

In General the text part of Section 2 is OK. I must trust that the numbers are correct.

2.4.4: “the Cooperative Group”

Comment: undefined – who are these people?

2.4.5: Indian Wells Valley Cooperative Groundwater Management Group (Cooperative Group)

Suggest be moved forward for clarity – Proper designation would be “IWV-CGMG” but nobody likes Acronyms.

2.5.2: Consider adding the SCE ROW acreages, DWP ROWs for power and the LAA, CalTrans Highways and county roads. May be in Todd Report-2014 or at BLM.

2.5.2.2: NO Mention of the Inyo County Water Ordinance for the Pearsonville area limiting permitting to Water Neutral development.

2.7.3.1: “Cash for Grass” was partly funded by a grant through IM-IRGMP. Prop 1 or 84 funding as I recall. Call Holly Alpert for clarification.

2.7.6 **Appendix ---**. Don’t know if you will include that NAWS-CL had the shallow aquifer in the SW corner of the Base reclassified by Lahontan as “non-municipal use” a few years ago. I suggest reference in the text here.

## FIGURES

Fig- 2-1 “Coso Range” needs to be moved off Owens Lake and further south. Reduce Font size.

Fig- 2-3 “Coso Range” covering Coso Basin. Move northwesterly.

China Lake and Mirror Lakes should be referred as “(playa)” (Lake implies: surface water to area strangers)

Fig- 2-4 “Los Angeles Aqueduct” is neither a Stream nor a Creek. Use another color and note in Text box.

Ridgecrest now includes NAWS-CL change this areas color or eliminate.

Far upper right of IWVGB is a missed inflow for recharge. May be “Wilson Canyon Wash”

Fig- 2-5 Again Ridgecrest does not include that part of the Base. Somebody using satellite photos for mapping.

Fig- 2-6 Still wrong. Get help from Adam or Don. Same error in detail box. **Continues through to last figure.**

Inyo County Line extends all the way to the California State Line E’ly.

Fig- 2-9 Way too busy. Colors too close together in some areas to do a good ID of areas.

Fig- 2-10 Line between Inyo and Kern needs repairs.

Fig- 2-12 Base is not properly represented as Urban (another satellite mapper error).

Fig- 2-13 What do they “Measure”??

Fig- 2-14 LUST ?? “Leaking UST Cleanup Site”

END OF COMMENTS



INDIAN WELLS VALLEY GROUNDWATER BASIN

GROUNDWATER SUSTAINABILITY PLAN

SECTION 2 – PLAN AREA

**DRAFT**

**September 3, 2019**

**SECTION 2: PLAN AREA .....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                 | <b>381,708</b>         | <b>100%</b>        |

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<br>(Bureau of Land Management) | 140,184                | 37%                |

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

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

| Entity                      | Overlying Land (acres) |                |                 |                | Overlying Land (%)    |     |                 |          |
|-----------------------------|------------------------|----------------|-----------------|----------------|-----------------------|-----|-----------------|----------|
|                             | NAWS<br>China<br>Lake  | BLM            | Non-<br>Federal | Subtotal       | NAWS<br>China<br>Lake | BLM | Non-<br>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<br>Bernardino<br>County | 32,527                 | 4,704          | 754             | 37,985         | 86%                   | 12% | 2%              | 100%     |
| Total                       | <b>161,911</b>         | <b>140,184</b> | <b>79,613</b>   | <b>381,708</b> | -                     | -   | -               | -        |

### 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                | <b>932</b>      |

## 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                          | <b>252,162<sup>1</sup></b> | <b>100%</b> |

### 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

<sup>1</sup> 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*

| <b>Zoning District</b>                  | <b>Area (acres)</b> | <b>Area (%)</b> |
|-----------------------------------------|---------------------|-----------------|
| 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%        |
| <b>Total</b>      | <b>66,215<sup>2</sup></b> | <b>100%</b> |

### 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*

| <b>Zoning District</b> | <b>Area (acres)</b>       | <b>Area (%)</b> |
|------------------------|---------------------------|-----------------|
| Resource Conservation  | 37,411                    | 98.5%           |
| Rural Living           | 574                       | 1.5%            |
| <b>Total</b>           | <b>37,985<sup>3</sup></b> | <b>100%</b>     |

<sup>2</sup> 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.

<sup>3</sup> 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<sup>4</sup>. 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.

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<sup>4</sup> 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 NAWIS 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://iwwgroundwater.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.iwvgs.com](http://www.iwvgs.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 hose 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<sup>5</sup>, 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.

<sup>5</sup> 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](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.

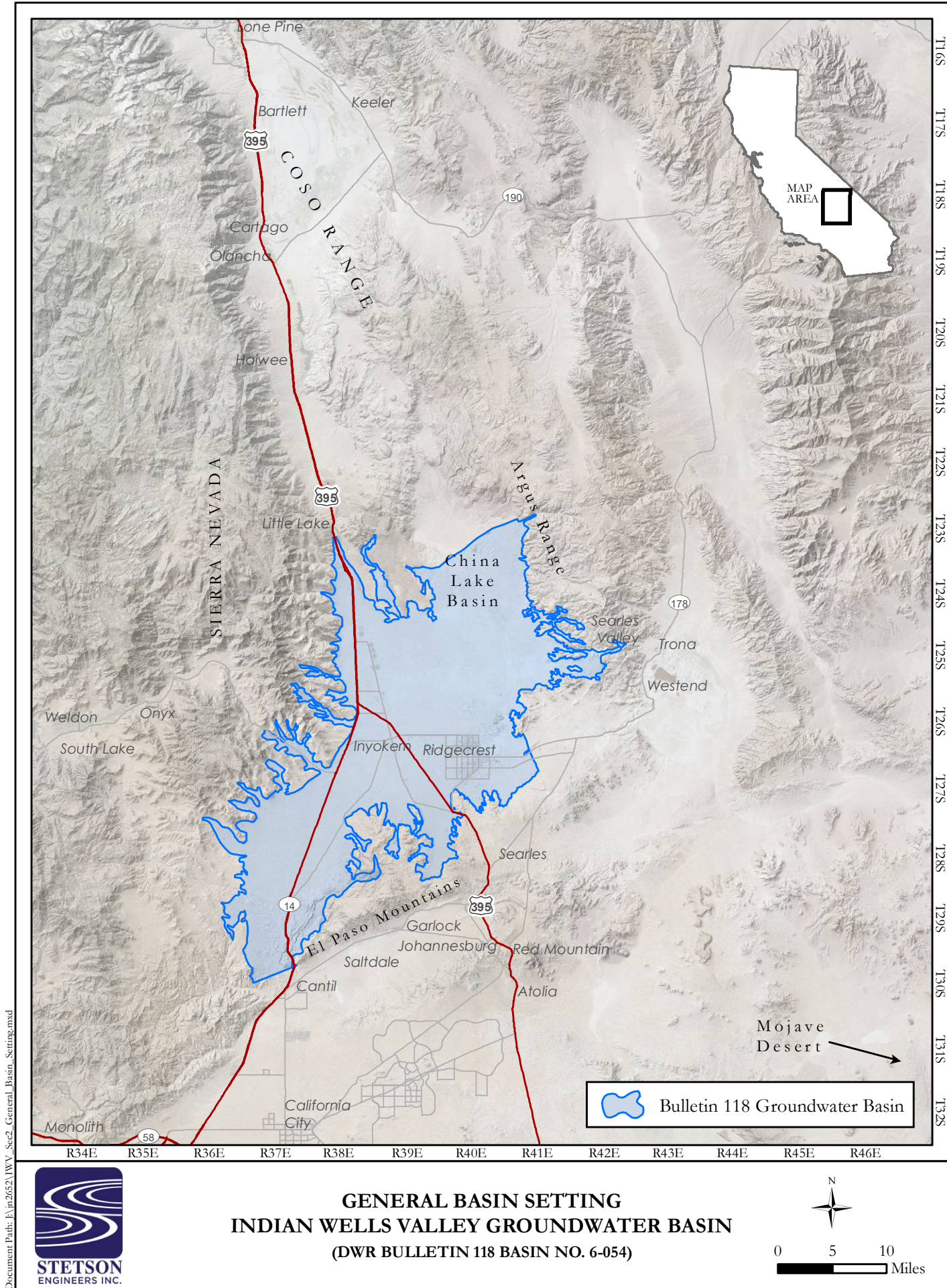
<https://www.iwvgsp.com>

## 2.9 REFERENCES

- Alpert, Holly, Ph. D, et al., 2014. *Inyo-Mono Integrated Regional Water Management Plan*. Prepared for the Inyo-Mono Integrated Regional Water Management Program. October 2014.
- Ecological Research Services (ERS), 1991. *Elements of a Habitat Management Plan for the Mohave Tui Chub at the China Lake Naval Weapons Center Relative to the City of Ridgecrest's Wastewater Reclamation Project*. Document provided by Stephan Bork of the Indian Wells Valley Technical Advisory Committee. October 1991.
- Inyo County Planning Department, 2013. *Inyo County General Plan - Introduction*. May 2013.
- Kern County Planning Department, 2009. *Kern County General Plan*. September 2009.
- Provost & Pritchard, 2015. *Wastewater Treatment Plant Facility Plan*. Prepared for the City of Ridgecrest. October 2015.
- RMC, Woodard & Curan, and Parker Groundwater, 2018. *Indian Wells Valley Groundwater Basin Salt and Nutrient Management Plan*. Prepared for City of Ridgecrest and the Indian Wells Valley Water District. March 2018.
- Todd Engineers, 2014. *Indian Wells Valley Resource Opportunity Plan, Water Availability and Conservation Report*. Prepared for Kern County Planning and Community Development Department. January 2014.
- URS Corporation, 2007. *County of San Bernardino 2007 General Plan*. Prepared for the San Bernardino County Land Use Services Division. March 2007.



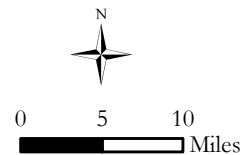
FIGURE 2-1

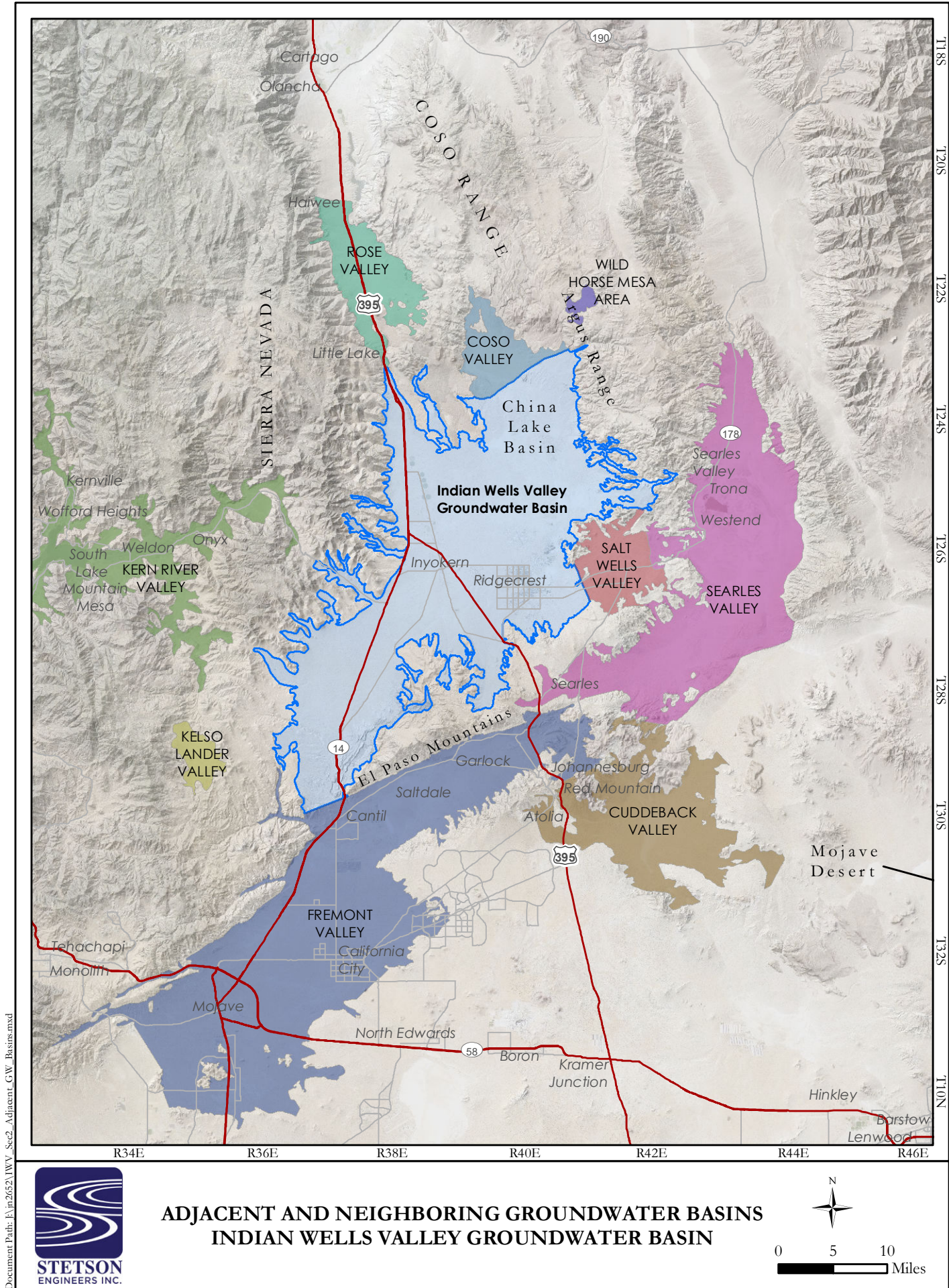


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**GENERAL BASIN SETTING**  
**INDIAN WELLS VALLEY GROUNDWATER BASIN**  
(DWR BULLETIN 118 BASIN NO. 6-054)





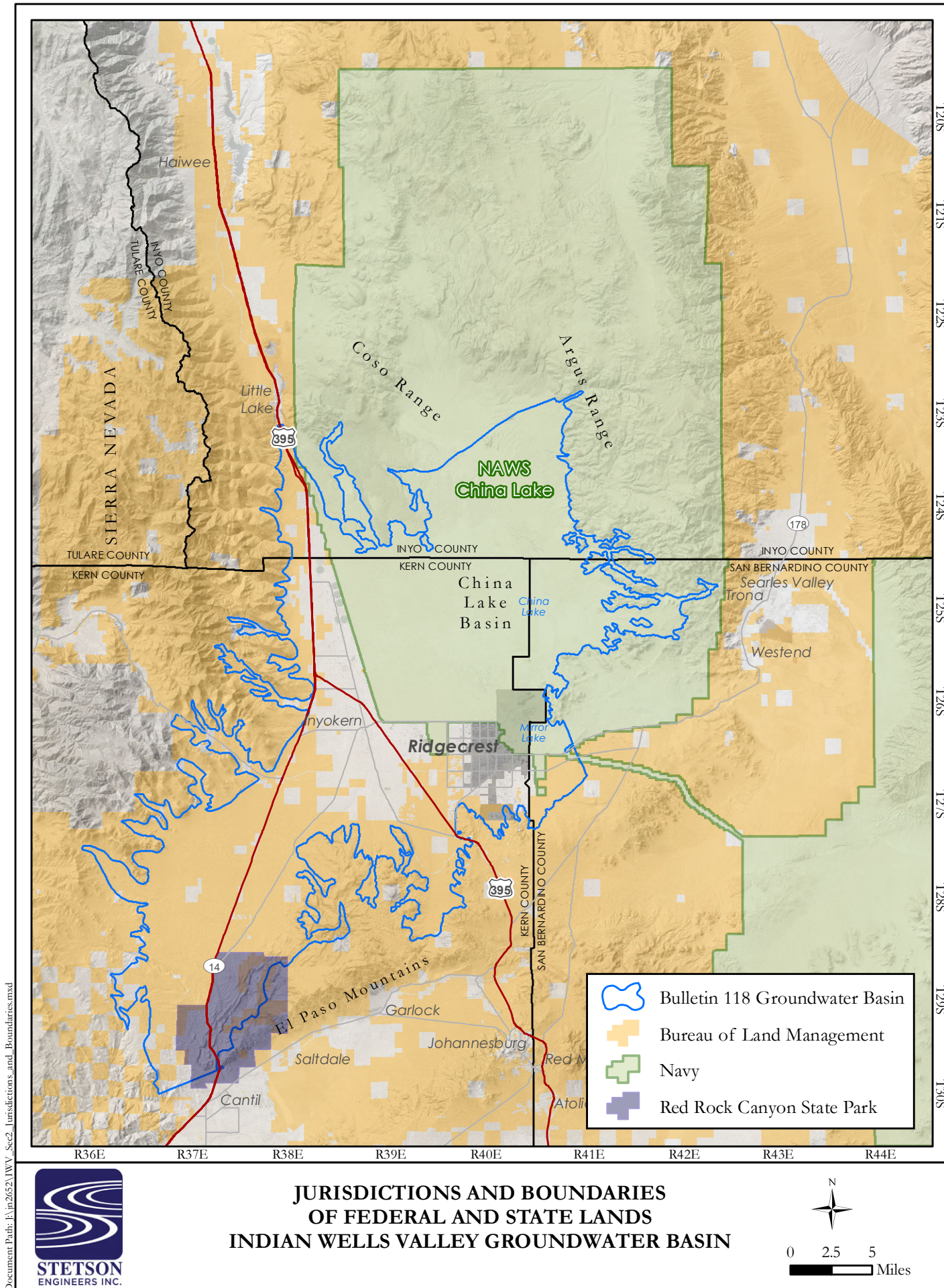
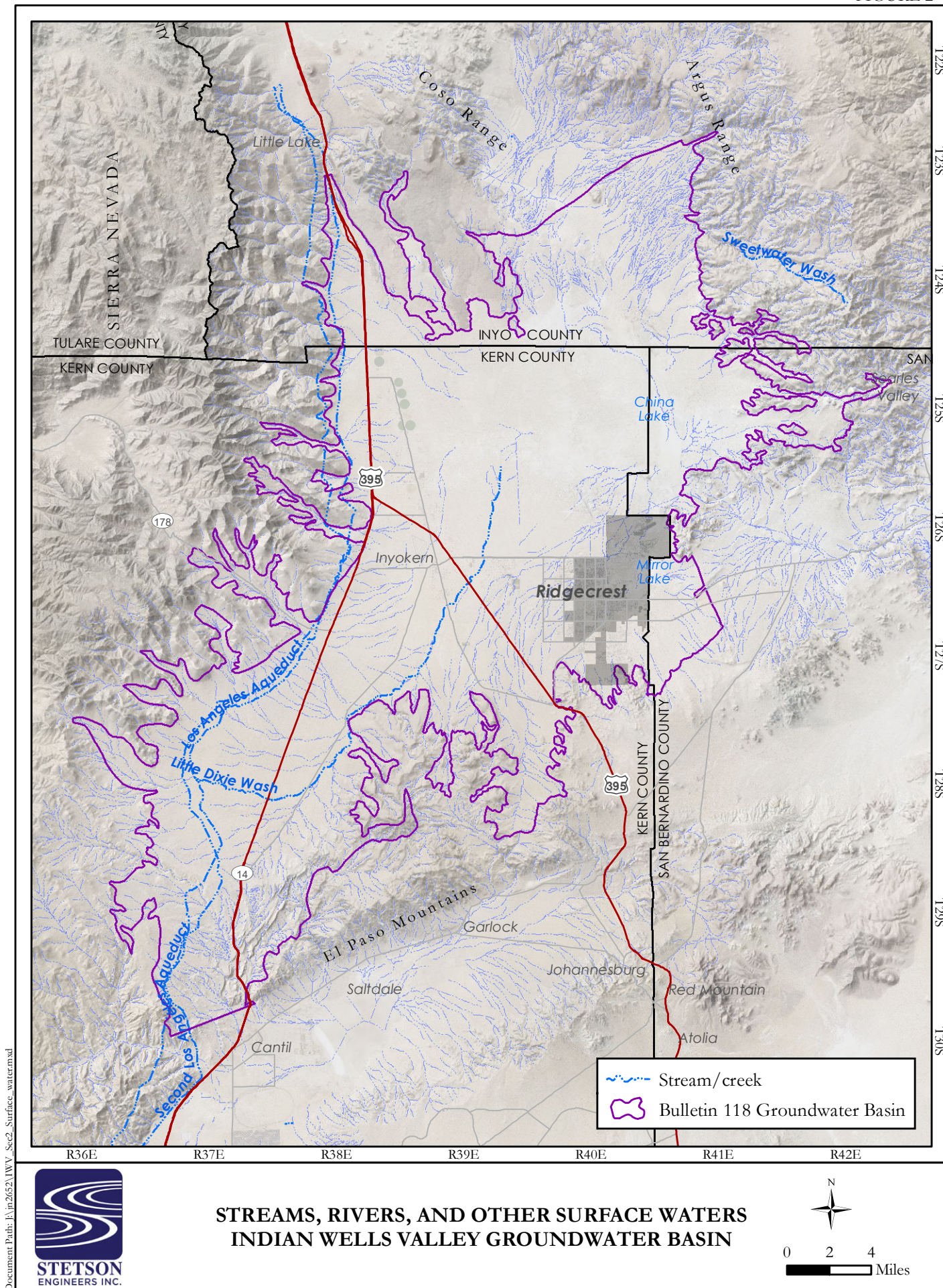


FIGURE 2-4



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

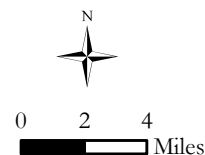
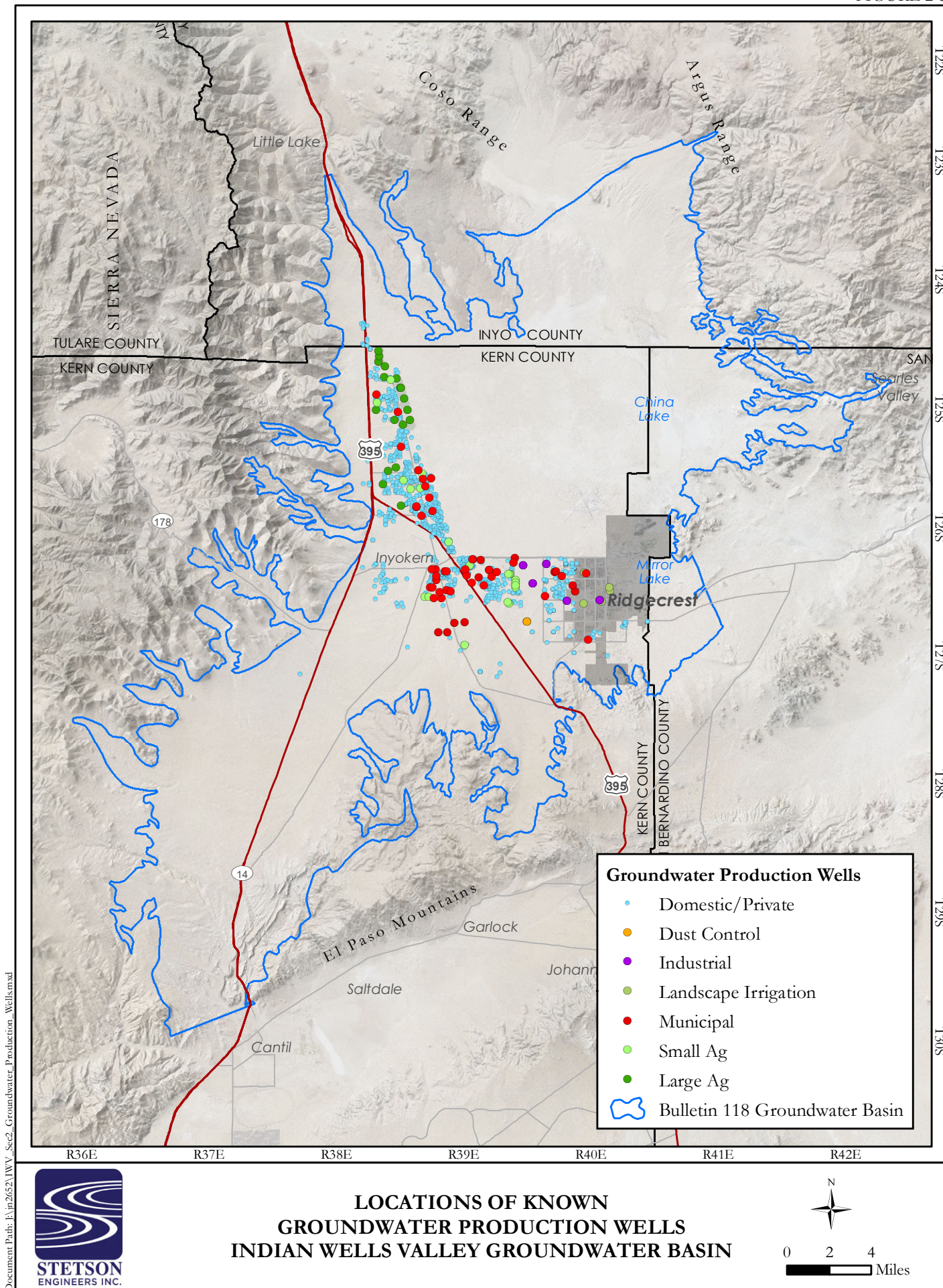


FIGURE 2-5



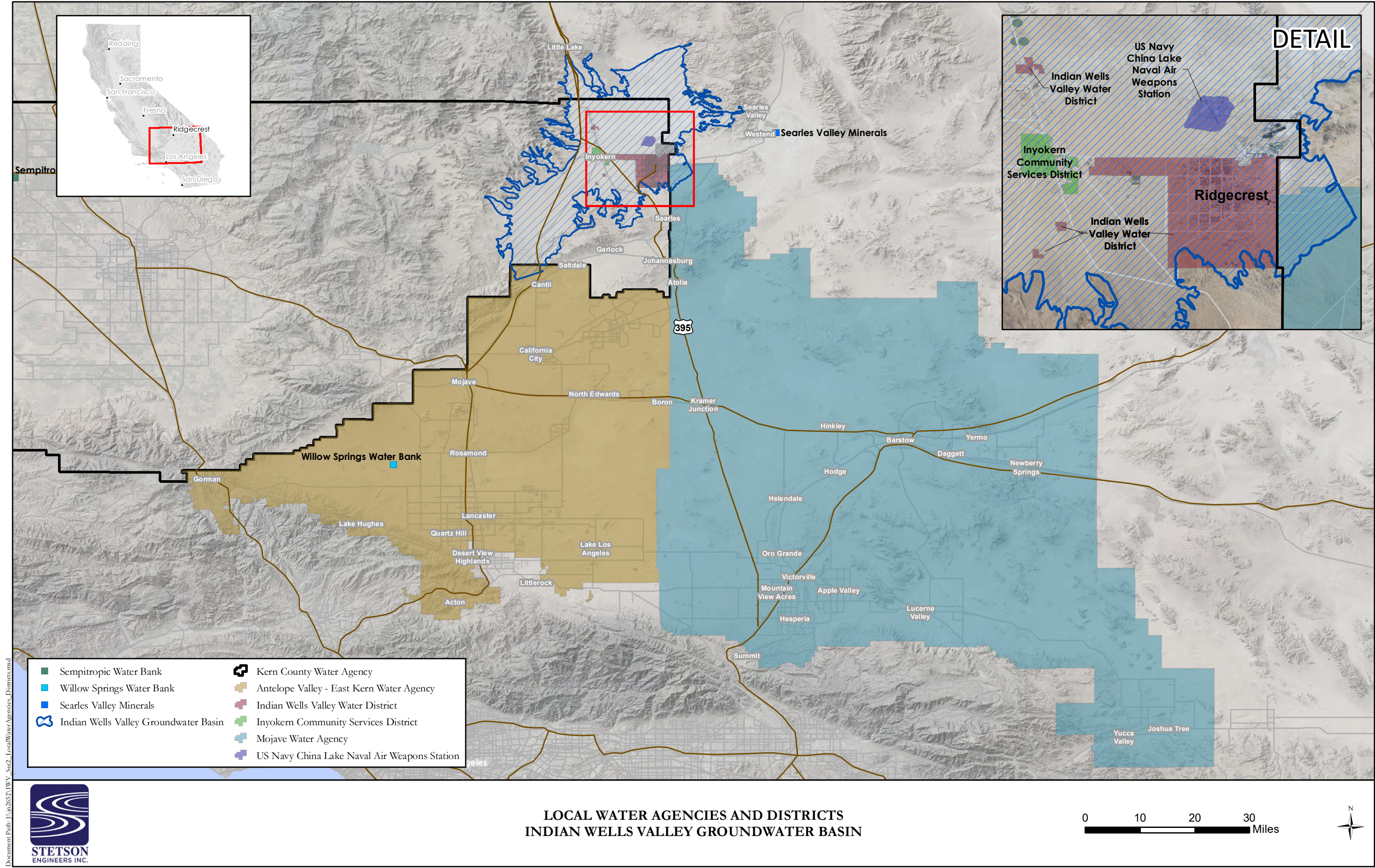
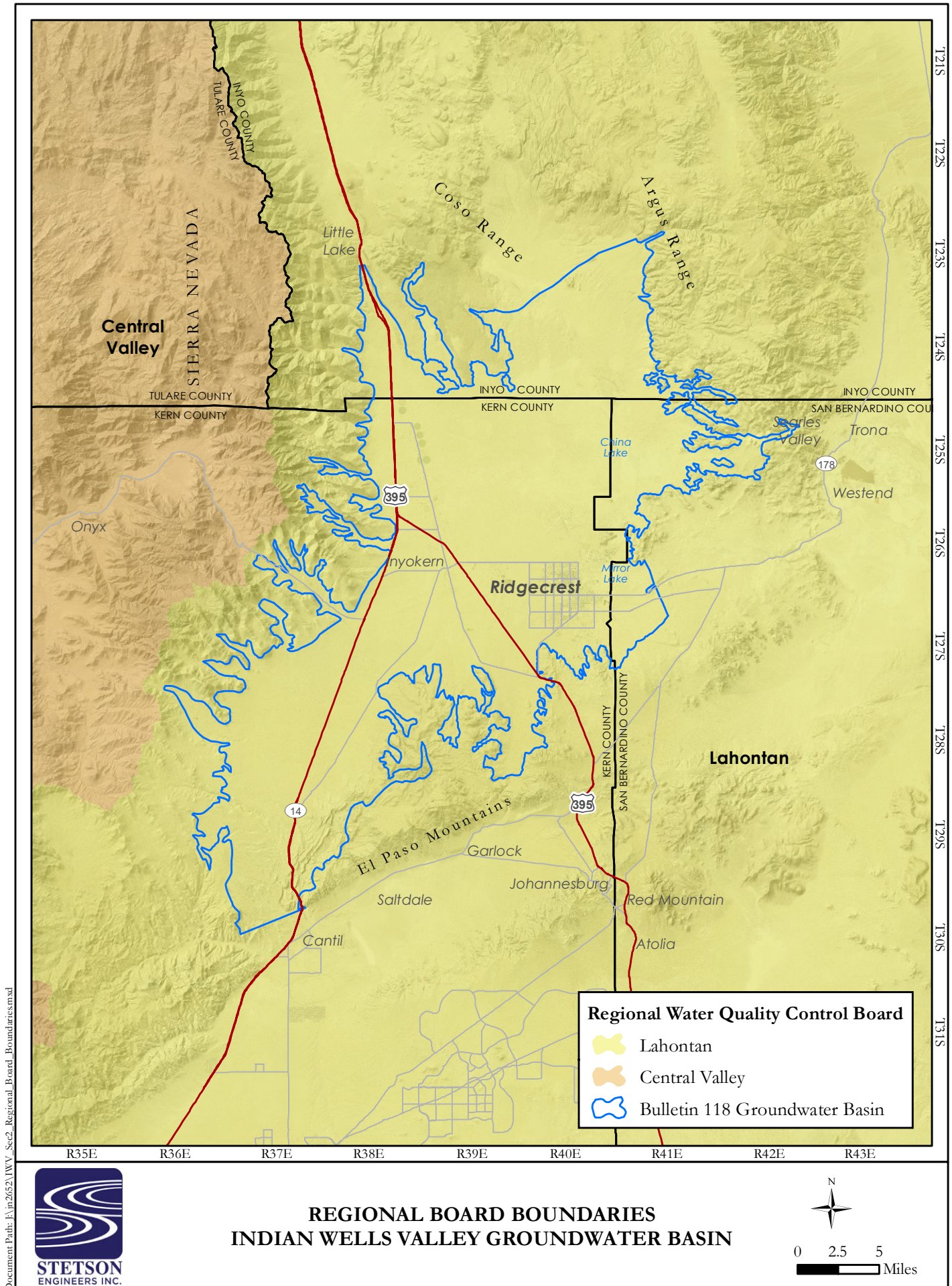


FIGURE 2-7



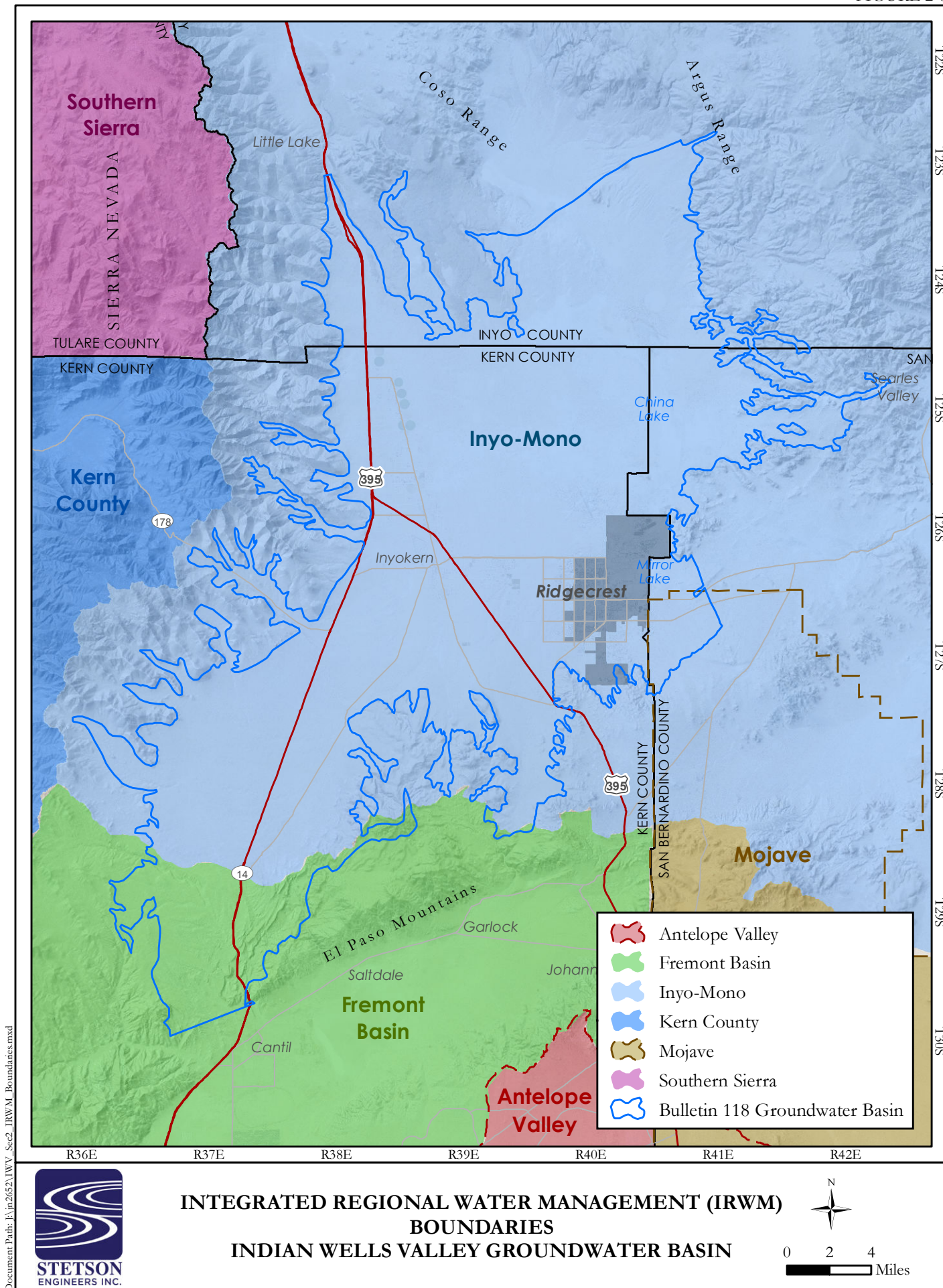
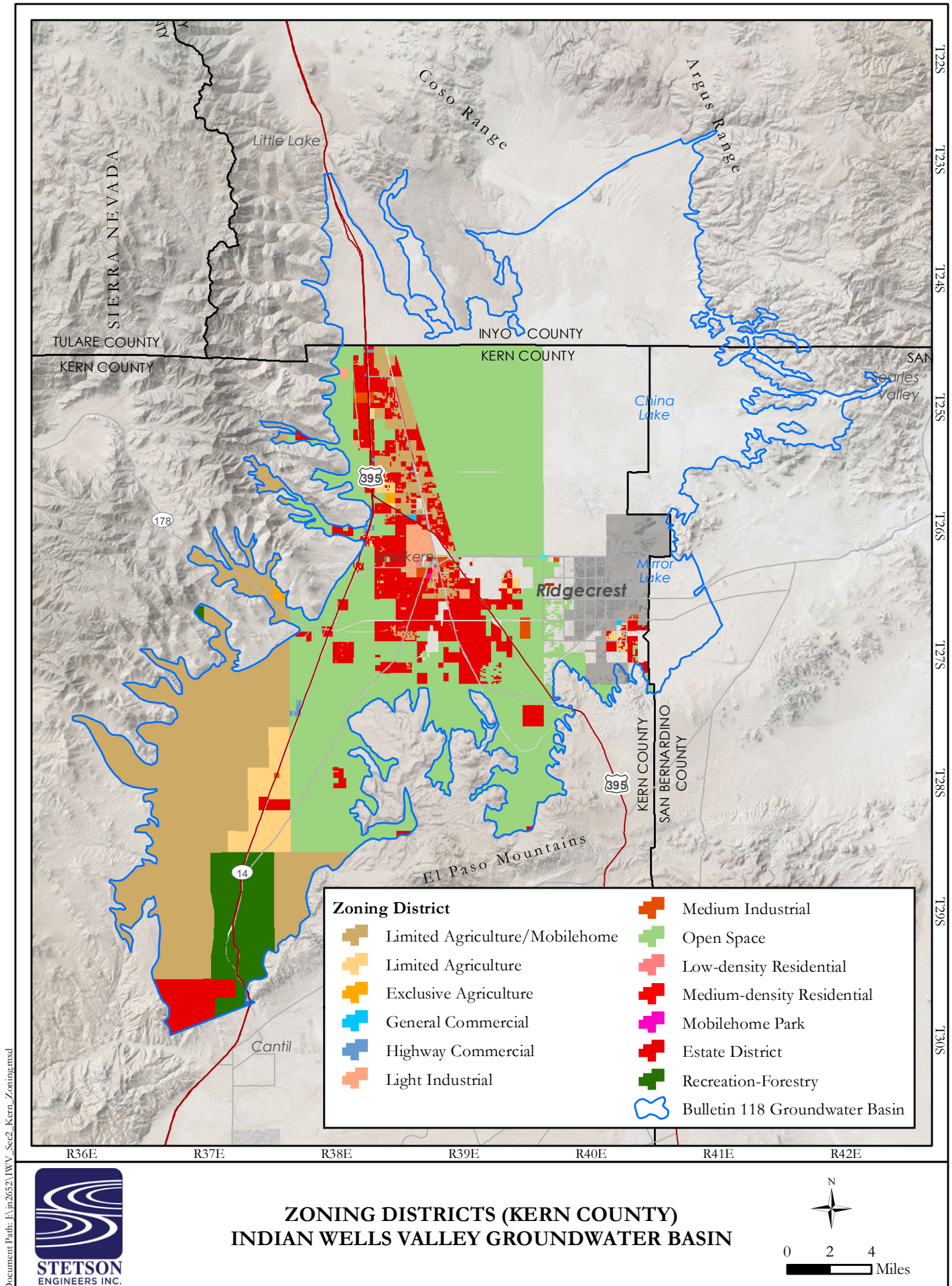
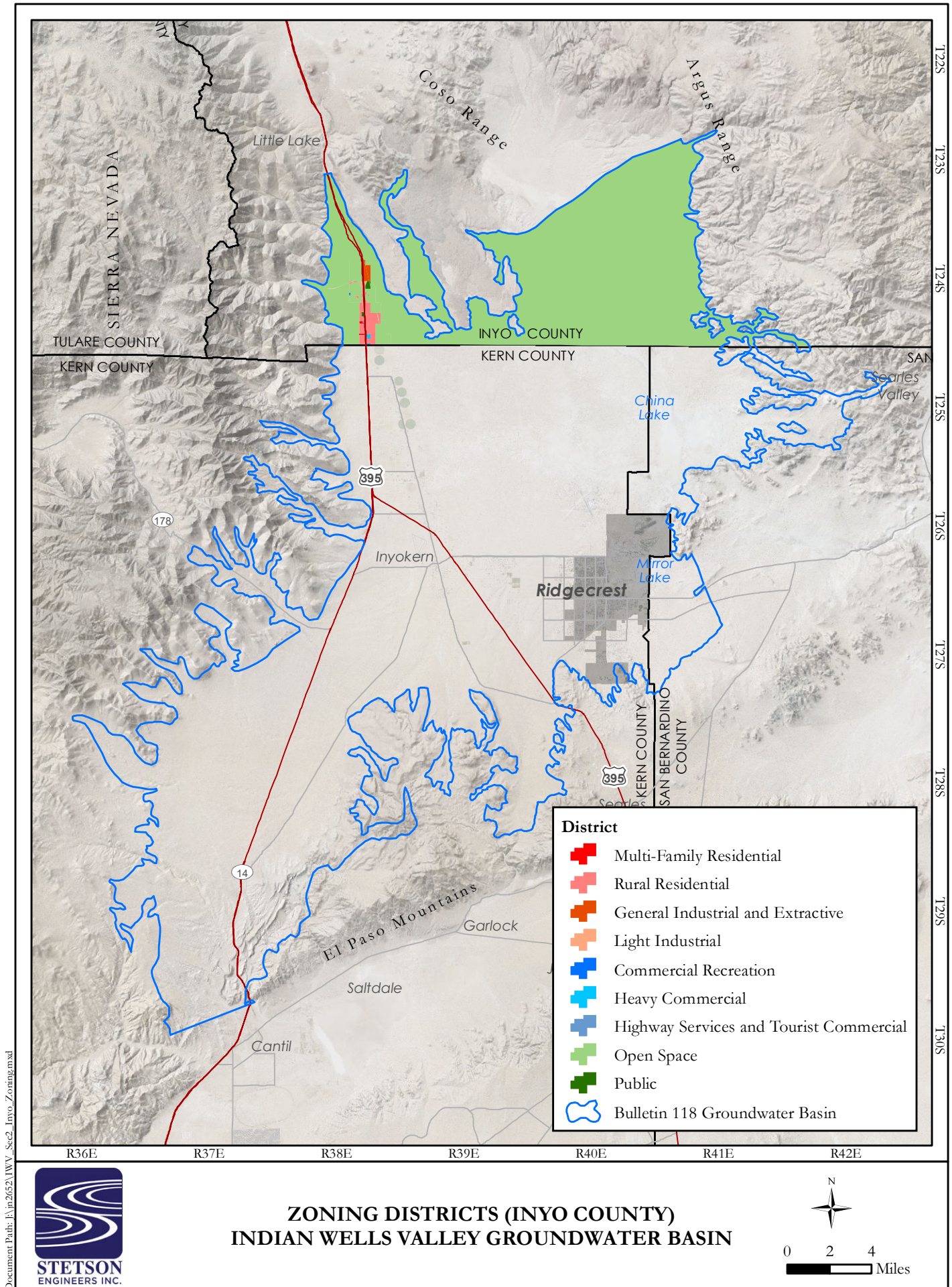
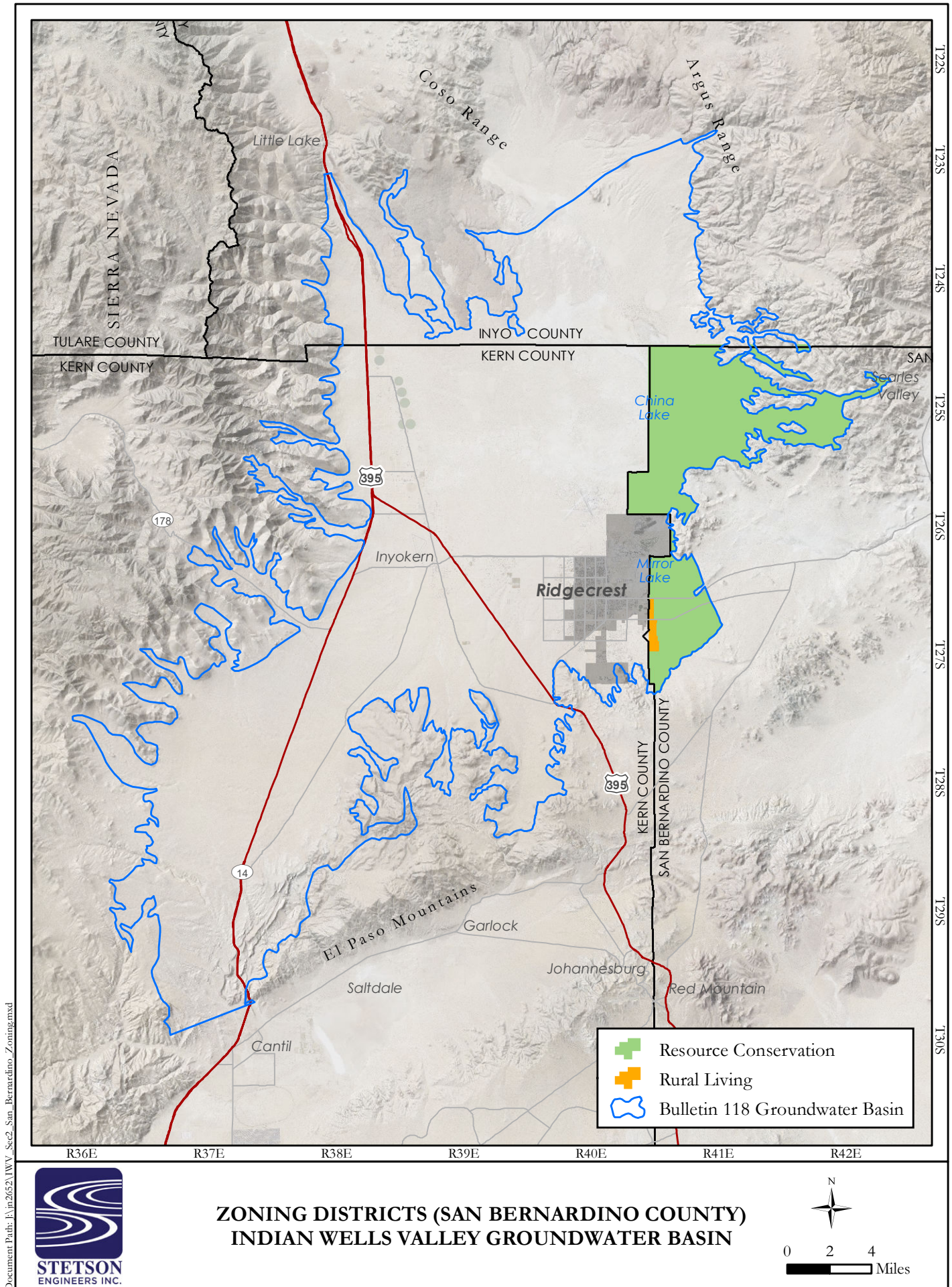
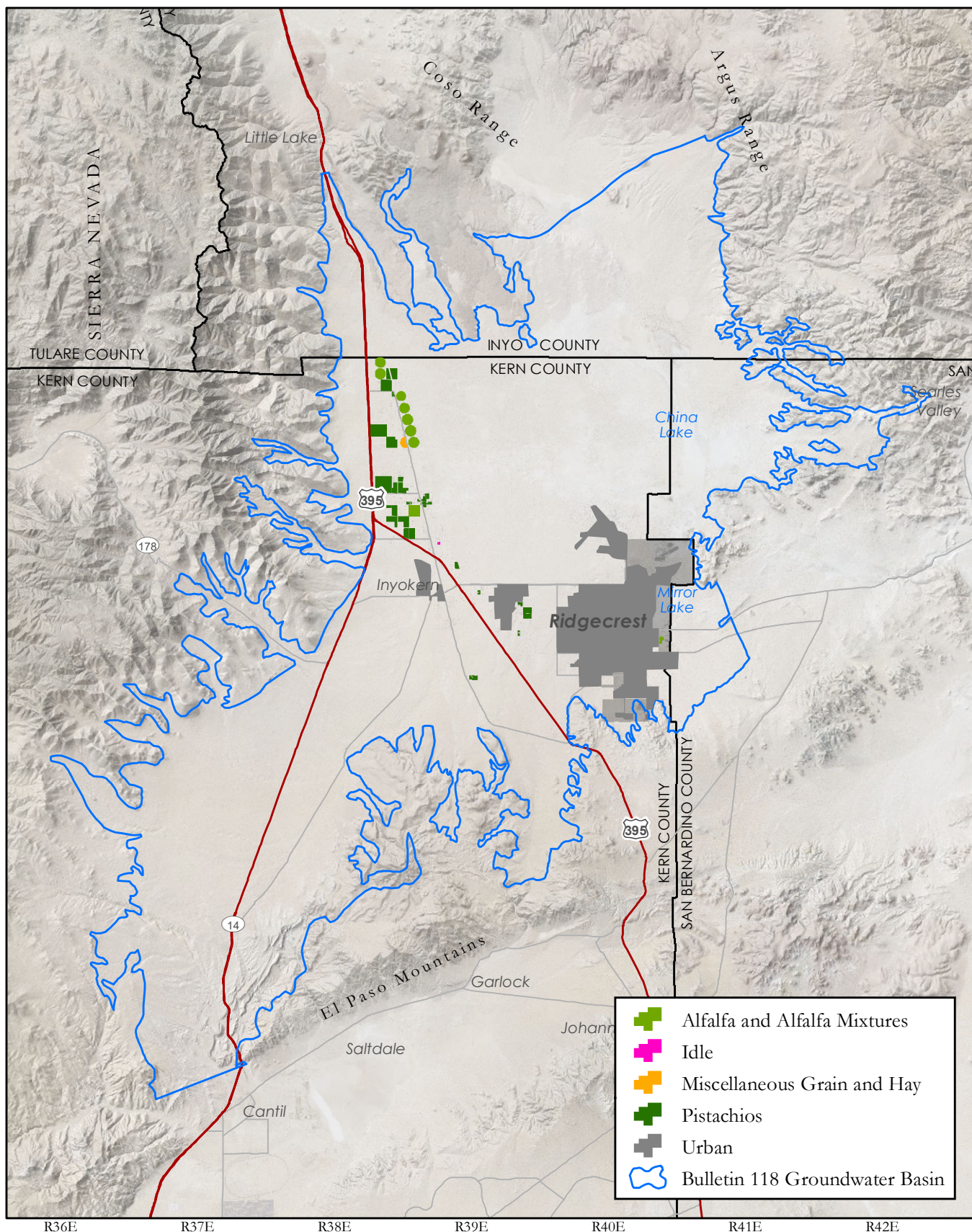


FIGURE 2-9



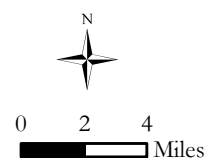


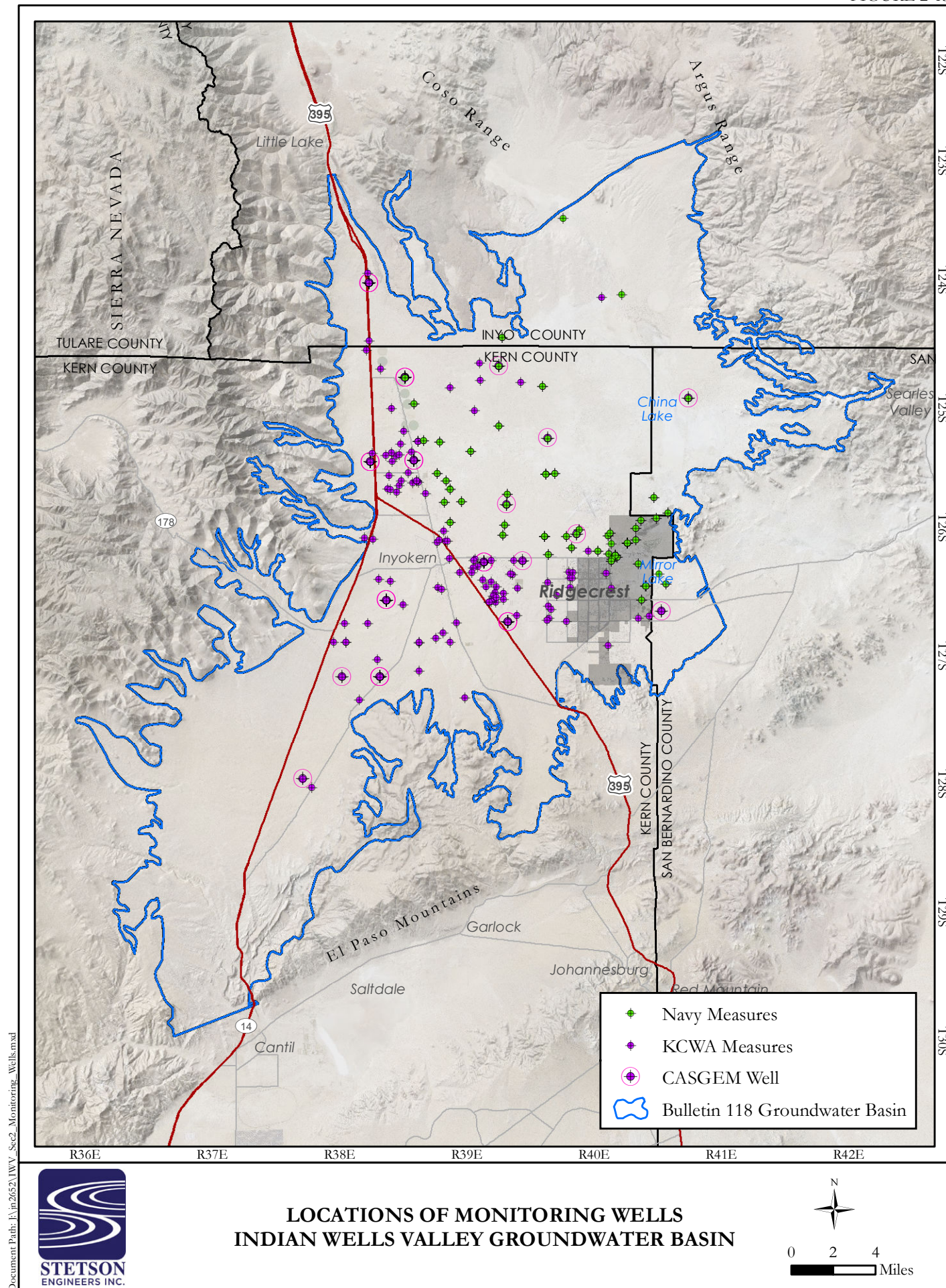


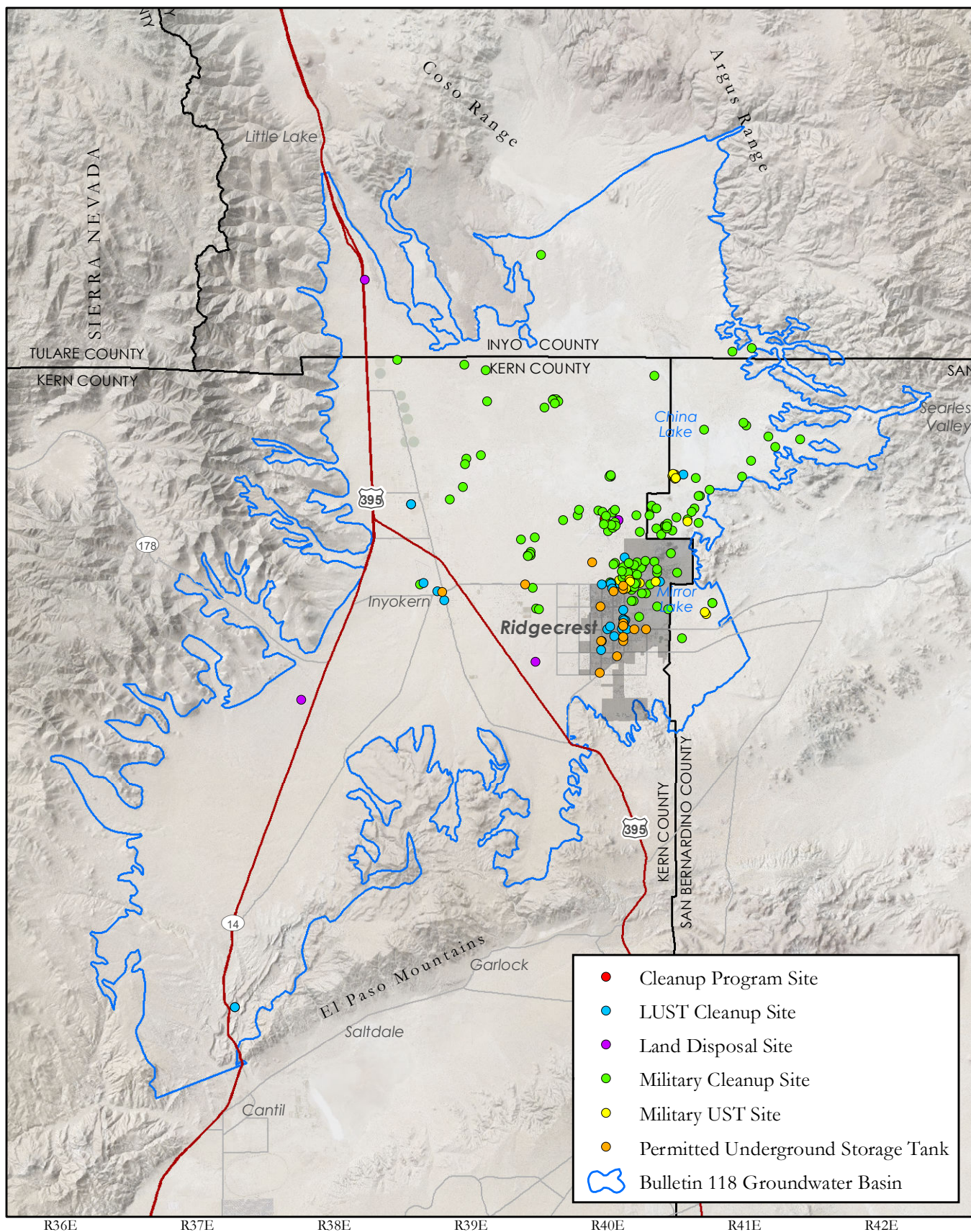


## ACTIVE AGRICULTURAL LANDS INDIAN WELLS VALLEY GROUNDWATER BASIN

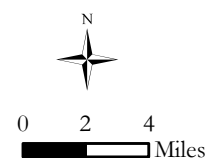
Source: DWR State Crop Mapping 2014; <https://data.cnra.ca.gov/dataset/crop-mapping-2014>







# LOCATIONS OF GROUNDWATER CONTAMINATION CLEANUP SITES INDIAN WELLS VALLEY GROUNDWATER BASIN





Respectfully submitted by Mallory Boyd

Comments regarding Sustainable management criteria summary submitted  
9/05/19 in support of discussions – Agenda item 3bii, IWVGA TAC meeting 9/05/19

As I mentioned during the subject TAC meeting, the specific sustainability criteria specified in SGMA lacks consideration for dust resulting (in-directly) from dropping water table levels, this is a particular concern in a basin in severe over-draft like the Indian Wells Valley (IWV). The playa in the China Lake region overlays the regions' shallowest depth to water table. This shallow depth exposes the IWV's water table to the atmosphere, resulting in relatively high levels of Evapo-transpiration, estimated (and supported with scientific instrumentation measurements) to be 2500 AC-FT/year. As the water table declines across the valley, the eventual effect in the playa area is a drying of surface minerals concentrated over countless years, as a direct result of lowering ground water. These now dry(er) minerals, mostly held in place while moist, become less secure and prone to become airborne when winds sufficiently powerful blow through the valley. While this problem is still somewhat in its' infancy (in the IWV), an example of a playa allowed to dry through excessive water diversions and the resultant dust issues lays just north in the Owens Valley. The problem is real, the consequences high – and can be predicted with reasonable accuracy. We must connect the most relevant sustainability criteria with this ancillary effect early in the development of the ground water plan, and take steps to isolate it from other dust producing events (like fallowing agriculture lands) as the mitigation steps are likely to be more protracted, if not more complicated – and if not acted upon early, more costly.

Playa dust contains myriad components, many environmentally threatening, and present substantive health challenges to not just IWV residents but to neighboring communities.

I have other concerns, but most have been touched upon by Mr Parker and Dr Decker in their written submissions.



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.

**Commented [TP1]:** Recommendation: Note that “these estimates were based on limited data from the mid-1900’s “

**Commented [TP2R1]:**

### 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                 | <b>381,708</b>         | <b>100%</b>        |

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.

**Commented [TP3]:** Recommendation - further break out "non-federal entities" into public and private land ownership and show on figures

*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<br>(Bureau of Land Management) | 140,184                | 37%                |

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

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

| Entity                      | Overlying Land (acres) |                |                 |                | Overlying Land (%)    |     |                 |          |
|-----------------------------|------------------------|----------------|-----------------|----------------|-----------------------|-----|-----------------|----------|
|                             | NAWS<br>China<br>Lake  | BLM            | Non-<br>Federal | Subtotal       | NAWS<br>China<br>Lake | BLM | Non-<br>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<br>Bernardino<br>County | 32,527                 | 4,704          | 754             | 37,985         | 86%                   | 12% | 2%              | 100%     |
| Total                       | <b>161,911</b>         | <b>140,184</b> | <b>79,613</b>   | <b>381,708</b> | -                     | -   | -               | -        |

### 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              |
| <b>Total</b>         | <b>932</b>      |

**Commented [TP4]:** Does this number of wells count metric include Navy supply wells?

The basin includes Inyo and San Bernardino Counties - were these databases consulted and included in the information in the GSP?

Was the data in the Kern County permitting data compared with the wells going dry over time analysis?

## 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.

**Commented [TP5]:** Please verify that Rand Communities Water District does not extend into the IWVGB - based on the SGMA Data Viewer, Rand CWD overlaps into the IWVGB.

### 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

**Commented [TP6]:** KCWA should just be included in the following section, not both sections - redundant

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~~ ENTITIES

### 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.

**Commented [TP7]:** Since RWQCB and the IWV Coop Group is included in the section, recommend replacing "Agencies" with "Entities"

**Commented [TP8]:** This is redundant to have KCWA described in two different sections - Recommendation - include KCWA description in only one section of the GSP

The KCWA collects, interprets, and distributes groundwater data for the IWWGB. Since 1989, the KCWA has measured depth to groundwater in the IWWGB 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 IWWGB. 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 IWWGB 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 IWWGB). The LRWQCB has also approved the IWWGB 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

**Commented [TP9]:** This section should include a status on the Coop Grp

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:

**Commented [TP10]:** SGMA and the GSP Emergency Regs include specific language regarding coordination between land use planning agencies and GSAs, and the reference to these should be included here:

**SGMA**

10723.2. CONSIDERATION OF ALL INTERESTS OF ALL BENEFICIAL USES AND USERS OF GROUNDWATER  
10726.8.(f) RELATIONSHIP OF THIS PART TO OTHER LAWS  
10727.4.(k) ADDITIONAL PLAN ELEMENTS  
65352.5. REQUIREMENT TO PROVIDE WATER-RELATED DOCUMENTS TO GENERAL PLAN AGENCY

**GSP Emergency Regs**

§ 354.8. Description of Plan Area  
§ 354.10. Notice and Communication

Additionally, the current narrative describing general plans is deficient - it does not address all the required elements in the GSP Regs and should also include GP growth projections and how the GPs may affect water supply - please see the GSP Regs.

The Navy land uses, while not under the jurisdiction of the IWVGA, should nonetheless, be included in the GSP as the lands are within the DWR designated SGMA groundwater basin.

- 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                          | <b>252,162<sup>1</sup></b> | <b>100%</b> |

#### 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

<sup>1</sup> 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*

| <b>Zoning District</b>                  | <b>Area (acres)</b> | <b>Area (%)</b> |
|-----------------------------------------|---------------------|-----------------|
| 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             | <b>66,215<sup>2</sup></b> | <b>100%</b> |

### 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                 | <b>37,985<sup>3</sup></b> | <b>100%</b> |

<sup>2</sup> 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.

<sup>3</sup> 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<sup>4</sup>. 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.

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<sup>4</sup> 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 [TP11]:** This statement seems out of place/too early in the document as it presumes there is already a demand management action in place, which there is not based on this reviewer's knowledge

## 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://iwwgroundwater.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](http://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).

**Commented [TP12]:** Isn't there an exact number of wells submitted to DWR under the CAQSGEM program? Recommendation - reference the exact number of CASGEM wells

## 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 to comply with specific requirements under

the SWRCB 2009 Recycled Water Policy, and for addressing the wastewater treatment plant NPDES permitting 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 an RWQCB-approved~~ water quality monitoring program as part of the SNMP, which will be incorporated into the GSP groundwater monitoring program.

**Commented [TP13]:** I have deleted the erroneous statement about the SNMP reference to the GSP and included legally accurate narrative - please refer to the SWRCB Recycled Water Policy.

### 2.7.3 Conservation Programs

#### 2.7.3.1 Water District Demand Management Measures

The Water District has implemented a number of successful water conservation programs. These actions have been implemented both in response to state mandated conservation goals, and 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

**Commented [TP14]:** This is erroneous and needs a re-write - the SWRCB under Governor's Executive Orders mandated increased conservation with specific metrics -

- 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 hose 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<sup>5</sup>, 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

<sup>5</sup> 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.

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

**Commented [TP15]:** Should the IWVGA review the technical content of the well permitting requirements and make recommendations as appropriate for basin management

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](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

**Commented [TP16]:** Inyo County also permits new wells in its portion of the IWVGB - Inyo County well permitting policies need to be included in the GSP, in spite of the fact that most of the wells have been completed in the Kern County portion of the IWVGB

- 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 are~~ 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 PDFs of 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

- Alpert, Holly, Ph. D, et al., 2014. *Inyo-Mono Integrated Regional Water Management Plan*. Prepared for the Inyo-Mono Integrated Regional Water Management Program. October 2014.
- Ecological Research Services (ERS), 1991. *Elements of a Habitat Management Plan for the Mohave Tui Chub at the China Lake Naval Weapons Center Relative to the City of Ridgecrest's Wastewater Reclamation Project*. Document provided by Stephan Bork of the Indian Wells Valley Technical Advisory Committee. October 1991.
- Inyo County Planning Department, 2013. *Inyo County General Plan - Introduction*. May 2013.
- Kern County Planning Department, 2009. *Kern County General Plan*. September 2009.
- Provost & Pritchard, 2015. *Wastewater Treatment Plant Facility Plan*. Prepared for the City of Ridgecrest. October 2015.
- RMC, Woodard & Curan, and Parker Groundwater, 2018. *Indian Wells Valley Groundwater Basin Salt and Nutrient Management Plan*. Prepared for City of Ridgecrest and the Indian Wells Valley Water District. March 2018.
- Todd Engineers, 2014. *Indian Wells Valley Resource Opportunity Plan, Water Availability and Conservation Report*. Prepared for Kern County Planning and Community Development Department. January 2014.
- URS Corporation, 2007. *County of San Bernardino 2007 General Plan*. Prepared for the San Bernardino County Land Use Services Division. March 2007.



## Draft GSP Text

### 4.2 SUSTAINABILITY GOAL

#### 4.2.1 Background

DWR states that “SGMA requires local agencies to develop and implement GSPs that achieve sustainable groundwater management by implementing projects and management actions intended to ensure that the basin is operated within its sustainable yield by avoiding undesirable results” (DWR, 2016). As discussed in Section 3.3.5, the sustainable yield is a crucial and fundamental element of GSP development, including for establishing sustainable management criteria. The results of the water balance analysis indicate the natural long-term average recharge of 7,650 AFY as the sustainable yield.

As discussed in Section 3.3.4.4, it is well documented that IWV has been in overdraft since the 1960s and before (Dutcher and Moyle, 1973). Current IWVGB outflows are approximately four times the inflows (see Section 3.3.4). The IWV community is currently experiencing the undesirable impacts of prolonged overdraft and will continue to experience increasing environmental, social, and economic impacts if sustainability is not achieved.

Water reliability is critical to military sustainability and resiliency at NAWS China Lake. The continuing overdraft conditions and undesirable impacts indicate groundwater resources in the IWVGB are not currently sustainably managed and water supply and demand management projects must be implemented in order to preserve the water resource and maintain the community to support the base.

#### 4.2.2 Description of Sustainability Goal

The sustainability goal is ~~to develop a basin wide management plan to preserve the IWVGB groundwater resource as a sustainable water supply~~ to develop a sustainable water supply for the NAWS China Lake mission and ~~for future~~the community ~~survival~~, while also preserving the character of the community and quality of life of the basin residents to the greatest extent possible. The absence of significant and unreasonable undesired results throughout the planning horizon will be indicative that the sustainability goal has been achieved. The sustainability goal will be accomplished by achieving the following objectives:

**Commented [TP1]:** The plan won't preserve the groundwater

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**Commented [TP2]:** Solely preserving IWVGB groundwater resources will not provide a sustainable water supply without including other management options

- Operate the IWVGB within the sustainable yield.
- Implement projects and management actions to reduce groundwater demands (including pumping reductions and additional conservation measures) and increase use of current supplies (recycled water and brackish water) and obtain additional supplemental water supplies (imported water- direct use and groundwater recharge).
- Monitor the IWVGB actively and thoroughly, and adaptively manage the program to ensure the plan is effective and significant and unreasonable undesirable results are avoided.

#### 4.2.3 Sustainability Measures

The IWVGA has developed a series of projects and management actions that will reduce demands and increase supplies, helping achieve the sustainability goal. These projects are briefly summarized below and described in greater detail in Section 5.

- Implement pumping limitations. Pumping limitations will be implemented consistent with existing groundwater priorities including the reservation of the groundwater necessary for the military purpose.
- Optimize recycled water use. The City's current recycled water supplies will be optimized for direct and indirect reuse to reduce groundwater demands. The expanded recycled water project is anticipated to be online in 2025.
- Continue emphasis on water conservation. Conservation pilot projects in severely disadvantaged communities will be implemented in 2020. In addition, the IWVGA, IWVWD, NAWS China Lake, and SVM will continue to evaluate and implement additional measures to reduce groundwater demands including additional restrictions on municipal use and opportunities to recycle and reuse pumped groundwater prior to flowing to a wastewater treatment plant. Consideration will also be given to rural domestic conservation programs.
- Continue to assess the feasibility of a brackish water supply. A brackish groundwater resources development feasibility study, funded by a state grant and local entities, is currently being implemented to assess the viability of a brackish water supply, to shift some of the pumping away from current pumping centers where chronic groundwater declines are occurring. This proposed project could provide a short-term (20-30 year) alternative supply to address sustainable

**Commented [TP3]:** What are the "existing groundwater priorities" and where are they written and agreed upon?

management criteria, and long-term could help address basin water quality degradation and provide an emergency water supply.

- Obtain an imported water supply. After all projects and management actions that use basin water supplies are fully implemented (Pumping Limitations, Recycled Water Project, and Conservation), it is anticipated groundwater demands will continue to be greater than the sustainable yield due to the necessity of maintaining a viable community in support of NAWs China Lake. Accordingly, the IWVGA will implement plans to develop a firm imported water supply no later than 2040 to ensure demand equals sustainable yield (plus imported water replenishment.) The goal is to have the imported water project online by 2035.

**Commented [TP4]:** This should probably say there is already a project in place to develop an imported water supply, and that imported water supply is currently planned to be online in 2040.

#### 4.2.4 Explanation of How Goal will be Achieved

The sustainability goal is described in Section 4.2.2 with the specific measures to achieve the goal listed in Section 4.2.3 above. The following is a description of how those measures will achieve the sustainability goal by 2040. (See Section 5.2 and Section 6.3 for additional information including discussion on project costs, funding, and schedule.)

**Commented [TP5]:** I can't review this without more detail and without the SMC section, including g defining significant and unreasonable undesirable results, minimum thresholds, measurable objectives and interim milestones to understand how this plays out in the basin.

- Implement pumping limitations. This management action will have a direct impact towards achieving sustainability and will be directly quantified through reported groundwater production and indirectly through groundwater elevation measurements. There is a direct relationship between reduced extractions and a reduction in the rate of decline of groundwater levels in the IWVGB. Furthermore, reduced groundwater pumping will reduce or eliminate localized pumping depressions, reduce impacts to shallow wells, reduce annual overdraft, reduce or eliminate adverse impacts to groundwater water quality (which will be quantified through groundwater quality sampling), and help to prevent the possibility of land subsidence.
- Optimize recycled water use. A recycled water project to optimize reuse of the City's recycled water supply will be implemented by 2025. This project will have a direct impact toward achieving sustainability through reduced groundwater demands which will be directly quantified through reported groundwater production and indirectly through groundwater elevation measurements.
- Continue emphasis on water conservation. Conservation will have a direct impact toward achieving sustainability through reduced groundwater demands which will be quantified directly through reported groundwater pumping and indirectly through groundwater elevation

measurements. Individual groundwater savings resulting from the conservation programs can be documented and measured.

- Obtain an imported water supply. The IWVGA is anticipated having an imported water supply program in place and operating by 2035. The addition of imported water for either direct use and/or groundwater replenishment will have a quantifiable benefit which will be identified through reported groundwater pumping and through groundwater level measurement. Furthermore, increased use of imported water will help to reduce or eliminate localized pumping depressions, reduce impacts to shallow wells, reduce annual overdraft, reduce or eliminate adverse impacts to groundwater water quality (which will be quantified through groundwater quality sampling), and help to prevent the possibility of land subsidence.





September 12, 2019  
File No. 18-1-021

Sent via e-mail: [SteveJ@stetsonengineers.com](mailto:SteveJ@stetsonengineers.com)

Mr. Steve Johnson, P.E.  
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Stetson Engineers Inc.  
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Indian Wells Valley Groundwater Authority Technical Advisory Committee Members  
c/o Water Resources Manager

**SUBJECT: INDIAN WELLS VALLEY GROUNDWATER AUTHORITY TECHNICAL ADVISORY COMMITTEE  
MEMBER COMMENTS ON SEPTEMBER 5, 2019 TAC ITEMS**

Dear Mr. Johnson:

This letter is being written on behalf of our client, Meadowbrook Dairy ("Meadowbrook"). This letter is submitted in response to the Indian Wells Valley Groundwater Authority (GA) Water Resources Manager's (WRM) September 5, 2019 request for input from Technical Advisory Committee (TAC) members on the following items:

1. Draft Model Documentation Appendix (DRI, August 2019)
2. Shallow Well Impact Results & Sustainable Management Criteria (WRM Presentation, September 5, 2019)

With respect to each of these discussion items, we reserve the opportunity to provide further comments as more detailed information is provided by the WRM, including for example, further comments on draft GSP materials and chapters, and in response to comments offered by other TAC members. Please distribute this letter to the TAC members prior to the October TAC meeting.

We appreciate the opportunity to provide preliminary comments on these items that lay the groundwork for the forthcoming Groundwater Sustainability Plan (GSP), and we look forward to developing a process to reach technical consensus as we move forward through the GSP process.

## DISCUSSION TOPIC NUMBER 1 – DRAFT MODEL DOCUMENTATION APPENDIX

### General Comments:

- Final model documentation should include a detailed table of contents and adhere to requirements of the GSP Regulations and DWR Modeling Best Management Practices.
- Model documentation should include at a minimum the following details presented in an organized report format. An example format has been provided below:
  - Executive Summary
  - Introduction
    - Background
    - Objectives and Approach
    - Report Organization
      - Model Code Section
      - Model Development Section
        - Spatial Discretization and Model Layering
        - Temporal Discretization
        - Climate
        - Groundwater Pumping
        - Off-Season Irrigation
        - Land Use
        - Crop Coefficients
        - Soil Type
        - Boundary Conditions
        - Aquifer Properties
        - Geological Framework
        - Simulation
        - Upscaling Hydraulic Parameters
        - Hydraulic Conductivity
        - Storage
        - Initial Conditions
        - Calibration
      - Groundwater Flow Model Results Section
        - Aquifer Parameters (Hydraulic Conductivity, Storage Coefficients)
        - Model Calibration
          - Statistical Measures of Model Fit
          - Hydraulic Head (Groundwater levels)
          - Model Water Budget
          - Land Surface System
          - Groundwater System
          - Estimate of Sustainable Yield

- Model Sensitivity
- Predictive Model Development Section
  - Baseline Model
    - Model Period and Hydrology
    - Model Geometry (Stress-Periods)
    - Climate
    - Groundwater Pumping
    - Boundary Conditions
    - Initialization
    - Climate Change
    - Model uncertainty due to climate change should be evaluated in accordance with Section 354.18(c)(3) of the GSP regulations and the DWR “Guidance for Climate Change Data Use During Groundwater Sustainability Plan Development” document (DWR, 2018).
- Projects and Management Actions Section
  - Utilize model to evaluate Projects and Management Actions considered by IWVGA as part of GSP preparation described in Project and Management Actions Section of GSP.
- Solute Transport Model Development Section
  - Porosity
  - Dispersion and Diffusion
  - Temporal Discretization
  - Initial Conditions
- Solute Transport Model Results Section
  - Calibration Results
  - Solute Budget
  - Residual Error Descriptive Statistics
- Conclusions & Recommendations Section
- Model Uncertainty and Limitations Section
- References Section

## DISCUSSION TOPIC NUMBER 2 – SUSTAINABLE MANAGEMENT CRITERIA

### General Comments on Shallow Well Impact Summary Slides (Agenda Item 3bi)

Given very limited site-specific (i.e. field verified, well construction information (age/depth/quality) and groundwater usage) domestic well information has been utilized in the current Shallow Well Impact Analysis, a much more reliable data is necessary in order to consider and evaluate any management action that would be implemented to address shallow well impacts. Current efforts to require registration of domestic wells is underway; however, based on the lack of current responses on the domestic well survey, domestic site-specific well information will not be available until after 2020 at the earliest (assuming

individual well owners respond). Implementation of the management actions built into Model Scenario 6 would jeopardize tens if not hundreds of millions of dollars of business investments and business value of the named “Non-Domestic Group” by, for example, forcing those producers including Meadowbrook to entirely cease pumping. It is unfathomable that the GSP would implement such harsh management actions in order to try to preserve a couple of dozen domestic wells utilizing the current Shallow Well Impact method that does not utilize quantifiable data such as the geographic location of the well, depth to water in the well, the age of the well, water quality from the well and historic usage.

Recommend that an official Economic Analysis and Framework for Potential Domestic Well Mitigation Program be developed and incorporated as an Appendix to the GSP. That Appendix should include an overview of the proposed program, discuss the benefits and costs of faster implementation of demand management. The mitigation program should discuss, for example:

1. Well mitigation program/purpose statement – Define the mission of the program, for example the program is to address any unreasonable adverse effects of groundwater pumping on domestic wells.
2. Definition of unreasonable adverse effects – Program should clearly define the types of impacts to domestic wells that will and will not be eligible for mitigation.
3. Register domestic wells – Develop a registration system. The current outreach methodology utilized has not resulted in much of a response.
4. Mitigation measures – Define mitigation measures. Other well mitigation programs suggest the following examples:
  - a. Domestic wells where municipal water service is not expected to exist in the near future (deepen or replace)
  - b. Domestic wells near existing municipal services (connect to municipal service)
  - c. Domestic wells impacted within a small geographic area (develop mutual/municipal to serve the impacted areas)
5. Define mitigation costs – Define how mitigation fund will pay for each type of impacted domestic well. Other well programs suggest:
  - a. Establish payment of \$XX/ft to deepen wells. If well cannot be deepened, establish standard cost to replace well \$XX/well
  - b. Decide how to compensate well owners that can connect to municipal systems
  - c. Establish “rapid response” approach for situations when wells go dry.
6. Establish review process – Develop a board to review and approve well mitigation claims consistent with the guidelines established. Establish process for expedient review.
7. Financing – Identify program financing sources, with priority toward external support including grants and low interest loans.

The program would be expected to be further developed during the first five years of GSP implementation. There are several well mitigation programs already in the state and they should be reviewed and considered for implementation in this basin.

#### **General Comments on current Baseline Scenario:**

The “current” baseline model developed for the initial modeling scenarios, should not be considered a baseline scenario for modeling comparisons. The “current” baseline model was initiated by a request from the WRM to selected producers to estimate future pumping over a 50-year period (factoring in growth). Those estimates were compiled and utilized in the current groundwater flow model, and subsequent model scenarios (only two of which, Model Scenarios 1 and 2, were vetted by the TAC prior to running) have been compared to this “current” baseline model run. Recommend that a “revised” baseline model scenario be developed in accordance with the GSP Regulations. (Please reference, for example, GSP Regulations Section 354.18 for more details).

Sustainable Management Criteria (SMC) including measurable objectives and minimum thresholds would be developed according to the “revised” baseline model scenario and in accordance with GSP Regulations and DWR’s SMC Best Management Practices. All Projects and Management Actions and model scenarios to evaluate Projects and Management Actions would be compared to the “revised” baseline in developing Sustainable Management Criteria.

#### **General Comments on Sustainable Management Criteria Slides (Agenda 3bii Slides):**

1. Following presentation of a specific topic (i.e. Sustainable Management Criteria), additional written documentation should also be provided to allow the reviewer to provide meaningful comments. The documentation could be in the form of a Technical Memorandum, and the contents could efficiently be incorporated into applicable sections of the GSP. Providing detailed comments only on summary PowerPoint presentation slide materials, where often the assumptions are not included, can be difficult, as is the case with the September 5 TAC meeting materials on SMCs.
2. For comparison purposes, include hydrographs for “revised baseline” results.
3. A description of the proposed minimum thresholds and measurable objectives and how they were established for the PowerPoint materials, and for all further SMC-related materials prepared by the WRM, should be provided. The assumptions should include recognition of the anticipated fluctuations in basin conditions around the established measurable objectives. In addition, please describe how each of the Projects and Management Actions and how the GSP will meet each measurable objective, how each measurable objective is intended to achieve the sustainability goal for the Plan area for the long-term beneficial uses, and how the interim milestones are intended to reflect the anticipated progress toward the measurable objectives during the 2020 to 2040 implementation period.
4. The GSP regulations define undesirable results as occurring when significant and unreasonable effects are caused by groundwater conditions occurring throughout the Plan area for a given sustainability indicator. Significant and unreasonable effects occur when minimum thresholds (MTs) are exceeded for one or more sustainability indicators. Information should be provided to the TAC and to the public to describe the following for each sustainability indicator relevant to

Plan area: the methodology used to set the minimum threshold and how selected MTs avoid causing undesirable results, relationships to other sustainability indicators, impact on adjacent subbasins, impacts on beneficial use/users, comparison to relevant federal, state, local standards, the measurement method.

5. To improve upon the technical understanding in the North Brown Road area, suggest adding additional domestic and existing agricultural wells to the current monitoring network.
6. Given the known uncertainties of the current groundwater model, recommend utilizing historical groundwater elevation and water quality measurements to define measurable objectives. Under SGMA, undesirable conditions prior to 2015 do not have to be addressed. As an example, the measurable objective for the groundwater levels at each monitoring site could be determined by taking the average groundwater elevation over the current monitoring period. Looking at groundwater levels in more recent years allows a more realistic, attainable goal to be set.

### **General Comments on Model Scenario 6.2**

1. Scenario 6.2 includes many built-in assumptions, including for example, imposition of groundwater pumping allocations that require Meadowbrook and other large producers to cease production over a given time period, relocating the IWW Water District's pumping locations, and importing water, all of which are more accurately described as Projects and Management Actions, and many of which are objectionable, not fully vetted and not agreed upon. Scenario 6.2 is, in other words, more accurately described as a Project and Management Action model scenario, and not a valid framework for a GSP. At a minimum, individual PMA's should instead be specifically identified, detailed in their assumptions, vetted for feasibility and consensus, and then compared to a revised baseline scenario, before being considered for inclusion or implementation in a GSP
2. As described under the GSP regulations, PMA's should be developed to address sustainability goals, measurable objectives, and undesirable results identified in the Subbasin. The PMAs developed for the GSP should consider reducing the potential socioeconomic impacts associated with actions required to sustainably manage groundwater in the Subbasin.

### **For your reference, GSP Regulation §354.44 requires the following:**

- a. Each Plan shall include a description of the projects and management actions the GSA has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.
- b. Each Plan shall include a description of the projects and management actions that include the following:
  1. A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:
    - A. A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of

projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.

- B. The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.
- 2. If overdraft conditions are identified through the analysis required by California Code of Regulations (CCR) Section 354.18 [Water Budget], the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.
  - 3. A summary of the permitting and regulatory process required for each project and management action.
  - 4. The status of each project and management action, including a timetable for expected initiation and completion, and the accrual of expected benefits.
  - 5. An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.
  - 6. An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.
  - 7. A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.
  - 8. A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.
  - 9. A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.
- c. Projects and management actions shall be supported by best available information and best available science.
  - d. An Agency shall consider the level of uncertainty associated with the basin setting when developing projects or management actions.

MR. STEVE JOHNSON, P.E.  
SEPTEMBER 12, 2019  
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Thank you for considering our initial comments and recommendations. We look forward to working with you to further define, develop and produce the Groundwater Sustainability Plan in Indian Wells Valley.

Sincerely,

LUHDORFF & SCALMANINI  
CONSULTING ENGINEERS



Eddy Teasdale, P.G., C.HG  
Senior Hydrogeologist

CC: Adam Bingham (Chair Technical Advisory Committee)