain the Mohave Tui Chub habitat, including construction of a water delivery system to discharge water to the existing seeps and channels in the habitat. No additional steps have been taken to implement any potential protection or maintenance plans for the Tui Chub habitat, although it has been proposed that an evaluation be conducted on potentially relocating the Tui Chub in the near future to potentially increase the amount of recycled water available in the IWVGB. Recycled water that would become available as a result of Tui Chub relocation may be used to either meet existing water demands to reduce groundwater extractions or serve as a source of groundwater recharge for the IWVGB.

SGMA requires that all beneficial uses and users, including Groundwater Dependent Ecosystems (GDEs), be considered in the development and implementation of GSPs. GDE identification must be included in the GSP to determine whether groundwater conditions are having potential effects on any and all beneficial uses and users within the basin. Additionally, GDE management must be incorporated into the sustainable management criteria established as part of the GSP. The location of the Mohave Tui Chub habitat coincides with GDEs identified in DWR's Natural Communities Commonly Associated with Groundwater (NCCAG) dataset. Further definition of and discussion on GDEs in the IWVGB is provided in Section 3.4.5 and in Section 4.

2.7.6 Groundwater Contamination Cleanup

The United States Department of Defense initiated the Installation Restoration Program (IRP) in 1980 to identify, investigate, and remediate or control the release of hazardous substances that resulted from past waste disposal operations and hazardous material spills at military facilities. Per the Navy's 2014 INRMP, NAWS China Lake is assessing and remediating areas of past contamination on its ranges through the IRP, including sites of possible and confirmed groundwater contamination. A list of these sites along with their cause of contamination and remediation status is provided in Appendix ---.

Sites of possible and confirmed groundwater contamination are made publicly available on GeoTracker, the State Water Resources Control Board's (SWRCB's) data management system for sites that impact, or

have the potential to impact, water quality in California. The data available on GeoTracker includes site characteristics (e.g. case number, site location, cleanup status, responsible parties, affected water resources) as well as site actions (e.g. project activities, compliance responses, milestone tracking, land use controls, risk to water quality assessments). GeoTracker also provides public records such as regulatory communication and decision documents for each site.

Figure 2-14 shows the sites of possible and confirmed groundwater contamination located in the IWVGB, including:

- Sites that require cleanup
    - Leaking Underground Storage Tank (LUST) sites
    - Department of Defense Sites
    - Cleanup Program Sites
- Permitted facilities
    - Operating Permitted Underground Storage Tanks (USTs)
    - Land Disposal Sites

2.7.7 Well Permitting Policies and Procedures

2.7.7.1 *Kern County*

Nearly all water supply wells in the IWVGB are located within the jurisdiction of Kern County. Well standards for both water supply and monitoring wells within Kern County are provided in Title 14, Chapter 14.08, Article III of the Kern County Municipal Code. Per Kern County Municipal Code Section 14.08.210, the standards for the construction, repair, reconstruction, or destruction of wells within Kern County are set forth in DWR Bulletin 74-81 "Water Well Standards, State of California" and all subsequent supplements and revisions. The construction, reconstruction, deepening, or destruction of any well requires filing a valid application for a permit with the Kern County Public Health Services Department (Kern County PHSD), and subsequent approval of the application. All abandoned wells within Kern County are to be destroyed within ninety (90) days of abandonment.

In July 2017, the Kern County Board of Supervisors approved an ordinance adding Sections 14.08.113 and 14.08.285 and amending Section 14.08.290 of Title 14, Chapter 14.08 of the Kern County Municipal Code.

The ordinance requires that all new private domestic, public domestic, industrial, agricultural, and any reconstructed or upgraded wells be installed with water flow meters or equivalent devices/methods for water measurement.

The Kern County PHSD administers a "Water Wells Program" to manage the permitting and compliance requirements for groundwater wells (both monitoring wells and drinking water wells) in the Kern County portion of the IWVGB. The Water Wells Program ensures that the public receives water that is safe to drink and that the quantity of water supplied is adequate to meet the community's needs. The Water Wells Program is responsible for processing applications and issuing permits for the following:

- Monitoring Wells
- Drinking Water Wells
- Well Destruction
- Well Driller Registration
- Water Supply Certification

Guidance and information are provided on the Water Wells Program website (https://kernpublichealth.com/water-wells/) including information on the following:

- Agriculture Well Permit Guidelines
- Domestic Well Permit Guidelines
- Well Destruction Procedures
- Disinfection Procedures, Laboratories, and Sampling
- List of Approved Drillers and Sealing Material
- Water Well Site Location Requirements

The Kern County PHSD maintains a listing of well information collected through administration of the Water Wells Program.

The Kern County PHSD also administers a Small Water Systems Program aimed at ensuring the quality and quantity of water supplied to meet user demands in State Small Water Systems (between 5 and 14 service connections) and Non-Public Water Systems (between 2-4 service connections). The Small Water Systems

Program assists small water systems by monitoring water quality, processing permits and inspections, and managing system maintenance.

Guidance and information are provided on the Small Water Systems Program website (https://kernpublichealth.com/water-wells-small-water-systems/) including information on the following:

- Water Supply Certification Application
- Permitting Process for State Small Water Systems and Non-Public Water Systems
- Intended Use Statements
- Laboratories and Sampling Services

2.7.7.2 *Inyo County*

The Inyo County Environmental Health Department administers a Small Water System Program to manage the permitting and compliance requirements of 105 active public and state small water systems throughout Inyo County, including:

Commented [dz5]: This may give the impression it is a relevant number. Suggest noting how many are actually within the IWVGB. (None?)

- 30 Community systems with between 25 and 199 residential service connections or 25 or more yearlong residents;
- 11 Nontransient Noncommunity systems such as schools, institutions, and places of employment;
- 47 Transient Noncommunity systems such as restaurants and campgrounds, and resorts; and
- 16 State Small systems that serve between 5 and 14 residential service connections but less than 25 yearlong residents.

Guidance and information on permit applications for new systems are provided on the Small Water Systems Program website (https://www.inyocounty.us/EnvironmentalHealth/drinking_water.html). The Inyo County Environmental Health Department maintains a database of well information collected through administration of the Small Water System Program.

2.7.7.3 *San Bernardino County*

The San Bernardino County Environmental Health Services administers a "Safe Drinking Water Program" and "Small Drinking Water Systems Program" which, in part, manages the permitting and compliance requirements for groundwater wells and 272 existing small drinking water systems.

Commented [dz6]: Same comment as for Inyo County.

The Safe Drinking Water Program is responsible for processing applications and issuing permits for the following:

- Well Permits
- Well Drillers Registration

Guidance and information are provided on the Safe Drinking Water Program website (http://wp.sbcounty.gov/dph/programs/ehs/safe-drinking-water/) including information on the following:

- Well Abandonment
- Private Domestic Well Owners
- Typical Well Requirements
- Well Sharing

The San Bernardino County Environmental Health Services maintains a database of well information collected through administration of the Safe Drinking Water Program and Small Drinking Water Systems Program.

2.7.7.4 *IWVGA Policies*

The IWVGA adopted a groundwater extraction fee on July 19, 2018 (Ordinance No. 02-18) under the authority granted by California Water Code Section 10730. In addition to authorizing the collection of fees, California Water Code Section 10725(a) authorizes the IWVGA to "perform any act necessary or proper to carry out the purposes of this part [SGMA]". In order to implement the groundwater extraction fee, the IWVGA required that all wells subject to the fee register their wells with the IWVGA. All groundwater pumpers in the IWVGB are subject to the groundwater extraction fee except for the following:

- Federal entities (U.S. Navy and United States Department of Interior, Bureau of Land Management); and
- Small pumpers defined as "de minimis extractors" or those who extract, for domestic purposes, two acre-feet or less per year (California Water Code Section 10721(e)).

As part of the preparation of this GSP, the IWVGA oversaw a basin-wide well registration process to formally document the existence and operation of wells subject to the groundwater extraction fee (i.e. all wells in the IWVGB except those owned by federal entities or by de minimis extractors). During the well registration process, well owners were required to provide the IWVGA's Water Resources Manager (WRM) with registration information including the following:

- Name and contact address of the well owner;
- Point of contact of the well operator;
- Well location;
- Name and address of the owner of land upon which the well is located;
- Description of the method used by the well owner and operator to measure groundwater extractions from the well;
- A statement describing whether the extracted groundwater is used for residential, commercial, industrial, or agricultural purposes, or a combination thereof; and
- Any other information that the IWVGA's General Manager deems necessary to achieve the legal purposes of the IWVGA.

The fee is determined and paid on a monthly basis by all producers with registered groundwater extraction facilities in the IWVGB. Unregistered groundwater extraction facilities that are subject to the groundwater extraction fee are prohibited from extracting groundwater from the basin until the facility is registered to the satisfaction of the WRM, which oversees the registration of groundwater extraction facilities and reviews producers' self-reported measurements of groundwater extractions.

2.8 DATA MANAGEMENT SYSTEM (DMS)

2.8.1 Purpose and Development

The IWVGA developed a web-based geo-Database Management System (DMS) consistent with the DWR

requirements for a GSP provided in Title 23 Section 352.6 of the California Code of Regulations: "Each agency shall develop and maintain a data management system that is capable of storing and reporting information relevant to the development or implementation of the Plan and monitoring of the basin." Development of the DMS occurred under two phases. Phase I work consisted of development of the DMS framework and structure, and Phase 2 work consisted of establishing monitoring protocols, database population, installation of equipment, and integration with the GSP to ensure its long-term success.

As part of on-going groundwater management activities, the DMS will be used to track sustainability goals and objectives for the IWVGB as part of the GSP. The DMS stores and presents specific supporting elements of the GSP, including monitoring, reporting, and management criteria. Other elements supporting the GSP are also stored in the DMS, including a water budget, hydrogeologic conceptual model, and supporting documentation. Data obtained through the current water resource monitoring and management programs helped populate the DMS, and that data was used to develop alternative groundwater basin management strategies (see Section 4).

The DMS provides the public with access to data that would be infeasible to deliver through more traditional printed report format. These types of data sets and information include the following:

- Searchable electronic library of reports regarding Indian Wells Valley water resources;
- Access to a copy of the full database of well information (including well logs if available) covering the basin, including information on all known well sites; and
- Data for the Groundwater Monitoring Plan.

2.8.2 User Access and Privileges

The DMS was developed with a tiered security structure limiting the data that can be accessed based on the user's login information. The DMS's security structure may also limit the functionality of the system based on the user's login. For example, the general public has a public user level, meaning that the general public is limited to either viewing GSP data or viewing/downloading GSP reports. The general public cannot manage, edit, or upload any data on the DMS. Furthermore, the general public does not have access to confidential documents.

The DMS has a pre-programmed default username and password so that any general user may easily access the DMS. To access the DMS, the general public may visit the website listed below and click the "Log In" button and subsequent "log on" button. Doing so will direct the user to the DMS homepage at the public user level using the default username and password.

https://www.iwvgsp.com

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Searles Valley Minerals

Searles Valley Minerals submits the following comments to the GSP Section 2 - Plan Area draft document, including to comments of others contained therein:

Section 2.5, subsection 2.2.4 Water Supply Source, page 2-5: SVM wants to insert the following language:
"Searles Valley Minerals operates production wells in Indian Wells Valley (IWV) that supply the water for its minerals recovery operation and production processes as well as the potable water needs of the CA PUC-regulated SDWC that supplies the potable water for the nearby communities of Argus, Pioneer Point and Westend. Production wells operated and maintained by the Indian Wells Valley Water District and domestic wells in the unincorporated areas of the IWV provide water to over two-thirds of Searles Valley Minerals staff (made up of scientists, engineers, professionals and technicians) and their dependents who reside in Indian Wells Valley. These personnel are critical to supporting research, development and operations at Searles Valley Minerals Inc."

Section 2.5, subsection 2.5.4 Industrial Land Use, page 2-18: SVM agrees that their current wells are located on the western edge of the city of Ridgecrest. We suggest that the second sentence should state "Since 1930, Searles Valley Minerals Inc. (SVM) has pumped groundwater from their wells originally located in the eastern part of Ridgecrest (and currently located both inside the city limits and outside the city limits on the western edge of Ridgecrest) to Searles Valley to support both its industrial operations and the domestic needs of the unincorporated communities of Trona, Westend, Argus, and Pioneer Point."

SVM does not agree with the comment made by commenter [KJDCNSA] about historic pumping referencing Cole, 1984. According to county records, the transport of water from the Indian Wells Valley to Searles Valley started in 1930 with a pipeline from a well near the San Bernardino County line, to Westend. An additional later pipeline was constructed and completed in 1942 to transport water from a different well to facilities in Trona.

Section 2, Subsection 2.7.3 Conservation Programs, pages 2-23 and 2-24: Commenter [KJDCNSA] references Navy water use and then expands the discussion to case law references dating to 1908 and the earlier Supremacy Clause of the U.S. Constitution. While this material is certainly interesting, the materials inserted here are not germane to a discussion of "conservation programs" per se and should be inserted elsewhere in the GSP. The inserted sentence: "Although not subject to formal regulation under SGMA, NAWS China Lake is committed to being a good steward of water resources and to exploring partnerships that help to achieve groundwater sustainability, including projects that benefit both the Navy and the community." is in keeping with the intent of the Conservation Programs subsection.

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INDIAN WELLS VALLEY GROUNDWATER BASIN

GROUNDWATER SUSTAINABILITY PLAN

SECTION 2 – PLAN AREA

DRAFT

September 3, 2019

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SECTION 2: PLAN AREA

2.1 INTRODUCTION

This section provides background and discussion of 1) geographic area and jurisdictions; 2) management agencies; 3) land use; 4) existing monitoring and management programs; and 5) the data management system, as required in the GSP Emergency Regulations (§354.8).

2.2 GENERAL DESCRIPTION

2.2.1 Setting

The IWVGB is located in the northwestern part of the Mojave Desert in southern California, as shown on Figure 2-1, and underlies approximately 382,000 acres or approximately 600 square miles of land area in portions of the Counties of Kern, Inyo, and San Bernardino. The IWVGB is bordered on the west by the Sierra Nevada Mountain Range, on the north by the Coso Range, on the east by the Argus Range, and on the south by the El Paso Mountains. Surface water flow from the surrounding mountain ranges drains to China Lake, a large dry lake, or playa, located in the central north-east part of the basin. U.S. Route 395 and State Route 14 are the major vehicular arteries through the Indian Wells Valley. The IWVGB is in the vicinity of other Bulletin-118 groundwater basins including the Fremont Valley, Salt Wells Valley, Searles Valley, Coso Valley, Rose Valley, and Kern River Valley groundwater basins (see Figure 2-2).

The IWVGB is designated Basin Number 6-054 by DWR and is included in DWR Bulletin No. 118 entitled "California's Ground Water", dated September 1975. Bulletin 118 noted that recharge in the IWVGB averaged about 10,000 acre-feet per year (AFY) while extractions (as of 1968) were about 12,500 AFY, implying that overdraft conditions have existed for at least the past 50 years. DWR Bulletin 118 was updated in January 1980 and designated Bulletin 118-80. Table 8 of Bulletin 118-80 noted that there is evidence of groundwater overdraft in the IWVGB. Table 1 of Bulletin 118-16 (dated January 2016) indicates the IWVGB is subject to critical conditions of overdraft.

2.2.2 Jurisdictions

The Indian Wells Valley land overlying the IWVGB encompasses portions of the Counties of Kern, Inyo, and San Bernardino, with the majority (approximately 73%) being in Kern County as shown in Table 2-1. The City of Ridgecrest is the only incorporated community in the Indian Wells Valley and covers an area of approximately 20 square miles with a population of approximately 27,000 people. Unincorporated communities in the Indian Wells Valley include the communities of Inyokern in Kern County and Pearsonville in Inyo County, along with other smaller communities.

Table 2-1. IWVGB: Distribution of Overlying Land, by County

County Name	Overlying Land (acres)	Overlying Land (%)
Kern County	277,204	73%
Inyo County	66,519	17%
San Bernardino County	37,985	10%
Total	**381,708**	**100%**

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As shown in Tables 2-2 and 2-3, approximately 302,000 acres of land overlying the IWVGB are federal property managed by either the US Navy's Naval Air Weapons Station China Lake (NAWS China Lake) or the US Department of Interior, Bureau of Land Management (BLM). The non-federal lands overlying the IWVGB consist of the incorporated city of Ridgecrest and unincorporated lands in the counties of Kern, Inyo, and San Bernardino (see Section 2.4). A map showing general jurisdictions and boundaries is provided in Figure 2-3.

Table 2-2. IWVGB: Distribution of Federal and Non-Federal Overlying Lands, by Entity

Entity	Overlying Land (acres)	Overlying Land (%)
U.S. Department of the Interior (Bureau of Land Management)	140,184	37%

U.S. Navy (Naval Air Weapons Station, China Lake)	161,911	42%
Non-Federal Entities	79,613	21%
Total	**381,708**	**100%**

Table 2-3. IWVGB: Distribution of Federal and Non-Federal Overlying Lands, by County

Entity	Overlying Land (acres)				Overlying Land (%)			
	NAWS China Lake	BLM	Non-Federal	Subtotal	NAWS China Lake	BLM	Non-Federal	Subtotal
Kern County	71,971	129,032	76,201	277,204	26%	47%	27%	100%
Inyo County	57,413	6,448	2,658	66,519	86%	10%	4%	100%
San Bernardino County	32,527	4,704	754	37,985	86%	12%	2%	100%
Total	**161,911**	**140,184**	**79,613**	**381,708**	-	-	-	-

2.2.3 Classification

In accordance with SGMA, DWR is required to classify groundwater basins by priority for achieving long-term sustainable groundwater management. DWR has published the "Sustainable Groundwater Management Act, 2018 Basin Prioritization Process and Results" document, dated January 2019, which provides the process, components, and rationale to develop the prioritization of California groundwater basins. In this document, DWR identifies and prioritizes 517 groundwater basins and subbasins as either

"High", "Medium", "Low," or "Very Low". DWR considered the following eight components when prioritizing the groundwater basins:

1) The population overlying the basin or subbasin.
2) The rate of current and projected growth of the population overlying the basin or subbasin.
3) The number of public supply wells that draw from the basin or subbasin.
4) The total number of wells that draw from the basin or subbasin.
5) The irrigated acreage overlying the basin or subbasin.
6) The degree to which persons overlying the basin or subbasin rely on groundwater as their primary source of water.
7) Any documented impacts on the groundwater within the basin or subbasin, including overdraft, subsidence, saline intrusion, and other water quality degradation.
8) Any other information determined to be relevant by the department, including determined to be relevant by the department, *including adverse impacts on local habitat and local streamflows*.

Commented [CA1]: Are the italics in the original?

In addition to the IWVGB's designation as a basin subject to critical conditions of overdraft, the 2018 Basin Prioritization Report rates the IWVGB as a "High" Priority basin. Consequently, the IWVGA is required to submit this GSP by January 31, 2020 pursuant to SGMA.

2.2.4 Water Supply Source

In general, streams and other surface waters in the IWVGB are ephemeral due to low annual precipitation in the Indian Wells Valley, and basin recharge occurs as mountain block recharge. Consequently, although natural channels for surface water exist in the IWVGB (see Figure 2-4), surface water resources in the IWVGB are limited. Further discussion on surface water systems in the IWVGB is provided in Section 3.

The IWVGB serves as the sole supply of potable water for the Indian Wells Valley. Residents of the Indian Wells Valley are served groundwater through private domestic wells, small cooperative groups sharing wells, small mutual water companies, the Inyokern Community Services District, and the Indian Wells Valley Water District. The Navy produces and distributes groundwater for use on the NAWS China Lake. Searles Valley Minerals Inc. produces groundwater from the IWVGB for use in its ~~mineral~~

~~mining~~minerals recovery and processing operations in the Searles Valley (located east of the IWVGB) and for potable use in the small communities of Trona, Westend, Argus, and Pioneer Point in the Searles Valley. In addition, a number of farms located in the Indian Wells Valley rely on the IWVGB's water supplies for their agricultural operations, including Meadowbrook Dairy, Mojave Pistachios, Simmons Ranch, Quist Farms, and other smaller farms. The crops grown in the Indian Wells Valley are primarily alfalfa and pistachios.

The Kern County Public Health Services Department has provided the IWVGA with spatial data on wells located in the Kern County portion of the IWVGB. The data included well information such as approximate well location, point of contact, driller, and permit number. As of July 2018, the data provided such information (where available) for a total of 546 wells located in the Kern County portion of the IWVGB. The IWVGA has incorporated this spatial data into the development of this GSP. As shown on Figure 2-5, there are 932 estimated groundwater production wells located in the IWVGB with an average well density of approximately 1.6 wells per square mile. A summary of groundwater production wells by type of use is provided in Table 2-4.

Table 2-4. Summary of Groundwater Production Wells in the IWVGB

Well Use	Number of Wells
Domestic/Private	832
Dust Control	1
Industrial	5
Landscape Irrigation	5
Large Agriculture	18
Municipal	51
Small Agriculture	20
Total	**932**

2.3 LOCAL WATER AGENCIES

2.3.1 Background

The local water agencies within the IWVGB are shown on Figure 2-6 and are briefly summarized below. Additional information on the local water agencies and total current groundwater pumping is provided in Section 3.3.4.1.

2.3.2 Indian Wells Valley Water District

The Indian Wells Valley Water District (Water District) was formed in 1955 as the Ridgecrest County Water District by consolidating several smaller water companies serving the Ridgecrest area with domestic water. On January 19, 1970, the Water District's Board of Directors voted to change the name from the Ridgecrest County Water District to the Indian Wells Valley County Water District, reflecting its service area which covers areas beyond the City of Ridgecrest. In 1980, the Water District's Board of Directors formally dropped the word "County" from the name of the Water District. Since that date, the Water District has been known as the "Indian Wells Valley Water District".

The Water District serves approximately 30,000 customers through over 12,000 connections and encompasses an area of approximately 37.7 square miles within the eastern portion of the IWVGB. The Water District operates facilities (groundwater production wells, treatment systems, booster stations, storage tanks, and distribution pipelines) to provide potable groundwater from the IWVGB to its customers. Accordingly, the protection, conservation, and replenishment of groundwater supplies is of critical importance to the Water District.

2.3.3 Inyokern Community Services District

The Inyokern Community Services District (Inyokern CSD), established in 1983, provides water, wastewater, and street lighting services to the community of Inyokern, located approximately 7 miles west of Ridgecrest. The Inyokern CSD operates service facilities including approximately 265 water service connections, 4 groundwater production wells, distribution pipelines, and a wastewater treatment plant. The Inyokern CSD serves a primarily residential population of approximately 1,000 and an estimated 420 residential households (Alpert et al., 2014).

2.3.4 Antelope Valley – East Kern Water Agency

The Antelope Valley – East Kern Water Agency (AVEK) is a wholesale water agency serving nearly 2,400 square miles in northern Los Angeles and eastern Kern Counties, as well as a small portion of Ventura County. AVEK produces groundwater from the Antelope Valley groundwater basin and also obtains imported water from Northern California through a long-term contract with the State Water Project (SWP). As shown on Figure 2-6, the AVEK service area extends into the largely undeveloped land in the southernmost portion of the IWVGB, but no AVEK water infrastructure or water supply services exist in that portion of the IWVGB. The AVEK water transmission lines closest to the IWVGB are located in California City, located approximately 15 miles south of the IWVGB boundaries and 50 miles south of Ridgecrest.

2.3.5 Kern County Water Agency

The Kern County Water Agency (KCWA) is a public agency providing wholesale water services to its 13 member units along with water resources management and monitoring services throughout Kern County. As shown on Figure 2-6, the KCWA service area encompasses all portions of the IWVGB within Kern County, except for that portion of the IWVGB in the AVEK service area. KCWA obtains imported water from Northern California through a long-term contract with the SWP. At this time, no water agencies in the IWVGB serve as member units to KCWA, and no KCWA water infrastructure exists within the IWVGB boundaries.

Additional information on KCWA's water resources monitoring efforts in the IWVGB is provided in Section 2.6.2.

2.3.6 Mojave Water Agency

The Mojave Water Agency (MWA) is a wholesale water agency serving 4,900 square miles of the High Desert in San Bernardino County. MWA produces groundwater from the Mojave Basin Area, a series of Bulletin 118 groundwater basins and subbasins located along the Mojave River. MWA also obtains imported water from Northern California through a long-term contract with the SWP. As shown on Figure 2-6, the MWA service area extends into the easternmost portion of the IWVGB, but no MWA water infrastructure or water supply services exist in that portion of the IWVGB. The MWA water

transmission lines closest to the IWVGB are located in Barstow, located approximately 60 miles southeast of the IWVGB boundaries and Ridgecrest.

2.4 REGIONAL WATER MANAGEMENT AGENCIES

2.4.1 Background

The IWVGA is the exclusive Groundwater Sustainability Agency for the IWVGB, Bulletin 118 Basin No. 6-054. There are several other existing regional entities with water supply, management, planning, and/or regulatory authority whose boundaries encompass all or portions of IWVGB. These entities include the Kern County Water Agency (KCWA), the Lahontan Regional Water Quality Control Board (LRWQCB), the Inyo-Mono Integrated Regional Water Management Program (Inyo-Mono IRWMP), and the Indian Wells Valley Cooperative Groundwater Management Group (Cooperative Group). The following is a brief overview of these entities and their role in water supply management within the IWVGB.

2.4.2 Kern County Water Agency

The Kern County Water Agency (KCWA) was created in 1961 by a special act of the California State Legislature and is the contracting entity in Kern County for the SWP. The KCWA participates in various water management activities including water quality control, flood control, and groundwater banking to preserve and enhance Kern County's water supply.

The KCWA is the second largest participant in the SWP, a water storage and delivery system for water supplies from Northern California. The KCWA has contracts with 13 local water districts, referred to by KCWA as Member Units for SWP water. Since 1968, about 33 million acre-feet of SWP water has been delivered to Kern County using SWP facilities. The KCWA does not have a contract with a local water agency in the IWVGB; therefore, the KCWA does not provide SWP water to the IWVGB.

Due to low rainfall in a semi-arid region, surface water supplies in Kern County must be augmented by groundwater supplies. The KCWA works to improve groundwater levels and to monitor groundwater quality throughout Kern County, especially in the areas surrounding groundwater banking projects.

The KCWA collects, interprets, and distributes groundwater data for the IWVGB. Since 1989, the KCWA has measured depth to groundwater in the IWVGB biannually during October (peak historical groundwater demand) and March (lowest historical groundwater demand). KCWA analyzes the resulting measurements to generate maps of groundwater elevation and depth to groundwater throughout the IWVGB. The KCWA is also a signatory to the Indian Wells Valley Cooperative Groundwater Management Group.

2.4.3 Lahontan Regional Water Quality Control Board

The Lahontan Regional Water Quality Control Board (LRWQCB) is a seven-member decision-making body appointed by the Governor of California for the purpose of protecting the water quality and ensuring the proper allocation and efficient use of water resources in the Lahontan Region. The Lahontan Region is divided into the North and South Lahontan Basins and includes over 700 lakes, 3,170 miles of streams, and 1,581 square miles of groundwater basins. The IWVGB is located within the South Lahontan Basin, which includes three major surface water systems (Mono Lake, Owens River, and the Mojave River watersheds) and multiple separated groundwater basins. A map of the LRWQCB boundaries is provided in Figure 2-7.

The LRWQCB's general duties include approving Water Quality Control Plans and Salt and Nutrient Management Plans; setting regional water quality standards; issuing waste discharge requirements; determining compliance with those standards and requirements; and taking appropriate enforcement actions. The LRWQCB has established the "Water Quality Control Plan for the Lahontan Region, North and South Basins" (Basin Plan) as the regulatory document that sets forth water quality standards and control measures for surface water and groundwater in the Lahontan Region (including the IWVGB). The LRWQCB has also approved the IWVGB Salt and Nutrient Management Plan in 2018 (see Section 2.6.4 for additional information).

2.4.4 Inyo-Mono Integrated Regional Water Management Program

The Inyo-Mono Integrated Regional Water Management Program (Inyo-Mono IRWMP) is a regional water resource planning organization which formed in 2008 as part of the statewide Integrated Regional Water Management collaborative effort. Over 30 organizations are members of the Inyo-Mono IRWMP, including the County of Kern, the County of Inyo, the Inyokern CSD, the Indian Wells Valley Water

District, the U.S. Bureau of Land Management, and the Cooperative Group. The Inyo-Mono IRWMP has obtained more than $2.5 million through DWR grants made available through Proposition 84 funding to assist essential water management projects and research efforts for Inyo, Mono, and Kern Counties, and includes the IWVGB. A map of the area included in the Inyo-Mono IRWMP is included in Figure 2-8.

The "Inyo-Mono Integrated Regional Water Management Plan" dated October 2014 states:

> "The purpose of the Inyo-Mono IRWM Program is to foster coordination, collaboration, and communication among water-related stakeholders in the region for the purpose of developing water management strategies and projects that will benefit multiple entities and enhance water supply, water quality, and watershed health."

2.4.5 Indian Wells Valley Cooperative Groundwater Management Group

Commented [CA2]: Does the Coop group still operate under the MOU setup at this time? It has not been active or had a meeting for over a year and members of this old cooperative group have removed themselves as they are a part of the GA Board and no longer active with the group. It may be listed as an old group that provided guidelines and information used in the establishment of the GSP for the GA Board.

The Indian Wells Valley Cooperative Groundwater Management Group (Cooperative Group) was created in 1995 as a public water data-sharing group to consolidate and coordinate water management efforts in the Indian Wells Valley. The Cooperative Group collected and shared information regarding groundwater resources and uses of groundwater in the IWVGB. Members of the Cooperative Group include the NAWS China Lake, Searles Valley Minerals, Indian Wells Valley Water District, Bureau of Land Management, City of Ridgecrest, KCWA, Kern County, Inyokern Community Services District, East Kern County Resource Conservation District, and Inyokern Airport District. These members provided materials and services as in-kind donations to support the Cooperative Group's goals. In addition to in-kind services, the Cooperative Group received state funding from DWR for groundwater basin studies.

One of the founding purposes of the Cooperative Group is the exchange of information and management of data. The shared information supported development and implementation of improved management practices among the members and provided valuable information to the public about the state of the IWVGB's water supplies.

The Cooperative Group developed a "Cooperative Groundwater Management Plan for the Indian Wells Valley" (CGMP) dated March 2006 that established planning objectives to address conditions of overdraft and the resulting consequences for stakeholders in the Indian Wells Valley. The CGMP was not intended to alter or affect any existing water rights, but rather served as a set of guidelines to encourage

participation in water management efforts among the Cooperative Group members. The water management efforts listed in the CGMP include:

- Working towards and encouraging limitation of additional large scale pumping in areas that appear to be adversely impacted;
- Distributing new groundwater extractions within the Indian Wells Valley in a manner that will minimize adverse effects to existing groundwater conditions (levels and quality), and maximize the long-term supply within the Indian Wells Valley;
- Aggressively pursuing the development and implementation of water conservation policy and education programs;
- Encouraging the use of treated water, reclaimed water, recycled, gray, and lower quality water where appropriate and economically feasible;
- Exploring the potential for other types of water management programs that are beneficial to the Indian Wells Valley;
- Continuing cooperative efforts to develop information and data which contributes to further defining and better understanding the groundwater resources in the Indian Wells Valley;
- Developing an interagency management framework to implement and enforce the objectives of the CGMP.

2.5 LAND USE

2.5.1 Background

California Government Code Section 65040.2 requires cities and counties to establish a General Plan as a guideline to determine growth patterns, land use, land development, etc. A municipal General Plan addresses the following elements for its city or county: land use, circulation, housing, conservation, open space, noise, safety, environmental justice, and other optional topics of local interest. The General Plan elements of greatest relevance to this GSP and the IWVGA's water supply issues are land use, housing, conservation, and open space.

Implementation of this GSP may impact the water supply and water demand assumptions of existing General Plans due to changes in the quantities and locations of groundwater extractions and acquisition

of alternative water supplies. Accordingly, it is important for the IWVGA to coordinate with the relevant land use planning agencies.

2.5.2 Summary of General Plans and Other Land Use Plans

2.5.2.1 *Kern County*

The majority of land overlying the IWVGB is within Kern County. The Kern County General Plan, adopted September 22, 2009, is a policy document that, along with its amendments, guides the development and/or preservation of the county's natural resources not directly managed by the federal government. The Kern County General Plan was prepared by the Kern County Planning and Community Development Department.

Page viii of the Introduction to the Kern County General Plan states:

> "This planning document recognizes that the relationship between water supply and land use planning is important to promoting future growth and a strong economy for Kern County's future. Recent State laws require local governments to ensure that development approvals occur with substantive, realistic assessments of the availability of a reliable water supply. The new laws require the verification of sufficient water supplies as a condition for approving certain developments and compel urban water suppliers to provide more information on the reliability of groundwater for a long-term time frame. Long-term water supply planning is important to ensuring that rural and urban economic growth can be accommodated into the future."

The Kern County General Plan acknowledges that water supply is a critical issue for Kern County's residents and economy. For this reason, the Kern County General Plan requires that General Plan amendments subject to environmental review and not otherwise subject to California Water Code Section 10910 demonstrate through a water supply assessment that a long-term water supply for a 20-year timeframe is available. Additionally, all development proposals are required to be reviewed by County staff to ensure that adequate water supplies are available to accommodate projected growth. To sustain long-term economic stability in Kern County, Chapters 1.9 and 1.10.6 of the Kern County General Plan encourage effective groundwater resource management through the following actions:

- Promoting groundwater recharge activities in various zone districts;
- Supporting the development of Urban Water Management Plans and promoting Department of Water Resources grant funding for all water providers;
- Supporting the development of groundwater management plans;
- Supporting the development of future sources of additional surface water and groundwater including conjunctive use, recycled water, conservation, additional storage of surface water and groundwater, and desalination;
- Requiring water-conserving design and equipment in new construction;
- Encouraging water-conserving landscaping and irrigation methods;
- Encouraging the retrofitting of existing development with water-conserving devices.

A total of 277,204 acres of land overlying the IWVGB is located within Kern County. 201,003 acres (73%) of the overlying land within Kern County is federal land managed by the Bureau of Land Management (BLM) (129,0032 acres, or 47%), or controlled by the NAWS China Lake (71,971 acres, or 26%). Most of the BLM-managed land in the IWVGB is open space managed for natural and economic resources, including mineral resources and rights-of-way for powerlines and pipelines (Todd Engineers, 2014). The land controlled by the NAWS China Lake is used for weapons research, development, acquisition, testing, and evaluation through the U.S. Navy.

Near the westerly and southeasterly City of Ridgecrest boundaries, the permitted zoning consists of residential zoning generally with a minimum lot size at 2.5 acres per dwelling unit, light industrial zoning, open space zoning, etc. The area between the City of Ridgecrest boundaries and the community of Inyokern contains primarily residential zoning districts with varying densities, while the areas northwest of Inyokern are residential and resource (primarily agriculture) zoning districts.

Zoning in the southwest portion of the IWVGB, commonly referred to as the El Paso area, consists primarily of open space, recreation (forestry), limited agriculture, and mobile homes. Lands in the El Paso area are largely uninhabited and are managed by BLM. As a result, significant groundwater extraction does not occur in this area due to the lack of water demands (see Section 3).

Commented [CA3]: Is it forestry or is it off road vehicle use? If this is a particular category, remove the parentheses around forestry.

A breakdown of the Kern County lands overlying the IWVGB and their associated land use designations is provided in Table 2-5 and is shown in Figure 2-9.

Table 2-5. Zoning Districts in the Kern County lands overlying the IWVGB

Zoning District	Area (acres)	Area (%)
Other (China Lake)	28,236	11.2%
Exclusive Agriculture	452	0.2%
General Commercial	167	0.1%
Highway Commercial	287	0.1%
Light Industrial	1,837	0.7%
Limited Agriculture	7,442	3.0%
Limited Agriculture/Mobilehome	64,954	25.8%
Low-density Residential	136	< 0.1%
Medium-density Residential	14	< 0.1%
Medium Industrial	1,020	0.4%
Military	533	0.2%
Mobilehome Park	23	< 0.1%
Open Space	105,340	41.8%
Recreation-Forestry	11,848	4.7%
Residential	29,873	11.9%
Total	**252,162**[1]	**100%**

2.5.2.2 *Inyo County*

The Inyo County General Plan was approved by the Inyo County Board of Supervisors in 2001. In accordance with the 2001 General Plan, the Inyo County Planning Department is currently updating its Zoning Code and has subsequently released draft General Plan updates associated with the proposed updates to the Zoning Code. The Inyo County General Plan Update dated May 2013 was used to complete this GSP, which will be appropriately updated in accordance with all updates to the Inyo County General Plan.

[1] Kern County zoning data was obtained from the County of Kern Geodat Open Data Portal. Updated as of May 9, 2017. Note that not all Kern County lands overlying the IWVGB were given zoning district categories in the dataset.

Section 8.5 of the 2001 Inyo County General Plan provides planning goals related to water resources including:

- Providing an adequate and high quality water supply to all users within the County;
- Protecting and preserving water resources for the maintenance, enhancement, and restoration of environmental resources; and
- Protecting and restoring environmental resources from the effects of export and withdrawal of water resources.

The vast majority of land in Inyo County is owned by either the federal government (~92%), the City of Los Angeles (~4%), and the state of California (~2.5%) (Inyo County Planning Department, 2013). Approximately 96% of the Inyo County land overlying the IWVGB is either owned by the US Navy as part of NAWS China Lake, or managed by the BLM (see Table 2-3 above). Approximately 98% of the Inyo County land overlying the IWVGB is zoned as open space (see Table 2-6 below). The community of Pearsonville, occupying approximately four-square miles, is zoned for various residential densities as well as some commercial and industrial zoning to compliment the community's highway-oriented businesses.

A breakdown of the Inyo County lands overlying the IWVGB and their associated zoning is provided in Table 2-6 and shown in Figure 2-10.

Table 2-6. Zoning Districts in the Inyo County lands overlying the IWVGB

Zoning District	Area (acres)	Area (%)
Commercial Recreation	5	< 0.1%
General Industrial and Extractive	167	0.3%
Heavy Commercial	15	< 0.1%
Highway Services and Tourist Commercial	25	< 0.1%
Light Industrial	29	< 0.1%
Multi-Family Residential	23	< 0.1%
Open Space	65,038	98.2%
Public	65	0.1%

Rural Residential		848	1.3%
	Total	**66,215**[2]	**100%**

2.5.2.3 *San Bernardino County*

The General Plan for San Bernardino County was last updated in 2007 and is currently in the process of being revised. The land just adjacent to the City of Ridgecrest's eastern boundary is designated as Rural Living, allowing for a maximum of one dwelling unit per 2.5 acre lot. This area contains less than one square mile of residential lots. Areas with a Resource/Land Management designations span over several miles to the east of China Lake and north of the Inyo County line. A majority of the land overlying the IWVGB within San Bernardino County is within the NAWS China Lake boundaries, as shown above in Table 2-3.

A breakdown of the San Bernardino County lands overlying the IWVGB and their associated zoning is provided in Table 2-7 and shown in Figure 2-11.

Table 2-7. Zoning Districts in the San Bernardino County lands overlying the IWVGB

Zoning District	Area (acres)	Area (%)
Resource Conservation	37,411	98.5%
Rural Living	574	1.5%
Total	**37,985**[3]	**100%**

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[2] Inyo County zoning data was obtained from the County of Inyo Public Geographic Information Systems Page. Updated as of January 31, 2019. Note that not all Inyo County lands overlying the IWVGB were given zoning district categories in the dataset.

[3] San Bernardino County zoning data was obtained from the ArcGIS Hub – Open Data, in conjunction with the San Bernardino County Land Services Department. Updated as of May 3, 2018.

2.5.2.4 *City of Ridgecrest*

The City of Ridgecrest has direct land use jurisdiction within its city limits with the exception of the small portion of the city within NAWS China Lake. The community within and surrounding the City of Ridgecrest is strongly linked to supporting NAWS China Lake by providing housing and services for personnel and contractors working at NAWS China Lake; accordingly, the City of Ridgecrest General Plan emphasizes both achieving growth and sustainably supporting the military installation.

2.5.2.5 *Federal Lands*

Commented [CA4]: BLM land use also recognizes a mandate for mixed use on federal lands, including mining which generates royalty revenues. Do we want to mention this?

The US Department of Interior Bureau of Land Management prepares Resource Management Plans (RMPs) that serve as land management blueprints. The majority of southern California, including the Indian Wells Valley, is within the California Desert Conservation Area (CDCA). The CDCA comprehensive land-use management plan was completed in 1980 and revised in 1999. Additionally, the Indian Wells Valley is within the BLM's West Mojave Plan area which established a Habitat Conservation Plan for sensitive plants and species in the region.

The US Department of Interior has assigned land management responsibility of NAWS China Lake to the Navy. Consequently, the Navy has developed a Comprehensive Land Use Management Plan (CLUMP) for land use management and environmental resources management for NAWS China Lake.

2.5.3 Agricultural Land Use

There are approximately 3,086 acres of actively farmed land overlying the IWVGB[4]. Typically, each farm has its own well system and water delivery system for its respective crops. The primary crops grown in the Indian Wells Valley are pistachios (2,027 acres) and alfalfa (985 acres), with other miscellaneous crops (74 acres) such as miscellaneous grain and hay constituting a minority of production. A map of actively farmed land overlying the IWVGB is provided in Figure 2-12.

[4] Actively farmed land in the IWVGB was determined using the California Department of Water Resources' Crop Mapping 2014 GIS dataset. Updated as of March 13, 2018.

2.5.4 Industrial Land Use

There are no large-scale industrial land uses in the Indian Wells Valley. Since the 1920's, Searles Valley Minerals Inc. ~~Corporation~~ (SVM) has exported groundwater from wells in the eastern part of Ridgecrest to Searles Valley (located outside of the Indian Wells Valley) to support both its industrial operations and the domestic needs of the unincorporated communities of Trona, Westend, Argus, and Pioneer Point. Section V.C of the San Bernardino County General Plan maintains a countywide goal of promoting conservation of water and maximizing the use of existing water resources by promoting activities and measures that facilitate the reclamation and reuse of water and wastewater, including for industrial uses. Implementation of this GSP will impact the potable water demands of industries in San Bernardino County (i.e. Searles Valley Minerals Inc. ~~Corporation~~) that rely on the IWVGB for water supplies. This GSP will therefore impact the water supply assumptions for San Bernardino County industry set forth in the San Bernardino General Plan (see Section 4 for further details on impacts to industrial water demands).

2.6 EXISTING WATER RESOURCES MONITORING PROGRAMS

2.6.1 Background

Multiple entities have been measuring depth to groundwater in the IWVGB since the 1920's. Monitoring programs were first initiated in the IWVGB by the United States Geological Survey (USGS) and have been primarily conducted by KCWA since 1989 with the assistance of the Water District, the United States Bureau of Reclamation (USBR), and the NAWS China Lake. Additionally, many of these entities have constructed wells dedicated solely to monitoring groundwater levels in the IWVGB.

Prior to formation of the IWVGA, monitoring efforts in the IWVGB were often duplicated due to a lack of communication among interested parties. In 1995, the Cooperative Group was formed to coordinate monitoring and management efforts, share data, and avoid the redundancy of groundwater study efforts. As a public data-sharing group consisting of the major water producers, government agencies, and concerned citizens in the IWVGB, the Cooperative Group compiled numerous study efforts in the IWVGB including a basin-wide recharge study, the construction of weather and stream gages, and a monitoring program involving over 100 monitoring wells. The Cooperative Group published its compiled monitoring data, including historical reported pumping and basin studies, on its website:

http://iwvgroundwater.org/

The Cooperative Group was designated as the California Statewide Groundwater Elevation Monitoring (CASGEM) monitoring entity for the IWVGB per a DWR letter dated November 18, 2011. The status of CASGEM monitoring entity was transferred to the IWVGA in January 2018 as part of the IWVGA's initial SGMA compliance efforts.

The following sections summarize the existing water resources monitoring programs that are on-going within the IWVGB. These programs are conducted by a variety of agencies and are now being incorporated into the SGMA compliance efforts overseen and managed by the IWVGA. Data obtained through the existing water resource monitoring programs helped populate the IWVGA's Data Management System (see Section 2.8), and the data was used to develop alternative groundwater basin management strategies (see Section 4).

2.6.2 KCWA Groundwater Monitoring Programs

The KCWA measures depth to groundwater in over 200 monitoring wells in the IWVGB consisting of a network of private and public water production wells and monitoring wells. Field measurements of water levels are conducted semiannually in October and March at periods of historical groundwater demand peaks and minimums. The water level data is collected, analyzed, and plotted onto contour maps to depict groundwater depths, groundwater elevations, and changes in groundwater elevation over time. The contour maps portray how the IWVGB spatially reacts to groundwater extractions across the Indian Wells Valley. The contour maps and hydrographs are updated annually by KCWA and can be viewed at the IWVGA's Data Management System (see Section 2.8), which can be accessed at www.iwvgsp.com.

KCWA also collects water quality samples and monitoring wells for analysis. The water quality results can then be plotted on contour maps and a variety of other types of diagrams and graphs.

The data collected from monitoring groundwater levels and water quality are archived in the IWVGA's Data Management System, which contains groundwater level data dating back to 1946 and water quality data dating back to 1952.

The locations of the KCWA monitoring wells and other monitoring wells in the IWVGB are provided in Figure 2-13.

2.6.3 CASGEM

A subset of the data from approximately 40 of the over 200 wells monitored throughout the IWVGB are submitted to DWR as part of their CASGEM program. CASGEM requires each individual groundwater basin to develop a representative groundwater level monitoring program to assist with tracking change in groundwater levels, and consequently changes in the volume of water stored in the groundwater basin. The CASGEM program aides in identifying the seasonal and long-term trends in the IWVGB. The locations of the IWVGB CASGEM wells are provided in Figure 2-13. A selection of these CASGEM wells served as representative monitoring sites while evaluating impacts and management actions and subsequently served as the locations where sustainability criteria were set (see Section 5).

2.7 EXISTING WATER RESOURCES MANAGEMENT PROGRAMS

2.7.1 Background

It has been well documented that the IWVGB has been in overdraft since the 1960s and that current basin outflows exceed basin inflows by approximately four times (see Section 3.3.4.4). Water resources management programs in the IWVGB have been implemented by a variety of entities to address conditions of basin overdraft. In many instances, these water resources management programs have resulted in curtailment of historical pumping to reduce the impacts of over-pumping.

The water resources management programs that are **not** currently practiced in the IWVGB include replenishment of groundwater extractions; conjunctive use and underground storage; and diversions to storage. The following section summarizes the existing and on-going water resources management programs administered in the IWVGB. Proposed water resources projects and management actions that will be primarily managed by the IWVGA are discussed in Section 4.

2.7.2 Salt and Nutrient Management Plan

A Salt and Nutrient Management Plan (SNMP) for the IWVGB was finalized in March 2018 and accepted by the LRWQCB. The SNMP (RMC, et al., 2018) was prepared as a high-level planning document to inform the monitoring and implementation elements being developed for this GSP. The SNMP provides an overview of basin characteristics, groundwater conditions, historical groundwater production, and existing groundwater quality. In addition, the SNMP:

- Identifies sources of additions/withdrawals of both salts (such as Total Dissolved Solids) and nutrients (such as n~~N~~itrate);
- Analyzes current assimilative capacity for salts and nutrients;
- Projects trends in water quality and loading;
- Analyzes water quality conditions against the water quality objectives described in the Basin Plan;
- Discusses existing and potential water resources practices that do and may impact basin water quality; and
- Provides a proposed preliminary water quality monitoring program.

2.7.3 Conservation Programs

2.7.3.1 *Water District Demand Management Measures*

The Water District has implemented water conservation programs in an attempt to reduce annual groundwater extractions. The Water District has achieved a 30% reduction in total water demand as a result of implementing a four-tier water rate structure along with various water conservation Ordinances issued by the Water District and the City of Ridgecrest. The Water District Ordinances include:

- Water District Ordinances 90 and 91 (adopted in 2009; rescinded in 2015)
    - Landscaping restrictions for new single-family/multi-family residential, commercial, and institutional buildings
- Water District Ordinances 98 and 99 (adopted in 2015)
    - Implementation of an Approved Plant List for landscaping

  - Mandated use of low volume irrigation systems, high efficiency sprinkler heads, pressure regulators, and master shut-off valves
    - Subsurface drip irrigation required on areas less than 10 feet wide
- Water District Ordinance 100 (adopted in 2016; rescinded in 2017)
  - No water user shall waste water; prohibits washing down hard or paved surfaces for strictly aesthetic purposes
  - Prohibit vehicle washing except by use of a hand-held bucket or hand-held nose equipped with a shut-off nozzle or device
  - Irrigation only between 8:00 AM – 8:00 PM; irrigation limited to 3 days per week based on addresses (1 day per week from November through February)
  - Restaurants shall only serve water on request
  - Turf or ornamental landscapes shall not be irrigated within 48 hours after measureable precipitation
  - Hotel/motel operators shall provide guests the option of choosing not to have towels and linens laundered daily
  - Prohibits recreational fountains or decorative water features
- Water District Ordinance 101 (adopted in 2017)
  - Implementation of the 2017 Water Shortage Contingency Plan
    - Actions for two stages of local water shortages and a drought state of emergency
- Water District Ordinance 103 (adopted in 2017)
  - Irrigation limited to 3 days per week during all months

Commented [CA5]: Is the irrigation only between 8:00 PM and 8:00 AM?

The Water District has hosted community outreach events (e.g. school education programs) to raise awareness of water conservation practices such as the use of appropriate desert landscaping. At these and other local events, the Water District has distributed water conservation fixtures including 3,746 low-flow showerheads; 5,256 low-flow hose nozzles; 880 shower timers; 2,480 faucet aerators; 3,514 water tumblers; and 2,339 moisture meters. The Water District's "Cash for Grass" Rebate Incentive Program offers rebates to property owners who elect to replace lawns with eligible low water-use landscaping. To supplement its ongoing conservation practices, the Water District manages a digital customer engagement portal that allows the Water District and its customers to track and analyze customer water use, conservation practices, ordinance violations, leakage incidents, etc.

2.7.3.2 *City of Ridgecrest Demand Management Measures*

Similar to the Water District, the City of Ridgecrest has adopted water conservation Ordinances to reduce demands. The Ordinances include:

- City of Ridgecrest Ordinance 09-05 (adopted in 2009)
  - Similar irrigation restrictions to Water District Ordinance 100
- City of Ridgecrest Ordinance 16-01 (adopted in 2016; supersedes Ordinance 09-05)
  - Water-efficient landscaping and irrigation scheduling
  - Promoted use of recycled water and greywater
  - Promoted stormwater management practices

2.7.3.3 *Navy Water Use*

The Cooperative Group's recorded production data indicates that the Navy has been a major pumper in the IWVGB historically (e.g. as much as 5,000 AFY in 1975). The Navy has since achieved a 53% reduction in groundwater pumping due to a combination of instituted conservation measures and a shift from on-base housing of Navy personnel to off-base housing within Ridgecrest.

As a member of the Cooperative Group, the NAWS China Lake has committed to explore the potential for water resources management programs that benefit the IWVGB, including water conservation efforts. In its "Water Conservation Public Advisory" dated June 2008, the Cooperative Group (including the Navy) developed strategies to reduce unnecessary and/or excessive water uses to support the sustainable management of the IWVGB.

The NAWS China Lake's Integrated Natural Resources Management Plan (INRMP) dated June 2014 describes the Navy's implementation of natural resources programs at NAWS China Lake, including water resources management. In its 2014 INRMP, the Navy emphasizes a water conservation program focused on xeriscaping, a landscaping method based on the use of native or drought-resistant plants, in addition to efficient irrigation practices that require less water. Principles of xeriscaping include using gravel or plastic/rubber-based products to preclude weed growth and enhance water retention; using ground cover to prevent blowing dust and soil erosion; watering using automatically controlled cycles during low evaporation periods; and using drip irrigation whenever possible. The 2014 INRMP

discourages the addition of new lawn areas except where functionally essential (i.e. in areas used for ceremonies, family housing, recreation fields, and children's playgrounds).

At the IWVGA Pumper Group Allocation meeting on October 1, 2018, the Navy indicated its short-term future water needs to be approximately 2,041 AFY, which includes a 25% increase in current water use. This estimation is **not** indicative of the Navy's federal reserve groundwater right, which has yet to be quantified and is not subject to the provisions of SGMA.

Commented [CA6]: This does not seem to be the right area to talk about the Navy's future water use estimates since it is in an area discussing conservation programs. This paragraph should be in a different section.

2.7.3.4 *Opportunities for Additional Conservation*

Opportunities for implementation of additional conservation measures are discussed in Section 4.

2.7.4 Efficient Water Management Practices

The Water District prepared its "2015 Urban Water Management Plan" (2015 UWMP), dated June 2016, which includes a discussion of efficient water management practices in Section 6.B.7 "Prohibitions, Penalties, and Consumption Reduction Methods". The following is a brief summary of these efficient water management practices.

2.7.4.1 *Mandatory Prohibitions on Wasting Water*

The Water District has adopted a Water Efficient Landscape Ordinance (Ordinance No. 93) and Ordinance No. 100 regarding emergency water conservation mandatory restrictions. The City of Ridgecrest adopted a Water Efficient Landscape Ordinance (Ordinance No. 16-01). These ordinances have common requirements, including but not limited to:

Commented [CA7]: This one does not appear in previous commentary. What does it say?

Commented [CA8]: This one was rescinded according to previous pg 2-22

- Prohibiting runoff from landscape irrigation;
- Prohibiting wash down of hard or paved surfaces;
- Prohibiting water leaks;
- Prohibiting use of a hose without a shut-off nozzle;
- Prohibiting landscape irrigation on the surface, except for hand watering or the use of a drip irrigation system, between the hours of 8:00 a.m. and 8:00 p.m. during the months of May,

June, July, August, September, and October, unless a special permit is issued to accommodate newly planted material;

- Requiring new plumbing fixtures to conform to requirements of law as to flow capacity.

2.7.4.2 *Water Efficient Landscaping*

The Water District has implemented numerous water-efficient landscape requirements, which include:

Commented [CA9]: Aren't most/all of these related to new construction? That should be stated as it does not cover most people in the IWV.

- Prohibiting turf in the front yard;
- Limiting plants in front yards to those provided in a Water District-approved list;
- Prohibiting front yard irrigation systems that are not low-volume;
- Requiring use of high-efficiency irrigation sprinkler heads;
- Prohibiting irrigation runoff.

2.7.4.3 *Excessive Use Penalties*

The Water District has adopted a tiered water rate structure which rewards customers that conserve water through lower water rates. Furthermore, customers that consistently waste water may be subject to having flow restrictions placed on their meters.

2.7.5 Recycled Water Use

California Water Code Section 13050(n) defines "recycled water" as water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur. There are currently two wastewater treatment facilities (WWTFs) within the IWVGB: The City of Ridgecrest WWTF[5], and the Inyokern CSD WWTF. IWVGB residents that do not contribute flow to either of these WWTFs use septic tanks to dispose of wastewater.

Prior to 1974, the City of Ridgecrest Sanitation District operated a small WWTF in the eastern portion of the City, near the eastern City limits. At that time, the Navy operated its own separate WWTF on the

[5] A Memorandum of Agreement dated April 1, 1993, between the Navy and the City states that the City owns and operates the WWTF, though there is a general lack of consensus among the IWVGB stakeholders regarding the ownership and operations of the WWTF. The term "City WWTF" is used in this GSP for the sole purpose of distinguishing between the two existing WWTFs in the IWVGB.

NAWS China Lake. To address capacity problems, the City abandoned its old WWTF and consolidated the two treatment facilities to treat combined flow from the City and from the NAWS at a common plant. The City has since operated the existing 3.6 million gallon per day (MGD) WWTF located on the NAWS base, approximately 3.5 miles northeast of the City center. Annual average day flows at the WWTF were approximately 2.44 MGD (2,739 AFY) in 2017. The City WWTF provides primary wastewater treatment through a series of headworks and sedimentation tanks. Secondary treatment occurs in a series of on-site facultative ponds with clay linings.

The City of Ridgecrest's WWTF is currently the only facility which generates a recycled water supply for direct beneficial or controlled use within the IWVGB. The City WWTF produces recycled water that is applied at a City site for alfalfa irrigation and at the NAWS China Lake for golf course irrigation. The remaining treated wastewater generated at the City WWTF is discharged to evaporation/percolation ponds at the City WWTF site.

Independent of this GSP, the City is currently planning to upgrade, expand, and potentially relocate the existing City WWTF. The City plans to abandon and demolish the existing City WWTF for construction of a new oxidation ditch secondary treatment plant with new evaporation/percolation ponds and new solids handling facilities (Provost & Pritchard, 2015). The City has evaluated constructing new recycled water facilities including tertiary treatment trains (filtration and disinfection) at the new WWTF, a recycled water storage tank, a recycled water pump station, and a purple pipe distribution system. The new recycled water facilities would provide up to 1.8 MGD (2,016 AFY) of recycled water for City use in landscape irrigation and/or groundwater recharge (Provost & Pritchard, 2015). The City is considering two (2) potential sites for the new WWTF: (1) the existing WWTF site, or (2) the old City WWTF site. The new WWTF location will depend on ongoing easement and land use negotiations between the City and the Navy.

The Inyokern CSD also operates a small WWTF with an approximate capacity of 0.035 MGD to treat wastewater from residents within its service area. The final effluent generated at the Inyokern WWTF is currently not of sufficient quality for any beneficial uses of recycled water and is instead disposed of through evaporation/percolation ponds located at the Inyokern WWTF site.

2.7.5.1 *Alfalfa Irrigation*

Approximately 220 AFY of recycled water (secondary-treated wastewater) from the City WWTF has been historically used to irrigate 30 acres of alfalfa located at the old City WWTF site. The alfalfa is commonly sold by the City for use in cattle feed. The July 2019 Searles Valley earthquakes caused disruptions to the City WWTF and prevented the City from irrigating its alfalfa for the 2019 growing season. The City plans to continue its alfalfa irrigation with recycled water until the new WWTF with recycled water facilities is constructed, at which point the City plans to instead apply recycled water (tertiary-treated wastewater) for landscape irrigation and/or groundwater recharge.

Commented [CA10]: Earthquakes were located in Salt Wells Valley area, not Searles Valley.

2.7.5.2 *NAWS China Lake Golf Course*

The Navy receives secondary-treated effluent from the City WWTF and provides additional treatment for beneficial use on a golf course. The Navy uses a chlorine contact basin to provide additional treatment of the effluent. A Negotiated Sewer Service Contract between the City and the Navy reserves up to 750 AFY of treated wastewater from the City WWTF for irrigation of the golf course located at the NAWS China Lake. However, it has been noted that the golf course only uses approximately 500 AFY of water (Provost & Pritchard 2015).

2.7.5.3 *Evaporation/Percolation Ponds*

The City WWTF site contains four (4) evaporation/percolation ponds which may receive secondary-treated effluent that is not supplied for alfalfa irrigation or golf course irrigation. Wastewater stored in these ponds evaporates or percolates into either the underlying shallow groundwater aquifer or the Mohave Tui Chub habitat located north of the City WWTF.

The Mohave Tui Chub are an endangered species of fish native to the Mohave River. Due to numerous alterations to its native habitat, the United States Fish and Wildlife Service and California Department of Fish and Wildlife relocated a population of the Tui Chub to the NAWS China Lake during the 1970s. The Tui Chub habitat at China Lake consists of two seeps, referred to as Lark Seep and G-1 Seep. The two seeps are connected through a series of man-made channels, which were originally constructed during the 1950s and 1960s to divert seeping groundwater away from nearby roads and facilities. The habitat inflows include seepage from the City WWTF ponds, irrigation percolation from the China Lake golf

course, and various contributions from the City of Ridgecrest area (e.g. irrigation percolation, wash-down, commercial water discharge, and transmission line leaks) (ERS 1991).

The Navy prepared a preliminary habitat management plan (HMP) for the Mohave Tui Chub (ERS, 1991) in response to a Biological Opinion issued by the U.S. Fish and Wildlife Service. The HMP proposed actions to protect and maintain the Mohave Tui Chub habitat, including construction of a water delivery system to discharge water to the existing seeps and channels in the habitat. No additional steps have been taken to implement any potential protection or maintenance plans for the Tui Chub habitat, although it has been proposed that an evaluation be conducted on potentially relocating the Tui Chub in the near future to potentially increase the amount of recycled water available in the IWVGB. Recycled water that would become available as a result of Tui Chub relocation may be used to either meet existing water demands to reduce groundwater extractions or serve as a source of groundwater recharge for the IWVGB.

SGMA requires that all beneficial uses and users, including Groundwater Dependent Ecosystems (GDEs), be considered in the development and implementation of GSPs. GDE identification must be included in the GSP to determine whether groundwater conditions are having potential effects on any and all beneficial uses and users within the basin. Additionally, GDE management must be incorporated into the sustainable management criteria established as part of the GSP. The location of the Mohave Tui Chub habitat coincides with GDEs identified in DWR's Natural Communities Commonly Associated with Groundwater (NCCAG) dataset. Further definition of and discussion on GDEs in the IWVGB is provided in Section 3.4.5 and in Section 4.

2.7.6 Groundwater Contamination Cleanup

The United States Department of Defense initiated the Installation Restoration Program (IRP) in 1980 to identify, investigate, and remediate or control the release of hazardous substances that resulted from past waste disposal operations and hazardous material spills at military facilities. Per the Navy's 2014 INRMP, NAWS China Lake is assessing and remediating areas of past contamination on its ranges through the IRP, including sites of possible and confirmed groundwater contamination. A list of these sites along with their cause of contamination and remediation status is provided in Appendix ---.

Sites of possible and confirmed groundwater contamination are made publicly available on GeoTracker, the State Water Resources Control Board's (SWRCB's) data management system for sites that impact, or have the potential to impact, water quality in California. The data available on GeoTracker includes site characteristics (e.g. case number, site location, cleanup status, responsible parties, affected water resources) as well as site actions (e.g. project activities, compliance responses, milestone tracking, land use controls, risk to water quality assessments). GeoTracker also provides public records such as regulatory communication and decision documents for each site.

Figure 2-14 shows the sites of possible and confirmed groundwater contamination located in the IWVGB, including:

- Sites that require cleanup
    - Leaking Underground Storage Tank (LUST) sites
    - Department of Defense Sites
    - Cleanup Program Sites
- Permitted facilities
    - Operating Permitted Underground Storage Tanks (USTs)
    - Land Disposal Sites

2.7.7 Well Permitting Policies and Procedures

2.7.7.1 *Kern County*

Nearly all water supply wells in the IWVGB are located within the jurisdiction of Kern County. Well standards for both water supply and monitoring wells within Kern County are provided in Title 14, Chapter 14.08, Article III of the Kern County Municipal Code. Per Kern County Municipal Code Section 14.08.210, the standards for the construction, repair, reconstruction, or destruction of wells within Kern County are set forth in DWR Bulletin 74-81 "Water Well Standards, State of California" and all subsequent supplements and revisions. The construction, reconstruction, deepening, or destruction of any well requires filing a valid application for a permit with the Kern County Public Health Services Department (Kern County PHSD), and subsequent approval of the application. All abandoned wells within Kern County are to be destroyed within ninety (90) days of abandonment.

In July 2017, the Kern County Board of Supervisors approved an ordinance adding Sections 14.08.113 and 14.08.285 and amending Section 14.08.290 of Title 14, Chapter 14.08 of the Kern County Municipal Code. The ordinance requires that all new private domestic, public domestic, industrial, agricultural, and any reconstructed or upgraded wells be installed with water flow meters or equivalent devices/methods for water measurement.

The Kern County PHSD administers a "Water Wells Program" to manage the permitting and compliance requirements for groundwater wells (both monitoring wells and drinking water wells) in the Kern County portion of the IWVGB. The Water Wells Program ensures that the public receives water that is safe to drink and that the quantity of water supplied is adequate to meet the community's needs. The Water Wells Program is responsible for processing applications and issuing permits for the following:

- Monitoring Wells
- Drinking Water Wells
- Well Destruction
- Well Driller Registration
- Water Supply Certification

Guidance and information are provided on the Water Wells Program website (https://kernpublichealth.com/water-wells/) including information on the following:

- Agriculture Well Permit Guidelines
- Domestic Well Permit Guidelines
- Well Destruction Procedures
- Disinfection Procedures, Laboratories, and Sampling
- List of Approved Drillers and Sealing Material
- Water Well Site Location Requirements

The Kern County PHSD maintains a listing of well information collected through administration of the Water Wells Program.

The Kern County PHSD also administers a Small Water Systems Program aimed at ensuring the quality and quantity of water supplied to meet user demands in State Small Water Systems (between 5 and 14 service connections) and Non-Public Water Systems (between 2-4 service connections). The Small Water Systems Program assists small water systems by monitoring water quality, processing permits and inspections, and managing system maintenance.

Guidance and information are provided on the Small Water Systems Program website (https://kernpublichealth.com/water-wells-small-water-systems/) including information on the following:

- Water Supply Certification Application
- Permitting Process for State Small Water Systems and Non-Public Water Systems
- Intended Use Statements
- Laboratories and Sampling Services

2.7.7.2 *Inyo County*

The Inyo County Environmental Health Department administers a Small Water System Program to manage the permitting and compliance requirements of 105 active public and state small water systems throughout Inyo County, including:

- 30 Community systems with between 25 and 199 residential service connections or 25 or more yearlong residents;
- 11 Nontransient Noncommunity systems such as schools, institutions, and places of employment;
- 47 Transient Noncommunity systems such as restaurants and campgrounds, and resorts; and
- 16 State Small systems that serve between 5 and 14 residential service connections but less than 25 yearlong residents.

Guidance and information on permit applications for new systems are provided on the Small Water Systems Program website (https://www.inyocounty.us/EnvironmentalHealth/drinking_water.html). The Inyo County Environmental Health Department maintains a database of well information collected through administration of the Small Water System Program.

2.7.7.3 *San Bernardino County*

The San Bernardino County Environmental Health Services administers a "Safe Drinking Water Program" and "Small Drinking Water Systems Program" which, in part, manages the permitting and compliance requirements for groundwater wells and 272 existing small drinking water systems.

The Safe Drinking Water Program is responsible for processing applications and issuing permits for the following:

- Well Permits
- Well Drillers Registration

Guidance and information are provided on the Safe Drinking Water Program website (http://wp.sbcounty.gov/dph/programs/ehs/safe-drinking-water/) including information on the following:

- Well Abandonment
- Private Domestic Well Owners
- Typical Well Requirements
- Well Sharing

The San Bernardino County Environmental Health Services maintains a database of well information collected through administration of the Safe Drinking Water Program and Small Drinking Water Systems Program.

2.7.7.4 *IWVGA Policies*

The IWVGA adopted a groundwater extraction fee on July 19, 2018 (Ordinance No. 02-18) under the authority granted by California Water Code Section 10730. In addition to authorizing the collection of fees, California Water Code Section 10725(a) authorizes the IWVGA to "perform any act necessary or proper to carry out the purposes of this part [SGMA]". In order to implement the groundwater extraction fee, the IWVGA required that all wells subject to the fee register their wells with the IWVGA.

All groundwater pumpers in the IWVGB are subject to the groundwater extraction fee except for the following:

- Federal entities (U.S. Navy and United States Department of Interior, Bureau of Land Management); and
- Small pumpers defined as "de minimis extractors" or those who extract, for domestic purposes, two acre-feet or less per year (California Water Code Section 10721(e)).

As part of the preparation of this GSP, the IWVGA oversaw a basin-wide well registration process to formally document the existence and operation of wells subject to the groundwater extraction fee (i.e. all wells in the IWVGB except those owned by federal entities or by de minimis extractors). During the well registration process, well owners were required to provide the IWVGA's Water Resources Manager (WRM) with registration information including the following:

- Name and contact address of the well owner;
- Point of contact of the well operator;
- Well location;
- Name and address of the owner of land upon which the well is located;
- Description of the method used by the well owner and operator to measure groundwater extractions from the well;
- A statement describing whether the extracted groundwater is used for residential, commercial, industrial, or agricultural purposes, or a combination thereof; and
- Any other information that the IWVGA's General Manager deems necessary to achieve the legal purposes of the IWVGA.

The fee is determined and paid on a monthly basis by all producers with registered groundwater extraction facilities in the IWVGB. Unregistered groundwater extraction facilities that are subject to the groundwater extraction fee are prohibited from extracting groundwater from the basin until the facility is registered to the satisfaction of the WRM, which oversees the registration of groundwater extraction facilities and reviews producers' self-reported measurements of groundwater extractions.

2.8 DATA MANAGEMENT SYSTEM (DMS)

2.8.1 Purpose and Development

The IWVGA developed a web-based geo-Database Management System (DMS) consistent with the DWR requirements for a GSP provided in Title 23 Section 352.6 of the California Code of Regulations: "Each agency shall develop and maintain a data management system that is capable of storing and reporting information relevant to the development or implementation of the Plan and monitoring of the basin." Development of the DMS occurred under two phases. Phase I work consisted of development of the DMS framework and structure, and Phase 2 work consisted of establishing monitoring protocols, database population, installation of equipment, and integration with the GSP to ensure its long-term success.

As part of on-going groundwater management activities, the DMS will be used to track sustainability goals and objectives for the IWVGB as part of the GSP. The DMS stores and presents specific supporting elements of the GSP, including monitoring, reporting, and management criteria. Other elements supporting the GSP are also stored in the DMS, including a water budget, hydrogeologic conceptual model, and supporting documentation. Data obtained through the current water resource monitoring and management programs helped populate the DMS, and that data was used to develop alternative groundwater basin management strategies (see Section 4).

The DMS provides the public with access to data that would be infeasible to deliver through more traditional printed report format. These types of data sets and information include the following:

- Searchable electronic library of reports regarding Indian Wells Valley water resources;
- Access to a copy of the full database of well information (including well logs if available) covering the basin, including information on all known well sites; and
- Data for the Groundwater Monitoring Plan.

2.8.2 User Access and Privileges

The DMS was developed with a tiered security structure limiting the data that can be accessed based on the user's login information. The DMS's security structure may also limit the functionality of the system

based on the user's login. For example, the general public has a public user level, meaning that the general public is limited to either viewing GSP data or viewing/downloading GSP reports. The general public cannot manage, edit, or upload any data on the DMS. Furthermore, the general public does not have access to confidential documents.

The DMS has a pre-programmed default username and password so that any general user may easily access the DMS. To access the DMS, the general public may visit the website listed below and click the "Log In" button and subsequent "log on" button. Doing so will direct the user to the DMS homepage at the public user level using the default username and password.

https://www.iwvgsp.com

2.9 REFERENCES

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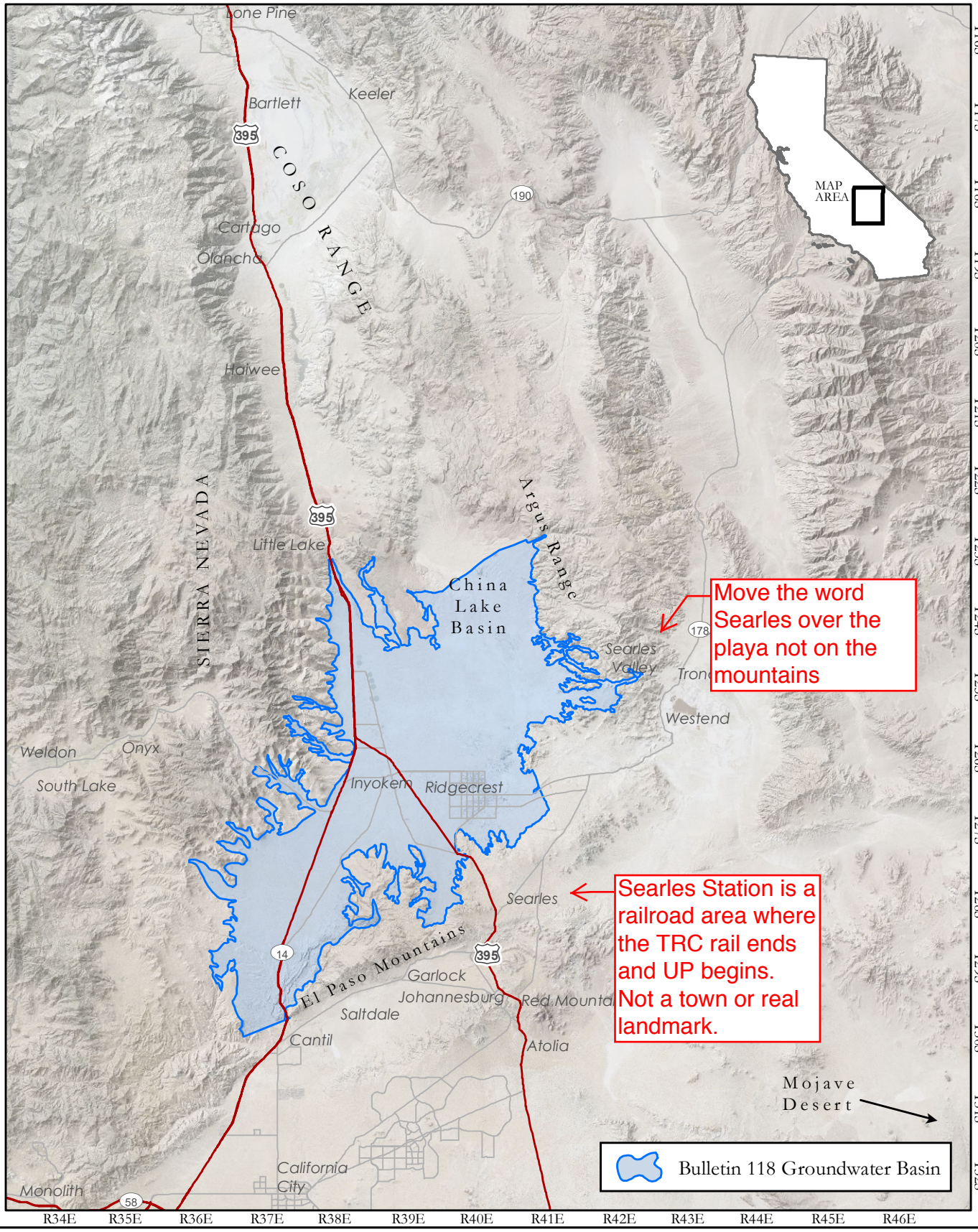

STETSON ENGINEERS INC.

GENERAL BASIN SETTING
INDIAN WELLS VALLEY GROUNDWATER BASIN
(DWR BULLETIN 118 BASIN NO. 6-054)

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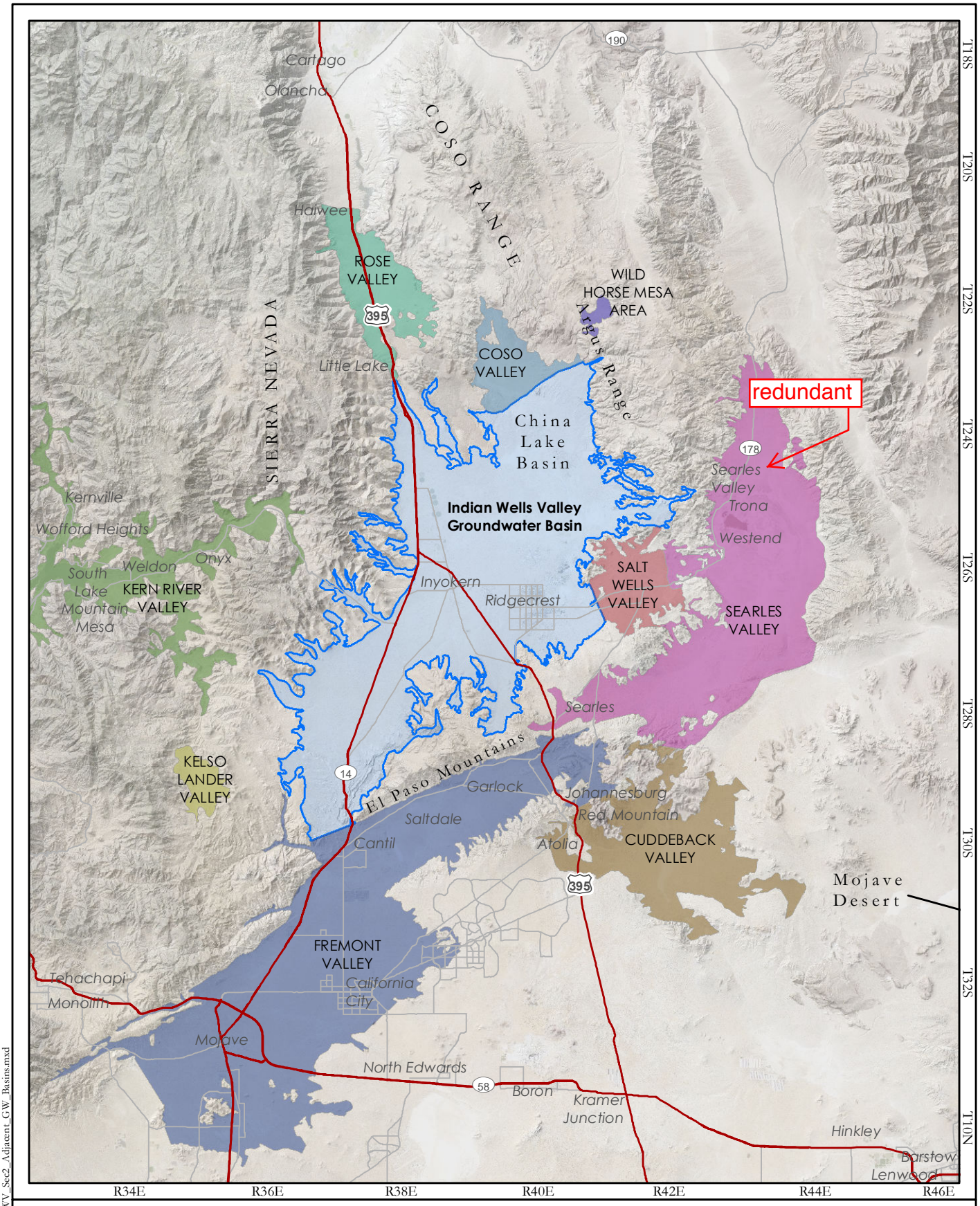
FIGURE 2-2



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STETSON ENGINEERS INC.

ADJACENT AND NEIGHBORING GROUNDWATER BASINS
INDIAN WELLS VALLEY GROUNDWATER BASIN

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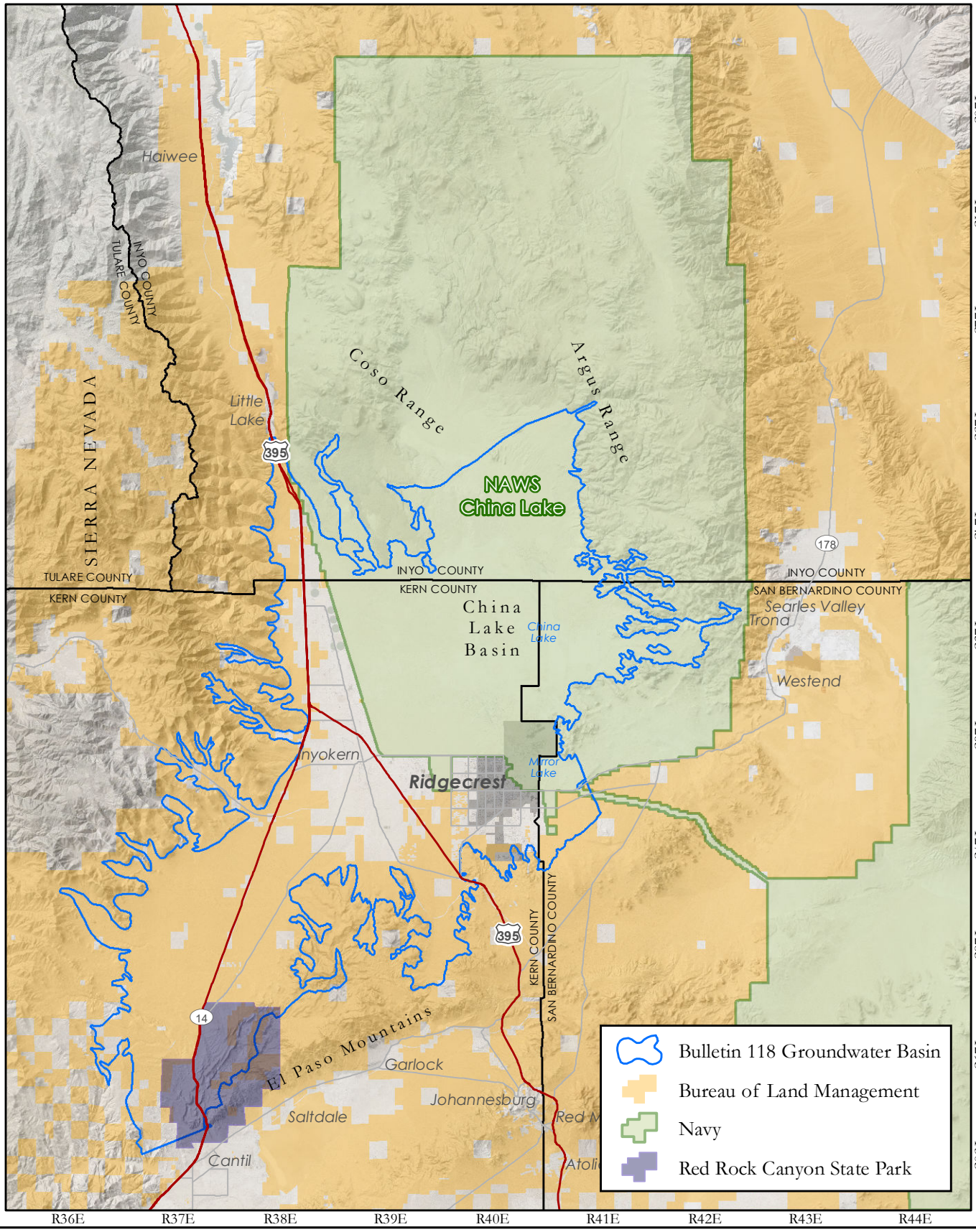

JURISDICTIONS AND BOUNDARIES OF FEDERAL AND STATE LANDS INDIAN WELLS VALLEY GROUNDWATER BASIN

STETSON ENGINEERS INC.

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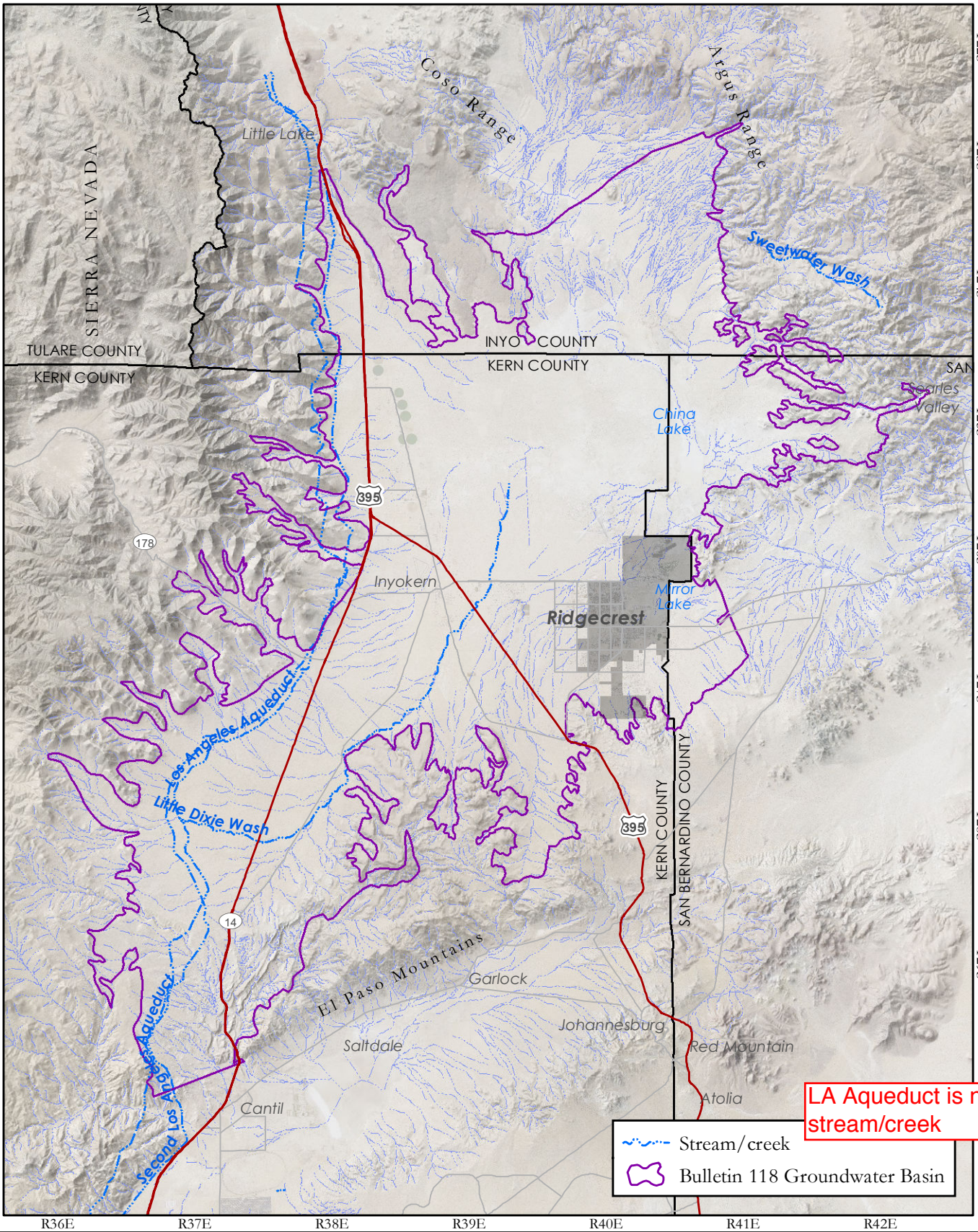

STETSON ENGINEERS INC.

STREAMS, RIVERS, AND OTHER SURFACE WATERS
INDIAN WELLS VALLEY GROUNDWATER BASIN

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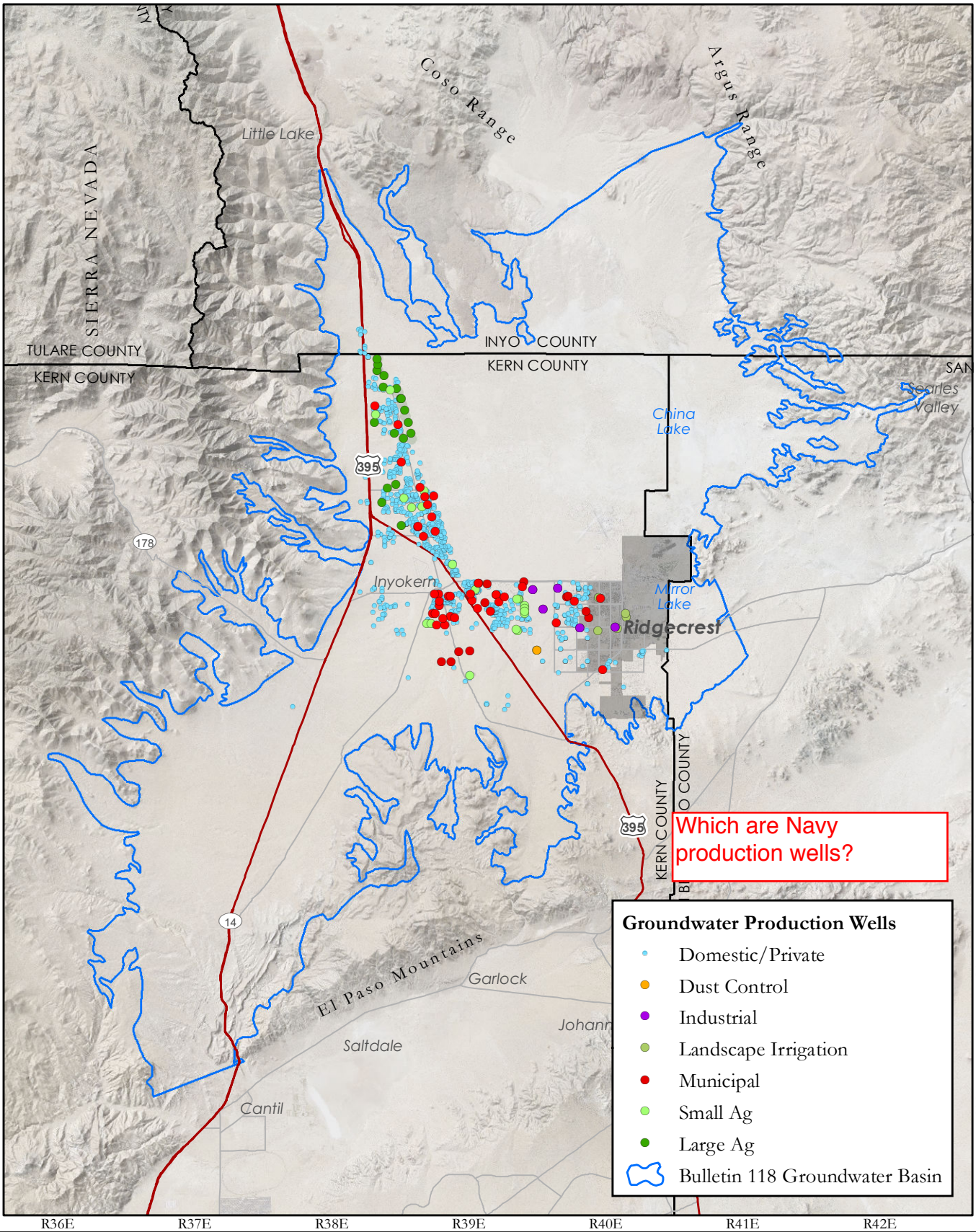

STETSON ENGINEERS INC.

LOCATIONS OF KNOWN
GROUNDWATER PRODUCTION WELLS
INDIAN WELLS VALLEY GROUNDWATER BASIN

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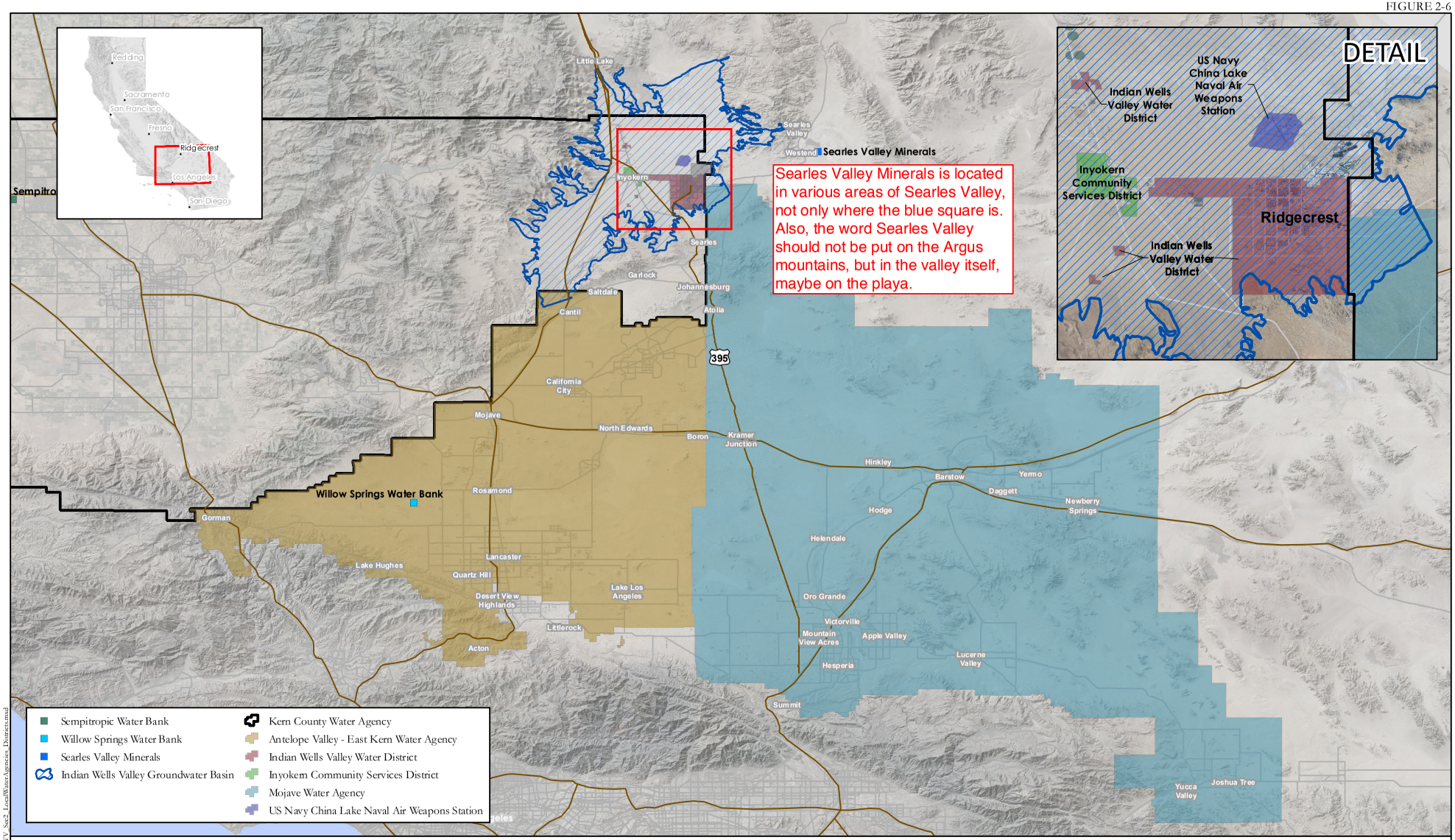
FIGURE 2-6



STETSON ENGINEERS INC.

LOCAL WATER AGENCIES AND DISTRICTS
INDIAN WELLS VALLEY GROUNDWATER BASIN

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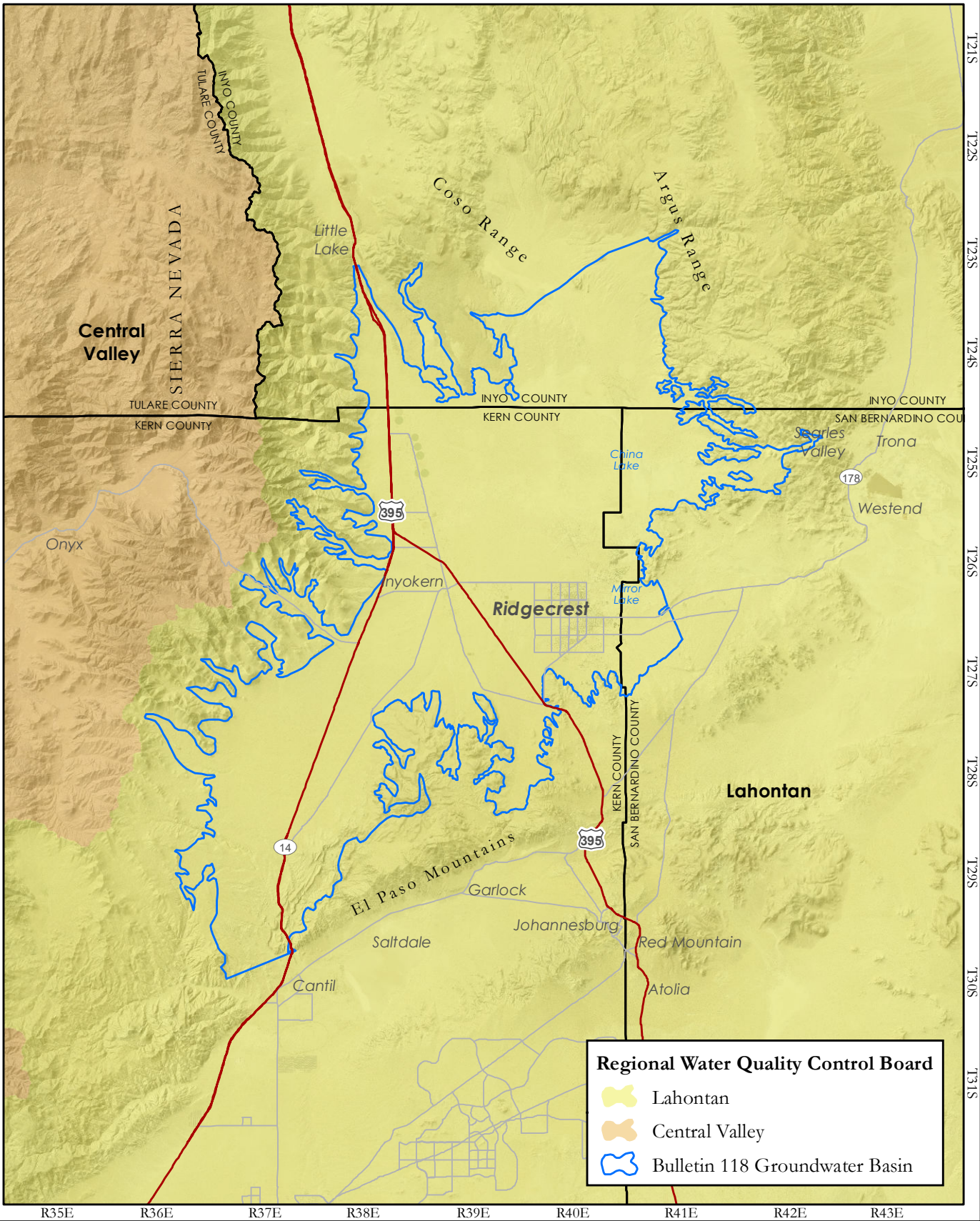

STETSON ENGINEERS INC.

REGIONAL BOARD BOUNDARIES
INDIAN WELLS VALLEY GROUNDWATER BASIN

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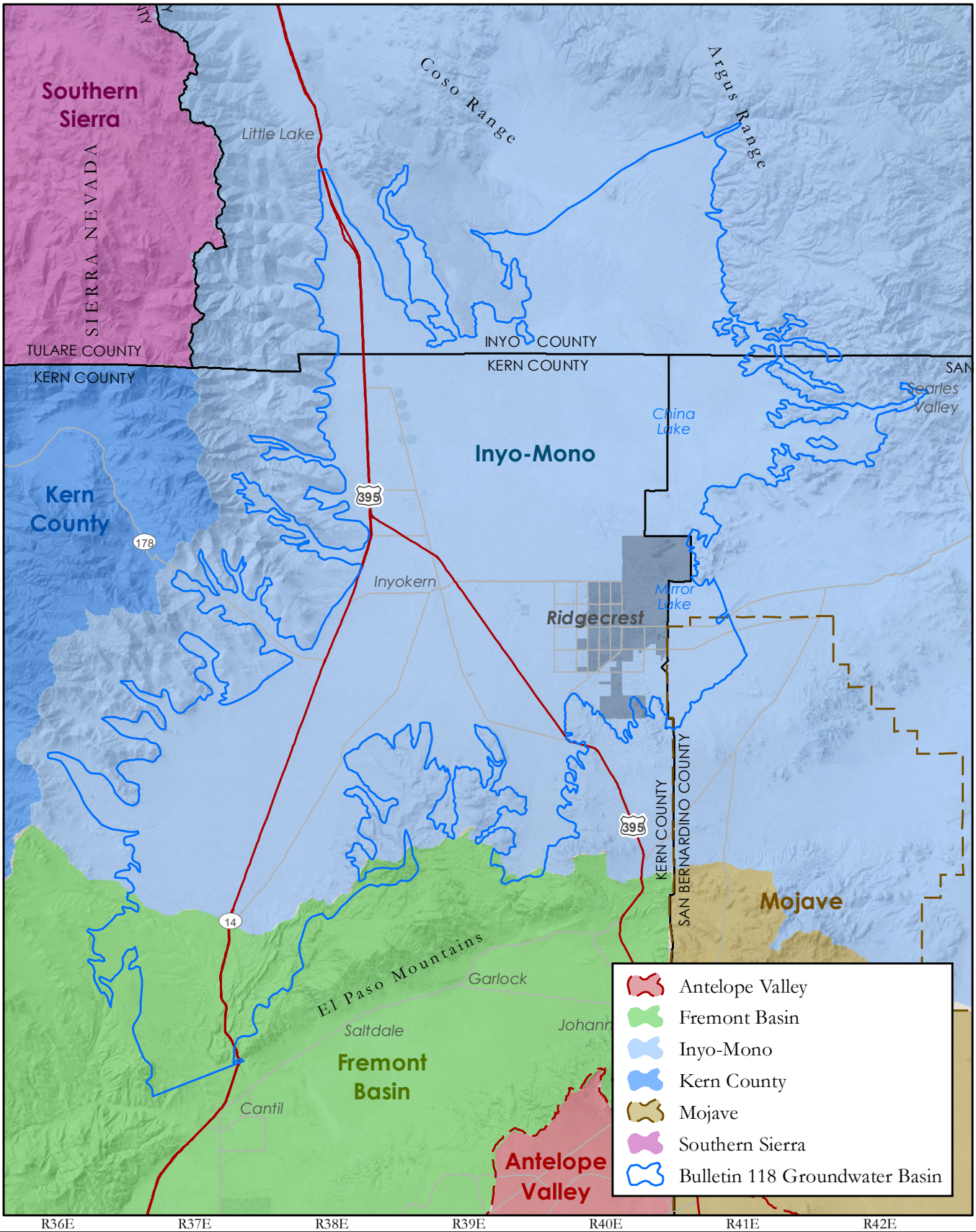

STETSON ENGINEERS INC.

INTEGRATED REGIONAL WATER MANAGEMENT (IRWM) BOUNDARIES
INDIAN WELLS VALLEY GROUNDWATER BASIN

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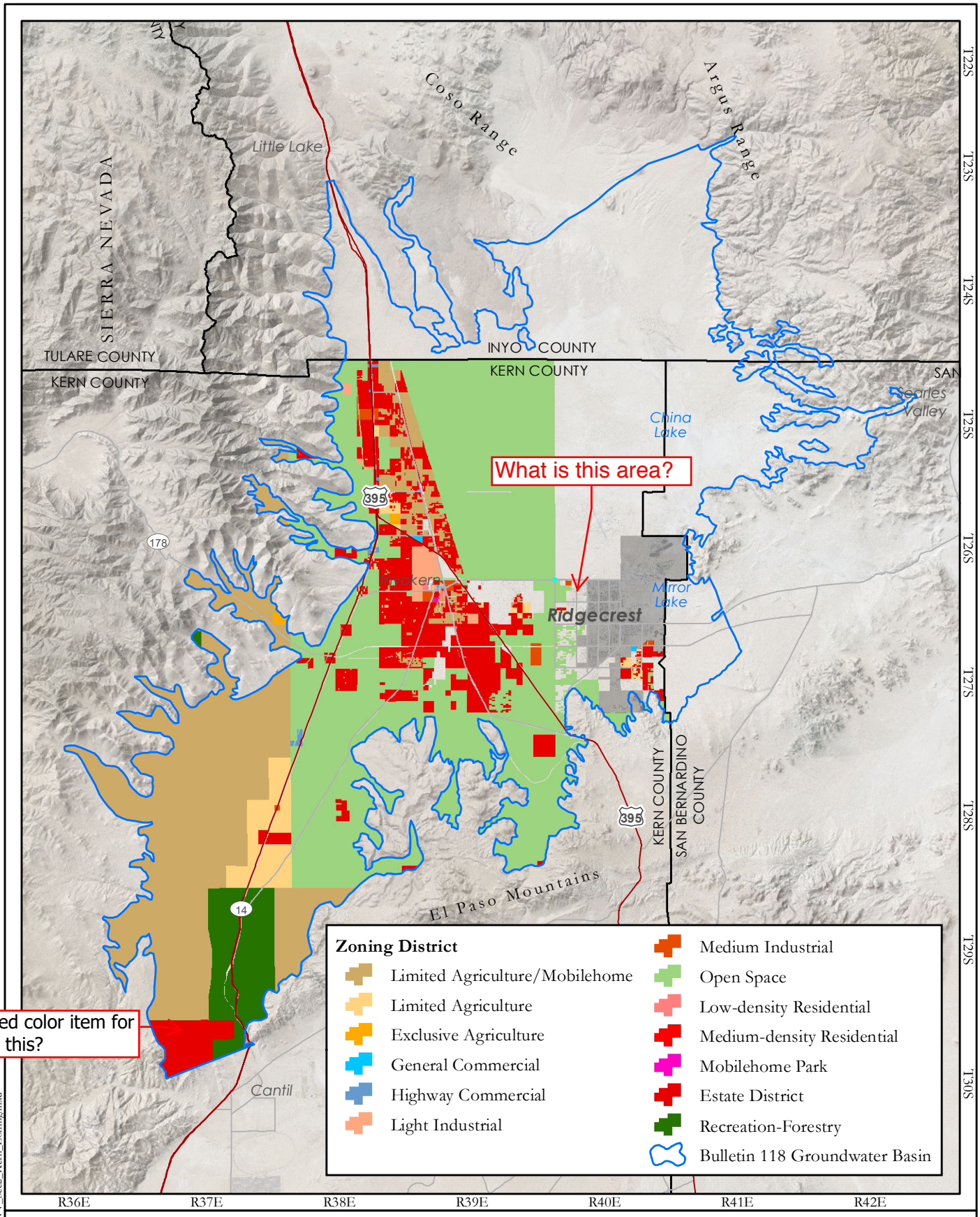

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STETSON ENGINEERS INC.

ZONING DISTRICTS (KERN COUNTY)
INDIAN WELLS VALLEY GROUNDWATER BASIN

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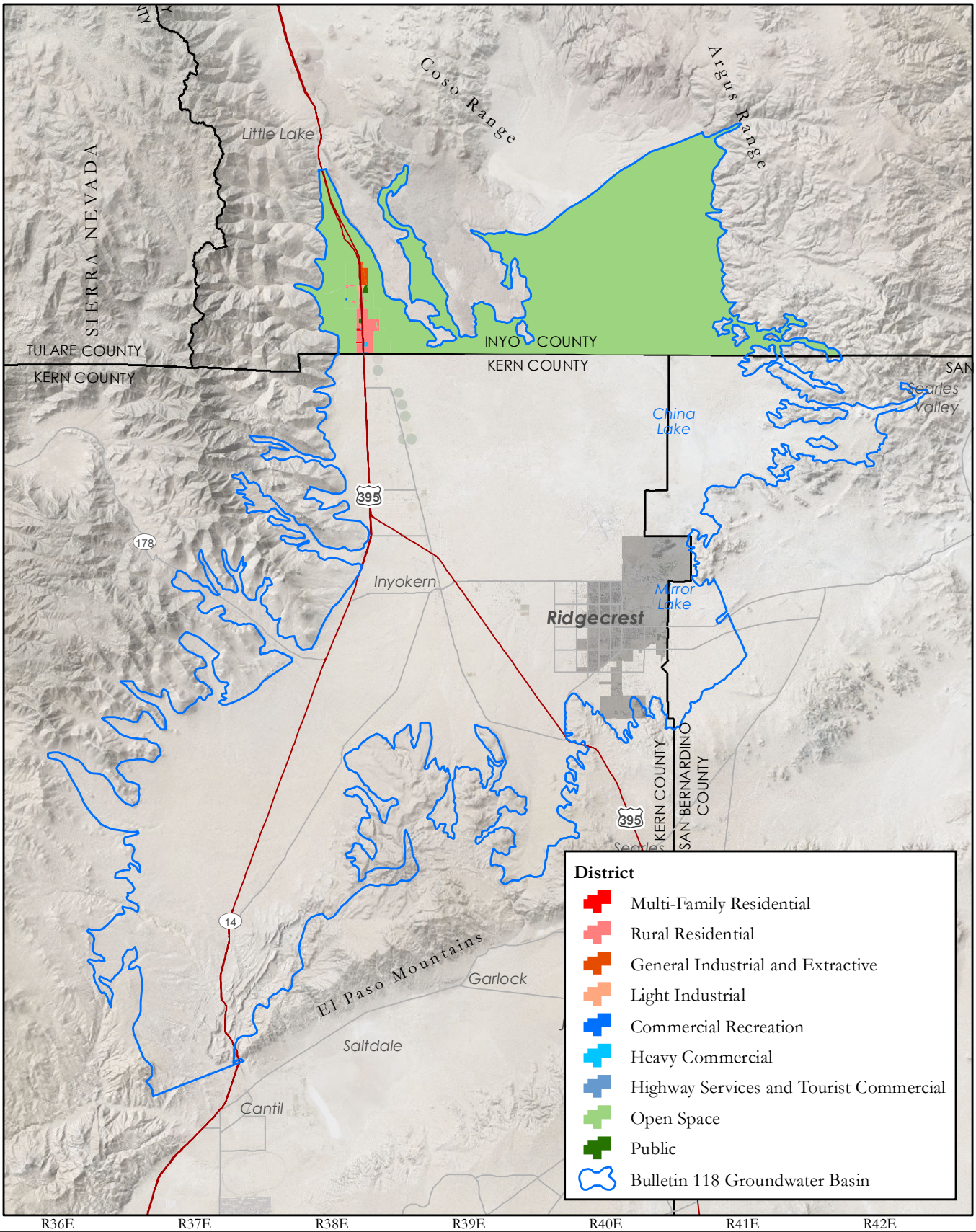

STETSON ENGINEERS INC.

ZONING DISTRICTS (INYO COUNTY)
INDIAN WELLS VALLEY GROUNDWATER BASIN

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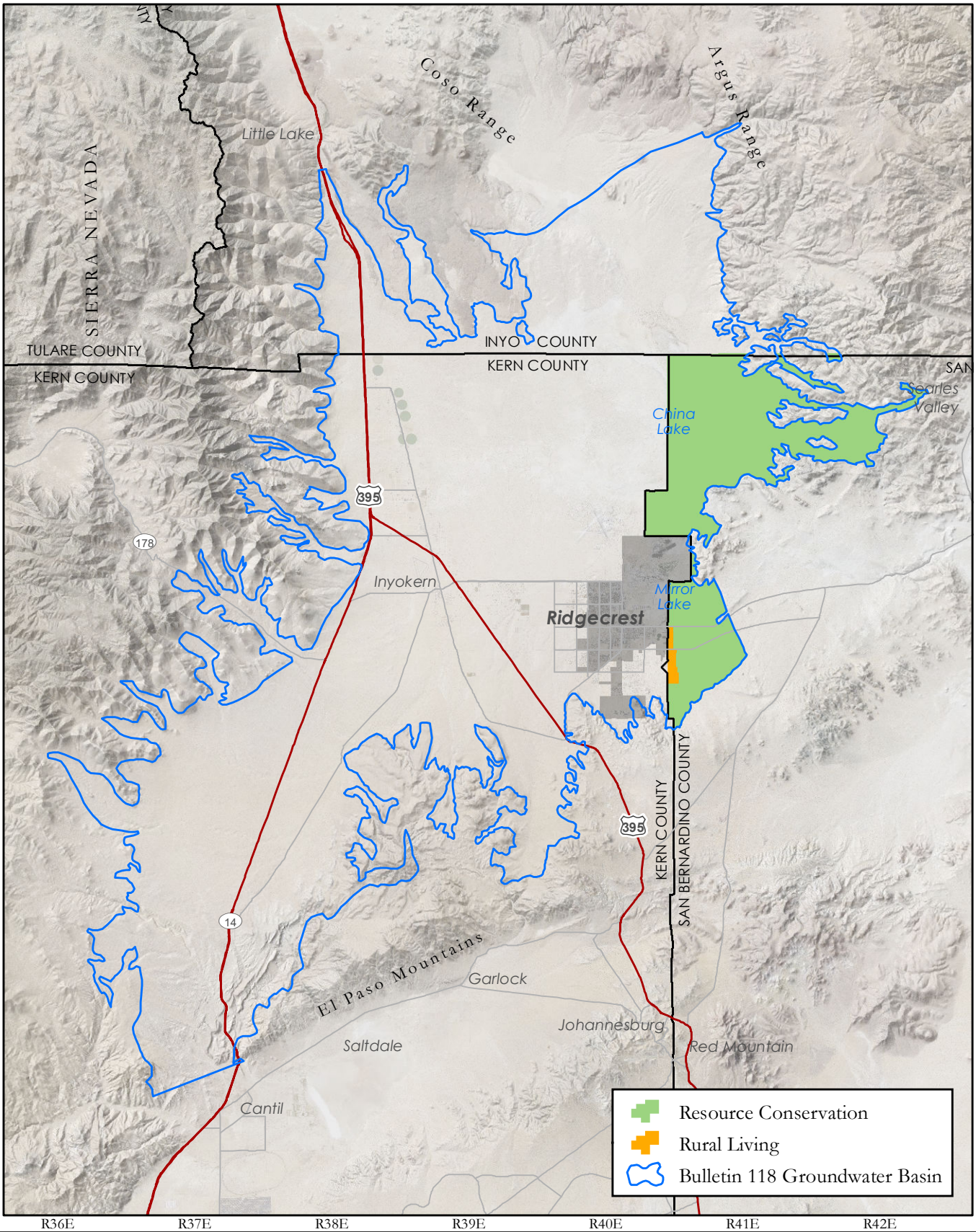

ZONING DISTRICTS (SAN BERNARDINO COUNTY)
INDIAN WELLS VALLEY GROUNDWATER BASIN

STETSON ENGINEERS INC.

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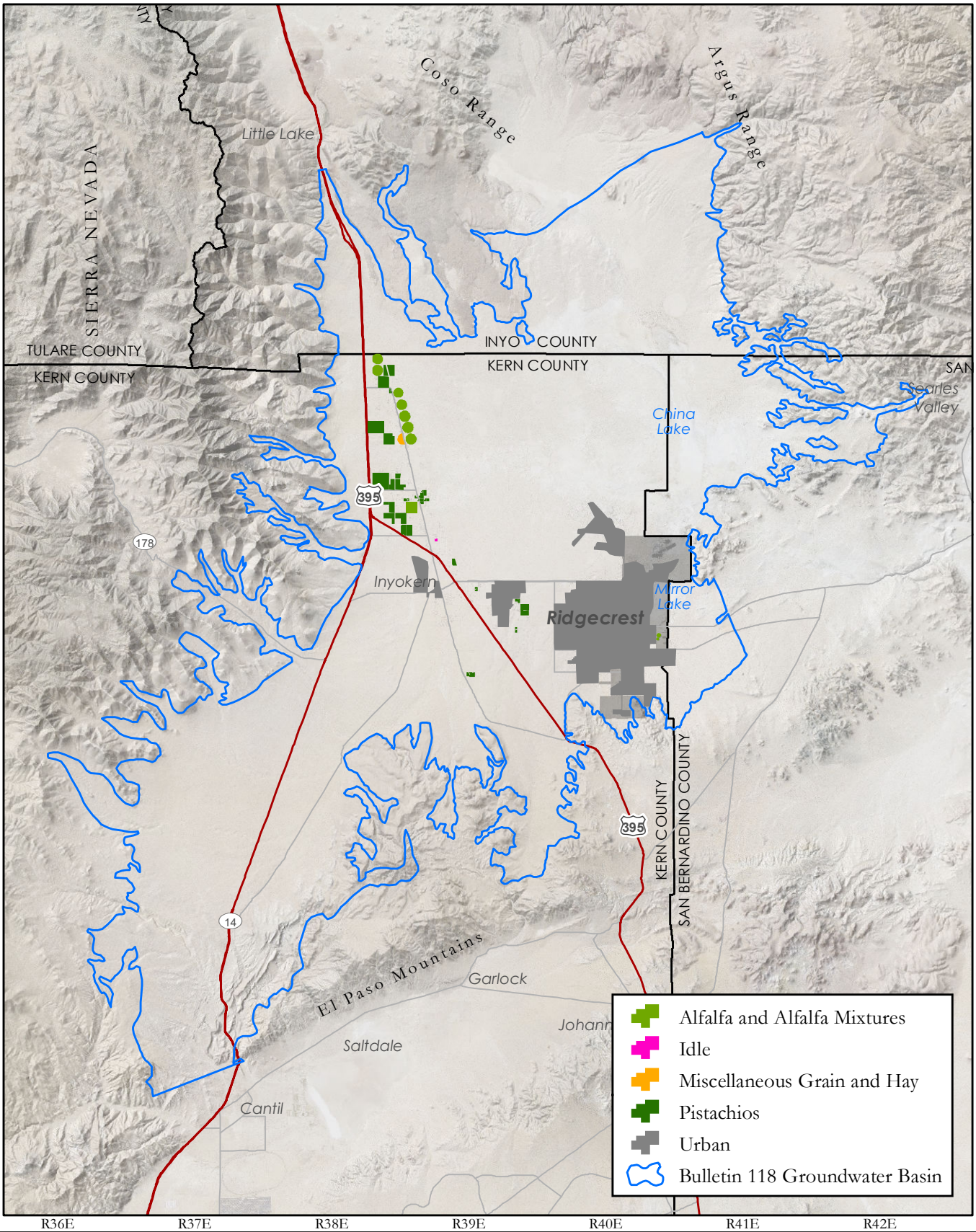

STETSON ENGINEERS INC.

ACTIVE AGRICULTURAL LANDS
INDIAN WELLS VALLEY GROUNDWATER BASIN

Source: DWR State Crop Mapping 2014; https://data.cnra.ca.gov/dataset/crop-mapping-2014

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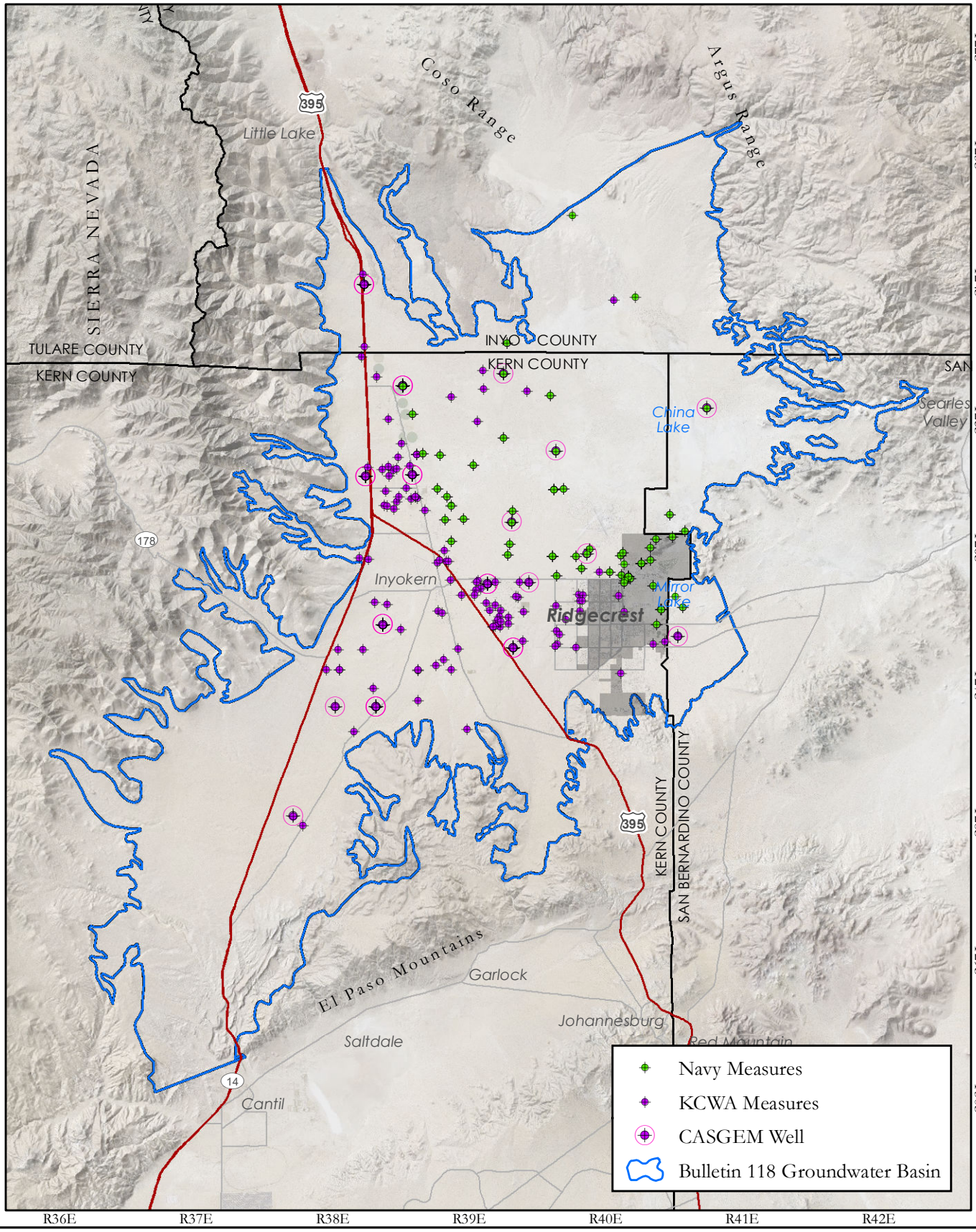

STETSON ENGINEERS INC.

LOCATIONS OF MONITORING WELLS
INDIAN WELLS VALLEY GROUNDWATER BASIN

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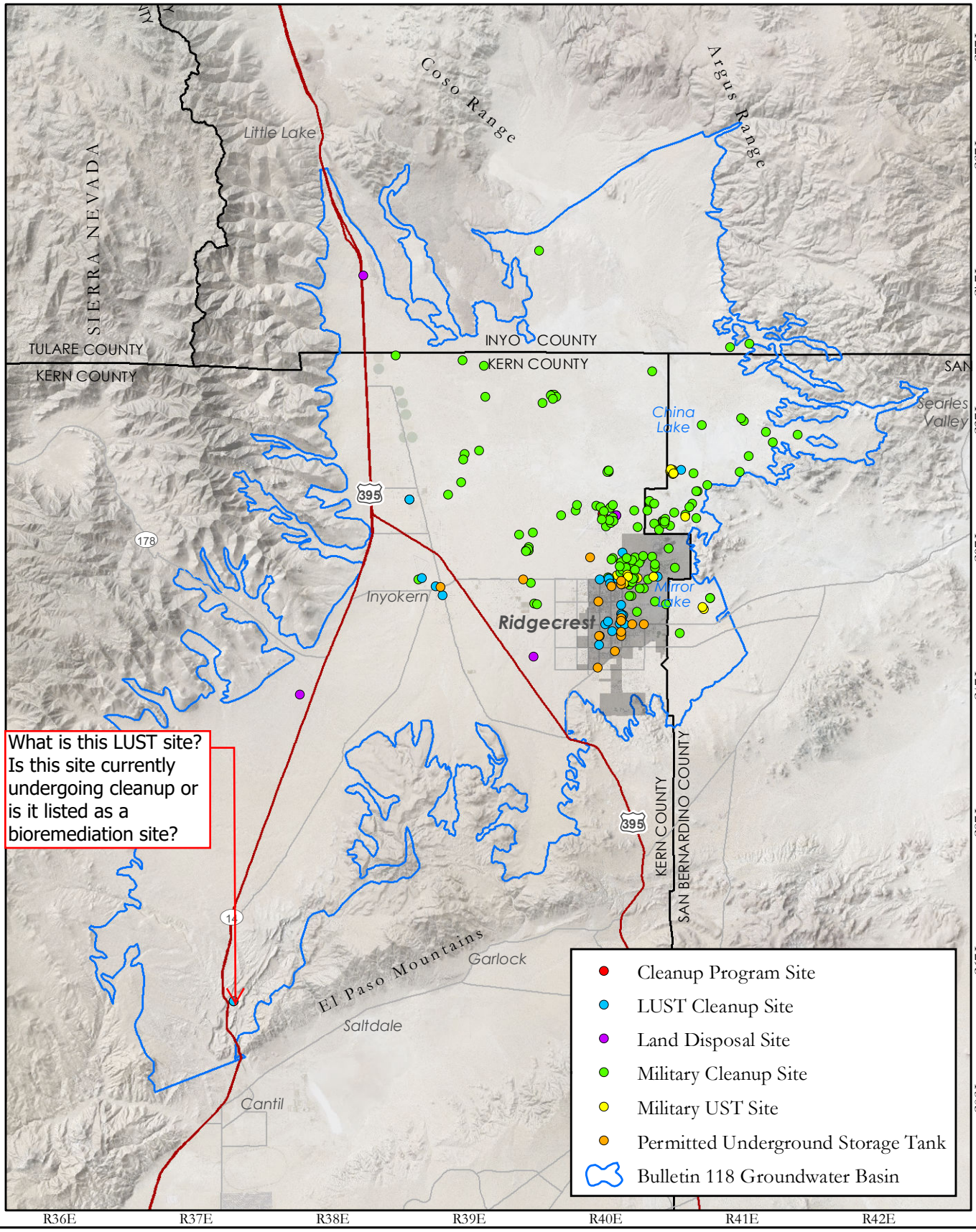

LOCATIONS OF
GROUNDWATER CONTAMINATION CLEANUP SITES
INDIAN WELLS VALLEY GROUNDWATER BASIN

STETSON ENGINEERS INC.

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INDIAN WELLS VALLEY GROUNDWATER BASIN

GROUNDWATER SUSTAINABILITY PLAN

SECTION 2 – PLAN AREA

DRAFT

September 3, 2019

SECTION 2: PLAN AREA 2-1

2.1 INTRODUCTION 2-1
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SECTION 2: PLAN AREA

2.1 INTRODUCTION

This section provides background and discussion of 1) geographic area and jurisdictions; 2) management agencies; 3) land use; 4) existing monitoring and management programs; and 5) the data management system, as required in the GSP Emergency Regulations (§354.8).

2.2 GENERAL DESCRIPTION

2.2.1 Setting

The IWVGB is located in the northwestern part of the Mojave Desert in southern California, as shown on Figure 2-1, and underlies approximately 382,000 acres or approximately 600 square miles of land area in portions of the Counties of Kern, Inyo, and San Bernardino. The IWVGB is bordered on the west by the Sierra Nevada mountain range, on the north by the Coso Range, on the east by the Argus Range, and on the south by the El Paso Mountains. Surface water flow from the surrounding mountain ranges drains to China Lake, a large dry lake, or playa, located in the central north-east part of the basin. U.S. Route 395 and State Route 14 are the major vehicular arteries through the Indian Wells Valley. The IWVGB is in the vicinity of other Bulletin-118 groundwater basins including the Fremont Valley, Salt Wells Valley, Searles Valley, Coso Valley, Rose Valley, and Kern River Valley groundwater basins (see Figure 2-2).

The IWVGB is designated Basin Number 6-054 by DWR and is included in DWR Bulletin No. 118 entitled "California's Ground Water", dated September 1975. Bulletin 118 noted that recharge in the IWVGB averaged about 10,000 acre-feet per year (AFY) while extractions (as of 1968) were about 12,500 AFY, implying that overdraft conditions have existed for at least the past 50 years. DWR Bulletin 118 was updated in January 1980 and designated Bulletin 118-80. Table 8 of Bulletin 118-80 noted that there is evidence of groundwater overdraft in the IWVGB. Table 1 of Bulletin 118-16 (dated January 2016) indicates the IWVGB is subject to critical conditions of overdraft.

2.2.2 Jurisdictions

The Indian Wells Valley land overlying the IWVGB encompasses portions of the Counties of Kern, Inyo, and San Bernardino, with the majority (approximately 73%) being in Kern County as shown in Table 2-1. The City of Ridgecrest is the only incorporated community in the Indian Wells Valley and covers an area of approximately 20 square miles with a population of approximately 27,000 people. Unincorporated communities in the Indian Wells Valley include the communities of Inyokern in Kern County and Pearsonville in Inyo County, along with other smaller communities.

Table 2-1. IWVGB: Distribution of Overlying Land, by County

County Name	Overlying Land (acres)	Overlying Land (%)
Kern County	277,204	73%
Inyo County	66,519	17%
San Bernardino County	37,985	10%
Total	**381,708**	**100%**

As shown in Tables 2-2 and 2-3, approximately 302,000 acres of land overlying the IWVGB are federal property managed by either the US Navy's Naval Air Weapons Station China Lake (NAWS China Lake) or the US Department of Interior, Bureau of Land Management (BLM). The non-federal lands overlying the IWVGB consist of the incorporated city of Ridgecrest and unincorporated lands in the counties of Kern, Inyo, and San Bernardino (see Section 2.4). A map showing general jurisdictions and boundaries is provided in Figure 2-3.

Table 2-2. IWVGB: Distribution of Federal and Non-Federal Overlying Lands, by Entity

Entity	Overlying Land (acres)	Overlying Land (%)
U.S. Department of the Interior (Bureau of Land Management)	140,184	37%

U.S. Navy (Naval Air Weapons Station, China Lake)	161,911	42%
Non-Federal Entities	79,613	21%
Total	**381,708**	**100%**

Table 2-3. IWVGB: Distribution of Federal and Non-Federal Overlying Lands, by County

Entity	Overlying Land (acres)				Overlying Land (%)			
	NAWS China Lake	BLM	Non-Federal	Subtotal	NAWS China Lake	BLM	Non-Federal	Subtotal
Kern County	71,971	129,032	76,201	277,204	26%	47%	27%	100%
Inyo County	57,413	6,448	2,658	66,519	86%	10%	4%	100%
San Bernardino County	32,527	4,704	754	37,985	86%	12%	2%	100%
Total	**161,911**	**140,184**	**79,613**	**381,708**	-	-	-	-

2.2.3 Classification

In accordance with SGMA, DWR is required to classify groundwater basins by priority for achieving long-term sustainable groundwater management. DWR has published the "Sustainable Groundwater Management Act, 2018 Basin Prioritization Process and Results" document, dated January 2019, which provides the process, components, and rationale to develop the prioritization of California groundwater basins. In this document, DWR identifies and prioritizes 517 groundwater basins and subbasins as either

"High", "Medium", "Low," or "Very Low". DWR considered the following eight components when prioritizing the groundwater basins:

1) The population overlying the basin or subbasin.
2) The rate of current and projected growth of the population overlying the basin or subbasin.
3) The number of public supply wells that draw from the basin or subbasin.
4) The total number of wells that draw from the basin or subbasin.
5) The irrigated acreage overlying the basin or subbasin.
6) The degree to which persons overlying the basin or subbasin rely on groundwater as their primary source of water.
7) Any documented impacts on the groundwater within the basin or subbasin, including overdraft, subsidence, saline intrusion, and other water quality degradation.
8) Any other information determined to be relevant by the department, including determined to be relevant by the department, *including adverse impacts on local habitat and local streamflows*.

In addition to the IWVGB's designation as a basin subject to critical conditions of overdraft, the 2018 Basin Prioritization Report rates the IWVGB as a "High" Priority basin. Consequently, the IWVGA is required to submit this GSP by January 31, 2020 pursuant to SGMA.

2.2.4 Water Supply Source

In general, streams and other surface waters in the IWVGB are ephemeral due to low annual precipitation in the Indian Wells Valley, and basin recharge occurs as mountain block recharge. Consequently, although natural channels for surface water exist in the IWVGB (see Figure 2-4), surface water resources in the IWVGB are limited. Further discussion on surface water systems in the IWVGB is provided in Section 3.

The IWVGB serves as the sole supply of potable water for the Indian Wells Valley. Residents of the Indian Wells Valley are served groundwater through private domestic wells, small cooperative groups sharing wells, small mutual water companies, the Inyokern Community Services District, and the Indian Wells Water District. The Navy operates production wells in the Indian Wells Valley (IWV) that supply the water needs on-Station. Production wells operated and maintained by the Indian Wells Valley Water District and domestic wells in the unincorporated areas of the IWV provide water to the

Navy affiliated staff (made up of scientists, engineers, technicians, and professionals) and their dependents that reside off-Station. These personnel are critical to supporting the mission at NAWS China Lake.~~The Navy produces and distributes groundwater for use on the NAWS China Lake.~~ Searles Valley Minerals produces groundwater from the IWVGB for use in its mineral mining and processing operations in the Searles Valley (located east of the IWVGB) and for potable use in the small communities of Trona, Westend, Argus, and Pioneer Point in the Searles Valley. In addition, a number of farms located in the Indian Wells Valley rely on the IWVGB's water supplies for their agricultural operations, including Meadowbrook Dairy, Mojave Pistachios, Simmons Ranch, Quist Farms, and other smaller farms. The crops grown in the Indian Wells Valley are primarily alfalfa and pistachios.

The Kern County Public Health Services Department has provided the IWVGA with spatial data on wells located in the Kern County portion of the IWVGB. The data included well information such as approximate well location, point of contact, driller, and permit number. As of July 2018, the data provided such information (where available) for a total of 546 wells located in the Kern County portion of the IWVGB. The IWVGA has incorporated this spatial data into the development of this GSP. As shown on Figure 2-5, there are 932 estimated groundwater production wells located in the IWVGB with an average well density of approximately 1.6 wells per square mile. A summary of groundwater production wells by type of use is provided in Table 2-4.

Table 2-4. Summary of Groundwater Production Wells in the IWVGB

Well Use	Number of Wells
Domestic/Private	832
Dust Control	1
Industrial	5
Landscape Irrigation	5
Large Agriculture	18
Municipal	51
Small Agriculture	20
Total	**932**

2.3 LOCAL WATER AGENCIES

2.3.1 Background

The local water agencies within the IWVGB are shown on Figure 2-6 and are briefly summarized below. Additional information on the local water agencies and total current groundwater pumping is provided in Section 3.3.4.1.

2.3.2 Indian Wells Valley Water District

The Indian Wells Valley Water District (Water District) was formed in 1955 as the Ridgecrest County Water District by consolidating several smaller water companies serving the Ridgecrest area with domestic water. On January 19, 1970, the Water District's Board of Directors voted to change the name from the Ridgecrest County Water District to the Indian Wells Valley County Water District, reflecting its service area which covers areas beyond the City of Ridgecrest. In 1980, the Water District's Board of Directors formally dropped the word "County" from the name of the Water District. Since that date, the Water District has been known as the "Indian Wells Valley Water District".

The Water District serves approximately 30,000 customers through over 12,000 connections and encompasses an area of approximately 37.7 square miles within the eastern portion of the IWVGB. The Water District operates facilities (groundwater production wells, treatment systems, booster stations, storage tanks, and distribution pipelines) to provide potable groundwater from the IWVGB to its customers. Accordingly, the protection, conservation, and replenishment of groundwater supplies is of critical importance to the Water District.

2.3.3 Inyokern Community Services District

The Inyokern Community Services District (Inyokern CSD), established in 1983, provides water, wastewater, and street lighting services to the community of Inyokern, located approximately 7 miles west of Ridgecrest. The Inyokern CSD operates service facilities including approximately 265 water service connections, 4 groundwater production wells, distribution pipelines, and a wastewater treatment plant. The Inyokern CSD serves a primarily residential population of approximately 1,000 and an estimated 420 residential households (Alpert et al., 2014).

2.3.4 Antelope Valley – East Kern Water Agency

The Antelope Valley – East Kern Water Agency (AVEK) is a wholesale water agency serving nearly 2,400 square miles in northern Los Angeles and eastern Kern Counties, as well as a small portion of Ventura County. AVEK produces groundwater from the Antelope Valley groundwater basin and also obtains imported water from Northern California through a long-term contract with the State Water Project (SWP). As shown on Figure 2-6, the AVEK service area extends into the largely undeveloped land in the southernmost portion of the IWVGB, but no AVEK water infrastructure or water supply services exist in that portion of the IWVGB. The AVEK water transmission lines closest to the IWVGB are located in California City, located approximately 15 miles south of the IWVGB boundaries and 50 miles south of Ridgecrest.

2.3.5 Kern County Water Agency

The Kern County Water Agency (KCWA) is a public agency providing wholesale water services to its 13 member units along with water resources management and monitoring services throughout Kern County. As shown on Figure 2-6, the KCWA service area encompasses all portions of the IWVGB within Kern County, except for that portion of the IWVGB in the AVEK service area. KCWA obtains imported water from Northern California through a long-term contract with the SWP. At this time, no water agencies in the IWVGB serve as member units to KCWA, and no KCWA water infrastructure exists within the IWVGB boundaries.

Additional information on KCWA's water resources monitoring efforts in the IWVGB is provided in Section 2.6.2.

2.3.6 Mojave Water Agency

The Mojave Water Agency (MWA) is a wholesale water agency serving 4,900 square miles of the High Desert in San Bernardino County. MWA produces groundwater from the Mojave Basin Area, a series of Bulletin 118 groundwater basins and subbasins located along the Mojave River. MWA also obtains imported water from Northern California through a long-term contract with the SWP. As shown on Figure 2-6, the MWA service area extends into the easternmost portion of the IWVGB, but no MWA water infrastructure or water supply services exist in that portion of the IWVGB. The MWA water transmission

lines closest to the IWVGB are located in Barstow, located approximately 60 miles southeast of the IWVGB boundaries and Ridgecrest.

2.4 REGIONAL WATER MANAGEMENT AGENCIES

2.4.1 Background

The IWVGA is the exclusive Groundwater Sustainability Agency for the IWVGB, Bulletin 118 Basin No. 6-054. There are several other existing regional entities with water supply, management, planning, and/or regulatory authority whose boundaries encompass all or portions of IWVGB. These entities include the Kern County Water Agency (KCWA), the Lahontan Regional Water Quality Control Board (LRWQCB), the Inyo-Mono Integrated Regional Water Management Program (Inyo-Mono IRWMP), and the Indian Wells Valley Cooperative Groundwater Management Group (Cooperative Group). The following is a brief overview of these entities and their role in water supply management within the IWVGB.

2.4.2 Kern County Water Agency

The Kern County Water Agency (KCWA) was created in 1961 by a special act of the California State Legislature and is the contracting entity in Kern County for the SWP. The KCWA participates in various water management activities including water quality control, flood control, and groundwater banking to preserve and enhance Kern County's water supply.

The KCWA is the second largest participant in the SWP, a water storage and delivery system for water supplies from Northern California. The KCWA has contracts with 13 local water districts, referred to by KCWA as Member Units for SWP water. Since 1968, about 33 million acre-feet of SWP water has been delivered to Kern County using SWP facilities. The KCWA does not have a contract with a local water agency in the IWVGB; therefore, the KCWA does not provide SWP water to the IWVGB.

Due to low rainfall in a semi-arid region, surface water supplies in Kern County must be augmented by groundwater supplies. The KCWA works to improve groundwater levels and to monitor groundwater quality throughout Kern County, especially in the areas surrounding groundwater banking projects.

The KCWA collects, interprets, and distributes groundwater data for the IWVGB. Since 1989, the KCWA has measured depth to groundwater in the IWVGB biannually during October (peak historical groundwater demand) and March (lowest historical groundwater demand). KCWA analyzes the resulting measurements to generate maps of groundwater elevation and depth to groundwater throughout the IWVGB. The KCWA is also a signatory to the Indian Wells Valley Cooperative Groundwater Management Group.

2.4.3 Lahontan Regional Water Quality Control Board

The Lahontan Regional Water Quality Control Board (LRWQCB) is a seven-member decision-making body appointed by the Governor of California for the purpose of protecting the water quality and ensuring the proper allocation and efficient use of water resources in the Lahontan Region. The Lahontan Region is divided into the North and South Lahontan Basins and includes over 700 lakes, 3,170 miles of streams, and 1,581 square miles of groundwater basins. The IWVGB is located within the South Lahontan Basin, which includes three major surface water systems (Mono Lake, Owens River, and the Mojave River watersheds) and multiple separated groundwater basins. A map of the LRWQCB boundaries is provided in Figure 2-7.

The LRWQCB's general duties include approving Water Quality Control Plans and Salt and Nutrient Management Plans; setting regional water quality standards; issuing waste discharge requirements; determining compliance with those standards and requirements; and taking appropriate enforcement actions. The LRWQCB has established the "Water Quality Control Plan for the Lahontan Region, North and South Basins" (Basin Plan) as the regulatory document that sets forth water quality standards and control measures for surface water and groundwater in the Lahontan Region (including the IWVGB). The LRWQCB has also approved the IWVGB Salt and Nutrient Management Plan in 2018 (see Section 2.6.4 for additional information).

2.4.4 Inyo-Mono Integrated Regional Water Management Program

The Inyo-Mono Integrated Regional Water Management Program (Inyo-Mono IRWMP) is a regional water resource planning organization which formed in 2008 as part of the statewide Integrated Regional Water Management collaborative effort. Over 30 organizations are members of the Inyo-Mono IRWMP, including the County of Kern, the County of Inyo, the Inyokern CSD, the Indian Wells Valley Water District,

the U.S. Bureau of Land Management, and the Cooperative Group. The Inyo-Mono IRWMP has obtained more than $2.5 million through DWR grants made available through Proposition 84 funding to assist essential water management projects and research efforts for Inyo, Mono, and Kern Counties, and includes the IWVGB. A map of the area included in the Inyo-Mono IRWMP is included in Figure 2-8.

The "Inyo-Mono Integrated Regional Water Management Plan" dated October 2014 states:

> "The purpose of the Inyo-Mono IRWM Program is to foster coordination, collaboration, and communication among water-related stakeholders in the region for the purpose of developing water management strategies and projects that will benefit multiple entities and enhance water supply, water quality, and watershed health."

2.4.5 Indian Wells Valley Cooperative Groundwater Management Group

The Indian Wells Valley Cooperative Groundwater Management Group (Cooperative Group) was created in 1995 as a public water data-sharing group to consolidate and coordinate water management efforts in the Indian Wells Valley. The Cooperative Group collected and shared information regarding groundwater resources and uses of groundwater in the IWVGB. Members of the Cooperative Group include the NAWS China Lake, Searles Valley Minerals, Indian Wells Valley Water District, Bureau of Land Management, City of Ridgecrest, KCWA, Kern County, Inyokern Community Services District, East Kern County Resource Conservation District, and Inyokern Airport District. These members provided materials and services as in-kind donations to support the Cooperative Group's goals. In addition to in-kind services, the Cooperative Group received state funding from DWR for groundwater basin studies.

One of the founding purposes of the Cooperative Group is the exchange of information and management of data. The shared information supported development and implementation of improved management practices among the members and provided valuable information to the public about the state of the IWVGB's water supplies.

The Cooperative Group developed a "Cooperative Groundwater Management Plan for the Indian Wells Valley" (CGMP) dated March 2006 that established planning objectives to address conditions of overdraft and the resulting consequences for stakeholders in the Indian Wells Valley. The CGMP was not intended to alter or affect any existing water rights, but rather served as a set of guidelines to encourage

participation in water management efforts among the Cooperative Group members. The water management efforts listed in the CGMP include:

- Working towards and encouraging limitation of additional large scale pumping in areas that appear to be adversely impacted;
- Distributing new groundwater extractions within the Indian Wells Valley in a manner that will minimize adverse effects to existing groundwater conditions (levels and quality), and maximize the long-term supply within the Indian Wells Valley;
- Aggressively pursuing the development and implementation of water conservation policy and education programs;
- Encouraging the use of treated water, reclaimed water, recycled, gray, and lower quality water where appropriate and economically feasible;
- Exploring the potential for other types of water management programs that are beneficial to the Indian Wells Valley;
- Continuing cooperative efforts to develop information and data which contributes to further defining and better understanding the groundwater resources in the Indian Wells Valley;
- Developing an interagency management framework to implement and enforce the objectives of the CGMP.

2.5 LAND USE

2.5.1 Background

California Government Code Section 65040.2 requires cities and counties to establish a General Plan as a guideline to determine growth patterns, land use, land development, etc. A municipal General Plan addresses the following elements for its city or county: land use, circulation, housing, conservation, open space, noise, safety, environmental justice, and other optional topics of local interest. The General Plan elements of greatest relevance to this GSP and the IWVGA's water supply issues are land use, housing, conservation, and open space.

Implementation of this GSP may impact the water supply and water demand assumptions of existing General Plans due to changes in the quantities and locations of groundwater extractions and acquisition

of alternative water supplies. Accordingly, it is important for the IWVGA to coordinate with the relevant land use planning agencies.

2.5.2 Summary of General Plans and Other Land Use Plans

2.5.2.1 *Kern County*

The majority of land overlying the IWVGB is within Kern County. The Kern County General Plan, adopted September 22, 2009, is a policy document that, along with its amendments, guides the development and/or preservation of the county's natural resources not directly managed by the federal government. The Kern County General Plan was prepared by the Kern County Planning and Community Development Department.

Page viii of the Introduction to the Kern County General Plan states:

> "This planning document recognizes that the relationship between water supply and land use planning is important to promoting future growth and a strong economy for Kern County's future. Recent State laws require local governments to ensure that development approvals occur with substantive, realistic assessments of the availability of a reliable water supply. The new laws require the verification of sufficient water supplies as a condition for approving certain developments and compel urban water suppliers to provide more information on the reliability of groundwater for a long-term time frame. Long-term water supply planning is important to ensuring that rural and urban economic growth can be accommodated into the future."

The Kern County General Plan acknowledges that water supply is a critical issue for Kern County's residents and economy. For this reason, the Kern County General Plan requires that General Plan amendments subject to environmental review and not otherwise subject to California Water Code Section 10910 demonstrate through a water supply assessment that a long-term water supply for a 20-year timeframe is available. Additionally, all development proposals are required to be reviewed by County staff to ensure that adequate water supplies are available to accommodate projected growth. To sustain long-term economic stability in Kern County, Chapters 1.9 and 1.10.6 of the Kern County General Plan encourage effective groundwater resource management through the following actions:

- Promoting groundwater recharge activities in various zone districts;
- Supporting the development of Urban Water Management Plans and promoting Department of Water Resources grant funding for all water providers;
- Supporting the development of groundwater management plans;
- Supporting the development of future sources of additional surface water and groundwater including conjunctive use, recycled water, conservation, additional storage of surface water and groundwater, and desalination;
- Requiring water-conserving design and equipment in new construction;
- Encouraging water-conserving landscaping and irrigation methods;
- Encouraging the retrofitting of existing development with water-conserving devices.

A total of 277,204 acres of land overlying the IWVGB is located within Kern County. 201,003 acres (73%) of the overlying land within Kern County is federal land managed by the Bureau of Land Management (BLM) (129,0032 acres, or 47%), or controlled by the NAWS China Lake (71,971 acres, or 26%). Most of the BLM-managed land in the IWVGB is open space managed for natural and economic resources, including mineral resources and rights-of-way for powerlines and pipelines (Todd Engineers, 2014). The land controlled by the NAWS China Lake is used for weapons research, development, acquisition, testing, and evaluation through the U.S. Navy.

Near the westerly and southeasterly City of Ridgecrest boundaries, the permitted zoning consists of residential zoning generally with a minimum lot size at 2.5 acres per dwelling unit, light industrial zoning, open space zoning, etc. The area between the City of Ridgecrest boundaries and the community of Inyokern contains primarily residential zoning districts with varying densities, while the areas northwest of Inyokern are residential and resource (primarily agriculture) zoning districts.

Zoning in the southwest portion of the IWVGB, commonly referred to as the El Paso area, consists primarily of open space, recreation (forestry), limited agriculture, and mobile homes. Lands in the El Paso area are largely uninhabited and are managed by BLM. As a result, significant groundwater extraction does not occur in this area due to the lack of water demands (see Section 3).

A breakdown of the Kern County lands overlying the IWVGB and their associated land use designations is provided in Table 2-5 and is shown in Figure 2-9.

Table 2-5. Zoning Districts in the Kern County lands overlying the IWVGB

Zoning District	Area (acres)	Area (%)
Other (China Lake)	28,236	11.2%
Exclusive Agriculture	452	0.2%
General Commercial	167	0.1%
Highway Commercial	287	0.1%
Light Industrial	1,837	0.7%
Limited Agriculture	7,442	3.0%
Limited Agriculture/Mobilehome	64,954	25.8%
Low-density Residential	136	< 0.1%
Medium-density Residential	14	< 0.1%
Medium Industrial	1,020	0.4%
Military	533	0.2%
Mobilehome Park	23	< 0.1%
Open Space	105,340	41.8%
Recreation-Forestry	11,848	4.7%
Residential	29,873	11.9%
Total	**252,162**[1]	**100%**

2.5.2.2 *Inyo County*

The Inyo County General Plan was approved by the Inyo County Board of Supervisors in 2001. In accordance with the 2001 General Plan, the Inyo County Planning Department is currently updating its Zoning Code and has subsequently released draft General Plan updates associated with the proposed updates to the Zoning Code. The Inyo County General Plan Update dated May 2013 was used to complete

[1] Kern County zoning data was obtained from the County of Kern Geodat Open Data Portal. Updated as of May 9, 2017. Note that not all Kern County lands overlying the IWVGB were given zoning district categories in the dataset.

this GSP, which will be appropriately updated in accordance with all updates to the Inyo County General Plan.

Section 8.5 of the 2001 Inyo County General Plan provides planning goals related to water resources including:

- Providing an adequate and high quality water supply to all users within the County;
- Protecting and preserving water resources for the maintenance, enhancement, and restoration of environmental resources; and
- Protecting and restoring environmental resources from the effects of export and withdrawal of water resources.

The vast majority of land in Inyo County is owned by either the federal government (~92%), the City of Los Angeles (~4%), and the state of California (~2.5%) (Inyo County Planning Department, 2013). Approximately 96% of the Inyo County land overlying the IWVGB is either owned by the US Navy as part of NAWS China Lake, or managed by the BLM (see Table 2-3 above). Approximately 98% of the Inyo County land overlying the IWVGB is zoned as open space (see Table 2-6 below). The community of Pearsonville, occupying approximately four-square miles, is zoned for various residential densities as well as some commercial and industrial zoning to compliment the community's highway-oriented businesses.

A breakdown of the Inyo County lands overlying the IWVGB and their associated zoning is provided in Table 2-6 and shown in Figure 2-10.

Table 2-6. Zoning Districts in the Inyo County lands overlying the IWVGB

Zoning District	Area (acres)	Area (%)
Commercial Recreation	5	< 0.1%
General Industrial and Extractive	167	0.3%
Heavy Commercial	15	< 0.1%
Highway Services and Tourist Commercial	25	< 0.1%
Light Industrial	29	< 0.1%
Multi-Family Residential	23	< 0.1%

Open Space		65,038	98.2%
Public		65	0.1%
Rural Residential		848	1.3%
	Total	**66,215**[2]	**100%**

2.5.2.3 *San Bernardino County*

The General Plan for San Bernardino County was last updated in 2007 and is currently in the process of being revised. The land just adjacent to the City of Ridgecrest's eastern boundary is designated as Rural Living, allowing for a maximum of one dwelling unit per 2.5 acre lot. This area contains less than one square mile of residential lots. Areas with a Resource/Land Management designations span over several miles to the east of China Lake and north of the Inyo County line. A majority of the land overlying the IWVGB within San Bernardino County is within the NAWS China Lake boundaries, as shown above in Table 2-3.

A breakdown of the San Bernardino County lands overlying the IWVGB and their associated zoning is provided in Table 2-7 and shown in Figure 2-11.

Table 2-7. Zoning Districts in the San Bernardino County lands overlying the IWVGB

Zoning District	Area (acres)	Area (%)
Resource Conservation	37,411	98.5%
Rural Living	574	1.5%
Total	**37,985**[3]	**100%**

[2] Inyo County zoning data was obtained from the County of Inyo Public Geographic Information Systems Page. Updated as of January 31, 2019. Note that not all Inyo County lands overlying the IWVGB were given zoning district categories in the dataset.

[3] San Bernardino County zoning data was obtained from the ArcGIS Hub – Open Data, in conjunction with the San Bernardino County Land Services Department. Updated as of May 3, 2018.

2.5.2.4 *City of Ridgecrest*

The City of Ridgecrest has direct land use jurisdiction within its city limits with the exception of the small portion of the city within NAWS China Lake. The community within and surrounding the City of Ridgecrest is strongly linked to supporting NAWS China Lake by providing housing and services for personnel and contractors at NAWS China Lake; accordingly, the City of Ridgecrest General Plan emphasizes both achieving growth and sustainably supporting the military installation.

2.5.2.5 *Federal Lands*

The US Department of Interior Bureau of Land Management prepares Resource Management Plans (RMPs) that serve as land management blueprints. The majority of southern California, including the Indian Wells Valley, is within the California Desert Conservation Area (CDCA). The CDCA comprehensive land-use management plan was completed in 1980 and revised in 1999. Additionally, the Indian Wells Valley is within the BLM's West Mojave Plan area which established a Habitat Conservation Plan for sensitive plants and species in the region.

The US Department of Interior has assigned land management responsibility of NAWS China Lake to the Navy. Consequently, the Navy has developed a Comprehensive Land Use Management Plan (CLUMP) for land use management and environmental resources management for NAWS China Lake.

2.5.3 Agricultural Land Use

There are approximately 3,086 acres of actively farmed land overlying the IWVGB[4]. Typically, each farm has its own well system and water delivery system for its respective crops. The primary crops grown in the Indian Wells Valley are pistachios (2,027 acres) and alfalfa (985 acres), with other miscellaneous crops (74 acres) such as miscellaneous grain and hay constituting a minority of production. A map of actively farmed land overlying the IWVGB is provided in Figure 2-12.

[4] Actively farmed land in the IWVGB was determined using the California Department of Water Resources' Crop Mapping 2014 GIS dataset. Updated as of March 13, 2018.

2.5.4 Industrial Land Use

There are no large-scale industrial land uses in the Indian Wells Valley. Since the 1920's, Searles Valley Minerals Corporation (SVM) has exported groundwater from wells in the eastern part of Ridgecrest to Searles Valley (located outside of the Indian Wells Valley) to support both its industrial operations and the domestic needs of the unincorporated communities of Trona, Westend, Argus, and Pioneer Point. Section V.C of the San Bernardino County General Plan maintains a countywide goal of promoting conservation of water and maximizing the use of existing water resources by promoting activities and measures that facilitate the reclamation and reuse of water and wastewater, including for industrial uses. Implementation of this GSP will impact the potable water demands of industries in San Bernardino County (i.e. Searles Valley Minerals Corporation) that rely on the IWVGB for water supplies. This GSP will therefore impact the water supply assumptions for San Bernardino County industry set forth in the San Bernardino General Plan (see Section 4 for further details on impacts to industrial water demands).

Commented [KJDCNSA1]: This isn't fully correct – SVM's wells (historic and current) are literally in downtown Ridgecrest (i.e. why 'Kerr-McGee Center' is named such) and to the west with wells along Ridgecrest Blvd west of Mahan Street and west of Jacks Ranch Road.

Commented [KJDCNSA2]: As provided in prior Navy comments for Section 3 in June, a reference on the development of the "Valley Water System" is "Trona", (Cole, O.N.; High Desert Scribe, Trona, CA. 1984). Cole states that the Valley Water System from IWV was completed in 1939. As written, this section may overstate the period of water pumping by SVM and predecessors, assuming that Cole is correct.

2.6 EXISTING WATER RESOURCES MONITORING PROGRAMS

2.6.1 Background

Multiple entities have been measuring depth to groundwater in the IWVGB since the 1920's. Monitoring programs were first initiated in the IWVGB by the United States Geological Survey (USGS) and have been primarily conducted by KCWA since 1989 with the assistance of the Water District, the United States Bureau of Reclamation (USBR), and the NAWS China Lake. Additionally, many of these entities have constructed wells dedicated solely to monitoring groundwater levels in the IWVGB.

Prior to formation of the IWVGA, monitoring efforts in the IWVGB were often duplicated due to a lack of communication among interested parties. In 1995, the Cooperative Group was formed to coordinate monitoring and management efforts, share data, and avoid the redundancy of groundwater study efforts. As a public data-sharing group consisting of the major water producers, government agencies, and concerned citizens in the IWVGB, the Cooperative Group compiled numerous study efforts in the IWVGB including a basin-wide recharge study, the construction of weather and stream gages, and a monitoring program involving over 100 monitoring wells. The Cooperative Group published its compiled monitoring data, including historical reported pumping and basin studies, on its website:

http://iwvgroundwater.org/

The Cooperative Group was designated as the California Statewide Groundwater Elevation Monitoring (CASGEM) monitoring entity for the IWVGB per a DWR letter dated November 18, 2011. The status of CASGEM monitoring entity was transferred to the IWVGA in January 2018 as part of the IWVGA's initial SGMA compliance efforts.

The following sections summarize the existing water resources monitoring programs that are on-going within the IWVGB. These programs are conducted by a variety of agencies and are now being incorporated into the SGMA compliance efforts overseen and managed by the IWVGA. Data obtained through the existing water resource monitoring programs helped populate the IWVGA's Data Management System (see Section 2.8), and the data was used to develop alternative groundwater basin management strategies (see Section 4).

2.6.2 KCWA Groundwater Monitoring Programs

The KCWA measures depth to groundwater in over 200 monitoring wells in the IWVGB consisting of a network of private and public water production wells and monitoring wells. Field measurements of water levels are conducted semiannually in October and March at periods of historical groundwater demand peaks and minimums. The water level data is collected, analyzed, and plotted onto contour maps to depict groundwater depths, groundwater elevations, and changes in groundwater elevation over time. The contour maps portray how the IWVGB spatially reacts to groundwater extractions across the Indian Wells Valley. The contour maps and hydrographs are updated annually by KCWA and can be viewed at the IWVGA's Data Management System (see Section 2.8), which can be accessed at www.iwvgsp.com.

KCWA also collects water quality samples and monitoring wells for analysis. The water quality results can then be plotted on contour maps and a variety of other types of diagrams and graphs.

The data collected from monitoring groundwater levels and water quality are archived in the IWVGA's Data Management System, which contains groundwater level data dating back to 1946 and water quality data dating back to 1952.

The locations of the KCWA monitoring wells and other monitoring wells in the IWVGB are provided in

Figure 2-13.

2.6.3 CASGEM

A subset of the data from approximately 40 of the over 200 wells monitored throughout the IWVGB are submitted to DWR as part of their CASGEM program. CASGEM requires each individual groundwater basin to develop a representative groundwater level monitoring program to assist with tracking change in groundwater levels, and consequently changes in the volume of water stored in the groundwater basin. The CASGEM program aides in identifying the seasonal and long-term trends in the IWVGB. The locations of the IWVGB CASGEM wells are provided in Figure 2-13. A selection of these CASGEM wells served as representative monitoring sites while evaluating impacts and management actions and subsequently served as the locations where sustainability criteria were set (see Section 5).

2.7 EXISTING WATER RESOURCES MANAGEMENT PROGRAMS

2.7.1 Background

It has been well documented that the IWVGB has been in overdraft since the 1960s and that current basin outflows exceed basin inflows by approximately four times (see Section 3.3.4.4). Water resources management programs in the IWVGB have been implemented by a variety of entities to address conditions of basin overdraft. In many instances, these water resources management programs have resulted in curtailment of historical pumping to reduce the impacts of over-pumping.

The water resources management programs that are **not** currently practiced in the IWVGB include replenishment of groundwater extractions; conjunctive use and underground storage; and diversions to storage. The following section summarizes the existing and on-going water resources management programs administered in the IWVGB. Proposed water resources projects and management actions that will be primarily managed by the IWVGA are discussed in Section 4.

2.7.2 Salt and Nutrient Management Plan

A Salt and Nutrient Management Plan (SNMP) for the IWVGB was finalized in March 2018 and accepted by the LRWQCB. The SNMP (RMC, et al., 2018) was prepared as a high-level planning document to inform

the monitoring and implementation elements being developed for this GSP. The SNMP provides an overview of basin characteristics, groundwater conditions, historical groundwater production, and existing groundwater quality. In addition, the SNMP:

- Identifies sources of additions/withdrawals of both salts (such as Total Dissolved Solids) and nutrients (such as Nitrate);
- Analyzes current assimilative capacity for salts and nutrients;
- Projects trends in water quality and loading;
- Analyzes water quality conditions against the water quality objectives described in the Basin Plan;
- Discusses existing and potential water resources practices that do and may impact basin water quality; and
- Provides a proposed preliminary water quality monitoring program.

2.7.3 Conservation Programs

2.7.3.1 *Water District Demand Management Measures*

The Water District has implemented water conservation programs in an attempt to reduce annual groundwater extractions. The Water District has achieved a 30% reduction in total water demand as a result of implementing a four-tier water rate structure along with various water conservation Ordinances issued by the Water District and the City of Ridgecrest. The Water District Ordinances include:

- Water District Ordinances 90 and 91 (adopted in 2009; rescinded in 2015)
    - Landscaping restrictions for new single-family/multi-family residential, commercial, and institutional buildings
- Water District Ordinances 98 and 99 (adopted in 2015)
    - Implementation of an Approved Plant List for landscaping
    - Mandated use of low volume irrigation systems, high efficiency sprinkler heads, pressure regulators, and master shut-off valves
        - Subsurface drip irrigation required on areas less than 10 feet wide
- Water District Ordinance 100 (adopted in 2016; rescinded in 2017)
    - No water user shall waste water; prohibits washing down hard or paved surfaces for strictly aesthetic purposes

  - Prohibit vehicle washing except by use of a hand-held bucket or hand-held nose equipped with a shut-off nozzle or device
  - Irrigation only between 8:00 AM – 8:00 PM; irrigation limited to 3 days per week based on addresses (1 day per week from November through February)
  - Restaurants shall only serve water on request
  - Turf or ornamental landscapes shall not be irrigated within 48 hours after measureable precipitation
  - Hotel/motel operators shall provide guests the option of choosing not to have towels and linens laundered daily
  - Prohibits recreational fountains or decorative water features
- Water District Ordinance 101 (adopted in 2017)
  - Implementation of the 2017 Water Shortage Contingency Plan
    - Actions for two stages of local water shortages and a drought state of emergency
- Water District Ordinance 103 (adopted in 2017)
  - Irrigation limited to 3 days per week during all months

The Water District has hosted community outreach events (e.g. school education programs) to raise awareness of water conservation practices such as the use of appropriate desert landscaping. At these and other local events, the Water District has distributed water conservation fixtures including 3,746 low-flow showerheads; 5,256 low-flow hose nozzles; 880 shower timers; 2,480 faucet aerators; 3,514 water tumblers; and 2,339 moisture meters. The Water District's "Cash for Grass" Rebate Incentive Program offers rebates to property owners who elect to replace lawns with eligible low water-use landscaping. To supplement its ongoing conservation practices, the Water District manages a digital customer engagement portal that allows the Water District and its customers to track and analyze customer water use, conservation practices, ordinance violations, leakage incidents, etc.

2.7.3.2 *City of Ridgecrest Demand Management Measures*

Similar to the Water District, the City of Ridgecrest has adopted water conservation Ordinances to reduce demands. The Ordinances include:

- City of Ridgecrest Ordinance 09-05 (adopted in 2009)
  - Similar irrigation restrictions to Water District Ordinance 100

- City of Ridgecrest Ordinance 16-01 (adopted in 2016; supersedes Ordinance 09-05)
    - Water-efficient landscaping and irrigation scheduling
    - Promoted use of recycled water and greywater
    - Promoted stormwater management practices

2.7.3.3 *Navy Water Use*

Naval Air Weapons Station (NAWS) China Lake consists of two major land areas: the North Range, encompassing 606,926 acres (245,615 hectares), and the South Range, encompassing 503,510 acres (203,764 hectares). The North Range lies in portions of Inyo, Kern, and San Bernardino counties and the South Range is located entirely within San Bernardino County. Mainsite and Headquarters areas, which are in the southern boundary of the North Range, adjoin the City of Ridgecrest on the south. The NAWSCL laboratories and ranges support the Navy's research, development, acquisition, test, and evaluation (RDAT&E) of cutting-edge weapons systems critical to national defense and create over 9,900 direct, indirect, and induced jobs within the region.

Water sustainability is critical to military sustainability, resiliency, and compatibility. The IWVGB is the sole source of potable water for NAWS China Lake and the neighboring communities. The Navy operates production wells in the Indian Wells Valley (IWV) that supply the water needs on-Station. Production wells operated and maintained by the Indian Wells Valley Water District and domestic wells in the unincorporated areas of the IWV provide water to the Navy affiliated staff (made up of scientists, engineers, technicians, and professionals) and their dependents that reside off-Station. These personnel are critical to supporting the mission at NAWS China Lake.

The California Sustainable Groundwater Management Act (SGMA) provides that the federal government, appreciating the shared interest in assuring the sustainability of groundwater resources, may voluntarily agree to participate in the preparation or administration of a groundwater sustainability plan, per Water Code Section 10720.3. Recognizing this shared interest, NAWS China Lake has voluntarily engaged in the development of the Groundwater Sustainability Plan for the IWVGB by the Indian Wells Valley Groundwater Authority (IWVGA).

While welcoming federal government participation, SGMA recognizes Federal Reserve Water Rights (FRWR) as distinct from those water rights based in state law and directs that Federal Reserve Water Rights be respected in full, and in case of any conflict between federal and state law, federal law shall prevail. Water Code § 10720.3(d). SGMA also directs that the groundwater sustainability agency consider the interests of all beneficial uses and users of groundwater, listing the federal government, including, but not limited to, the military and managers of federal lands among those interests. Water Code § 10723.2.

Under U.S. Supreme Court case law defining the FRWR, federal agencies have an implied right to water to support the primary mission for which Congress and the Federal government have designated that land, including a provision of water for growth to support that mission.[5] It is well established in the Supremacy Clause of the U.S Constitution, Article VI, Clause 2, that the Federal Government is not subject to state regulation, unless Congress clearly and unambiguously waives this sovereign immunity. There is no such waiver for state regulation of groundwater, except in the case of a comprehensive state court adjudication of all rights to water, as expressed in the McCarran Amendment (43 U.S.C § 666).

Consistent with its proactive and cooperative engagement with IWVGA, NAWS China Lake has a vested interest in participating in the SGMA effort to support a groundwater basin that achieves a sustainable yield. NAWS China Lake may voluntarily agree to an allocation under the GSP less than its full FRWR. In recognition and acknowledgment of the limits on IWVGA to regulate the federal government, any such allocation shall be directly assigned to the federal agency and shall not be subject to the requirements of any allocation ordinance, including but not limited to allocation carryovers, borrowing, transfers, reductions and/or variances and fees.

Although not subject to formal regulation under SGMA, NAWS China Lake is committed to being a good steward of water resources and to exploring partnerships that help to achieve groundwater sustainability, including projects that benefit both the Navy and the community.

The Cooperative Group's recorded production data indicates that the Navy has been a major pumper in the IWVGB historically (e.g. as much as 5,000 AFY in 1975). The Navy has since achieved a 53% reduction in groundwater pumping due to a combination of instituted conservation measures and a shift from on-base housing of Navy personnel to off-base housing within Ridgecrest.

As a member of the Cooperative Group, the NAWS China Lake has committed to explore the potential for water resources management programs that benefit the IWVGB, including water conservation efforts. In its "Water Conservation Public Advisory" dated June 2008, the Cooperative Group (including the Navy) developed strategies to reduce unnecessary and/or excessive water uses to support the sustainable management of the IWVGB.

The NAWS China Lake's Integrated Natural Resources Management Plan (INRMP) dated June 2014 describes the Navy's implementation of natural resources programs at NAWS China Lake, including water resources management. In its 2014 INRMP, the Navy emphasizes a water conservation program focused on xeriscaping, a landscaping method based on the use of native or drought-resistant plants, in addition

Commented [KJDCNSA3]: The FRWR was first recognized by the U.S. Supreme Court in the context of tribal interests (*See Winters v. United States*, 207 U.S. 564 (1908)) and subsequently expanded to federal agencies (*See Cappaert v. United States*, 426 U.S. 128 (1976)), *Federal Power Commission v. Oregon*, 349 U.S. 435 (1955)).

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to efficient irrigation practices that require less water. Principles of xeriscaping include using gravel or plastic/rubber-based products to preclude weed growth and enhance water retention; using ground cover to prevent blowing dust and soil erosion; watering using automatically controlled cycles during low evaporation periods; and using drip irrigation whenever possible. The 2014 INRMP discourages the addition of new lawn areas except where functionally essential (i.e. in areas used for ceremonies, family housing, recreation fields, and children's playgrounds).

~~At the IWVGA Pumper Group Allocation meeting on October 1, 2018, the Navy indicated its short term future water needs to be approximately 2,041 AFY, which includes a 25% increase in current water use. This estimation is **not** indicative of the Navy's federal reserve groundwater right, which has yet to be quantified and is not subject to the provisions of SGMA.~~

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2.7.3.4 ~~-~~*Opportunities for Additional Conservation*

Opportunities for implementation of additional conservation measures are discussed in Section 4.

2.7.4 Efficient Water Management Practices

The Water District prepared its "2015 Urban Water Management Plan" (2015 UWMP), dated June 2016, which includes a discussion of efficient water management practices in Section 6.B.7 "Prohibitions, Penalties, and Consumption Reduction Methods". The following is a brief summary of these efficient water management practices.

2.7.4.1 *Mandatory Prohibitions on Wasting Water*

The Water District has adopted a Water Efficient Landscape Ordinance (Ordinance No. 93) and Ordinance No. 100 regarding emergency water conservation mandatory restrictions. The City of Ridgecrest adopted a Water Efficient Landscape Ordinance (Ordinance No. 16-01). These ordinances have common requirements, including but not limited to:

- Prohibiting runoff from landscape irrigation;
- Prohibiting wash down of hard or paved surfaces;
- Prohibiting water leaks;
- Prohibiting use of a hose without a shut-off nozzle;

- Prohibiting landscape irrigation on the surface, except for hand watering or the use of a drip irrigation system, between the hours of 8:00 a.m. and 8:00 p.m. during the months of May, June, July, August, September, and October, unless a special permit is issued to accommodate newly planted material;
- Requiring new plumbing fixtures to conform to requirements of law as to flow capacity.

2.7.4.2 *Water Efficient Landscaping*

The Water District has implemented numerous water-efficient landscape requirements, which include:

- Prohibiting turf in the front yard;
- Limiting plants in front yards to those provided in a Water District-approved list;
- Prohibiting front yard irrigation systems that are not low-volume;
- Requiring use of high-efficiency irrigation sprinkler heads;
- Prohibiting irrigation runoff.

2.7.4.3 *Excessive Use Penalties*

The Water District has adopted a tiered water rate structure which rewards customers that conserve water through lower water rates. Furthermore, customers that consistently waste water may be subject to having flow restrictions placed on their meters.

2.7.5 Recycled Water Use

California Water Code Section 13050(n) defines "recycled water" as water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur. There are currently two wastewater treatment facilities (WWTFs) within the IWVGB: The City of Ridgecrest WWTF[6], and the Inyokern CSD WWTF. IWVGB residents that do not contribute flow to either of these WWTFs use septic tanks to dispose of wastewater.

[6] A Memorandum of Agreement dated April 1, 1993, between the Navy and the City states that the City owns and operates the WWTF, though there is a general lack of consensus among the IWVGB stakeholders regarding the ownership and operations of the WWTF. The term "City WWTF" is used in this GSP for the sole purpose of distinguishing between the two existing WWTFs in the IWVGB.

Prior to 1974, the City of Ridgecrest Sanitation District operated a small WWTF in the eastern portion of the City, near the eastern City limits. At that time, the Navy operated its own separate WWTF on the NAWS China Lake. To address capacity problems, the City abandoned its old WWTF and consolidated the two treatment facilities to treat combined flow from the City and from the NAWS at a common plant. The City has since operated the existing 3.6 million gallon per day (MGD) WWTF located on the NAWS base, approximately 3.5 miles northeast of the City center. Annual average day flows at the WWTF were approximately 2.44 MGD (2,739 AFY) in 2017. The City WWTF provides primary wastewater treatment through a series of headworks and sedimentation tanks. Secondary treatment occurs in a series of on-site facultative ponds with clay linings.

The City of Ridgecrest's WWTF is currently the only facility which generates a recycled water supply for direct beneficial or controlled use within the IWVGB. The City WWTF produces recycled water that is applied at a City site for alfalfa irrigation and at the NAWS China Lake for golf course irrigation. The remaining treated wastewater generated at the City WWTF is discharged to evaporation/percolation ponds at the City WWTF site.

Independent of this GSP, the City is currently planning to upgrade, expand, and potentially relocate the existing City WWTF. The City plans to abandon and demolish the existing City WWTF for construction of a new oxidation ditch secondary treatment plant with new evaporation/percolation ponds and new solids handling facilities (Provost & Pritchard, 2015). The City has evaluated constructing new recycled water facilities including tertiary treatment trains (filtration and disinfection) at the new WWTF, a recycled water storage tank, a recycled water pump station, and a purple pipe distribution system. The new recycled water facilities would provide up to 1.8 MGD (2,016 AFY) of recycled water for City use in landscape irrigation and/or groundwater recharge (Provost & Pritchard, 2015). The City is considering two (2) potential sites for the new WWTF: (1) the existing WWTF site, or (2) the old City WWTF site. The new WWTF location will depend on ongoing easement and land use negotiations between the City and the Navy.

The Inyokern CSD also operates a small WWTF with an approximate capacity of 0.035 MGD to treat wastewater from residents within its service area. The final effluent generated at the Inyokern WWTF is currently not of sufficient quality for any beneficial uses of recycled water and is instead disposed of through evaporation/percolation ponds located at the Inyokern WWTF site.

2.7.5.1 *Alfalfa Irrigation*

Approximately 220 AFY of recycled water (secondary-treated wastewater) from the City WWTF has been historically used to irrigate 30 acres of alfalfa located at the old City WWTF site. The alfalfa is commonly sold by the City for use in cattle feed. The July 2019 Searles Valley earthquakes caused disruptions to the City WWTF and prevented the City from irrigating its alfalfa for the 2019 growing season. The City plans to continue its alfalfa irrigation with recycled water until the new WWTF with recycled water facilities is constructed, at which point the City plans to instead apply recycled water (tertiary-treated wastewater) for landscape irrigation and/or groundwater recharge.

2.7.5.2 *NAWS China Lake Golf Course*

The Navy receives secondary-treated effluent from the City WWTF and provides additional treatment for beneficial use on a golf course. The Navy uses a chlorine contact basin to provide additional treatment of the effluent. A Negotiated Sewer Service Contract between the City and the Navy reserves up to 750 AFY of treated wastewater from the City WWTF for irrigation of the golf course located at the NAWS China Lake. However, it has been noted that the golf course only uses approximately 500 AFY of water (Provost & Pritchard 2015).

2.7.5.3 *Evaporation/Percolation Ponds*

The City WWTF site contains four (4) evaporation/percolation ponds which may receive secondary-treated effluent that is not supplied for alfalfa irrigation or golf course irrigation. Wastewater stored in these ponds evaporates or percolates into either the underlying shallow groundwater aquifer or the Mohave Tui Chub habitat located north of the City WWTF.

The Mohave Tui Chub are an endangered species of fish native to the Mohave River. Due to numerous alterations to its native habitat, the United States Fish and Wildlife Service and California Department of Fish and Wildlife relocated a population of the Tui Chub to the NAWS China Lake during the 1970s. The Tui Chub habitat at China Lake consists of two seeps, referred to as Lark Seep and G-1 Seep. The two seeps are connected through a series of man-made channels, which were originally constructed during the 1950s and 1960s to divert seeping groundwater away from nearby roads and facilities. The habitat inflows include seepage from the City WWTF ponds, irrigation percolation from the China Lake golf course, and

various contributions from the City of Ridgecrest area (e.g. irrigation percolation, wash-down, commercial water discharge, and transmission line leaks) (ERS 1991).

The Navy prepared a preliminary habitat management plan (HMP) for the Mohave Tui Chub (ERS, 1991) in response to a Biological Opinion issued by the U.S. Fish and Wildlife Service. The HMP proposed actions to protect and maintain the Mohave Tui Chub habitat, including construction of a water delivery system to discharge water to the existing seeps and channels in the habitat. No additional steps have been taken to implement any potential protection or maintenance plans for the Tui Chub habitat, although it has been proposed that an evaluation be conducted on potentially relocating the Tui Chub in the near future to potentially increase the amount of recycled water available in the IWVGB. Recycled water that would become available as a result of Tui Chub relocation may be used to either meet existing water demands to reduce groundwater extractions or serve as a source of groundwater recharge for the IWVGB.

SGMA requires that all beneficial uses and users, including Groundwater Dependent Ecosystems (GDEs), be considered in the development and implementation of GSPs. GDE identification must be included in the GSP to determine whether groundwater conditions are having potential effects on any and all beneficial uses and users within the basin. Additionally, GDE management must be incorporated into the sustainable management criteria established as part of the GSP. The location of the Mohave Tui Chub habitat coincides with GDEs identified in DWR's Natural Communities Commonly Associated with Groundwater (NCCAG) dataset. Further definition of and discussion on GDEs in the IWVGB is provided in Section 3.4.5 and in Section 4.

2.7.6 Groundwater Contamination Cleanup

The United States Department of Defense initiated the Installation Restoration Program (IRP) in 1980 to identify, investigate, and remediate or control the release of hazardous substances that resulted from past waste disposal operations and hazardous material spills at military facilities. Per the Navy's 2014 INRMP, NAWS China Lake is assessing and remediating areas of past contamination on its ranges through the IRP, including sites of possible and confirmed groundwater contamination. A list of these sites along with their cause of contamination and remediation status is provided in Appendix ---.

Sites of possible and confirmed groundwater contamination are made publicly available on GeoTracker, the State Water Resources Control Board's (SWRCB's) data management system for sites that impact, or

have the potential to impact, water quality in California. The data available on GeoTracker includes site characteristics (e.g. case number, site location, cleanup status, responsible parties, affected water resources) as well as site actions (e.g. project activities, compliance responses, milestone tracking, land use controls, risk to water quality assessments). GeoTracker also provides public records such as regulatory communication and decision documents for each site.

Figure 2-14 shows the sites of possible and confirmed groundwater contamination located in the IWVGB, including:

- Sites that require cleanup
    - Leaking Underground Storage Tank (LUST) sites
    - Department of Defense Sites
    - Cleanup Program Sites
- Permitted facilities
    - Operating Permitted Underground Storage Tanks (USTs)
    - Land Disposal Sites

2.7.7 Well Permitting Policies and Procedures

2.7.7.1 *Kern County*

Nearly all water supply wells in the IWVGB are located within the jurisdiction of Kern County. Well standards for both water supply and monitoring wells within Kern County are provided in Title 14, Chapter 14.08, Article III of the Kern County Municipal Code. Per Kern County Municipal Code Section 14.08.210, the standards for the construction, repair, reconstruction, or destruction of wells within Kern County are set forth in DWR Bulletin 74-81 "Water Well Standards, State of California" and all subsequent supplements and revisions. The construction, reconstruction, deepening, or destruction of any well requires filing a valid application for a permit with the Kern County Public Health Services Department (Kern County PHSD), and subsequent approval of the application. All abandoned wells within Kern County are to be destroyed within ninety (90) days of abandonment.

In July 2017, the Kern County Board of Supervisors approved an ordinance adding Sections 14.08.113 and 14.08.285 and amending Section 14.08.290 of Title 14, Chapter 14.08 of the Kern County Municipal Code.

The ordinance requires that all new private domestic, public domestic, industrial, agricultural, and any reconstructed or upgraded wells be installed with water flow meters or equivalent devices/methods for water measurement.

The Kern County PHSD administers a "Water Wells Program" to manage the permitting and compliance requirements for groundwater wells (both monitoring wells and drinking water wells) in the Kern County portion of the IWVGB. The Water Wells Program ensures that the public receives water that is safe to drink and that the quantity of water supplied is adequate to meet the community's needs. The Water Wells Program is responsible for processing applications and issuing permits for the following:

- Monitoring Wells
- Drinking Water Wells
- Well Destruction
- Well Driller Registration
- Water Supply Certification

Guidance and information are provided on the Water Wells Program website (https://kernpublichealth.com/water-wells/) including information on the following:

- Agriculture Well Permit Guidelines
- Domestic Well Permit Guidelines
- Well Destruction Procedures
- Disinfection Procedures, Laboratories, and Sampling
- List of Approved Drillers and Sealing Material
- Water Well Site Location Requirements

The Kern County PHSD maintains a listing of well information collected through administration of the Water Wells Program.

The Kern County PHSD also administers a Small Water Systems Program aimed at ensuring the quality and quantity of water supplied to meet user demands in State Small Water Systems (between 5 and 14 service connections) and Non-Public Water Systems (between 2-4 service connections). The Small Water Systems

Program assists small water systems by monitoring water quality, processing permits and inspections, and managing system maintenance.

Guidance and information are provided on the Small Water Systems Program website (https://kernpublichealth.com/water-wells-small-water-systems/) including information on the following:

- Water Supply Certification Application
- Permitting Process for State Small Water Systems and Non-Public Water Systems
- Intended Use Statements
- Laboratories and Sampling Services

2.7.7.2 *Inyo County*

The Inyo County Environmental Health Department administers a Small Water System Program to manage the permitting and compliance requirements of 105 active public and state small water systems throughout Inyo County, including:

- 30 Community systems with between 25 and 199 residential service connections or 25 or more yearlong residents;
- 11 Nontransient Noncommunity systems such as schools, institutions, and places of employment;
- 47 Transient Noncommunity systems such as restaurants and campgrounds, and resorts; and
- 16 State Small systems that serve between 5 and 14 residential service connections but less than 25 yearlong residents.

Guidance and information on permit applications for new systems are provided on the Small Water Systems Program website (https://www.inyocounty.us/EnvironmentalHealth/drinking_water.html). The Inyo County Environmental Health Department maintains a database of well information collected through administration of the Small Water System Program.

2.7.7.3 *San Bernardino County*

The San Bernardino County Environmental Health Services administers a "Safe Drinking Water Program" and "Small Drinking Water Systems Program" which, in part, manages the permitting and compliance requirements for groundwater wells and 272 existing small drinking water systems.

The Safe Drinking Water Program is responsible for processing applications and issuing permits for the following:

- Well Permits
- Well Drillers Registration

Guidance and information are provided on the Safe Drinking Water Program website (http://wp.sbcounty.gov/dph/programs/ehs/safe-drinking-water/) including information on the following:

- Well Abandonment
- Private Domestic Well Owners
- Typical Well Requirements
- Well Sharing

The San Bernardino County Environmental Health Services maintains a database of well information collected through administration of the Safe Drinking Water Program and Small Drinking Water Systems Program.

2.7.7.4 *IWVGA Policies*

The IWVGA adopted a groundwater extraction fee on July 19, 2018 (Ordinance No. 02-18) under the authority granted by California Water Code Section 10730. In addition to authorizing the collection of fees, California Water Code Section 10725(a) authorizes the IWVGA to "perform any act necessary or proper to carry out the purposes of this part [SGMA]". In order to implement the groundwater extraction fee, the IWVGA required that all wells subject to the fee register their wells with the IWVGA. All groundwater pumpers in the IWVGB are subject to the groundwater extraction fee except for the following:

- Federal entities (U.S. Navy and United States Department of Interior, Bureau of Land Management); and
- Small pumpers defined as "de minimis extractors" or those who extract, for domestic purposes, two acre-feet or less per year (California Water Code Section 10721(e)).

As part of the preparation of this GSP, the IWVGA oversaw a basin-wide well registration process to formally document the existence and operation of wells subject to the groundwater extraction fee (i.e. all wells in the IWVGB except those owned by federal entities or by de minimis extractors). During the well registration process, well owners were required to provide the IWVGA's Water Resources Manager (WRM) with registration information including the following:

- Name and contact address of the well owner;
- Point of contact of the well operator;
- Well location;
- Name and address of the owner of land upon which the well is located;
- Description of the method used by the well owner and operator to measure groundwater extractions from the well;
- A statement describing whether the extracted groundwater is used for residential, commercial, industrial, or agricultural purposes, or a combination thereof; and
- Any other information that the IWVGA's General Manager deems necessary to achieve the legal purposes of the IWVGA.

The fee is determined and paid on a monthly basis by all producers with registered groundwater extraction facilities in the IWVGB. Unregistered groundwater extraction facilities that are subject to the groundwater extraction fee are prohibited from extracting groundwater from the basin until the facility is registered to the satisfaction of the WRM, which oversees the registration of groundwater extraction facilities and reviews producers' self-reported measurements of groundwater extractions.

2.8 DATA MANAGEMENT SYSTEM (DMS)

2.8.1 Purpose and Development

The IWVGA developed a web-based geo-Database Management System (DMS) consistent with the DWR

requirements for a GSP provided in Title 23 Section 352.6 of the California Code of Regulations: "Each agency shall develop and maintain a data management system that is capable of storing and reporting information relevant to the development or implementation of the Plan and monitoring of the basin." Development of the DMS occurred under two phases. Phase I work consisted of development of the DMS framework and structure, and Phase 2 work consisted of establishing monitoring protocols, database population, installation of equipment, and integration with the GSP to ensure its long-term success.

As part of on-going groundwater management activities, the DMS will be used to track sustainability goals and objectives for the IWVGB as part of the GSP. The DMS stores and presents specific supporting elements of the GSP, including monitoring, reporting, and management criteria. Other elements supporting the GSP are also stored in the DMS, including a water budget, hydrogeologic conceptual model, and supporting documentation. Data obtained through the current water resource monitoring and management programs helped populate the DMS, and that data was used to develop alternative groundwater basin management strategies (see Section 4).

The DMS provides the public with access to data that would be infeasible to deliver through more traditional printed report format. These types of data sets and information include the following:

- Searchable electronic library of reports regarding Indian Wells Valley water resources;
- Access to a copy of the full database of well information (including well logs if available) covering the basin, including information on all known well sites; and
- Data for the Groundwater Monitoring Plan.

2.8.2 User Access and Privileges

The DMS was developed with a tiered security structure limiting the data that can be accessed based on the user's login information. The DMS's security structure may also limit the functionality of the system based on the user's login. For example, the general public has a public user level, meaning that the general public is limited to either viewing GSP data or viewing/downloading GSP reports. The general public cannot manage, edit, or upload any data on the DMS. Furthermore, the general public does not have access to confidential documents.

The DMS has a pre-programmed default username and password so that any general user may easily access the DMS. To access the DMS, the general public may visit the website listed below and click the "Log In" button and subsequent "log on" button. Doing so will direct the user to the DMS homepage at the public user level using the default username and password.

https://www.iwvgsp.com

2.9 REFERENCES

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West Katzenstein Comments on Draft Sec 2

“ I have reviewed 'Section_2_Draft_09.03.19_clean'.

I see no significant errors or omissions in the document. It is well written and comprehensive.

I did find one minor wording error on page 2-19. The sentence in question is:

'KCWA also collects water quality samples and monitoring wells for analysis.'

I believe the word 'and' should be replaced with 'at'.

West

The page intentionally blank

From: Renee Westa-Lusk PAC Member

SUBJECT: Comments on Groundwater Sustainability Plan Section 2 Plan Area

Page 7 Section 2.2.3 Classification

No. 8 reads as follows:

8) **Any other information determined to be relevant by the department, including determined to be relevant by the department, including adverse impacts on local habitat and local streamflows.**

I recommend deleting "including determined to be relevant by the department" (underlined above). If you do not delete it the sentence needs to be reworded so it makes sense.

Pages 13-14 Section 2.4.5 Indian Wells Valley Cooperative Groundwater Management Group

This section needs to be rewritten as the Indian Wells Valley Cooperative Groundwater Management Group does not exist in the form described in this paragraph. Many of the members have resigned such as NAWS China Lake, Indian Wells Valley Water District, KCWA, and Kern County (these organizations used to be members and resigned from May to September in 2018). The last meeting I was aware of took place September 20, 2018. I believe the organization may not be continuing to function this past year. The paragraph needs to be written in the past tense as this organization did these things when it was active and functioning with these past government agency members---but they are no longer members.

Pages 17-18 Table 2-5, Figure 2-9 (Zoning Districts Kern County IWVGB)
Section 2.5.2 Summary of General Plans and Other Land Use Plans and 2.5.2.1 Kern County

-Table 2-5 and Figure 2-9 Do not match. The reader is referred and led to believe the zoning districts listed in 2-5 will be shown in Figure 2-9 by the sentence above Table 2-5 which states "A breakdown of the Kern County lands overlying the IWVGB and their associated land use designations is provided in Table 2-5 and is shown in Figure 2-9." The following zoning districts are missing:

Table 2-5 is missing "Estate Designation"

Figure 2-9 is missing: 1) Other (China Lake), 2) Military, 3) Residential

If Figure 2-9 is using other "zoning districts" to pick up the 3 missing ones listed above then it needs to be put in the key box on the map.

Page 19 Section 2.5.2.2 Inyo County

6 th line from the top of the page: "of NAWS China Lake , or managed by BLM (see Table 2-3 above)."

I recommend changing to: " (see Table 2-3 on page 6)." This helps the reader find Table 2-3 more quickly.

Figure 2-10 Zoning Districts (Inyo County) IWVGB

Colors used to represent 3 of the zoning districts on this map look the same, cannot tell them apart. The following zoning district colors look the same: 1) Multi-Family Residential, 2) Rural Residential, and 3) General Industrial and Extractive. I recommend colors with more contrast to each other be used to represent these 3 zoning districts.

Page 20 Section 2.5.2.3 San Bernardino

6 th printed line below section heading. "IWVGB within San Bernardino County is within the NAWS China Lake boundaries, as shown above in Table 2-3."

I recommend changing to "as shown on page 6 in Table 2-3."
This helps the reader find Table 2-3 more quickly.

Figure 2-12 (related to Page 21 Section 2.5.3 Agricultural Land Use)

On the map, what do the light gray areas adjacent to the dark gray areas that are "urban" areas represent? Should a light gray area be put into the key of the map to represent less dense population areas?

Pages 22-24 Section 2.6 Existing Water Resources Monitoring Programs Figure 2-13

The reader is led to believe there are 100 CASGEM wells plus 200 KCWA wells being monitored. However when you look at Figure 2-13 there are at most maybe around 150 wells shown on the map that are being monitored. There is no mention in the paragraphs from pages 22-24 of Navy wells being monitored. Yet in Figure 2-13 there are 3 types of wells being monitored: CASGEM, KCWA, and Navy wells. Is the purpose of Figure 2-13 to show only location of some of the wells being monitored without regard to the total number of wells being monitored?

I recommend that a paragraph be put in about the Navy monitoring their wells and some of the KCWA wells that are monitored by the Navy.

I recommend some statement be put into about the number of each type of well being shown on the map. There are 3 types of wells being monitored (CASGEM, KCWA, Navy).

Pages 27-28 Section 2.7.3.3 Navy Water Use

In these paragraphs it refers to the IWV Cooperative Groundwater Management Group (CGMG) as if it is still functioning like it did in the past. It also states the Navy being a member and to my knowledge the Navy resigned its position on the CGMG before September 2018.

Page 33 Section 2.7.6 Groundwater Contamination Cleanup

How does the reader access SWRCB's data management system (GeoTracker)?

I recommend this be written into this section. Instructions were given how to access other

systems of information in other parts of Section 2.

Page 34 Section 2.7.6 Groundwater Contamination Cleanup and Figure 2-14

What is contained on page 34 regarding "Sites that require cleanup"and "Operating Permitted Underground Storage Tanks (USTs)" is not accurately reflected in the map key in the lower right hand corner of Figure 2-14.

Please see contents of page 34 compared to contents of map key in Figure 2-14 below to see the inconsistencies or discrepancies:

Page 34	Map key Figure 2-14
Sites that require cleanup	
Cleanup Program Sites	**Cleanup Program Site**
Leaking Underground Storage Tank(LUST) sites	**LUST Cleanup Site**
Department of Defense sites	**Military Cleanup Site**
Permitted facilities	
Operating Permitted Underground Storage Tanks(USTs)	**Permitted Underground Storage Tank**
Land Disposal Site	**Land Disposal Site**
	Military UST Site

The inconsistencies I see here: 1) the lists on page 34 contain 5 categories but the Map key in Figure 2-14 contains 6 categories, 2) the words used to describe categories for example: "military cleanup site" is that the same as "Department of Defense sites"?, 3) when looking for red circles on Figure 2-14 that represent "Cleanup Program Sites" I could not find any on the map in Figure 2-14.

The top sentence of page 34 states "Figure 2-14 shows the sites of possible and confirmed groundwater contamination located in the IWVGB, including"(lists are included above). This sentence leaves the reader to believe that what is on page 34 should be consistent with what is shown in Figure 2-14.

I recommend making page 34 consistent with what is shown in Figure 2-14.

Pages 36-37 Section 2.7.7.2 (Well Permitting Policies & Procedures) Inyo County

Is this section complete? Does Inyo County issue permits for groundwater wells? This would include construction, reconstruction, deepening or destruction of wells. It appears Kern County and San Bernardino County issue groundwater well permits but Inyo County does not. I find that hard to believe. I compared this section to sections: 2.7.7.1 Kern County and 2.7.7.3 San Bernardino County.

I recommend if Inyo County does not permit wells there needs to be a statement stating so.

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INDIAN WELLS VALLEY GROUNDWATER BASIN

GROUNDWATER SUSTAINABILITY PLAN

SECTION 2 – PLAN AREA

DRAFT

September 3, 2019

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SECTION 2: PLAN AREA

2.1 INTRODUCTION

This section provides background and discussion of 1) geographic area and jurisdictions; 2) management agencies; 3) land use; 4) existing monitoring and management programs; and 5) the data management system, as required in the GSP Emergency Regulations (§354.8).

2.2 GENERAL DESCRIPTION

2.2.1 Setting

The IWVGB is located in the northwestern part of the Mojave Desert in southern California, as shown on Figure 2-1, and underlies approximately 382,000 acres or approximately 600 square miles of land area in portions of the Counties of Kern, Inyo, and San Bernardino. The IWVGB is bordered on the west by the Sierra Nevada mountain range, on the north by the Coso Range, on the east by the Argus Range, and on the south by the El Paso Mountains. Surface water flow from the surrounding mountain ranges drains to China Lake, a large dry lake, or playa, located in the central north-east part of the basin. U.S. Route 395 and State Route 14 are the major vehicular arteries through the Indian Wells Valley. The IWVGB is in the vicinity of other Bulletin-118 groundwater basins including the Fremont Valley, Salt Wells Valley, Searles Valley, Coso Valley, Rose Valley, and Kern River Valley groundwater basins (see Figure 2-2).

The IWVGB is designated Basin Number 6-054 by DWR and is included in DWR Bulletin No. 118 entitled "California's Ground Water", dated September 1975. Bulletin 118 noted that recharge in the IWVGB averaged about 10,000 acre-feet per year (AFY) while extractions (as of 1968) were about 12,500 AFY, implying that overdraft conditions have existed for at least the past 50 years. DWR Bulletin 118 was updated in January 1980 and designated Bulletin 118-80. Table 8 of Bulletin 118-80 noted that there is evidence of groundwater overdraft in the IWVGB. Table 1 of Bulletin 118-16 (dated January 2016) indicates the IWVGB is subject to critical conditions of overdraft.

2.2.2 Jurisdictions

The Indian Wells Valley land overlying the IWVGB encompasses portions of the Counties of Kern, Inyo, and San Bernardino, with the majority (approximately 73%) being in Kern County as shown in Table 2-1. The City of Ridgecrest is the only incorporated community in the Indian Wells Valley and covers an area of approximately 20 square miles with a population of approximately 27,000 people. Unincorporated communities in the Indian Wells Valley include the communities of Inyokern in Kern County and Pearsonville in Inyo County, along with other smaller communities.

Table 2-1. IWVGB: Distribution of Overlying Land, by County

County Name	Overlying Land (acres)	Overlying Land (%)
Kern County	277,204	73%
Inyo County	66,519	17%
San Bernardino County	37,985	10%
Total	**381,708**	**100%**

As shown in Tables 2-2 and 2-3, approximately 302,000 acres of land overlying the IWVGB are federal property managed by either the US Navy's Naval Air Weapons Station China Lake (NAWS China Lake) or the US Department of Interior, Bureau of Land Management (BLM). The non-federal lands overlying the IWVGB consist of the incorporated city of Ridgecrest and unincorporated lands in the counties of Kern, Inyo, and San Bernardino (see Section 2.4). A map showing general jurisdictions and boundaries is provided in Figure 2-3.

Table 2-2. IWVGB: Distribution of Federal and Non-Federal Overlying Lands, by Entity

Entity	Overlying Land (acres)	Overlying Land (%)
U.S. Department of the Interior (Bureau of Land Management)	140,184	37%

U.S. Navy (Naval Air Weapons Station, China Lake)	161,911	42%
Non-Federal Entities	79,613	21%
Total	**381,708**	**100%**

Table 2-3. IWVGB: Distribution of Federal and Non-Federal Overlying Lands, by County

Entity	Overlying Land (acres)				Overlying Land (%)			
	NAWS China Lake	BLM	Non-Federal	Subtotal	NAWS China Lake	BLM	Non-Federal	Subtotal
Kern County	71,971	129,032	76,201	277,204	26%	47%	27%	100%
Inyo County	57,413	6,448	2,658	66,519	86%	10%	4%	100%
San Bernardino County	32,527	4,704	754	37,985	86%	12%	2%	100%
Total	**161,911**	**140,184**	**79,613**	**381,708**	-	-	-	-

2.2.3 Classification

In accordance with SGMA, DWR is required to classify groundwater basins by priority for achieving long-term sustainable groundwater management. DWR has published the "Sustainable Groundwater Management Act, 2018 Basin Prioritization Process and Results" document, dated January 2019, which provides the process, components, and rationale to develop the prioritization of California groundwater basins. In this document, DWR identifies and prioritizes 517 groundwater basins and subbasins as either

"High", "Medium", "Low," or "Very Low". DWR considered the following eight components when prioritizing the groundwater basins:

1) The population overlying the basin or subbasin.
2) The rate of current and projected growth of the population overlying the basin or subbasin.
3) The number of public supply wells that draw from the basin or subbasin.
4) The total number of wells that draw from the basin or subbasin.
5) The irrigated acreage overlying the basin or subbasin.
6) The degree to which persons overlying the basin or subbasin rely on groundwater as their primary source of water.
7) Any documented impacts on the groundwater within the basin or subbasin, including overdraft, subsidence, saline intrusion, and other water quality degradation.
8) Any other information determined to be relevant by the department, including determined to be relevant by the department, *including adverse impacts on local habitat and local streamflows*.

In addition to the IWVGB's designation as a basin subject to critical conditions of overdraft, the 2018 Basin Prioritization Report rates the IWVGB as a "High" Priority basin. Consequently, the IWVGA is required to submit this GSP by January 31, 2020 pursuant to SGMA.

2.2.4 Water Supply Source

In general, streams and other surface waters in the IWVGB are ephemeral due to low annual precipitation in the Indian Wells Valley, and basin recharge occurs as mountain block recharge. Consequently, although natural channels for surface water exist in the IWVGB (see Figure 2-4), surface water resources in the IWVGB are limited. Further discussion on surface water systems in the IWVGB is provided in Section 3.

The IWVGB serves as the sole supply of potable water for the Indian Wells Valley. Residents of the Indian Wells Valley are served groundwater through private domestic wells, small cooperative groups sharing wells, small mutual water companies, the Inyokern Community Services District, and the Indian Wells Water District. The Navy produces and distributes groundwater for use on the NAWS China Lake. Searles Valley Minerals produces groundwater from the IWVGB for use in its mineral mining and processing operations in the Searles Valley (located east of the IWVGB) and for potable use in the small communities of Trona, Westend, Argus, and Pioneer Point in the Searles Valley. In addition, a number of farms located

in the Indian Wells Valley rely on the IWVGB's water supplies for their agricultural operations, including Meadowbrook Dairy, Mojave Pistachios, Simmons Ranch, Quist Farms, and other smaller farms. The crops grown in the Indian Wells Valley are primarily alfalfa and pistachios.

The Kern County Public Health Services Department has provided the IWVGA with spatial data on wells located in the Kern County portion of the IWVGB. The data included well information such as approximate well location, point of contact, driller, and permit number. As of July 2018, the data provided such information (where available) for a total of 546 wells located in the Kern County portion of the IWVGB. The IWVGA has incorporated this spatial data into the development of this GSP. As shown on Figure 2-5, there are 932 estimated groundwater production wells located in the IWVGB with an average well density of approximately 1.6 wells per square mile. A summary of groundwater production wells by type of use is provided in Table 2-4.

Table 2-4. Summary of Groundwater Production Wells in the IWVGB

Well Use	Number of Wells
Domestic/Private	832
Dust Control	1
Industrial	5
Landscape Irrigation	5
Large Agriculture	18
Municipal	51
Small Agriculture	20
Total	**932**

2.3 LOCAL WATER AGENCIES

2.3.1 Background

The local water agencies within the IWVGB are shown on Figure 2-6 and are briefly summarized below. Additional information on the local water agencies and total current groundwater pumping is provided in Section 3.3.4.1.

2.3.2 Indian Wells Valley Water District

The Indian Wells Valley Water District (Water District) was formed in 1955 as the Ridgecrest County Water District by consolidating several smaller water companies serving the Ridgecrest area with domestic water. On January 19, 1970, the Water District's Board of Directors voted to change the name from the Ridgecrest County Water District to the Indian Wells Valley County Water District, reflecting its service area which covers areas beyond the City of Ridgecrest. In 1980, the Water District's Board of Directors formally dropped the word "County" from the name of the Water District. Since that date, the Water District has been known as the "Indian Wells Valley Water District".

The Water District serves approximately 30,000 customers through over 12,000 connections and encompasses an area of approximately 37.7 square miles within the eastern portion of the IWVGB. The Water District operates facilities (groundwater production wells, treatment systems, booster stations, storage tanks, and distribution pipelines) to provide potable groundwater from the IWVGB to its customers. Accordingly, the protection, conservation, and replenishment of groundwater supplies is of critical importance to the Water District.

2.3.3 Inyokern Community Services District

The Inyokern Community Services District (Inyokern CSD), established in 1983, provides water, wastewater, and street lighting services to the community of Inyokern, located approximately 7 miles west of Ridgecrest. The Inyokern CSD operates service facilities including approximately 265 water service connections, 4 groundwater production wells, distribution pipelines, and a wastewater treatment plant. The Inyokern CSD serves a primarily residential population of approximately 1,000 and an estimated 420 residential households (Alpert et al., 2014).

2.3.4 Antelope Valley – East Kern Water Agency

The Antelope Valley – East Kern Water Agency (AVEK) is a wholesale water agency serving nearly 2,400 square miles in northern Los Angeles and eastern Kern Counties, as well as a small portion of Ventura County. AVEK produces groundwater from the Antelope Valley groundwater basin and also obtains imported water from Northern California through a long-term contract with the State Water Project (SWP). As shown on Figure 2-6, the AVEK service area extends into the largely undeveloped land in the southernmost portion of the IWVGB, but no AVEK water infrastructure or water supply services exist in that portion of the IWVGB. The AVEK water transmission lines closest to the IWVGB are located in California City, located approximately 15 miles south of the IWVGB boundaries and 50 miles south of Ridgecrest.

2.3.5 Kern County Water Agency

The Kern County Water Agency (KCWA) is a public agency providing wholesale water services to its 13 member units along with water resources management and monitoring services throughout Kern County. As shown on Figure 2-6, the KCWA service area encompasses all portions of the IWVGB within Kern County, except for that portion of the IWVGB in the AVEK service area. KCWA obtains imported water from Northern California through a long-term contract with the SWP. At this time, no water agencies in the IWVGB serve as member units to KCWA, and no KCWA water infrastructure exists within the IWVGB boundaries.

Additional information on KCWA's water resources monitoring efforts in the IWVGB is provided in Section 2.6.2.

2.3.6 Mojave Water Agency

The Mojave Water Agency (MWA) is a wholesale water agency serving 4,900 square miles of the High Desert in San Bernardino County. MWA produces groundwater from the Mojave Basin Area, a series of Bulletin 118 groundwater basins and subbasins located along the Mojave River. MWA also obtains imported water from Northern California through a long-term contract with the SWP. As shown on Figure 2-6, the MWA service area extends into the easternmost portion of the IWVGB, but no MWA water infrastructure or water supply services exist in that portion of the IWVGB. The MWA water transmission

lines closest to the IWVGB are located in Barstow, located approximately 60 miles southeast of the IWVGB boundaries and Ridgecrest.

2.4 REGIONAL WATER MANAGEMENT AGENCIES

2.4.1 Background

The IWVGA is the exclusive Groundwater Sustainability Agency for the IWVGB, Bulletin 118 Basin No. 6-054. There are several other existing regional entities with water supply, management, planning, and/or regulatory authority whose boundaries encompass all or portions of IWVGB. These entities include the Kern County Water Agency (KCWA), the Lahontan Regional Water Quality Control Board (LRWQCB), the Inyo-Mono Integrated Regional Water Management Program (Inyo-Mono IRWMP), and the Indian Wells Valley Cooperative Groundwater Management Group (Cooperative Group). The following is a brief overview of these entities and their role in water supply management within the IWVGB.

2.4.2 Kern County Water Agency

The Kern County Water Agency (KCWA) was created in 1961 by a special act of the California State Legislature and is the contracting entity in Kern County for the SWP. The KCWA participates in various water management activities including water quality control, flood control, and groundwater banking to preserve and enhance Kern County's water supply.

The KCWA is the second largest participant in the SWP, a water storage and delivery system for water supplies from Northern California. The KCWA has contracts with 13 local water districts, referred to by KCWA as Member Units for SWP water. Since 1968, about 33 million acre-feet of SWP water has been delivered to Kern County using SWP facilities. The KCWA does not have a contract with a local water agency in the IWVGB; therefore, the KCWA does not provide SWP water to the IWVGB.

Due to low rainfall in a semi-arid region, surface water supplies in Kern County must be augmented by groundwater supplies. The KCWA works to improve groundwater levels and to monitor groundwater quality throughout Kern County, especially in the areas surrounding groundwater banking projects.

The KCWA collects, interprets, and distributes groundwater data for the IWVGB. Since 1989, the KCWA has measured depth to groundwater in the IWVGB biannually during October (peak historical groundwater demand) and March (lowest historical groundwater demand). KCWA analyzes the resulting measurements to generate maps of groundwater elevation and depth to groundwater throughout the IWVGB. The KCWA is also a signatory to the Indian Wells Valley Cooperative Groundwater Management Group.

2.4.3 Lahontan Regional Water Quality Control Board

The Lahontan Regional Water Quality Control Board (LRWQCB) is a seven-member decision-making body appointed by the Governor of California for the purpose of protecting the water quality and ensuring the proper allocation and efficient use of water resources in the Lahontan Region. The Lahontan Region is divided into the North and South Lahontan Basins and includes over 700 lakes, 3,170 miles of streams, and 1,581 square miles of groundwater basins. The IWVGB is located within the South Lahontan Basin, which includes three major surface water systems (Mono Lake, Owens River, and the Mojave River watersheds) and multiple separated groundwater basins. A map of the LRWQCB boundaries is provided in Figure 2-7.

The LRWQCB's general duties include approving Water Quality Control Plans and Salt and Nutrient Management Plans; setting regional water quality standards; issuing waste discharge requirements; determining compliance with those standards and requirements; and taking appropriate enforcement actions. The LRWQCB has established the "Water Quality Control Plan for the Lahontan Region, North and South Basins" (Basin Plan) as the regulatory document that sets forth water quality standards and control measures for surface water and groundwater in the Lahontan Region (including the IWVGB). The LRWQCB has also approved the IWVGB Salt and Nutrient Management Plan in 2018 (see Section 2.6.4 for additional information).

2.4.4 Inyo-Mono Integrated Regional Water Management Program

The Inyo-Mono Integrated Regional Water Management Program (Inyo-Mono IRWMP) is a regional water resource planning organization which formed in 2008 as part of the statewide Integrated Regional Water Management collaborative effort. Over 30 organizations are members of the Inyo-Mono IRWMP, including the County of Kern, the County of Inyo, the Inyokern CSD, the Indian Wells Valley Water District,

the U.S. Bureau of Land Management, and the Cooperative Group. The Inyo-Mono IRWMP has obtained more than $2.5 million through DWR grants made available through Proposition 84 funding to assist essential water management projects and research efforts for Inyo, Mono, and Kern Counties, and includes the IWVGB. A map of the area included in the Inyo-Mono IRWMP is included in Figure 2-8.

The "Inyo-Mono Integrated Regional Water Management Plan" dated October 2014 states:

> "The purpose of the Inyo-Mono IRWM Program is to foster coordination, collaboration, and communication among water-related stakeholders in the region for the purpose of developing water management strategies and projects that will benefit multiple entities and enhance water supply, water quality, and watershed health."

2.4.5 Indian Wells Valley Cooperative Groundwater Management Group

The Indian Wells Valley Cooperative Groundwater Management Group (Cooperative Group) was created in 1995 as a public water data-sharing group to consolidate and coordinate water management efforts in the Indian Wells Valley. The Cooperative Group collected and shared information regarding groundwater resources and uses of groundwater in the IWVGB. Members of the Cooperative Group include the NAWS China Lake, Searles Valley Minerals, Indian Wells Valley Water District, Bureau of Land Management, City of Ridgecrest, KCWA, Kern County, Inyokern Community Services District, East Kern County Resource Conservation District, and Inyokern Airport District. These members provided materials and services as in-kind donations to support the Cooperative Group's goals. In addition to in-kind services, the Cooperative Group received state funding from DWR for groundwater basin studies.

One of the founding purposes of the Cooperative Group is the exchange of information and management of data. The shared information supported development and implementation of improved management practices among the members and provided valuable information to the public about the state of the IWVGB's water supplies.

The Cooperative Group developed a "Cooperative Groundwater Management Plan for the Indian Wells Valley" (CGMP) dated March 2006 that established planning objectives to address conditions of overdraft and the resulting consequences for stakeholders in the Indian Wells Valley. The CGMP was not intended to alter or affect any existing water rights, but rather served as a set of guidelines to encourage

participation in water management efforts among the Cooperative Group members. The water management efforts listed in the CGMP include:

- Working towards and encouraging limitation of additional large scale pumping in areas that appear to be adversely impacted;
- Distributing new groundwater extractions within the Indian Wells Valley in a manner that will minimize adverse effects to existing groundwater conditions (levels and quality), and maximize the long-term supply within the Indian Wells Valley;
- Aggressively pursuing the development and implementation of water conservation policy and education programs;
- Encouraging the use of treated water, reclaimed water, recycled, gray, and lower quality water where appropriate and economically feasible;
- Exploring the potential for other types of water management programs that are beneficial to the Indian Wells Valley;
- Continuing cooperative efforts to develop information and data which contributes to further defining and better understanding the groundwater resources in the Indian Wells Valley;
- Developing an interagency management framework to implement and enforce the objectives of the CGMP.

2.5 LAND USE

2.5.1 Background

California Government Code Section 65040.2 requires cities and counties to establish a General Plan as a guideline to determine growth patterns, land use, land development, etc. A municipal General Plan addresses the following elements for its city or county: land use, circulation, housing, conservation, open space, noise, safety, environmental justice, and other optional topics of local interest. The General Plan elements of greatest relevance to this GSP and the IWVGA's water supply issues are land use, housing, conservation, and open space.

Implementation of this GSP may impact the water supply and water demand assumptions of existing General Plans due to changes in the quantities and locations of groundwater extractions and acquisition

of alternative water supplies. Accordingly, it is important for the IWVGA to coordinate with the relevant land use planning agencies.

2.5.2 Summary of General Plans and Other Land Use Plans

2.5.2.1 *Kern County*

The majority of land overlying the IWVGB is within Kern County. The Kern County General Plan, adopted September 22, 2009, is a policy document that, along with its amendments, guides the development and/or preservation of the county's natural resources not directly managed by the federal government. The Kern County General Plan was prepared by the Kern County Planning and Community Development Department.

Page viii of the Introduction to the Kern County General Plan states:

> "This planning document recognizes that the relationship between water supply and land use planning is important to promoting future growth and a strong economy for Kern County's future. Recent State laws require local governments to ensure that development approvals occur with substantive, realistic assessments of the availability of a reliable water supply. The new laws require the verification of sufficient water supplies as a condition for approving certain developments and compel urban water suppliers to provide more information on the reliability of groundwater for a long-term time frame. Long-term water supply planning is important to ensuring that rural and urban economic growth can be accommodated into the future."

The Kern County General Plan acknowledges that water supply is a critical issue for Kern County's residents and economy. For this reason, the Kern County General Plan requires that General Plan amendments subject to environmental review and not otherwise subject to California Water Code Section 10910 demonstrate through a water supply assessment that a long-term water supply for a 20-year timeframe is available. Additionally, all development proposals are required to be reviewed by County staff to ensure that adequate water supplies are available to accommodate projected growth. To sustain long-term economic stability in Kern County, Chapters 1.9 and 1.10.6 of the Kern County General Plan encourage effective groundwater resource management through the following actions:

- Promoting groundwater recharge activities in various zone districts;
- Supporting the development of Urban Water Management Plans and promoting Department of Water Resources grant funding for all water providers;
- Supporting the development of groundwater management plans;
- Supporting the development of future sources of additional surface water and groundwater including conjunctive use, recycled water, conservation, additional storage of surface water and groundwater, and desalination;
- Requiring water-conserving design and equipment in new construction;
- Encouraging water-conserving landscaping and irrigation methods;
- Encouraging the retrofitting of existing development with water-conserving devices.

A total of 277,204 acres of land overlying the IWVGB is located within Kern County. 201,003 acres (73%) of the overlying land within Kern County is federal land managed by the Bureau of Land Management (BLM) (129,0032 acres, or 47%), or controlled by the NAWS China Lake (71,971 acres, or 26%). Most of the BLM-managed land in the IWVGB is open space managed for natural and economic resources, including mineral resources and rights-of-way for powerlines and pipelines (Todd Engineers, 2014). The land controlled by the NAWS China Lake is used for weapons research, development, acquisition, testing, and evaluation through the U.S. Navy.

Near the westerly and southeasterly City of Ridgecrest boundaries, the permitted zoning consists of residential zoning generally with a minimum lot size at 2.5 acres per dwelling unit, light industrial zoning, open space zoning, etc. The area between the City of Ridgecrest boundaries and the community of Inyokern contains primarily residential zoning districts with varying densities, while the areas northwest of Inyokern are residential and resource (primarily agriculture) zoning districts.

Zoning in the southwest portion of the IWVGB, commonly referred to as the El Paso area, consists primarily of open space, recreation (forestry), limited agriculture, and mobile homes. Lands in the El Paso area are largely uninhabited and are managed by BLM. As a result, significant groundwater extraction does not occur in this area due to the lack of water demands (see Section 3).

A breakdown of the Kern County lands overlying the IWVGB and their associated land use designations is provided in Table 2-5 and is shown in Figure 2-9.

Table 2-5. Zoning Districts in the Kern County lands overlying the IWVGB

Zoning District	Area (acres)	Area (%)
Other (China Lake)	28,236	11.2%
Exclusive Agriculture	452	0.2%
General Commercial	167	0.1%
Highway Commercial	287	0.1%
Light Industrial	1,837	0.7%
Limited Agriculture	7,442	3.0%
Limited Agriculture/Mobilehome	64,954	25.8%
Low-density Residential	136	< 0.1%
Medium-density Residential	14	< 0.1%
Medium Industrial	1,020	0.4%
Military	533	0.2%
Mobilehome Park	23	< 0.1%
Open Space	105,340	41.8%
Recreation-Forestry	11,848	4.7%
Residential	29,873	11.9%
Total	**252,162**[1]	**100%**

2.5.2.2 *Inyo County*

The Inyo County General Plan was approved by the Inyo County Board of Supervisors in 2001. In accordance with the 2001 General Plan, the Inyo County Planning Department is currently updating its Zoning Code and has subsequently released draft General Plan updates associated with the proposed updates to the Zoning Code. The Inyo County General Plan Update dated May 2013 was used to complete

[1] Kern County zoning data was obtained from the County of Kern Geodat Open Data Portal. Updated as of May 9, 2017. Note that not all Kern County lands overlying the IWVGB were given zoning district categories in the dataset.

this GSP, which will be appropriately updated in accordance with all updates to the Inyo County General Plan.

Section 8.5 of the 2001 Inyo County General Plan provides planning goals related to water resources including:

- Providing an adequate and high quality water supply to all users within the County;
- Protecting and preserving water resources for the maintenance, enhancement, and restoration of environmental resources; and
- Protecting and restoring environmental resources from the effects of export and withdrawal of water resources.

The vast majority of land in Inyo County is owned by either the federal government (~92%), the City of Los Angeles (~4%), and the state of California (~2.5%) (Inyo County Planning Department, 2013). Approximately 96% of the Inyo County land overlying the IWVGB is either owned by the US Navy as part of NAWS China Lake, or managed by the BLM (see Table 2-3 above). Approximately 98% of the Inyo County land overlying the IWVGB is zoned as open space (see Table 2-6 below). The community of Pearsonville, occupying approximately four-square miles, is zoned for various residential densities as well as some commercial and industrial zoning to compliment the community's highway-oriented businesses.

A breakdown of the Inyo County lands overlying the IWVGB and their associated zoning is provided in Table 2-6 and shown in Figure 2-10.

Table 2-6. Zoning Districts in the Inyo County lands overlying the IWVGB

Zoning District	Area (acres)	Area (%)
Commercial Recreation	5	< 0.1%
General Industrial and Extractive	167	0.3%
Heavy Commercial	15	< 0.1%
Highway Services and Tourist Commercial	25	< 0.1%
Light Industrial	29	< 0.1%
Multi-Family Residential	23	< 0.1%

Open Space		65,038	98.2%
Public		65	0.1%
Rural Residential		848	1.3%
	Total	**66,215**[2]	**100%**

2.5.2.3 *San Bernardino County*

The General Plan for San Bernardino County was last updated in 2007 and is currently in the process of being revised. The land just adjacent to the City of Ridgecrest's eastern boundary is designated as Rural Living, allowing for a maximum of one dwelling unit per 2.5 acre lot. This area contains less than one square mile of residential lots. Areas with a Resource/Land Management designations span over several miles to the east of China Lake and north of the Inyo County line. A majority of the land overlying the IWVGB within San Bernardino County is within the NAWS China Lake boundaries, as shown above in Table 2-3.

A breakdown of the San Bernardino County lands overlying the IWVGB and their associated zoning is provided in Table 2-7 and shown in Figure 2-11.

Table 2-7. Zoning Districts in the San Bernardino County lands overlying the IWVGB

Zoning District	Area (acres)	Area (%)
Resource Conservation	37,411	98.5%
Rural Living	574	1.5%
Total	**37,985**[3]	**100%**

[2] Inyo County zoning data was obtained from the County of Inyo Public Geographic Information Systems Page. Updated as of January 31, 2019. Note that not all Inyo County lands overlying the IWVGB were given zoning district categories in the dataset.

[3] San Bernardino County zoning data was obtained from the ArcGIS Hub – Open Data, in conjunction with the San Bernardino County Land Services Department. Updated as of May 3, 2018.

2.5.2.4 *City of Ridgecrest*

The City of Ridgecrest has direct land use jurisdiction within its city limits with the exception of the small portion of the city within NAWS China Lake. The community within and surrounding the City of Ridgecrest is strongly linked to supporting NAWS China Lake by providing housing and services for personnel and contractors at NAWS China Lake; accordingly, the City of Ridgecrest General Plan emphasizes both achieving growth and sustainably supporting the military installation.

2.5.2.5 *Federal Lands*

The US Department of Interior Bureau of Land Management prepares Resource Management Plans (RMPs) that serve as land management blueprints. The majority of southern California, including the Indian Wells Valley, is within the California Desert Conservation Area (CDCA). The CDCA comprehensive land-use management plan was completed in 1980 and revised in 1999. Additionally, the Indian Wells Valley is within the BLM's West Mojave Plan area which established a Habitat Conservation Plan for sensitive plants and species in the region.

The US Department of Interior has assigned land management responsibility of NAWS China Lake to the Navy. Consequently, the Navy has developed a Comprehensive Land Use Management Plan (CLUMP) for land use management and environmental resources management for NAWS China Lake.

2.5.3 Agricultural Land Use

There are approximately 3,086 acres of actively farmed land overlying the IWVGB[4]. Typically, each farm has its own well system and water delivery system for its respective crops. The primary crops grown in the Indian Wells Valley are pistachios (2,027 acres) and alfalfa (985 acres), with other miscellaneous crops (74 acres) such as miscellaneous grain and hay constituting a minority of production. A map of actively farmed land overlying the IWVGB is provided in Figure 2-12.

[4] Actively farmed land in the IWVGB was determined using the California Department of Water Resources' Crop Mapping 2014 GIS dataset. Updated as of March 13, 2018.

2.5.4 Industrial Land Use

There are no large-scale industrial land uses in the Indian Wells Valley. Since the 1920's, Searles Valley Minerals Corporation (SVM) has exported groundwater from wells in the eastern part of Ridgecrest to Searles Valley (located outside of the Indian Wells Valley) to support both its industrial operations and the domestic needs of the unincorporated communities of Trona, Westend, Argus, and Pioneer Point. Section V.C of the San Bernardino County General Plan maintains a countywide goal of promoting conservation of water and maximizing the use of existing water resources by promoting activities and measures that facilitate the reclamation and reuse of water and wastewater, including for industrial uses. Implementation of this GSP will impact the potable water demands of industries in San Bernardino County (i.e. Searles Valley Minerals Corporation) that rely on the IWVGB for water supplies. This GSP will therefore impact the water supply assumptions for San Bernardino County industry set forth in the San Bernardino General Plan (see Section 4 for further details on impacts to industrial water demands).

2.6 EXISTING WATER RESOURCES MONITORING PROGRAMS

2.6.1 Background

Multiple entities have been measuring depth to groundwater in the IWVGB since the 1920's. Monitoring programs were first initiated in the IWVGB by the United States Geological Survey (USGS) and have been primarily conducted by KCWA since 1989 with the assistance of the Water District, the United States Bureau of Reclamation (USBR), and the NAWS China Lake. Additionally, many of these entities have constructed wells dedicated solely to monitoring groundwater levels in the IWVGB.

Prior to formation of the IWVGA, monitoring efforts in the IWVGB were often duplicated due to a lack of communication among interested parties. In 1995, the Cooperative Group was formed to coordinate monitoring and management efforts, share data, and avoid the redundancy of groundwater study efforts. As a public data-sharing group consisting of the major water producers, government agencies, and concerned citizens in the IWVGB, the Cooperative Group compiled numerous study efforts in the IWVGB including a basin-wide recharge study, the construction of weather and stream gages, and a monitoring program involving over 100 monitoring wells. The Cooperative Group published its compiled monitoring data, including historical reported pumping and basin studies, on its website:

http://iwvgroundwater.org/

The Cooperative Group was designated as the California Statewide Groundwater Elevation Monitoring (CASGEM) monitoring entity for the IWVGB per a DWR letter dated November 18, 2011. The status of CASGEM monitoring entity was transferred to the IWVGA in January 2018 as part of the IWVGA's initial SGMA compliance efforts.

The following sections summarize the existing water resources monitoring programs that are on-going within the IWVGB. These programs are conducted by a variety of agencies and are now being incorporated into the SGMA compliance efforts overseen and managed by the IWVGA. Data obtained through the existing water resource monitoring programs helped populate the IWVGA's Data Management System (see Section 2.8), and the data was used to develop alternative groundwater basin management strategies (see Section 4).

2.6.2 KCWA Groundwater Monitoring Programs

The KCWA measures depth to groundwater in over 200 monitoring wells in the IWVGB consisting of a network of private and public water production wells and monitoring wells. Field measurements of water levels are conducted semiannually in October and March at periods of historical groundwater demand peaks and minimums. The water level data is collected, analyzed, and plotted onto contour maps to depict groundwater depths, groundwater elevations, and changes in groundwater elevation over time. The contour maps portray how the IWVGB spatially reacts to groundwater extractions across the Indian Wells Valley. The contour maps and hydrographs are updated annually by KCWA and can be viewed at the IWVGA's Data Management System (see Section 2.8), which can be accessed at www.iwvgsp.com.

KCWA also collects water quality samples and monitoring wells for analysis. The water quality results can then be plotted on contour maps and a variety of other types of diagrams and graphs.

The data collected from monitoring groundwater levels and water quality are archived in the IWVGA's Data Management System, which contains groundwater level data dating back to 1946 and water quality data dating back to 1952.

The locations of the KCWA monitoring wells and other monitoring wells in the IWVGB are provided in

Figure 2-13.

2.6.3 CASGEM

A subset of the data from approximately 40 of the over 200 wells monitored throughout the IWVGB are submitted to DWR as part of their CASGEM program. CASGEM requires each individual groundwater basin to develop a representative groundwater level monitoring program to assist with tracking change in groundwater levels, and consequently changes in the volume of water stored in the groundwater basin. The CASGEM program aides in identifying the seasonal and long-term trends in the IWVGB. The locations of the IWVGB CASGEM wells are provided in Figure 2-13. A selection of these CASGEM wells served as representative monitoring sites while evaluating impacts and management actions and subsequently served as the locations where sustainability criteria were set (see Section 5).

2.7 EXISTING WATER RESOURCES MANAGEMENT PROGRAMS

2.7.1 Background

It has been well documented that the IWVGB has been in overdraft since the 1960s and that current basin outflows exceed basin inflows by approximately four times (see Section 3.3.4.4). Water resources management programs in the IWVGB have been implemented by a variety of entities to address conditions of basin overdraft. In many instances, these water resources management programs have resulted in curtailment of historical pumping to reduce the impacts of over-pumping.

The water resources management programs that are **not** currently practiced in the IWVGB include replenishment of groundwater extractions; conjunctive use and underground storage; and diversions to storage. The following section summarizes the existing and on-going water resources management programs administered in the IWVGB. Proposed water resources projects and management actions that will be primarily managed by the IWVGA are discussed in Section 4.

2.7.2 Salt and Nutrient Management Plan

A Salt and Nutrient Management Plan (SNMP) for the IWVGB was finalized in March 2018 and accepted by the LRWQCB. The SNMP (RMC, et al., 2018) was prepared as a high-level planning document to inform

the monitoring and implementation elements being developed for this GSP. The SNMP provides an overview of basin characteristics, groundwater conditions, historical groundwater production, and existing groundwater quality. In addition, the SNMP:

- Identifies sources of additions/withdrawals of both salts (such as Total Dissolved Solids) and nutrients (such as Nitrate);
- Analyzes current assimilative capacity for salts and nutrients;
- Projects trends in water quality and loading;
- Analyzes water quality conditions against the water quality objectives described in the Basin Plan;
- Discusses existing and potential water resources practices that do and may impact basin water quality; and
- Provides a proposed preliminary water quality monitoring program.

2.7.3 Conservation Programs

2.7.3.1 *Water District Demand Management Measures*

The Water District has implemented water conservation programs in an attempt to reduce annual groundwater extractions. The Water District has achieved a 30% reduction in total water demand as a result of implementing a four-tier water rate structure along with various water conservation Ordinances issued by the Water District and the City of Ridgecrest. The Water District Ordinances include:

- Water District Ordinances 90 and 91 (adopted in 2009; rescinded in 2015)
    - Landscaping restrictions for new single-family/multi-family residential, commercial, and institutional buildings
- Water District Ordinances 98 and 99 (adopted in 2015)
    - Implementation of an Approved Plant List for landscaping
    - Mandated use of low volume irrigation systems, high efficiency sprinkler heads, pressure regulators, and master shut-off valves
        - Subsurface drip irrigation required on areas less than 10 feet wide
- Water District Ordinance 100 (adopted in 2016; rescinded in 2017)
    - No water user shall waste water; prohibits washing down hard or paved surfaces for strictly aesthetic purposes

  - Prohibit vehicle washing except by use of a hand-held bucket or hand-held nose equipped with a shut-off nozzle or device
  - Irrigation only between 8:00 AM – 8:00 PM; irrigation limited to 3 days per week based on addresses (1 day per week from November through February)
  - Restaurants shall only serve water on request
  - Turf or ornamental landscapes shall not be irrigated within 48 hours after measureable precipitation
  - Hotel/motel operators shall provide guests the option of choosing not to have towels and linens laundered daily
  - Prohibits recreational fountains or decorative water features
- Water District Ordinance 101 (adopted in 2017)
  - Implementation of the 2017 Water Shortage Contingency Plan
    - Actions for two stages of local water shortages and a drought state of emergency
- Water District Ordinance 103 (adopted in 2017)
  - Irrigation limited to 3 days per week during all months

The Water District has hosted community outreach events (e.g. school education programs) to raise awareness of water conservation practices such as the use of appropriate desert landscaping. At these and other local events, the Water District has distributed water conservation fixtures including 3,746 low-flow showerheads; 5,256 low-flow hose nozzles; 880 shower timers; 2,480 faucet aerators; 3,514 water tumblers; and 2,339 moisture meters. The Water District's "Cash for Grass" Rebate Incentive Program offers rebates to property owners who elect to replace lawns with eligible low water-use landscaping. To supplement its ongoing conservation practices, the Water District manages a digital customer engagement portal that allows the Water District and its customers to track and analyze customer water use, conservation practices, ordinance violations, leakage incidents, etc.

2.7.3.2 *City of Ridgecrest Demand Management Measures*

Similar to the Water District, the City of Ridgecrest has adopted water conservation Ordinances to reduce demands. The Ordinances include:

- City of Ridgecrest Ordinance 09-05 (adopted in 2009)
  - Similar irrigation restrictions to Water District Ordinance 100

- City of Ridgecrest Ordinance 16-01 (adopted in 2016; supersedes Ordinance 09-05)
    - Water-efficient landscaping and irrigation scheduling
    - Promoted use of recycled water and greywater
    - Promoted stormwater management practices

2.7.3.3 *Navy Water Use*

The Cooperative Group's recorded production data indicates that the Navy has been a major pumper in the IWVGB historically (e.g. as much as 5,000 AFY in 1975). The Navy has since achieved a 53% reduction in groundwater pumping due to a combination of instituted conservation measures and a shift from on-base housing of Navy personnel to off-base housing within Ridgecrest.

As a member of the Cooperative Group, the NAWS China Lake has committed to explore the potential for water resources management programs that benefit the IWVGB, including water conservation efforts. In its "Water Conservation Public Advisory" dated June 2008, the Cooperative Group (including the Navy) developed strategies to reduce unnecessary and/or excessive water uses to support the sustainable management of the IWVGB.

The NAWS China Lake's Integrated Natural Resources Management Plan (INRMP) dated June 2014 describes the Navy's implementation of natural resources programs at NAWS China Lake, including water resources management. In its 2014 INRMP, the Navy emphasizes a water conservation program focused on xeriscaping, a landscaping method based on the use of native or drought-resistant plants, in addition to efficient irrigation practices that require less water. Principles of xeriscaping include using gravel or plastic/rubber-based products to preclude weed growth and enhance water retention; using ground cover to prevent blowing dust and soil erosion; watering using automatically controlled cycles during low evaporation periods; and using drip irrigation whenever possible. The 2014 INRMP discourages the addition of new lawn areas except where functionally essential (i.e. in areas used for ceremonies, family housing, recreation fields, and children's playgrounds).

At the IWVGA Pumper Group Allocation meeting on October 1, 2018, the Navy indicated its short-term future water needs to be approximately 2,041 AFY, which includes a 25% increase in current water use. This estimation is **not** indicative of the Navy's federal reserve groundwater right, which has yet to be quantified and is not subject to the provisions of SGMA.

2.7.3.4 *Opportunities for Additional Conservation*

Opportunities for implementation of additional conservation measures are discussed in Section 4.

2.7.4 Efficient Water Management Practices

The Water District prepared its "2015 Urban Water Management Plan" (2015 UWMP), dated June 2016, which includes a discussion of efficient water management practices in Section 6.B.7 "Prohibitions, Penalties, and Consumption Reduction Methods". The following is a brief summary of these efficient water management practices.

2.7.4.1 *Mandatory Prohibitions on Wasting Water*

The Water District has adopted a Water Efficient Landscape Ordinance (Ordinance No. 93) and Ordinance No. 100 regarding emergency water conservation mandatory restrictions. The City of Ridgecrest adopted a Water Efficient Landscape Ordinance (Ordinance No. 16-01). These ordinances have common requirements, including but not limited to:

- Prohibiting runoff from landscape irrigation;
- Prohibiting wash down of hard or paved surfaces;
- Prohibiting water leaks;
- Prohibiting use of a hose without a shut-off nozzle;
- Prohibiting landscape irrigation on the surface, except for hand watering or the use of a drip irrigation system, between the hours of 8:00 a.m. and 8:00 p.m. during the months of May, June, July, August, September, and October, unless a special permit is issued to accommodate newly planted material;
- Requiring new plumbing fixtures to conform to requirements of law as to flow capacity.

2.7.4.2 *Water Efficient Landscaping*

The Water District has implemented numerous water-efficient landscape requirements, which include:

- Prohibiting turf in the front yard;

- Limiting plants in front yards to those provided in a Water District-approved list;
- Prohibiting front yard irrigation systems that are not low-volume;
- Requiring use of high-efficiency irrigation sprinkler heads;
- Prohibiting irrigation runoff.

2.7.4.3 *Excessive Use Penalties*

The Water District has adopted a tiered water rate structure which rewards customers that conserve water through lower water rates. Furthermore, customers that consistently waste water may be subject to having flow restrictions placed on their meters.

2.7.5 Recycled Water Use

California Water Code Section 13050(n) defines "recycled water" as water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur. There are currently two wastewater treatment facilities (WWTFs) within the IWVGB: The City of Ridgecrest WWTF[5], and the Inyokern CSD WWTF. IWVGB residents that do not contribute flow to either of these WWTFs use septic tanks to dispose of wastewater.

Prior to 1974, the City of Ridgecrest Sanitation District operated a small WWTF in the eastern portion of the City, near the eastern City limits. At that time, the Navy operated its own separate WWTF on the NAWS China Lake. To address capacity problems, the City abandoned its old WWTF and consolidated the two treatment facilities to treat combined flow from the City and from the NAWS at a common plant. The City has since operated the existing 3.6 million gallon per day (MGD) WWTF located on the NAWS base, approximately 3.5 miles northeast of the City center. Annual average day flows at the WWTF were approximately 2.44 MGD (2,739 AFY) in 2017. The City WWTF provides primary wastewater treatment through a series of headworks and sedimentation tanks. Secondary treatment occurs in a series of on-site facultative ponds with clay linings.

[5] A Memorandum of Agreement dated April 1, 1993, between the Navy and the City states that the City owns and operates the WWTF, though there is a general lack of consensus among the IWVGB stakeholders regarding the ownership and operations of the WWTF. The term "City WWTF" is used in this GSP for the sole purpose of distinguishing between the two existing WWTFs in the IWVGB.

The City of Ridgecrest's WWTF is currently the only facility which generates a recycled water supply for direct beneficial or controlled use within the IWVGB. The City WWTF produces recycled water that is applied at a City site for alfalfa irrigation and at the NAWS China Lake for golf course irrigation. The remaining treated wastewater generated at the City WWTF is discharged to evaporation/percolation ponds at the City WWTF site.

Independent of this GSP, the City is currently planning to upgrade, expand, and potentially relocate the existing City WWTF. The City plans to abandon and demolish the existing City WWTF for construction of a new oxidation ditch secondary treatment plant with new evaporation/percolation ponds and new solids handling facilities (Provost & Pritchard, 2015). The City has evaluated constructing new recycled water facilities including tertiary treatment trains (filtration and disinfection) at the new WWTF, a recycled water storage tank, a recycled water pump station, and a purple pipe distribution system. The new recycled water facilities would provide up to 1.8 MGD (2,016 AFY) of recycled water for City use in landscape irrigation and/or groundwater recharge (Provost & Pritchard, 2015). The City is considering two (2) potential sites for the new WWTF: (1) the existing WWTF site, or (2) the old City WWTF site. The new WWTF location will depend on ongoing easement and land use negotiations between the City and the Navy.

The Inyokern CSD also operates a small WWTF with an approximate capacity of 0.035 MGD to treat wastewater from residents within its service area. The final effluent generated at the Inyokern WWTF is currently not of sufficient quality for any beneficial uses of recycled water and is instead disposed of through evaporation/percolation ponds located at the Inyokern WWTF site.

2.7.5.1 *Alfalfa Irrigation*

Approximately 220 AFY of recycled water (secondary-treated wastewater) from the City WWTF has been historically used to irrigate 30 acres of alfalfa located at the old City WWTF site. The alfalfa is commonly sold by the City for use in cattle feed. The July 2019 Searles Valley earthquakes caused disruptions to the City WWTF and prevented the City from irrigating its alfalfa for the 2019 growing season. The City plans to continue its alfalfa irrigation with recycled water until the new WWTF with recycled water facilities is constructed, at which point the City plans to instead apply recycled water (tertiary-treated wastewater) for landscape irrigation and/or groundwater recharge.

2.7.5.2 *NAWS China Lake Golf Course*

The Navy receives secondary-treated effluent from the City WWTF and provides additional treatment for beneficial use on a golf course. The Navy uses a chlorine contact basin to provide additional treatment of the effluent. A Negotiated Sewer Service Contract between the City and the Navy reserves up to 750 AFY of treated wastewater from the City WWTF for irrigation of the golf course located at the NAWS China Lake. However, it has been noted that the golf course only uses approximately 500 AFY of water (Provost & Pritchard 2015).

2.7.5.3 *Evaporation/Percolation Ponds*

The City WWTF site contains four (4) evaporation/percolation ponds which may receive secondary-treated effluent that is not supplied for alfalfa irrigation or golf course irrigation. Wastewater stored in these ponds evaporates or percolates into either the underlying shallow groundwater aquifer or the Mohave Tui Chub habitat located north of the City WWTF.

The Mohave Tui Chub are an endangered species of fish native to the Mohave River. Due to numerous alterations to its native habitat, the United States Fish and Wildlife Service and California Department of Fish and Wildlife relocated a population of the Tui Chub to the NAWS China Lake during the 1970s. The Tui Chub habitat at China Lake consists of two seeps, referred to as Lark Seep and G-1 Seep. The two seeps are connected through a series of man-made channels, which were originally constructed during the 1950s and 1960s to divert seeping groundwater away from nearby roads and facilities. The habitat inflows include seepage from the City WWTF ponds, irrigation percolation from the China Lake golf course, and various contributions from the City of Ridgecrest area (e.g. irrigation percolation, wash-down, commercial water discharge, and transmission line leaks) (ERS 1991).

The Navy prepared a preliminary habitat management plan (HMP) for the Mohave Tui Chub (ERS, 1991) in response to a Biological Opinion issued by the U.S. Fish and Wildlife Service. The HMP proposed actions to protect and maintain the Mohave Tui Chub habitat, including construction of a water delivery system to discharge water to the existing seeps and channels in the habitat. No additional steps have been taken to implement any potential protection or maintenance plans for the Tui Chub habitat, although it has been proposed that an evaluation be conducted on potentially relocating the Tui Chub in the near future to potentially increase the amount of recycled water available in the IWVGB. Recycled water that would

become available as a result of Tui Chub relocation may be used to either meet existing water demands to reduce groundwater extractions or serve as a source of groundwater recharge for the IWVGB.

SGMA requires that all beneficial uses and users, including Groundwater Dependent Ecosystems (GDEs), be considered in the development and implementation of GSPs. GDE identification must be included in the GSP to determine whether groundwater conditions are having potential effects on any and all beneficial uses and users within the basin. Additionally, GDE management must be incorporated into the sustainable management criteria established as part of the GSP. The location of the Mohave Tui Chub habitat coincides with GDEs identified in DWR's Natural Communities Commonly Associated with Groundwater (NCCAG) dataset. Further definition of and discussion on GDEs in the IWVGB is provided in Section 3.4.5 and in Section 4.

2.7.6 Groundwater Contamination Cleanup

The United States Department of Defense initiated the Installation Restoration Program (IRP) in 1980 to identify, investigate, and remediate or control the release of hazardous substances that resulted from past waste disposal operations and hazardous material spills at military facilities. Per the Navy's 2014 INRMP, NAWS China Lake is assessing and remediating areas of past contamination on its ranges through the IRP, including sites of possible and confirmed groundwater contamination. A list of these sites along with their cause of contamination and remediation status is provided in Appendix ---.

Sites of possible and confirmed groundwater contamination are made publicly available on GeoTracker, the State Water Resources Control Board's (SWRCB's) data management system for sites that impact, or have the potential to impact, water quality in California. The data available on GeoTracker includes site characteristics (e.g. case number, site location, cleanup status, responsible parties, affected water resources) as well as site actions (e.g. project activities, compliance responses, milestone tracking, land use controls, risk to water quality assessments). GeoTracker also provides public records such as regulatory communication and decision documents for each site.

Figure 2-14 shows the sites of possible and confirmed groundwater contamination located in the IWVGB, including:

- Sites that require cleanup

  - Leaking Underground Storage Tank (LUST) sites
  - Department of Defense Sites
  - Cleanup Program Sites
- Permitted facilities
  - Operating Permitted Underground Storage Tanks (USTs)
  - Land Disposal Sites

2.7.7 Well Permitting Policies and Procedures

2.7.7.1 *Kern County*

Nearly all water supply wells in the IWVGB are located within the jurisdiction of Kern County. Well standards for both water supply and monitoring wells within Kern County are provided in Title 14, Chapter 14.08, Article III of the Kern County Municipal Code. Per Kern County Municipal Code Section 14.08.210, the standards for the construction, repair, reconstruction, or destruction of wells within Kern County are set forth in DWR Bulletin 74-81 "Water Well Standards, State of California" and all subsequent supplements and revisions. The construction, reconstruction, deepening, or destruction of any well requires filing a valid application for a permit with the Kern County Public Health Services Department (Kern County PHSD), and subsequent approval of the application. All abandoned wells within Kern County are to be destroyed within ninety (90) days of abandonment.

In July 2017, the Kern County Board of Supervisors approved an ordinance adding Sections 14.08.113 and 14.08.285 and amending Section 14.08.290 of Title 14, Chapter 14.08 of the Kern County Municipal Code. The ordinance requires that all new private domestic, public domestic, industrial, agricultural, and any reconstructed or upgraded wells be installed with water flow meters or equivalent devices/methods for water measurement.

The Kern County PHSD administers a "Water Wells Program" to manage the permitting and compliance requirements for groundwater wells (both monitoring wells and drinking water wells) in the Kern County portion of the IWVGB. The Water Wells Program ensures that the public receives water that is safe to drink and that the quantity of water supplied is adequate to meet the community's needs. The Water Wells Program is responsible for processing applications and issuing permits for the following:

- Monitoring Wells
- Drinking Water Wells
- Well Destruction
- Well Driller Registration
- Water Supply Certification

Guidance and information are provided on the Water Wells Program website (https://kernpublichealth.com/water-wells/) including information on the following:

- Agriculture Well Permit Guidelines
- Domestic Well Permit Guidelines
- Well Destruction Procedures
- Disinfection Procedures, Laboratories, and Sampling
- List of Approved Drillers and Sealing Material
- Water Well Site Location Requirements

The Kern County PHSD maintains a listing of well information collected through administration of the Water Wells Program.

The Kern County PHSD also administers a Small Water Systems Program aimed at ensuring the quality and quantity of water supplied to meet user demands in State Small Water Systems (between 5 and 14 service connections) and Non-Public Water Systems (between 2-4 service connections). The Small Water Systems Program assists small water systems by monitoring water quality, processing permits and inspections, and managing system maintenance.

Guidance and information are provided on the Small Water Systems Program website (https://kernpublichealth.com/water-wells-small-water-systems/) including information on the following:

- Water Supply Certification Application
- Permitting Process for State Small Water Systems and Non-Public Water Systems
- Intended Use Statements

- Laboratories and Sampling Services

2.7.7.2 *Inyo County*

The Inyo County Environmental Health Department administers a Small Water System Program to manage the permitting and compliance requirements of 105 active public and state small water systems throughout Inyo County, including:

- 30 Community systems with between 25 and 199 residential service connections or 25 or more yearlong residents;
- 11 Nontransient Noncommunity systems such as schools, institutions, and places of employment;
- 47 Transient Noncommunity systems such as restaurants and campgrounds, and resorts; and
- 16 State Small systems that serve between 5 and 14 residential service connections but less than 25 yearlong residents.

Guidance and information on permit applications for new systems are provided on the Small Water Systems Program website (https://www.inyocounty.us/EnvironmentalHealth/drinking_water.html). The Inyo County Environmental Health Department maintains a database of well information collected through administration of the Small Water System Program.

2.7.7.3 *San Bernardino County*

The San Bernardino County Environmental Health Services administers a "Safe Drinking Water Program" and "Small Drinking Water Systems Program" which, in part, manages the permitting and compliance requirements for groundwater wells and 272 existing small drinking water systems.

The Safe Drinking Water Program is responsible for processing applications and issuing permits for the following:

- Well Permits
- Well Drillers Registration

Guidance and information are provided on the Safe Drinking Water Program website (http://wp.sbcounty.gov/dph/programs/ehs/safe-drinking-water/) including information on the following:

- Well Abandonment
- Private Domestic Well Owners
- Typical Well Requirements
- Well Sharing

The San Bernardino County Environmental Health Services maintains a database of well information collected through administration of the Safe Drinking Water Program and Small Drinking Water Systems Program.

2.7.7.4 *IWVGA Policies*

The IWVGA adopted a groundwater extraction fee on July 19, 2018 (Ordinance No. 02-18) under the authority granted by California Water Code Section 10730. In addition to authorizing the collection of fees, California Water Code Section 10725(a) authorizes the IWVGA to "perform any act necessary or proper to carry out the purposes of this part [SGMA]". In order to implement the groundwater extraction fee, the IWVGA required that all wells subject to the fee register their wells with the IWVGA. All groundwater pumpers in the IWVGB are subject to the groundwater extraction fee except for the following:

- Federal entities (U.S. Navy and United States Department of Interior, Bureau of Land Management); and
- Small pumpers defined as "de minimis extractors" or those who extract, for domestic purposes, two acre-feet or less per year (California Water Code Section 10721(e)).

As part of the preparation of this GSP, the IWVGA oversaw a basin-wide well registration process to formally document the existence and operation of wells subject to the groundwater extraction fee (i.e. all wells in the IWVGB except those owned by federal entities or by de minimis extractors). During the well registration process, well owners were required to provide the IWVGA's Water Resources Manager (WRM) with registration information including the following:

- Name and contact address of the well owner;
- Point of contact of the well operator;
- Well location;
- Name and address of the owner of land upon which the well is located;
- Description of the method used by the well owner and operator to measure groundwater extractions from the well;
- A statement describing whether the extracted groundwater is used for residential, commercial, industrial, or agricultural purposes, or a combination thereof; and
- Any other information that the IWVGA's General Manager deems necessary to achieve the legal purposes of the IWVGA.

The fee is determined and paid on a monthly basis by all producers with registered groundwater extraction facilities in the IWVGB. Unregistered groundwater extraction facilities that are subject to the groundwater extraction fee are prohibited from extracting groundwater from the basin until the facility is registered to the satisfaction of the WRM, which oversees the registration of groundwater extraction facilities and reviews producers' self-reported measurements of groundwater extractions.

2.8 DATA MANAGEMENT SYSTEM (DMS)

2.8.1 Purpose and Development

The IWVGA developed a web-based geo-Database Management System (DMS) consistent with the DWR requirements for a GSP provided in Title 23 Section 352.6 of the California Code of Regulations: "Each agency shall develop and maintain a data management system that is capable of storing and reporting information relevant to the development or implementation of the Plan and monitoring of the basin." Development of the DMS occurred under two phases. Phase I work consisted of development of the DMS framework and structure, and Phase 2 work consisted of establishing monitoring protocols, database population, installation of equipment, and integration with the GSP to ensure its long-term success.

As part of on-going groundwater management activities, the DMS will be used to track sustainability goals and objectives for the IWVGB as part of the GSP. The DMS stores and presents specific supporting elements of the GSP, including monitoring, reporting, and management criteria. Other elements supporting the GSP are also stored in the DMS, including a water budget, hydrogeologic conceptual model,

and supporting documentation. Data obtained through the current water resource monitoring and management programs helped populate the DMS, and that data was used to develop alternative groundwater basin management strategies (see Section 4).

The DMS provides the public with access to data that would be infeasible to deliver through more traditional printed report format. These types of data sets and information include the following:

- Searchable electronic library of reports regarding Indian Wells Valley water resources;
- Access to a copy of the full database of well information (including well logs if available) covering the basin, including information on all known well sites; and
- Data for the Groundwater Monitoring Plan.

2.8.2 User Access and Privileges

The DMS was developed with a tiered security structure limiting the data that can be accessed based on the user's login information. The DMS's security structure may also limit the functionality of the system based on the user's login. For example, the general public has a public user level, meaning that the general public is limited to either viewing GSP data or viewing/downloading GSP reports. The general public cannot manage, edit, or upload any data on the DMS. Furthermore, the general public does not have access to confidential documents.

The DMS has a pre-programmed default username and password so that any general user may easily access the DMS. To access the DMS, the general public may visit the website listed below and click the "Log In" button and subsequent "log on" button. Doing so will direct the user to the DMS homepage at the public user level using the default username and password.

https://www.iwvgsp.com

2.9 REFERENCES

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From: Renee Westa-Lusk September 15, 2019
PAC Member

SUBJECT: Comment on Projects and Management Actions

I read over and reviewed the draft "Projects and Management Actions" section for the GSP.

I compared the content to what is required in DWR Sustainable Groundwater Management Program / **Draft GSP Emergency Regulations Guide** listed on page 15.

I could not find the following requirements (in the Draft GSP Emergency Regulations Guide) in Projects and Management Actions section of the GSP for the IWVGA:
1)an outline for required permitting
2)an implementation time-table
3)required legal authority

Secondly, I could not find a distinction in between the Projects and Management Actions that would be required to address the goal to reach sustainability vs. contingency Projects and Management Actions that would be intended to to be implemented as a last ditch effort if measurable objectives have not been met to reach sustainability. I think there needs to be a direct spelling out which of the two categories these water projects falls under. For example imported water and recycled water would be required Projects and Management Actions in the IWVGA GSP. Another example, brackish water program would be a contingency Project and Management Action.

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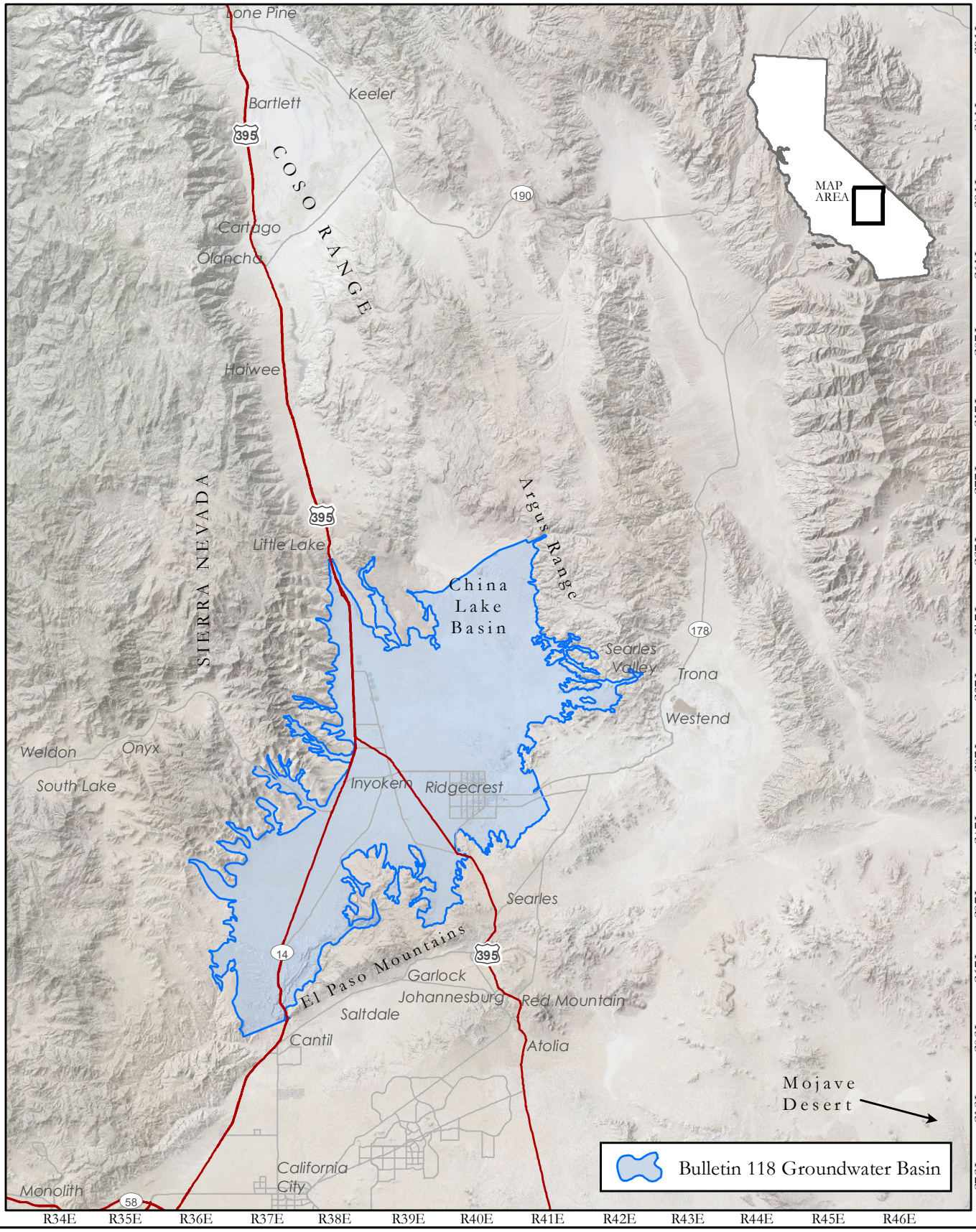

STETSON ENGINEERS INC.

GENERAL BASIN SETTING
INDIAN WELLS VALLEY GROUNDWATER BASIN
(DWR BULLETIN 118 BASIN NO. 6-054)

N

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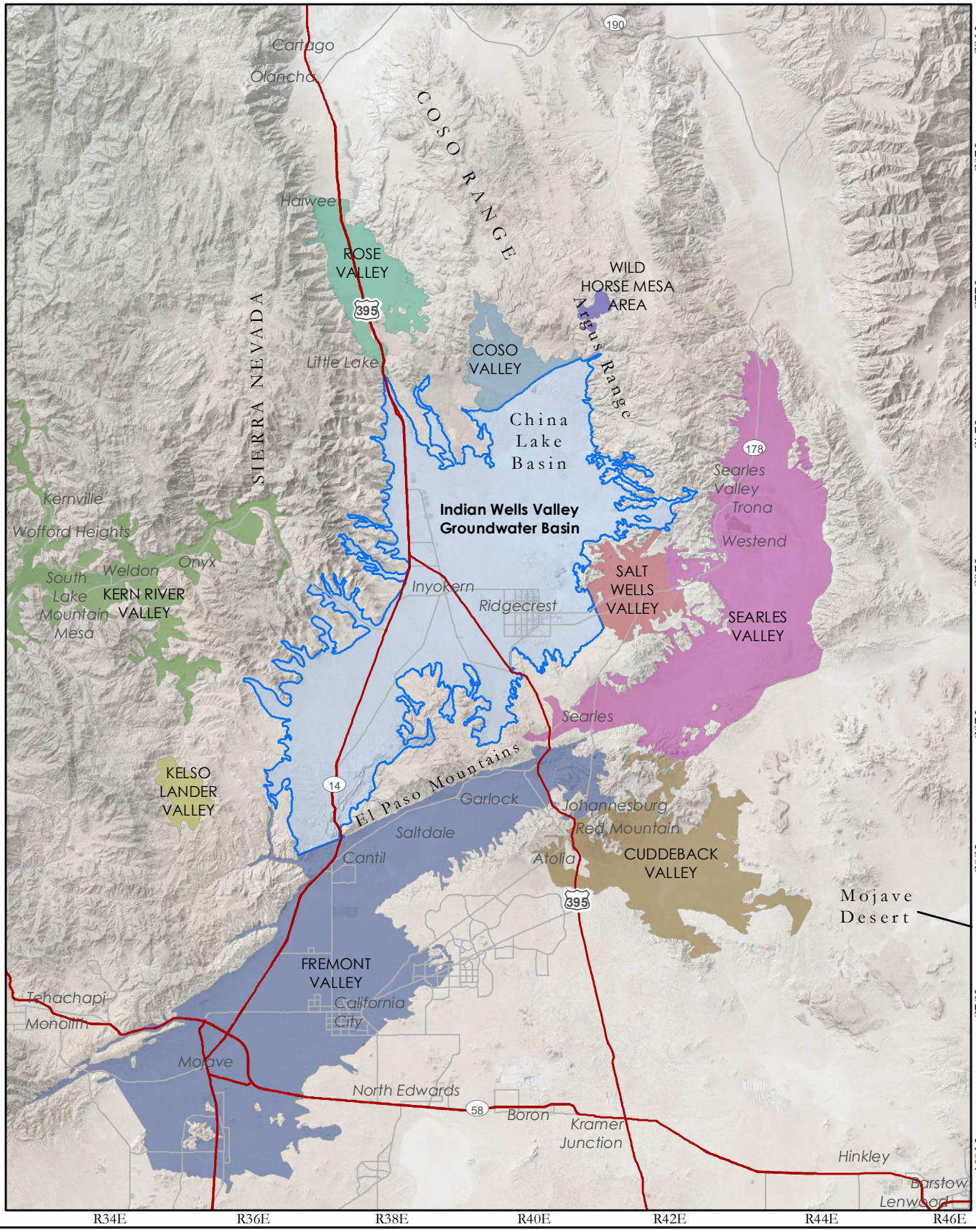

STETSON ENGINEERS INC.

ADJACENT AND NEIGHBORING GROUNDWATER BASINS
INDIAN WELLS VALLEY GROUNDWATER BASIN

N

0 5 10 Miles

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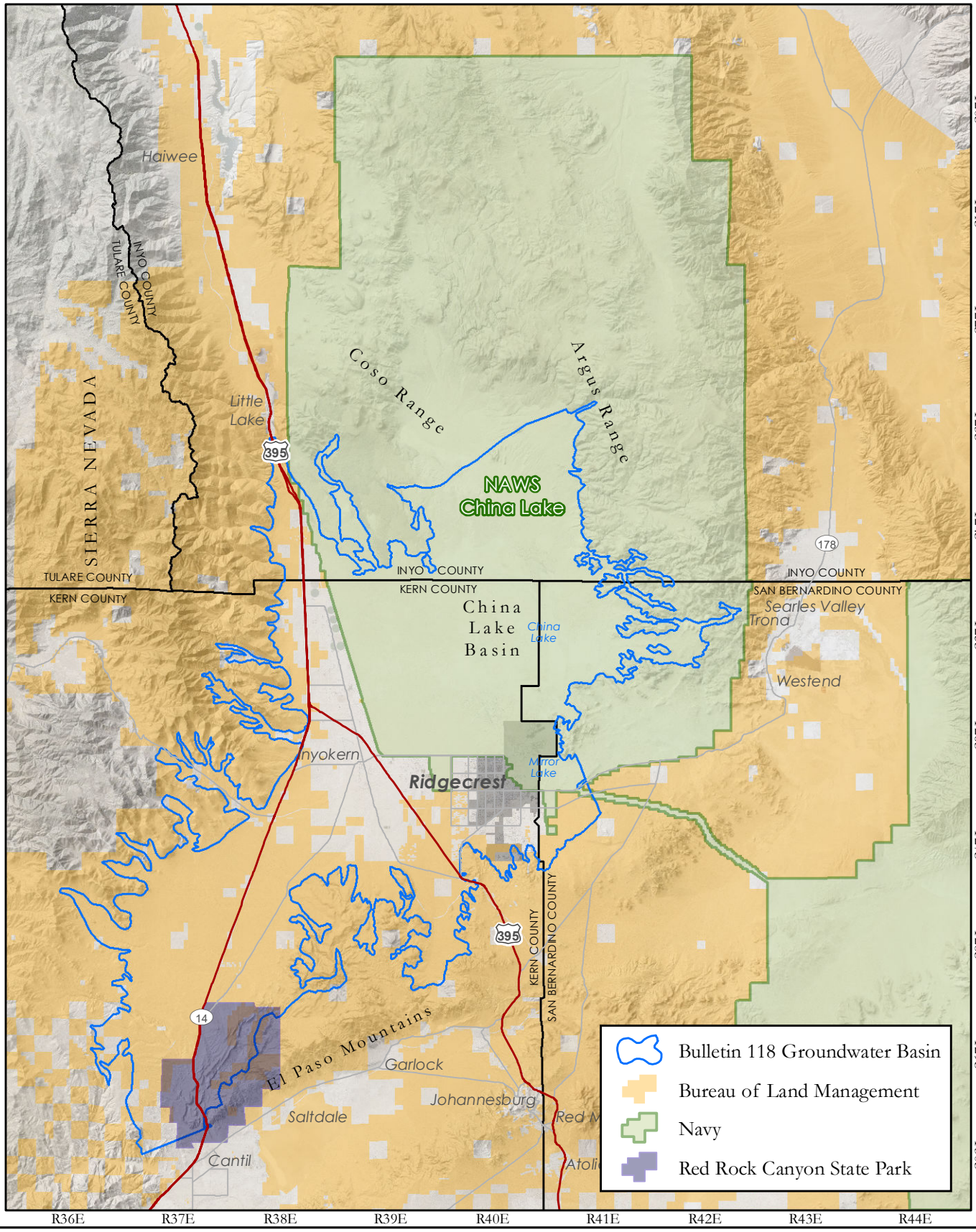

JURISDICTIONS AND BOUNDARIES OF FEDERAL AND STATE LANDS INDIAN WELLS VALLEY GROUNDWATER BASIN

STETSON ENGINEERS INC.

N

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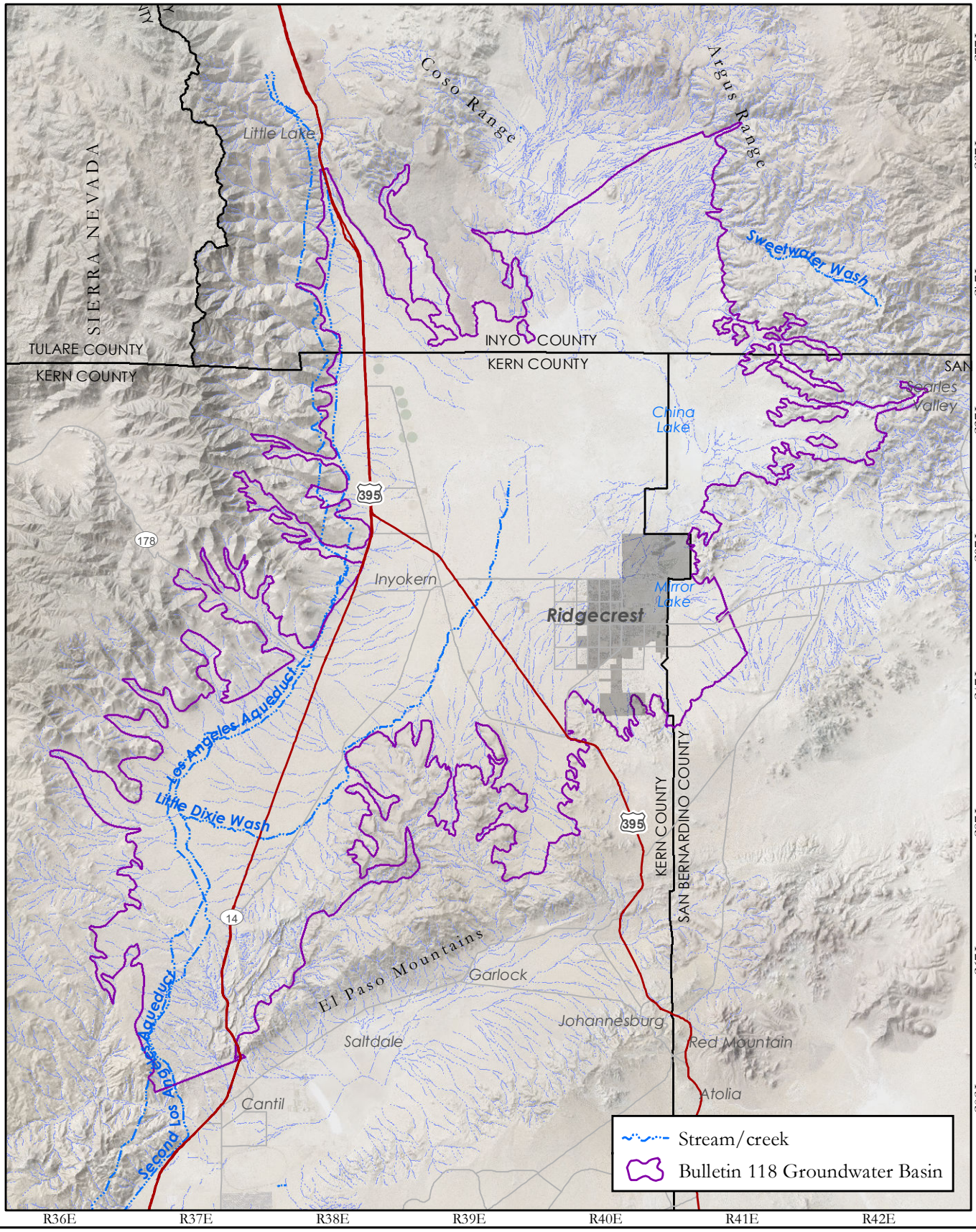

STETSON ENGINEERS INC.

STREAMS, RIVERS, AND OTHER SURFACE WATERS
INDIAN WELLS VALLEY GROUNDWATER BASIN

N

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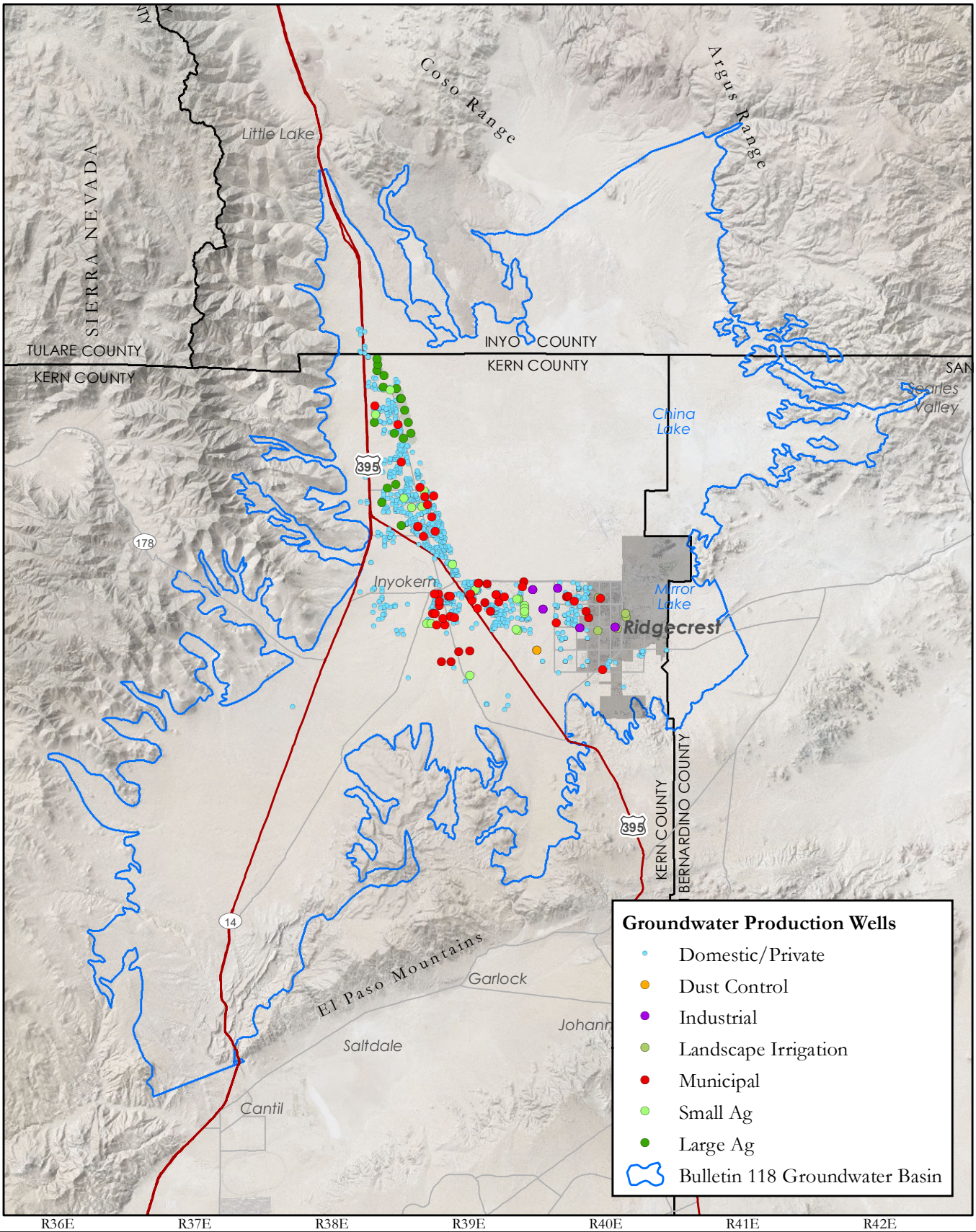

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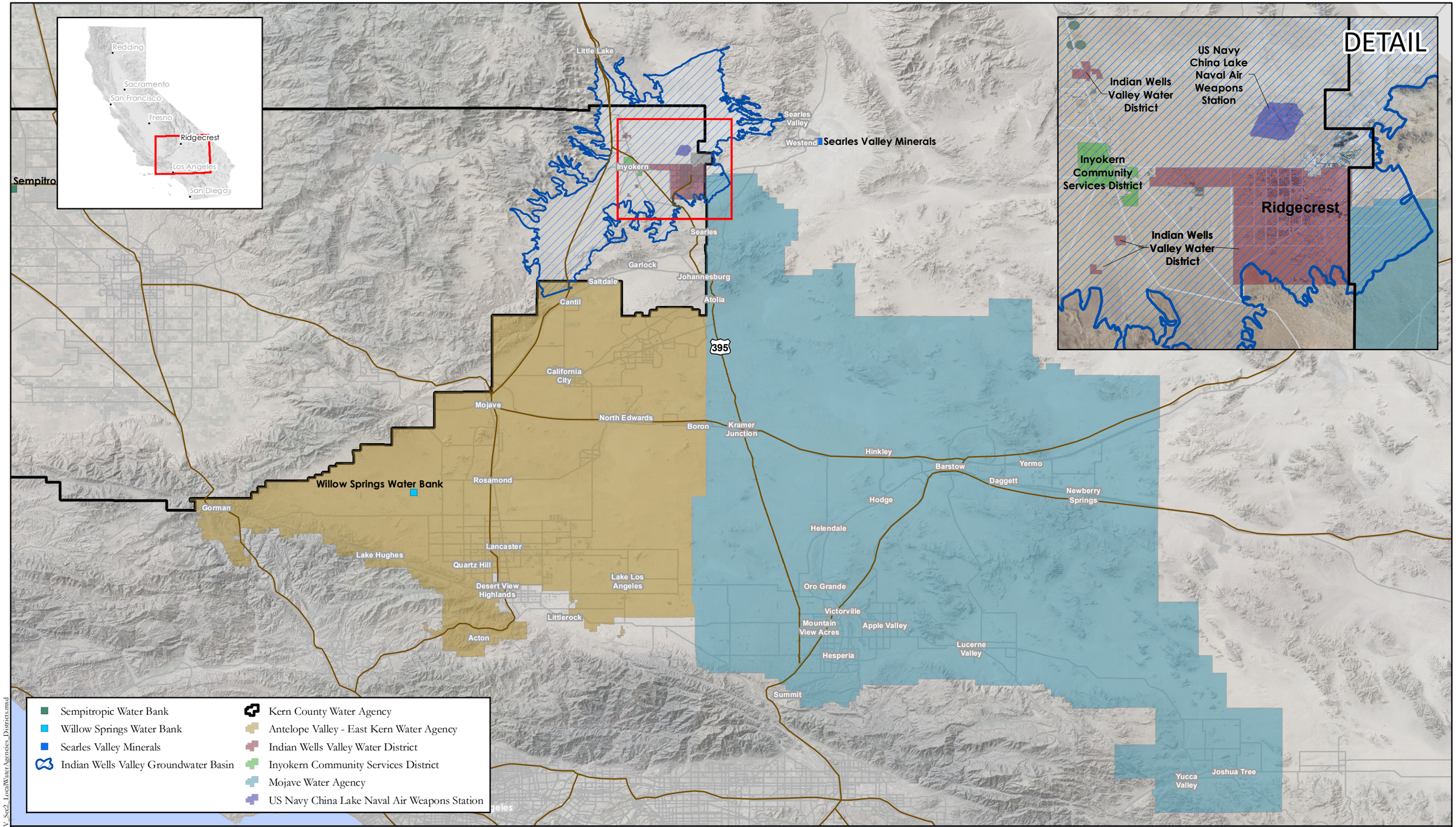
STETSON ENGINEERS INC.

LOCATIONS OF KNOWN GROUNDWATER PRODUCTION WELLS INDIAN WELLS VALLEY GROUNDWATER BASIN

N

0 2 4 Miles



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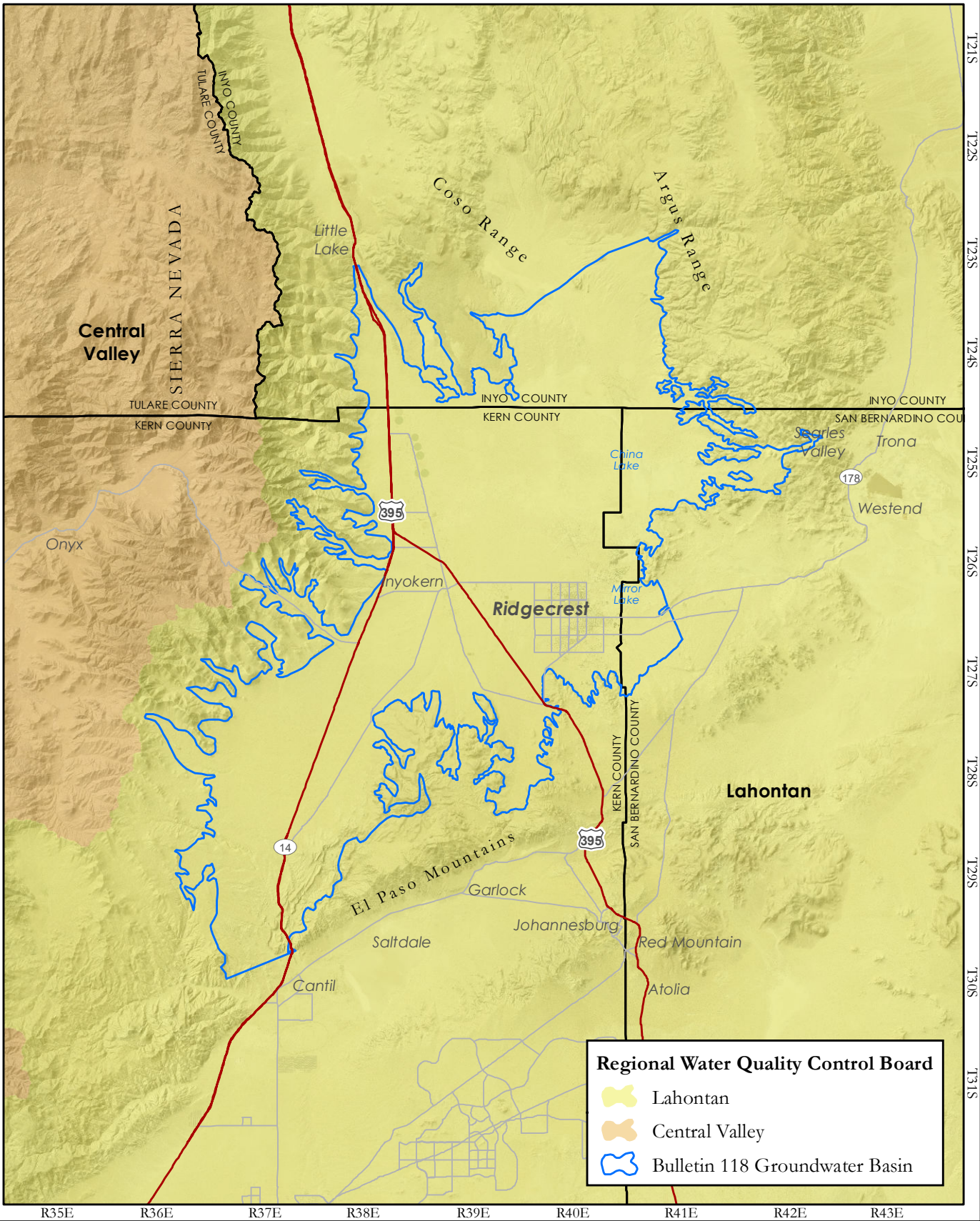
STETSON ENGINEERS INC.

LOCAL WATER AGENCIES AND DISTRICTS
INDIAN WELLS VALLEY GROUNDWATER BASIN

0 10 20 30 Miles

N



STETSON ENGINEERS INC.

REGIONAL BOARD BOUNDARIES
INDIAN WELLS VALLEY GROUNDWATER BASIN

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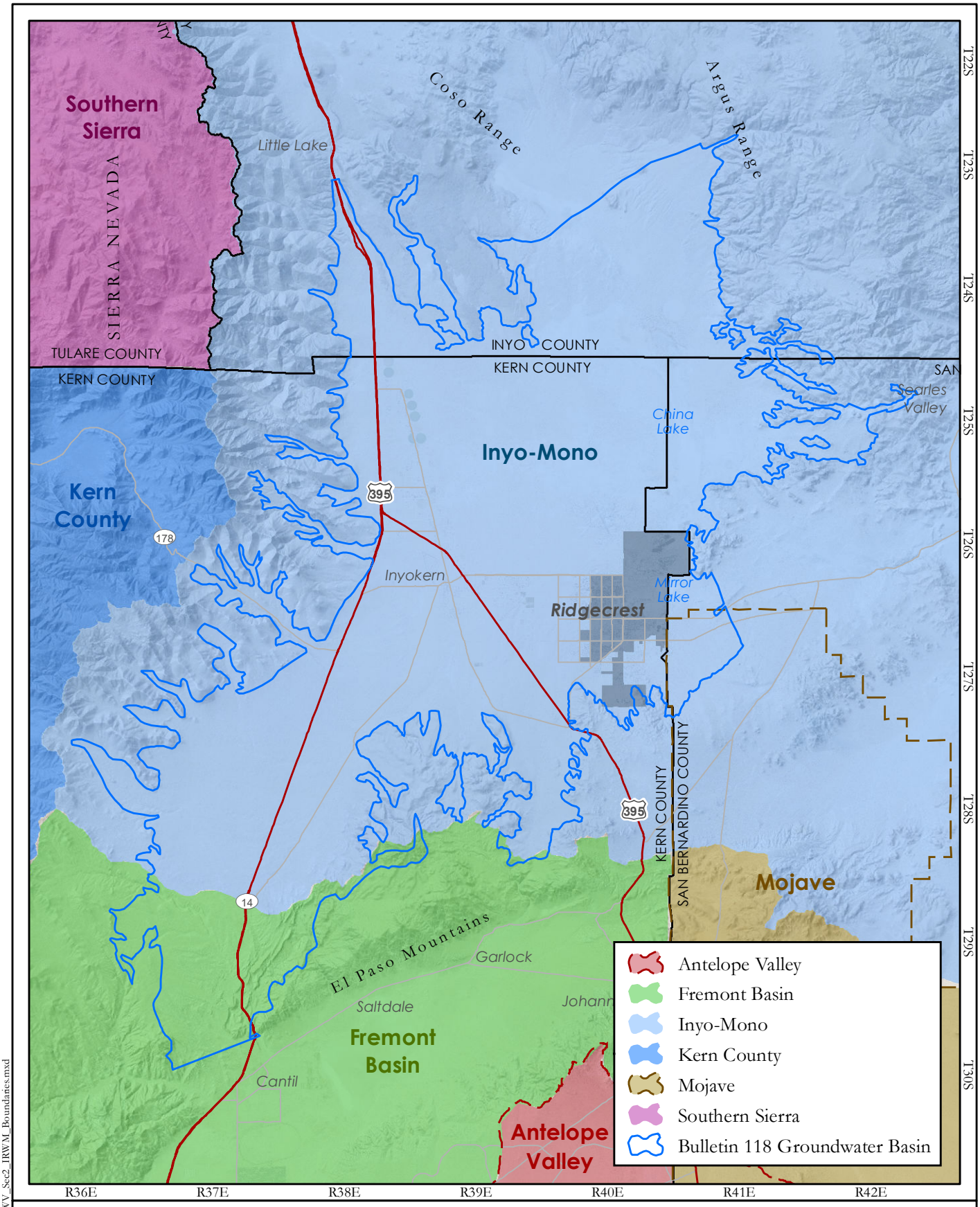

STETSON ENGINEERS INC.

INTEGRATED REGIONAL WATER MANAGEMENT (IRWM) BOUNDARIES
INDIAN WELLS VALLEY GROUNDWATER BASIN

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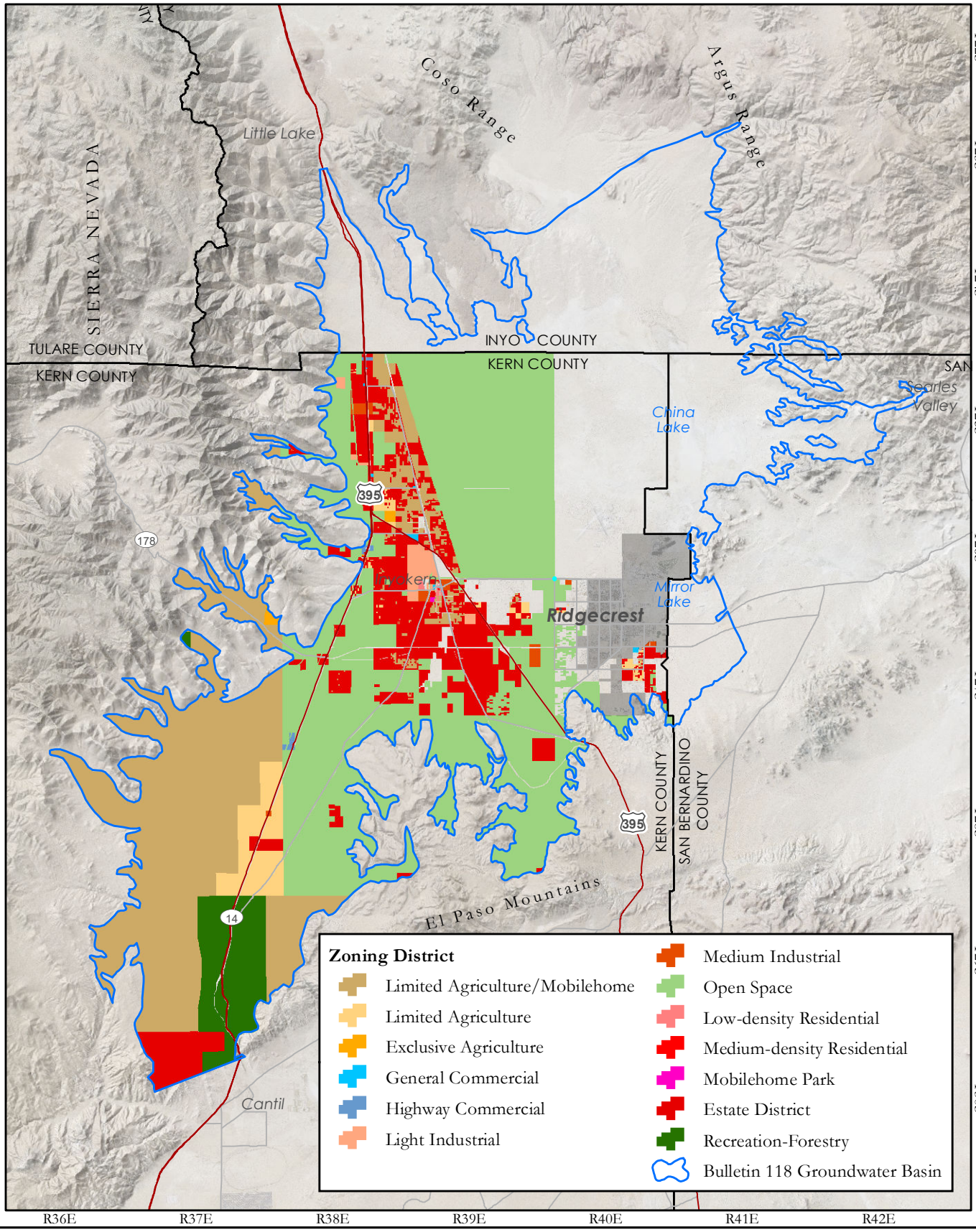

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STETSON ENGINEERS INC.

ZONING DISTRICTS (KERN COUNTY)
INDIAN WELLS VALLEY GROUNDWATER BASIN

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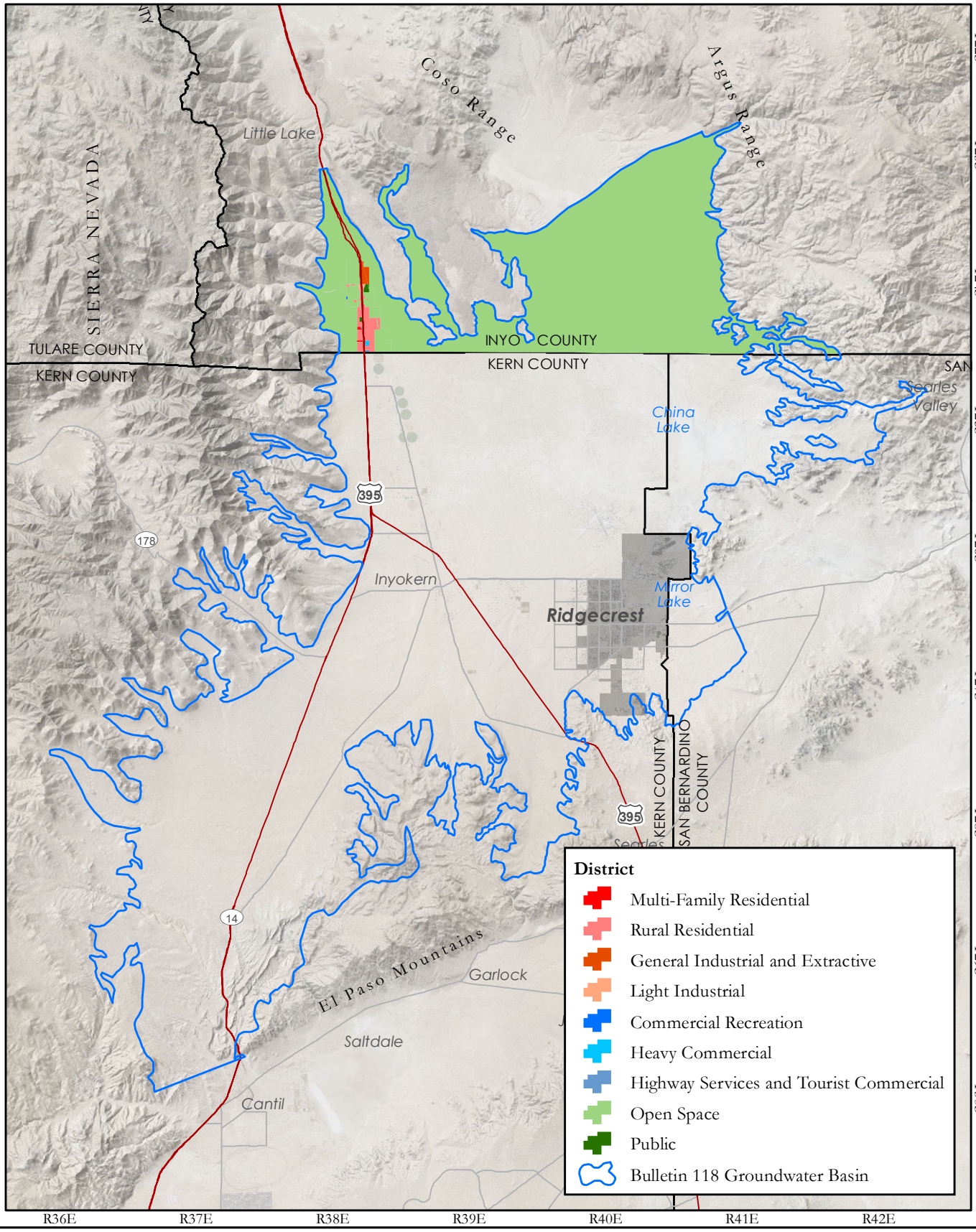

STETSON ENGINEERS INC.

ZONING DISTRICTS (INYO COUNTY)
INDIAN WELLS VALLEY GROUNDWATER BASIN

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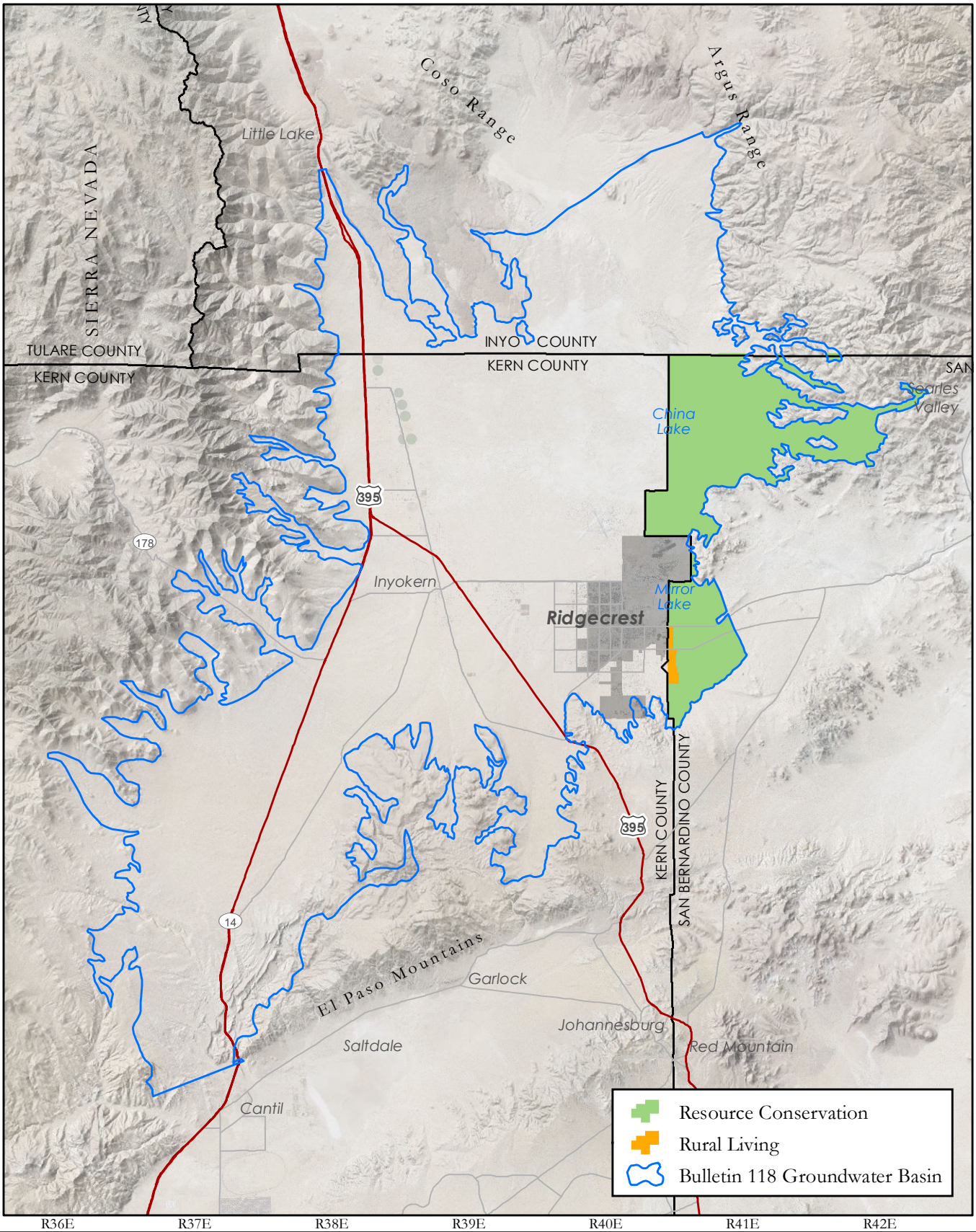

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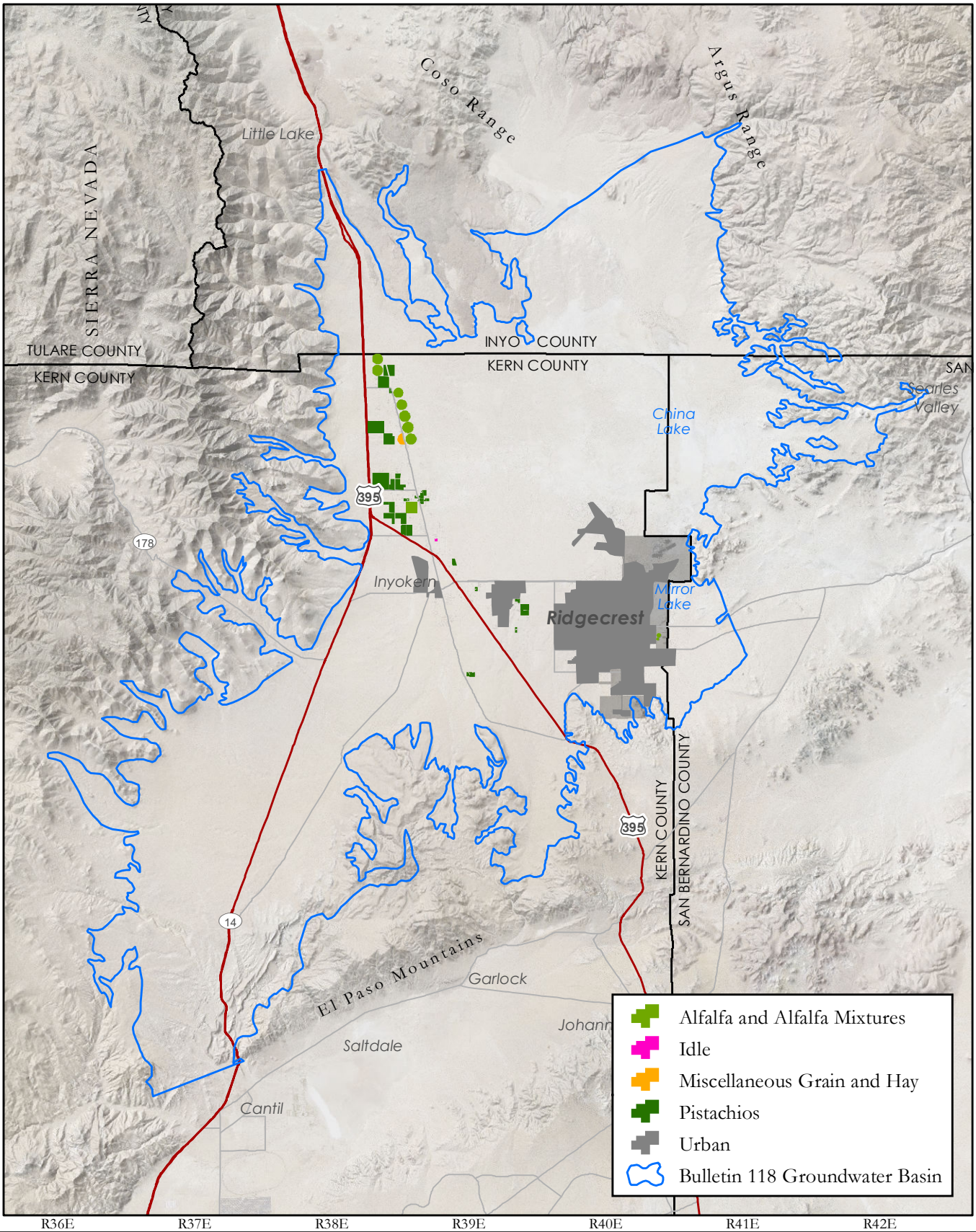
ZONING DISTRICTS (SAN BERNARDINO COUNTY)
INDIAN WELLS VALLEY GROUNDWATER BASIN

N

0 2 4 Miles



STETSON ENGINEERS INC.

ACTIVE AGRICULTURAL LANDS
INDIAN WELLS VALLEY GROUNDWATER BASIN

Source: DWR State Crop Mapping 2014; https://data.cnra.ca.gov/dataset/crop-mapping-2014

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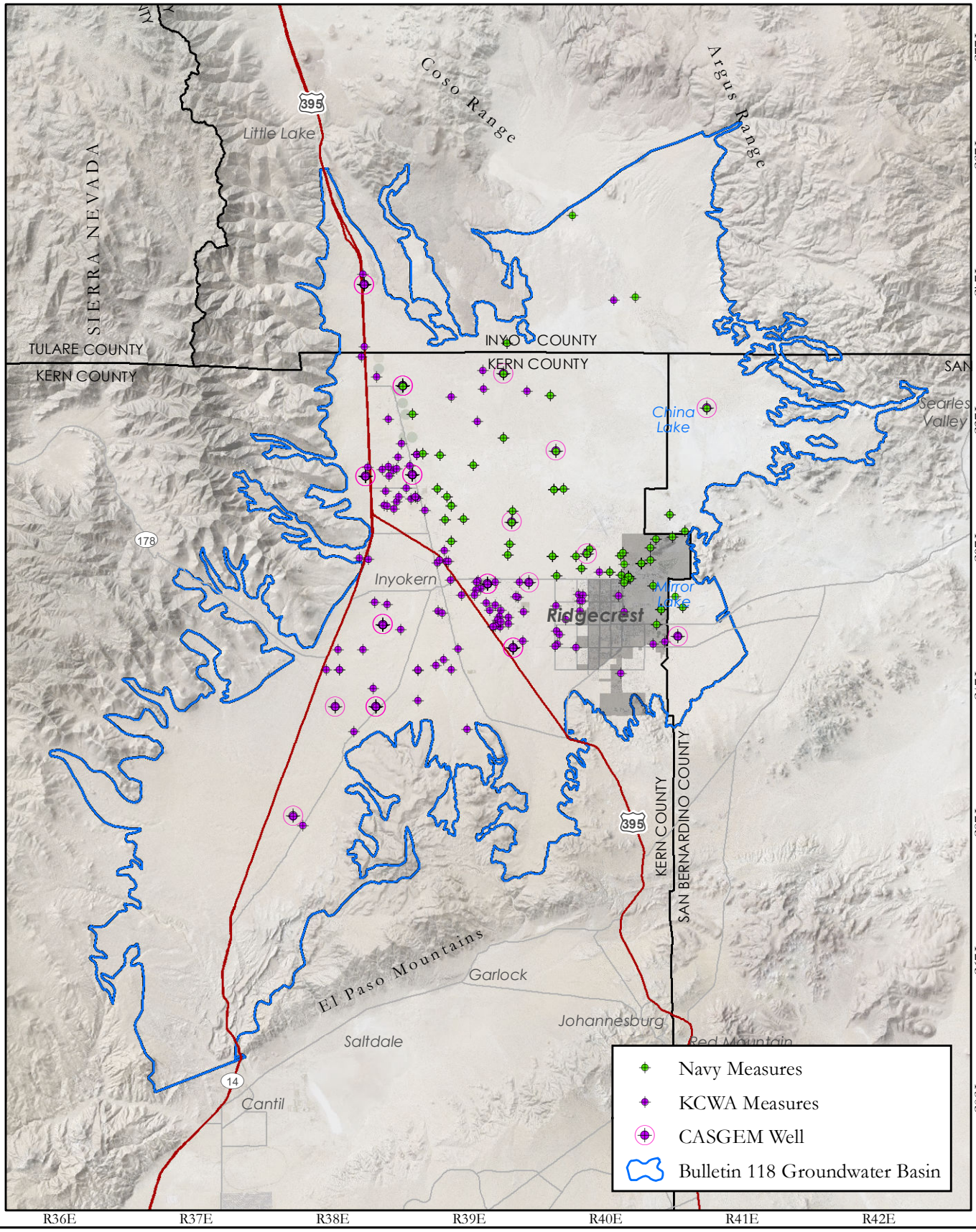

LOCATIONS OF MONITORING WELLS
INDIAN WELLS VALLEY GROUNDWATER BASIN

STETSON ENGINEERS INC.

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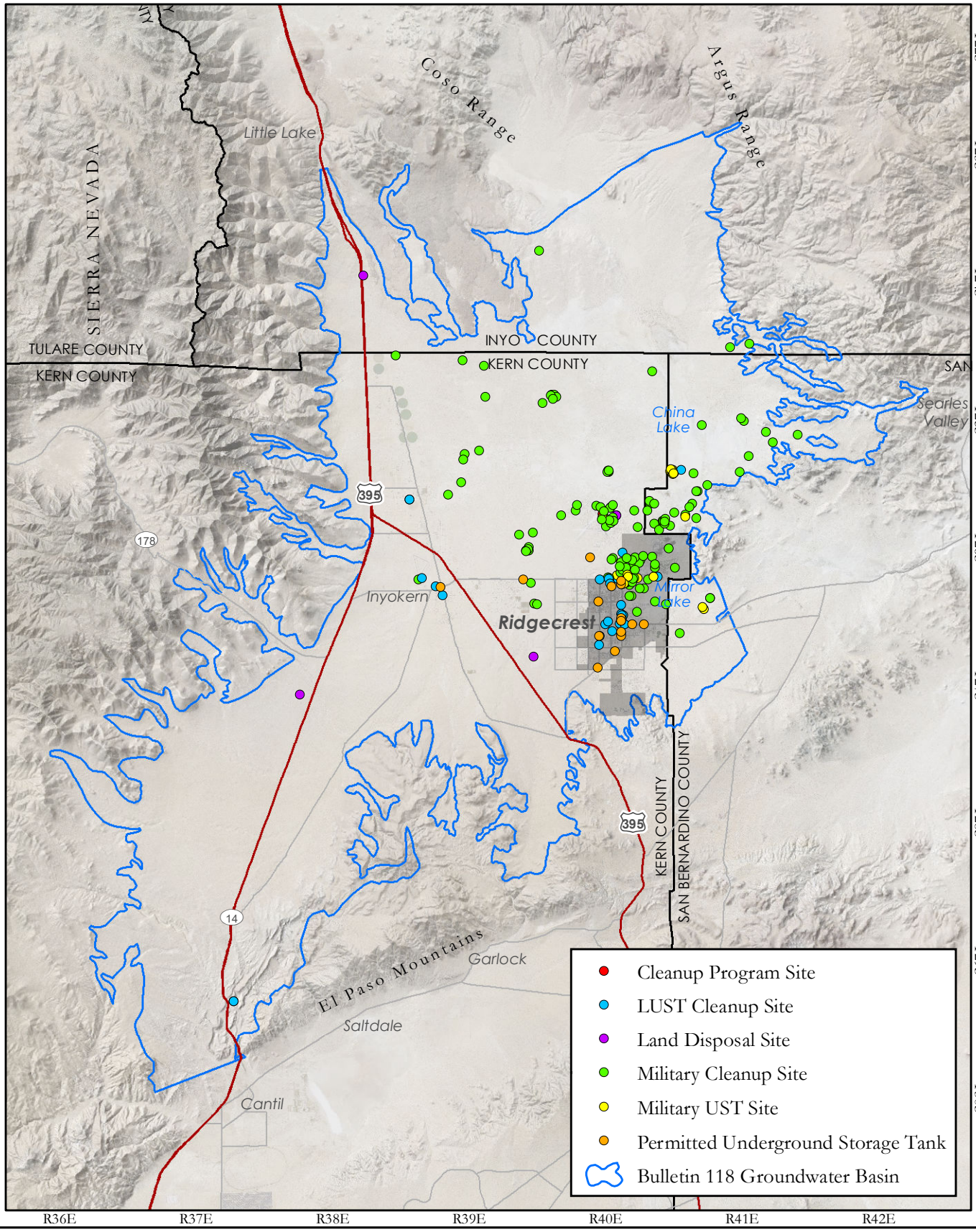

LOCATIONS OF
GROUNDWATER CONTAMINATION CLEANUP SITES
INDIAN WELLS VALLEY GROUNDWATER BASIN

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0 2 4 Miles

STETSON ENGINEERS INC.

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