SECTION 2.0
DESCRIPTION OF PROPOSED PROJECT

2.1 INTRODUCTION

2.1.1 IWVWD Background

IWVWD is the primary provider of water for domestic use, landscape irrigation, and fire protection in the City of Ridgecrest and the surrounding area in the counties of Kern and San Bernardino. IWVWD was formed in 1953 with the purpose of providing potable water to users in its 38 square mile service area. The IWVWD serves approximately 31,120 people through approximately 12,544 service connections. Approximately 78 percent of the water produced by the IWVWD is used by single-family residential uses. Population estimates and projections for the IWVWD service area are provided in Table 2-1. Population estimates and projections for the portion of the District's service area within Kern County were provided by the Kern Council of Governments (Kern COG), and assumes an approximately 1 percent growth in population per year (Kern COG 2010). Population estimates and projections for the portion of the District's service area within San Bernardino County are based on the number of District connections in that area multiplied by the average number of persons per household for the City of Ridgecrest as estimated by the US Census Bureau (US Census Bureau 2011). No annual percentage increase was applied to these connections because the District does not expect any new connections in San Bernardino County in the foreseeable future.

Table 2-1
Estimated Population
IWVWD Service Area

County	2010	2015
Kern County	30,900	32,400
San Bernardino County	220	220
Total Service Area	**31,120**	**32,620**

Source: Kern COG 2010; US Census Bureau 2011

The IWVWD's domestic water system is divided into five separate pressures zones and consists of eleven well pumping plants, nine booster stations, ten water storage reservoirs, and over one million linear feet of transmission and distribution pipelines.

IWVWD draws its water supply solely from groundwater. This is true of all water users in the Indian Wells Valley. The IWVWD is a participant in the Indian Wells Valley Cooperative Groundwater Management Working Group, which is made up of groundwater extractors in the Valley whose purpose is to cooperatively address the decrease in groundwater levels in the Valley and localized pumping depressions. Since the 1970s, groundwater production from all users in the Indian Wells Valley has increased, with the peak year in 1985, when total annual groundwater production was 29,730 acre-feet (Table 2-2). (An acre-foot is the quantity of water required to cover one acre to a depth of one foot, and contains 325,850 gallons of water). Between 1985 and 2010, total groundwater production from all public and private users in the valley has fluctuated between the high of 29,730 acre-feet in 1985 and a low of 23,532 acre-feet in 1991. Total groundwater production in 2010 was 27,285.6 acre-feet. IWVWD has accounted for approximately 30 percent of the groundwater production in the valley since 1995.

Table 2-2
Indian Wells Valley Groundwater Production Estimates 1979-2010
(acre-feet)

Year	IWVWD Production	Basin Annual Total Production	IWVWD Production Percent of Total
1979[1]	3,402	22,294	15.3
1980	3,319	26,157	12.7
1985	4,981	29,730	16.8
1990	8,600	24,304	35.4[2]
1995	8,100	25,455	31.8
2000	8,148	24,975	32.6
2001	8,392	25,761	32.6
2002	8,865	27,887.6	31.8
2003	9,098	29,471	30.9
2004	8,992	28,994.4	31.0
2005	8,545	28,818	29.7
2006	8,864.4	29,315.6	30.2
2007	9,198.5	29,432.6	31.3
2008	8,564.8	28,321.5	30.2
2009	8,398.2	28,469.7	29.5
2010	7,670	27,285.6	28.1

Source: Indian Wells Valley Cooperative Groundwater Management Working Group 2011
Notes: [1]1979 is the first year for which complete data are available.
[2]Wells at China Lake Acres, Neal Ranch, and Ridgecrest Heights, which were previously included on this table as separate producers, were purchased by IWVWD between 1985 and 1990.

IWVWD has proactively pursued a variety of methods to conserve the groundwater supply, including brackish water treatment and water conservation ordinances. In June 2011, the IWVWD completed the construction of two arsenic treatment facilities to remove arsenic from the water supply to achieve compliance with federal and state arsenic standards at four existing wells (wells 9A, 10, 11 and 13). These wells all provide drinking water to IWVWD Pressure Zone A, which contains approximately 78 percent of the IWVWD's service connections. Without these treatment facilities, the water from these wells could not continue to be used for potable water. The IWVWD also has three water conservation ordinances that provide for water efficient landscape practices for existing connections and mandated water efficient landscape requirements for new construction. In addition, IWVWD distributes water conservation literature within its service area, including historical water consumption information on water bills, makes promotional radio broadcasts, holds public workshops and educational programs, calibrates and replaces water meters as needed, bills for water use using an ascending rate schedule to discourage excessive water consumption, participates in funding basin investigations, and pursues a system water audit.

2.2 PROJECT BACKGROUND

2.2.1 Introduction and Purpose

The District's Water General Plan and Urban Water Management Plan (IWVWD 1997 and 2011) recommend that the District's water production wells should have sufficient combined capacity to meet maximum day demands with the largest well pumping plant out of service, to accommodate scheduled and unscheduled outages on the maximum day, or a 20 percent redundancy in capacity. Although the IWVWD currently has interconnection agreements with Searles Valley Minerals and NAWS China Lake, these agreements are only for use in a catastrophic interruption of water supplies, defined in the California Water Code Section 10632 as "regional power outage, earthquake, or other disaster." The interconnections could not be relied upon during general equipment failures or scheduled maintenance. Therefore, development of additional water supplies is necessary both to satisfy the 20 percent redundancy in capacity needed to continue serving current demand in the case of a mechanical failure or water quality issue in one or more wells during the maximum day. Additional capacity is also required to accommodate a modest predicted future population growth of approximately one percent per year.

2.2.2 2007 WSIP

In 2007, IWVWD proposed a WSIP to meet the maximum day demand with a 20 percent redundancy in capacity, as well as additional domestic water service demand from a potential increase in population associated with the transfer of new employees to NAWS China Lake and a moderate growth in the community. A CEQA Initial Study/Mitigated Negative Declaration (IS/MND) for the project was prepared, and was circulated for public comment from May 8 to June 7, 2007. The IWVWD Board of Directors held public hearings for the project and the associated IS/MND on July 9 and August 13, 2007. During the public comment period for the IS/MND, comments were submitted that included concerns about how the proposed increase in groundwater production would affect existing hydrogeologic conditions (water levels and water quality). The project was not approved, and the Board of Directors directed staff to re-evaluate the project and to prepare a comprehensive groundwater model that would evaluate the impacts of increasing the IWVWD's pumping capacity.

2.2.3 2010 Water Model

In 2010, Layne Christensen Company prepared an evaluation of the existing water supply wells, the water quality in the existing wells, and the impacts of increasing water supply through additional pumping at existing wells and new wells (Layne Christensen Company 2010). The evaluation reviewed existing wells and determined the feasibility of increasing capacity at existing wells. The evaluation also used three primary hydrogeologic criteria to identify favorable areas for the construction of new water supply production wells:

- Water quality;
- Aquifer transmissivity (how much water can be transmitted horizontally to the well); and
- Recent historical changes in water levels.

Based on the evaluation, four existing wells and four new well sites were selected for further assessment. Seven model scenarios (six pumping configurations plus a "status quo" scenario to represent the current pumping configuration) were constructed and run for the 13-year period of 2008 to 2020. The six pumping configurations represented combinations of different existing and new wells. The ultimate objective was to compare the short-term and long-term regional water levels resulting from the proposed pumping configurations to the water levels predicted for the "status quo" pumping configuration. The models were run twice, once for annualized pumping rates and once to account for seasonal variations in pumping (more pumping occurs in the summer than in the winter). The results of the models were used to recommend a new WSIP.

2.2.4 Changes to the WSIP Resulting from EIR Scoping

A CEQA Initial Study and Notice of Preparation (NOP) of an Environmental Impact Report (EIR) were prepared for the WSIP using Scenario 6 from the 2010 Layne Christensen model as the Proposed Project. Scenario 6 had the fewest impacts to the aquifer. Scenario 6 included upgrades to two existing wells (wells 18 and 34) to provide system redundancy (Phase 1), and the installation of two new wells (proposed well 35 [Phase 2] and proposed well 36 [Phase 3]) to provide additional capacity to accommodate future projected demand and to continue the system redundancy. It was estimated that Phase 2 would occur in 2015 and Phase 3 would occur in 2020.

As described in Section 1.0, the NOP was distributed to agencies and the public for the purposes of soliciting comments on the scope of the EIR from July 6 to August 4, 2011. Comments were received from stakeholders concerning the production demand estimates used in the WSIP. Increases in workforce originally estimated by the Navy as a result of new missions at NAWS China Lake have since been determined by the Navy not likely to occur. Additionally, because alternative water sources may become available after 2015, the water source to provide for additional demand after 2015 could not be determined. Phase 3 was therefore eliminated from the WSIP, and the construction and operation of new Well 36 is no longer proposed. Well 17 is also no longer scheduled for abandonment because better technology available to sequester calcium has decreased the frequency for needed equipment replacement and acid treatment of the well. To summarize, the following changes were made to the WSIP as a result of scoping comments:

- Production demand estimates have been recalculated and lowered based on new information from the Navy and growth estimates from Kern COG as projected in the Urban Water Management Plan (IWVWD 2011);
- Phase 3 has been eliminated, because alternative water sources may become available after 2015. Well 36, which would have been located on the southeast corner of Las Flores Avenue and N. Victor Street, is no longer proposed as part of this project. Future water supply projects would require separate evaluation under CEQA;
- Well 17 would not be removed from service during the planning period (prior to 2015).

After the scoping period, the WSIP was revised as described above, resulting in the Proposed Project analyzed in this EIR. New groundwater modeling was conducted by Layne Hydro

(successor firm to Layne Christensen) in August 2011 to reflect the new Proposed Project (Layne Hydro 2011, Appendix G). The Proposed Project is described in more detail in Sections 2.3 and 2.4, below. Alternatives are described in Section 4.0. Additional information on modeling and water resources impacts is provided in Section 3.8.

2.3 PROJECT OBJECTIVES

The District has projected that its existing groundwater production capacity cannot satisfy the current 20 percent redundancy in capacity needed to continue serving customers in the case of a mechanical failure or water quality issue in one or more of their existing wells, as required by the Water General Plan and the Urban Water Management Plan (IWVWD 1997 and 2011). Additionally, existing capacity will be inadequate to accommodate predicted future population growth. The requirement to remove arsenic from four District wells also leaves the District more vulnerable to production shortages due to the complexity of the two arsenic treatment plants. If a plant cannot be used for some reason for a period of time, the District would lose production from two wells. Table 2-3 includes the IWVWD's projected capacity and maximum day demand with a 20 percent safety factor for its domestic water system without the Proposed Project. IWVWD's current maximum day demand with a 20 percent safety factor is approximately 13,960 gallons per minute (gpm). By 2015, the maximum day demand with a 20 percent safety factor is anticipated to be 14,350 gpm. IWVWD's existing domestic water production wells have an estimated nominal capacity of approximately 11,600 gpm, including reserve capacity.

Table 2-3
IWVWD Domestic Water System
Nominal Capacity of Well Pumping Plants Compared to Maximum Day Demand (plus 20% Safety Factor), Without Proposed Project
(values in gpm)

WELL	YEAR	
	2012	2015
9A	1,000	1,000
10	1,100	1,100
11	1,000	1,000
13	1,100	1,100
17	1,200	1,200
30	1,400	1,400
31	1,200	1,200
18	1,200	1,200
33	1,200	1,200
34	1,200	1,200
NOMINAL CAPACITY	**11,600**	**11,600**
PRODUCTION DEMAND (max day plus 20% safety factor)	**13,960**	**14,350**
PRODUCTION CAPACITY (NEED)	**(2,360)**	**(2,750)**

As seen in Table 2-3, the IWVWD currently does not have enough capacity to allow for a 20 percent redundancy to cover planned and unplanned equipment failure during the maximum demand days with a 20 percent safety factor. Additionally, production demand is anticipated to increase based on population growth estimates from Kern COG (Kern COG 2010). The IWVWD has proposed a WSIP to meet redundancy and increased demand requirements through 2015, as described and analyzed in this EIR.

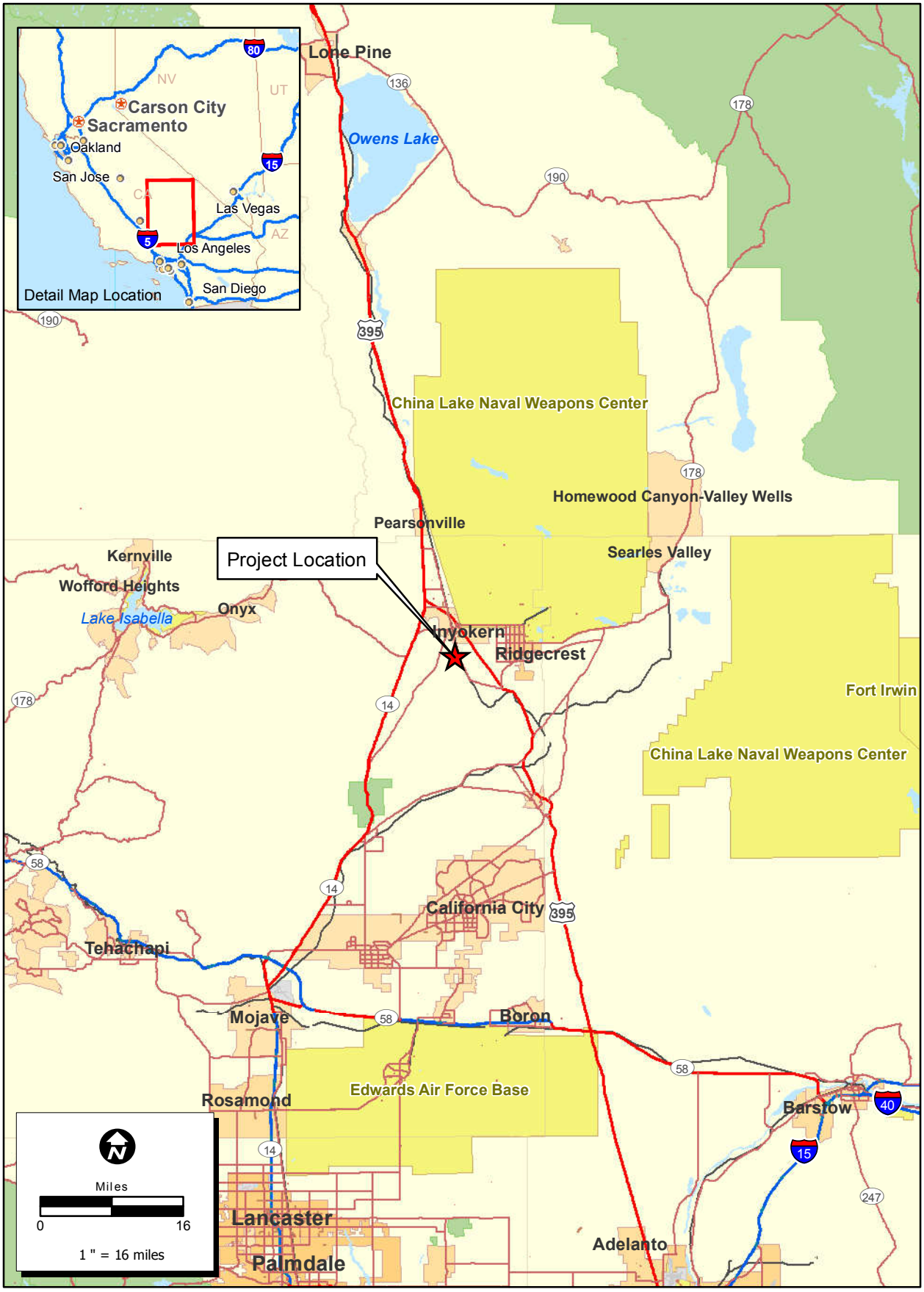
The WSIP is proposed to meet the following project objectives:

- Provide a cost-effective, safe and reliable source of domestic water supply for the IWVWD's customers;
- Provide a 20 percent system redundancy to ensure water supply to IWVWD's customers during maximum pumping days; and
- Meet the IWVWD's current and future water production requirements, including increases in domestic water demand resulting from projected population increases of approximately 1 percent per year in Kern County and no additional connections in San Bernardino County.

2.4 PROJECT LOCATION

The Proposed Project would be generally located west of the City of Ridgecrest, southeast and east of Inyokern, and south of NAWS China Lake in Kern County, California (Figure 2-1). The Proposed Project would increase system capacity to meet the existing demand with a 20 percent redundancy in capacity through equipment improvements in existing Wells 18 and 34 (Phase 1). In the future, if water demand increases, the IWVWD would construct and operate one new well, proposed Well 35 (Phase 2). Project phasing, including criteria that would trigger Phase 2, is discussed in Section 2.4.1.

The locations of the existing IWVWD wells and the new proposed well are shown on Figure 2-2. Existing Wells 18 and 34 are located east and west of Brown Road and south of Bowman Road, just south of Inyokern. Proposed Well 35 would be located on the south side of Bowman Road between Moon Place and Star Place (Figure 2-3). An approximately 400-foot, 12- to 16-inch pipeline would connect proposed Well 35 to the existing pipeline in Bowman Road. The pipeline would only be for transmission purposes and no individual distribution connections are proposed. Well 35 and the transmission pipeline would be located on two parcels which total 3.92 acres, and are recorded with the County of Kern as Assessor's Parcel Numbers (APNs) 341-234-02 and -03 (Figure 2-4). Both parcels are owned by IWVWD.



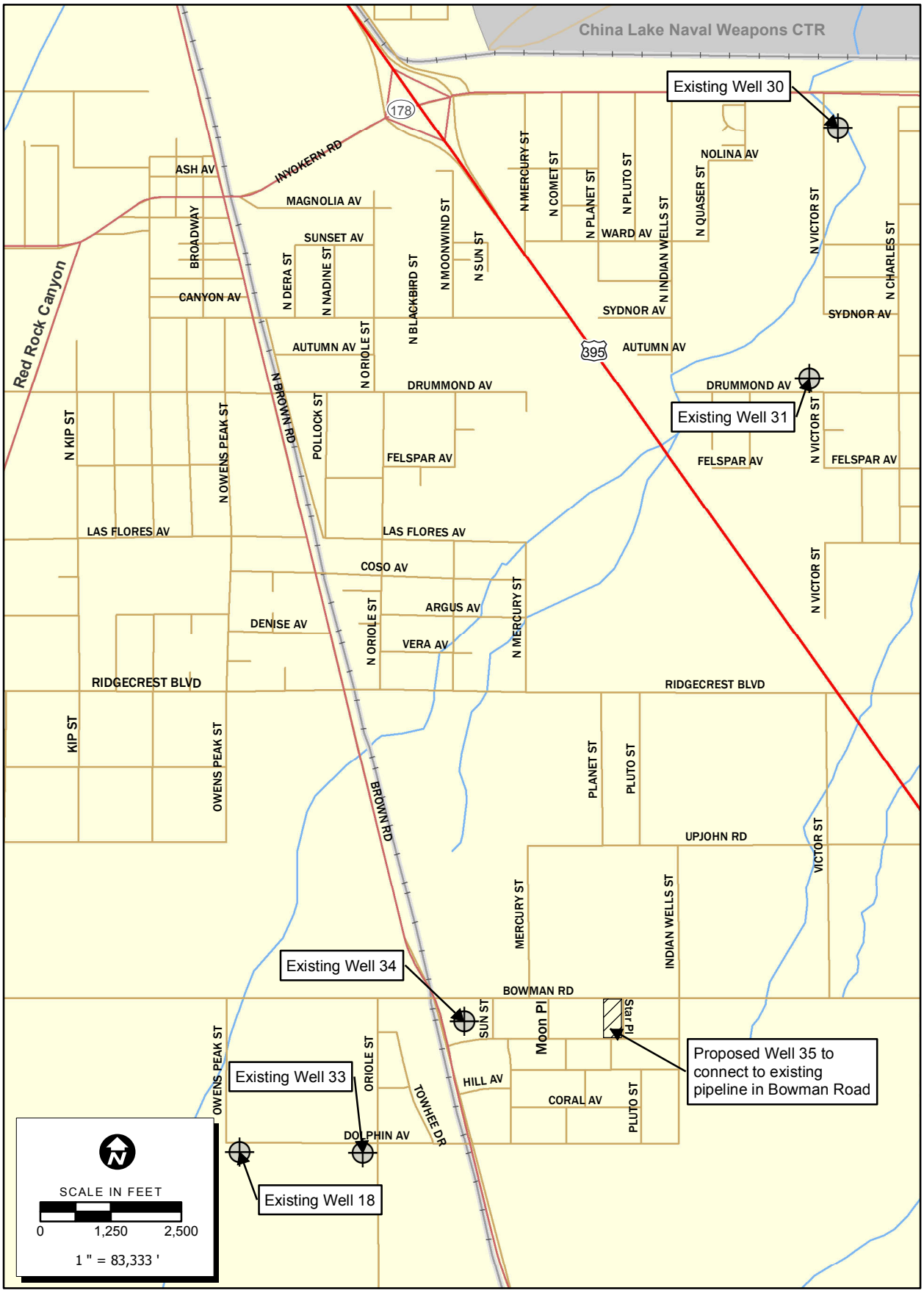
Location: N:\2010\2010-132 IWVWD EIR\MAPS\Site_Vicinity\IWVWD_Vicinity.mxd *(aaguirre 5/20/2011)*

Map Date: 5/20/2011

Figure 2-1 Regional Map

2010-132 Indian Wells Valley Water District EIR

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS



Location: N:\2010\2010-132 IWVWD EIR\MAPS\Site_Vicinity\Facilities_Location_v2.mxd *(aaguirre, 10/20/2011)*

Map Date: 10/20/2011

Figure 2-2 Facilities Location Map

2010-132 Indian Wells Valley Water District EIR

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Location: N:\2010\2010-132 IWVWD EIR\MAPS\Site_Vicinity\Proposed_Well35_Aerial.mxd *(aaguirre 8/12/2011)*

Map Date: 8/12/2011

Figure 2-3 Proposed Well 35

2010-132 Indian Wells Valley Water District EIR

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Location: N:\2010\2010-132 IWVWD EIR\MAPS\Site_Vicinity\Proposed_Well35_APN.mxd *(aaguirre 8/12/2011)*

Map Date: 8/12/2011

Figure 2-4 Proposed Well 35 APN Map

2010-132 Indian Wells Valley Water District EIR

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2.5 PROJECT DESCRIPTION

2.5.1 Project Timing

IWVWD proposes to meet current and projected system redundancy and future increased domestic water demand in two phases. The first phase would be an increase in pumping capacity at its existing Wells 18 and 34 to provide a 20 percent system redundancy for the existing maximum day demand with a 20 percent safety factor. The nominal pumping capacity for each well would be increased from 1,200 gpm to 2,200 gpm. The first phase would occur in 2012. The second phase, new Well 35, would be constructed when maximum day production demand (with 20 percent safety factor) is 14,350 gpm, which is anticipated to occur in approximately 2015. Table 2-4 shows the nominal capacity and the maximum day demand with a 20 percent safety factor for the Proposed Project.

Table 2-4
IWVWD Domestic Water System
Nominal Capacity of Well Pumping Plant Compared to Maximum Day Demand (plus 20% Safety Factor), With Proposed Project
(values in gpm)

WELL	PHASE	
	Phase 1 (2012)	Phase 2 (2015)
9A	1,000	1,000
10	1,100	1,100
11	1,000	1,000
13	1,100	1,100
17	1,200	1,200
30	1,400	1,400
31	1,200	1,200
18	2,200	2,200
33	1,200	1,200
34	2,200	2,200
35	0	1,000-2,200
NOMINAL CAPACITY	**13,600**	**14,600-15,800**
PRODUCTION DEMAND (max day plus 20% redundancy)	**13,960**	**14,350**
PRODUCTION CAPACITY (NEED) SURPLUS	**(360)**	**250-1,450**

The IWVWD cannot currently meet a maximum day demand with 20 percent safety factor, and is proposing to construct Phase 1 in 2012. The timing of future phases was estimated based on population projections; however, the actual implementation of the future phase would be triggered based on actual demand. Water production figures are currently, and would continue

to be, recorded daily in the IWVWD's computerized database. Tank levels and pumping plants are monitored on a continuous basis by telemetry at the IWVWD's headquarters. If there is a period, likely during the summer season, where maximum day demand cannot be reliably met, then the next phase of the WSIP would be triggered.

Installation of new equipment at existing wells is expected to take approximately 60 days for each well. Site work and pumping facility construction for new Well 35 is anticipated to take nine to eleven months, including one month for site preparation and rough grading and two to three weeks for final grading. New well drilling is anticipated to take three to four months.

2.5.2 Improvements to Existing Wells

During Phase 1, anticipated to be implemented in 2012, Wells 18 and 34 would be refitted with new pumping units and related power/control equipment to increase their nominal capacity as shown in Table 2-5 below.

Table 2-5
Maximum Additional Nominal Capacity from Proposed Improvements at Existing Wells

Well	Current Pumping Rate (gpm)	New Pumping Rate (gpm)	Additional Nominal Capacity (gpm)
18	1,200	2,200	1,000
34	1,200	2,200	1,000
TOTAL	**2,400**	**4,400**	**2,000**

2.5.3 Well 35 Construction and Operation

Well 35 would be constructed according to IWVWD standard well specifications, as described below. Well 35 would be located on the south side of Bowman Road between Moon Place and Star Place (Figure 2-3). The proposed well site would be approximately 250 feet by 250 feet within the 3.92-acre project site and would be accessed from Bowman Road. The well would be 16 to 20 inches in diameter with an anticipated depth of 900 to 1,400 feet below ground surface (bgs). The new well would have a nominal pumping capacity of up to 2,200 gpm.

A 12- to 16-inch pipeline of up to 400 feet would connect Well 35 to the existing pipeline in Bowman Road. Installation of the pipeline would require an approximately 6-foot-deep trench. The trench would be backfilled and compacted to match the existing road grade.

2.5.3.1 Construction

The proposed well site would be cleared of vegetation and graded to prepare for the construction of the well. A chain-link, tortoise-proof fence with three-strand barbed wire or razor wire would be erected around the perimeter of the well site. Construction equipment would be staged within the fenced area. Drilling would take approximately three to four months. The new well would include steel screens, a 50-foot sanitary seal and conductor casing, and a concrete pump foundation within a well building. Pumping units, motors, controls,

and electric switchgear would be installed based on parameters determined during well drilling operations. Electrical services would come from the nearest Southern California Edison power pole located along the existing roadway (Bowman Road).

2.5.3.2 Well Development

The new well would be developed using air-lift and pumping equipment driven by diesel engine drivers. The well would be tested using the temporary diesel-driven pump for approximately one week. The water discharged from the development and testing of the well would be percolated into the ground locally, either by discharge to an on-site percolation pond or by sprinklers.

2.5.3.3 Disinfection and/or Treatment Facilities

The new well would require chlorination facilities (dosing pump and sodium hypochlorite storage tank with secondary containment) and such additional treatment facilities that may be indicated by water quality testing performed at the time of drilling. Prior to operation, the well would be disinfected in accordance with the District's standard specifications. Disinfection water would be dechlorinated and discharged on the site in the same manner as the development and testing water. Arsenic treatment is not anticipated to be required.

2.5.3.4 Discharge Pond

An approximate one-half to one acre discharge pond would be constructed immediately adjacent to the well. The discharge pond would be approximately three to six feet deep, and would be used for purge water during well start-up for normal well pumping operations and may be used for well development and disinfection as described above.

2.5.3.5 Operation

The well would be operated in accordance with system demands and maintenance schedules, approximately 70 to 90 percent of the time during high-demand summer months and 20 to 40 percent of the time during winter months.

2.5.4 Water Conservation Efforts

The IWVWD's existing water conservation efforts would be continued with the Proposed Project. As a result of the IWVWD's conservation efforts, the average annual water consumption for connections within the IWVWD has decreased from approximately 269 gallons per capita per day in 1998 to approximately 243 gallons per capita per day in 2009. These conservation efforts are summarized below (IWVWD 2007):

- Conservation based rate structure: Since 1982, the IWVWD has developed and used an ascending block water rate structure. This rate structure provides for higher water rates when higher water use occurs, and is intended to encourage water conservation. In 2009, the District revised its rate structure, significantly increasing the rates of its highest level of use over 100 percent. Currently, the charge in the highest useage rate tier is 582 percent greater than the charge in the lowest usage rate tier.

- Conservation education: The IWVWD has provided educational services to inform the public about the need for water conservation and how to use water more efficiently. These educational services include school programs, presentations to various organizations, demonstration gardens, public service announcements, and the IWVWD newsletter.

- Conservation measures: The IWVWD has adopted various conservation and recycling practices. These practices include water surveys, free water-saving devices such as low-flow showerheads, water audits/leak detection, system repairs, landscape conservation assistance, public information programs, detailed accounting of water use, and cooperation with the City of Ridgecrest.

- Conservation regulations: The IWVWD has adopted two water conservation ordinances requiring water-efficient landscape as a condition of new IWVWD service. Additionally, IWVWD has a water-efficient landscape ordinance that addresses water use practices and prohibits water runoff and waste for existing connections (IWVWD 2011).

During a water supply emergency, the existing Water Shortage Contingency Plan and other measures described in the Urban Water Management Plan (IWVWD 2011) would be enacted. This includes a four-stage rationing plan that provides for voluntary and mandatory rationing depending on the causes, severity, and anticipated duration of the water supply shortage. During the volunteer rationing stage, a customer reduction goal of water use from 15 to 20 percent is requested. During the mandatory rationing stages, customer reductions of 30 to 40 percent would be required. For the 30 percent reduction, customers would have sufficient water for indoor uses, but non-essential (e.g., outdoor) water uses would not be allowed. For the 40 percent reduction, indoor uses would also be limited.