February 19, 2010

DOCKET	
09-AFC-9	
DATE	FEB 19 2010
RECD.	FEB 22 2010

Eric Solorio
Project Manager
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

RE: Ridgecrest Solar Power Project (RSPP), Docket No. 09-AFC-9, Responses to CEC Data Requests for Cultural Resources (DR 105 and 262) and Soils and Water Resources (DR 170 to 172)

Dear Mr. Solorio:

As requested, attached please find Ridgecrest Solar I, LLC's responses to CEC Data Requests CULT-105, CULT-262 and S&W 170-172. Cultural resources figures in response to DR-CULT-262 are provided to the CEC under confidential cover. Also included for docketing is email correspondence dated January 12, 2010 from the Kern County Air Pollution Control District.

If you have any questions on these data responses to the Staff's Data Requests, please feel free to contact me at 510-809-4662 (office) or 949-433-4049 (cell).

Sincerely,

Billy Owens
Director, Project Development

Solar Millennium LLC
1625 Shattuck Avenue, Suite 270
Berkeley, CA 94709-4611
tel (1) 510-524-4517
fax (1) 510-524-5516
Info@SolarMillennium.com
http://www.SolarMillennium.com

RIDGECREST SOLAR POWER PROJECT (09-AFC-9)
CEC STAFF DATA REQUEST NUMBERS 105 and 262

Technical Area: Cultural Resources (AFC Section 5.4) **Response Date: February 19, 2010**

DR-CULT-105

Information Required:

Please provide to staff a series of scaled and dimensioned plan-and-profile views of the proposed project's (and alternative locations') impact blocks.

Response:

Scaled and dimensioned plan and profile view of the proposed project's impact blocks are provided at the end of this section. For the Ridgecrest power block arrangement and heights, please refer to Figure 2-5 General Arrangement Power Block located in the Project Overview section of Volume 3 Data Adequacy Supplement, submitted to the CEC on October 26, 2009.

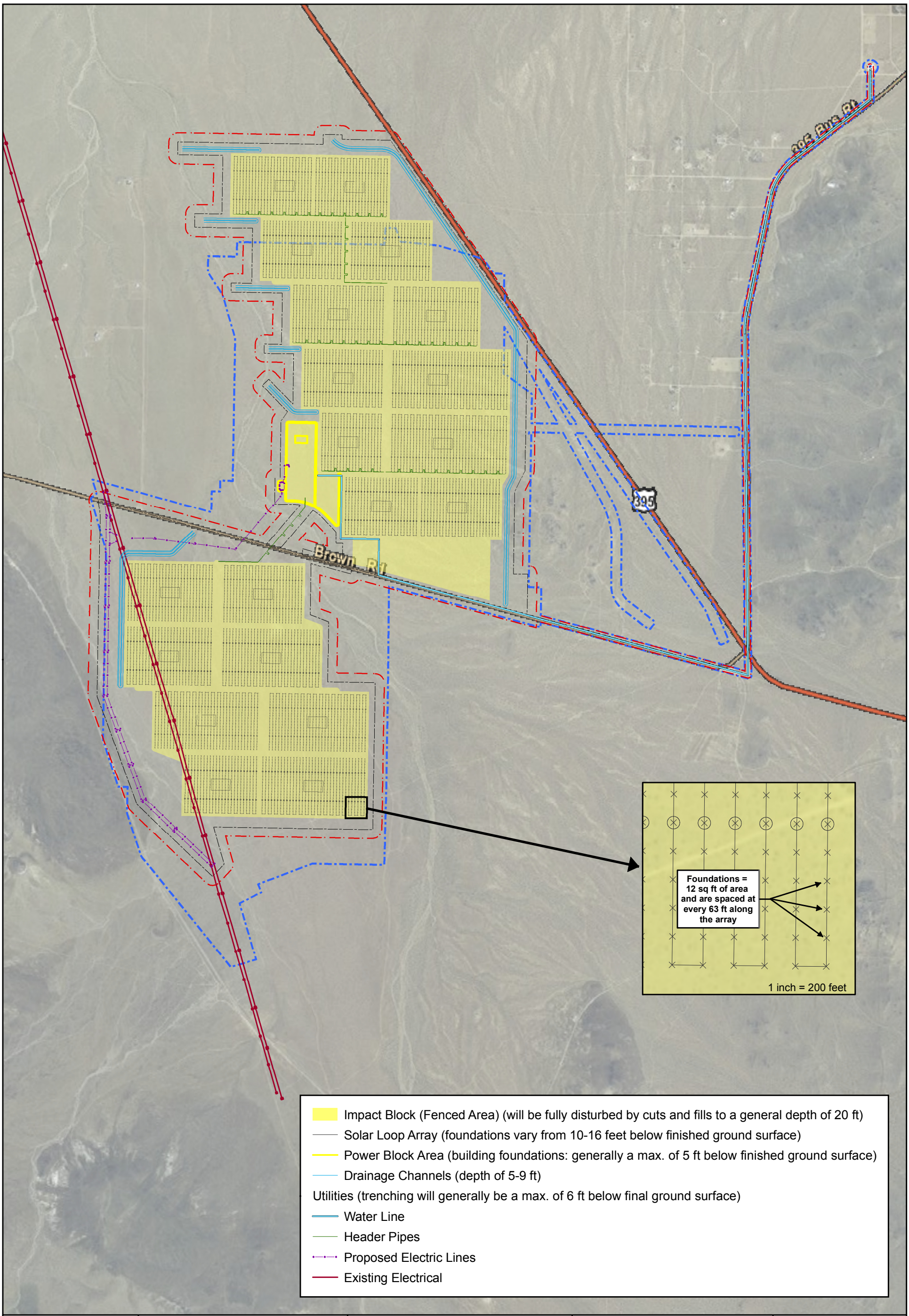
DR-CULT-262

Information Required:

Please provide 2 copies each of quad scale (1:24,000) maps showing the placement of Alternatives 1, 2, and 3 that will facilitate the comparison of archaeological site map data for sites identified within the RSPP ROW.

Response:

Figures depicting cultural resources for the proposed Project site (Alternative 1), north of Brown Road (Alternative 2) and south of Brown Road (Alternative 3) are provided to the CEC under confidential cover. The Applicant has not included a site design for Alternatives 2 and 3 because, as detailed in response DR-ALT-50, the acreages of these alternatives were determined to be insufficient for economically viable development (i.e., sufficient space to produce 250 MW). According to information provided by the CEC, Alternatives 2 and 3 would nominally produce approximately 146 MW and 104 MW, respectively. Accordingly, neither alternative would constitute an economically viable project



Map Location

Legend

- Disturbance Boundary
- CEC Buffer
- Archaeological Survey Area

Source: ESRI 2009; AECOM 2009

N
W
E
S

1 inch = 2,000 feet

0 2,000 4,000 Feet

Ridgecrest Solar Power Project

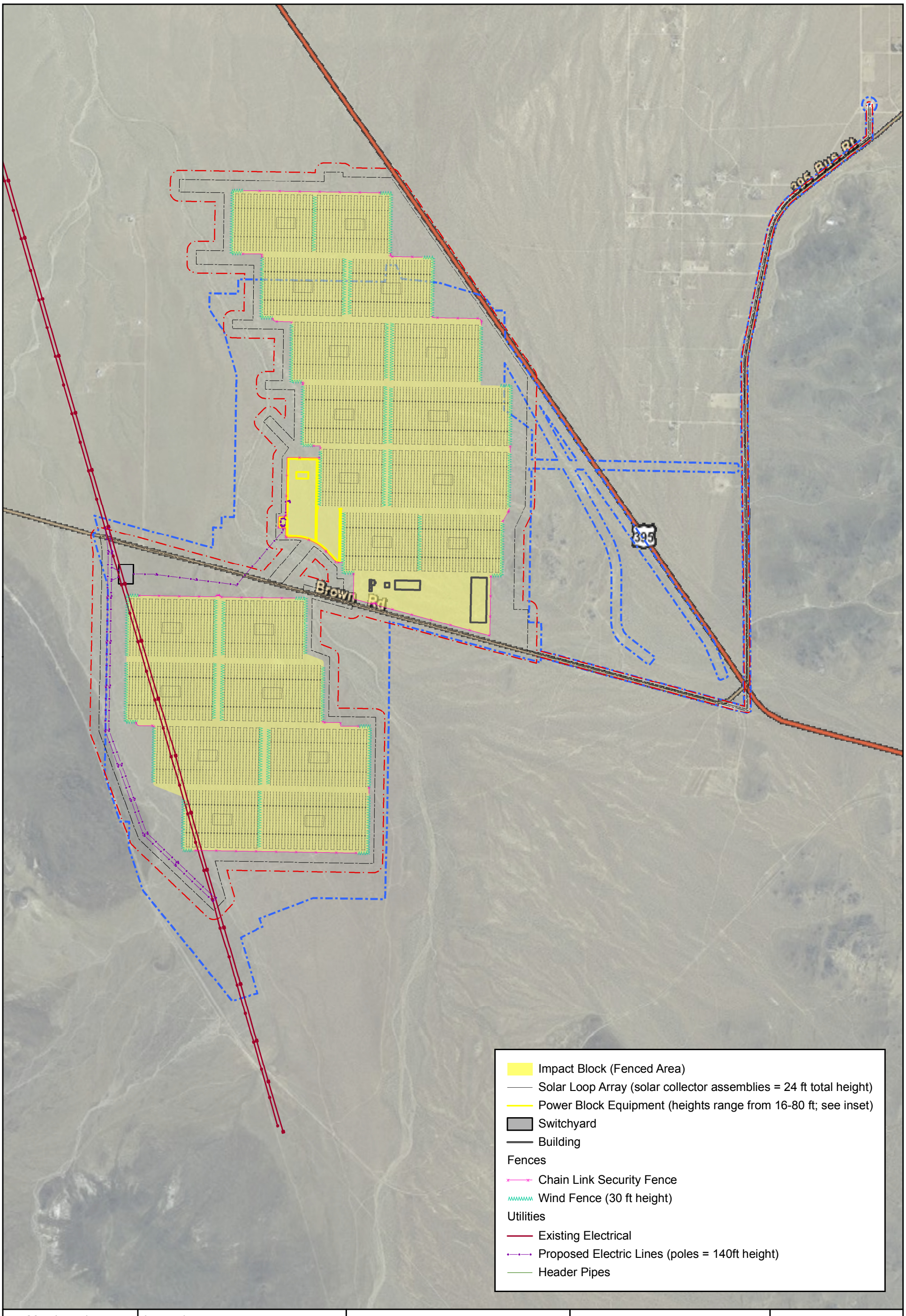
DR-CULT-105-1
Plan View of Impact Blocks
Disturbance Below Ground

Solar Millennium

AECOM

Date: February 2010

Path: P:\2009\09080080 Sol Mil Ridgecrest\6.0 GIS\6.3 Layout\Reports\ClassIIIArchyReport\4_jan2010_CEC_DataRequests\DR-CUL-105 below ground.mxd, 02/17/10, wilsons5



Map Location

Legend

- Disturbance Boundary
- CEC Buffer
- Archaeological Survey Area

Source: ESRI 2009; AECOM 2009

N
W
E
S

1 inch = 2,000 feet

0 2,000 4,000 Feet

Ridgecrest Solar Power Project

DR-CULT-105-2
Plan View of Impact Blocks
Disturbance Level
Above Ground

Solar Millennium

AECOM

Date: February 2010

Path: P:\2009\09080080 Sol Mil Ridgecrest\6.0 GIS\6.3 Layout\Reports\ClassIIIArchyReport\4_jan2010_CEC_DataRequests\DR-CUL-105 above ground.mxd, 02/17/10, wilsons5

DR-S&W-170

Information Required:

Please discuss the specific quantity of water that can be conserved using the proposed mitigation methods.

Response:

Please refer to the Plan for Offsetting Proposed Construction and Operational Water Supply, Ridgecrest Solar Power Project, provided at the end of this section.

DR-S&W-171

Information Required:

Please provide an assessment of whether the proposed mitigation methods and whether they can achieve the intended savings in the basin.

Response:

Please refer to the Plan for Offsetting Proposed Construction and Operational Water Supply, Ridgecrest Solar Power Project, provided at the end of this section.

DR-S&W-172

Information Required:

Please provide the specific measures that will be used to demonstrate the water conservation would be achieved during the life of the project.

Response:

Please refer to the Plan for Offsetting Proposed Construction and Operational Water Supply, Ridgecrest Solar Power Project, provided at the end of this section.

AECOM
Environment

Prepared for:
Ridgecrest Solar I, LLC

Data Request 170-172

Plan for Offsetting Proposed Construction and Operational Water Supply

Ridgecrest Solar Power Project
Kern County, California

February 2010

60139696-WMP

AECOM
Environment

Prepared for:
Ridgecrest Solar I, LLC

Data Request 170-172

Plan of Offsetting Proposed Construction and Operational Water Supply

Ridgecrest Solar Power Project
Kern County, California

Prepared By Brian Ho

Reviewed By Michael Flack, PG, CEG

February 2010

60139696-WMP

Contents

List of Appendices

List of Tables

List of Figures

List of Abbreviations

°F	degrees Fahrenheit
af	acre-feet
afy	acre-feet per year
AVEK	Antelope Valley East Kern Water Agency
AWAC	Alliance for Water Awareness and Conservation
Basin	Indian Wells Valley Groundwater Basin
BMPs	Best Management Practices
CEC	California Energy Commission
CIMIS	California Irrigation Management Information Systems
DOE	Department of Energy
DWR	Department of Water Resources
ET	evapotranspiration
$gpft^2$/year	gallons per square foot per year
gpm	gallons per minute
Group	Indian Wells Valley Cooperative Groundwater Management Group
IWV Water District	Indian Wells Valley Water District
KCDA	Kern County Department of Agriculture
Kgal	Kilogallon
LADWP	Los Angeles Department of Water and Power
MDW	Metropolitan Water District
NAWS	Naval Air Weapons Station
Project	Ridgecrest Solar Power Project
PVID	Palo Verde Irrigation District
RSPP	Ridgecrest Solar Power Project
SNWA	Southern Nevada Water Authority
sq. ft.	square feet
STC	Synthetic Turf Council
USGS	US Geological Survey
WRCC	Western Region Climate Center

1.0 Introduction

This report was prepared as a supplemental response to Data Request 170-172 that was provided to the California Energy Commission (CEC) on January 25, 2010 to address water offset/mitigation plans.

Ridgecrest Solar I, LLC is proposing the Ridgecrest Solar Power Project (RSPP or Project), a solar thermal power project (in the Indian Wells Valley Groundwater Basin (Basin). The Project proposes to use dry (or air) cooling in the steam-cycle, which significantly minimizes water use by comparison to a wet-cooled facility of a similar design. The Project has been designed to minimize its water use in consideration of the Basin, which has been in overdraft for many years.

Though water use is minimized, some water for construction and other operational processes including mirror washing is required. Any additional water use, such as that required by the Project, is considered to be a significant impact on the water resources by the CEC. As such, the Project has always proposed to mitigate or offset the water supply that will be provided from existing groundwater supply wells through the Indian Wells Valley Water District (IWV Water District). This plan is the next step in identifying measures to offset water use.

The plan identifies possible offset options (Section 2) within the Basin, and evaluates their feasibility of implementation, as well as provides the required offset in a reasonable time frame (Section 3). From the feasibility study, a plan is presented wherein multiple options are proposed that will address the timely implementation of the full offset volume for construction and operational water supply (Section 4). The source of water for the Indian Wells Valley is exclusively groundwater, which is currently being used at a rate above what is being recharged to the Basin. With the exception of one possible option for construction water supply that may represent a new source of water to the Basin, all the options considered result in a net reduction of current groundwater use by residential, public or agricultural users.

1.1 Project Description

Ridgecrest Solar I, LLC is proposing to construct, own and operate a concentrating solar electric generating facility proposed on an approximately 3,995-acre site in Kern County, California (**Figure 1**). The Project will have a nominal electrical output of 250 megawatts and commercial operation is planned to commence by the third quarter of 2013, subject to timing of regulatory approvals, equipment procurement and construction schedule. The Project will use well-established parabolic trough solar thermal technology which uses solar energy in a heat transfer process to generate steam and drive a steam turbine generator that produces electricity. The estimated life for the Project is 30 years.

1.2 Water Use Requirements

The Project proposes to use dry cooling in the steam cycle. Water for process water makeup and other industrial uses such as mirror washing will be supplied by the IWV Water District through their water supply wells no. 18, 33 and 34 that are located north of the Project site. Groundwater will be pumped from these wells and conveyed through existing pipelines to the Ridgecrest Heights Booster Station. From there, a new five-mile long, 12- to 16-inch diameter pipeline will be constructed along China Lake Boulevard, south to the Project site. Construction of the pipeline is expected to take approximately five months to complete. During the period it takes to construct the water pipeline, water will be delivered daily to the Project site by tanker trucks supplied from a turnout at the Ridgecrest Heights Booster Station.

The Project will use about 450 acre-feet (af) of groundwater per year (afy) during the 2.33-year long (28 month) construction period. This equates to a total volume of 1,500 af over the construction period.[1]

The Project will use about 150 afy of groundwater for operations, which equates to an average pumping rate of about 90 gallons per minute (gpm). Over the Project's 30-year life, water use will total about 4,500 af.

A Memorandum of Understanding has been approved (dated October 2, 2010) by the IWV Water District Board for water supply to the Project in the volume of 1,500 af for construction and up to 165 afy[2] for operational supply for 30 years. Amortizing the construction water volume over the life of the Project (30 years) yields a yearly water supply for offset of 215 afy.

1.3 Groundwater Use within the Indian Wells Valley Groundwater Basin

The current conceptual model for the hydrogeologic system in the Basin is that it is closed with no groundwater outflow and the bulk of inflow comes primarily from the mountain front recharge. Recharge to the Basin is derived from the infiltration of precipitation and runoff from the Sierra Nevada, sub-flow from the Rose Valley Basin through the Little Lake Gap and return form excess water applied for domestic or agricultural irrigation, or from wastewater treatment system percolation ponds. The estimates of total basin recharge have varied from 9,000 to 11,000 afy (AECOM 2009).

Water usage information for the Basin was provided for review in development of this plan by the IWV Water District (AECOM 2010a). While this information should be considered an order-of-magnitude estimate, as not all the usage could be verified, groundwater production from 1975 to 2008 show that the total average groundwater use for the period was 26,134 afy. The major water users within the Basin and their average water use over the period are as follows:

- Brown Road Farming (alfalfa) – 7,257 afy;
- IWV Water District – 6,806 afy;
- Naval Air Weapons Station (NAWS) – 3,720 afy;
- Private Wells – 3,434 afy; and
- Searles Valley Minerals – 2,645 afy.

Of the major water users, Brown Road Farming represents about 30 percent of the total average water use since 1975. Recent trends over the past 10 years show a decline in the annual water use for private water users and NAWS, and a relative stability of consumption for Searles Valley Minerals. In general, there has been an increase in water use for Brown Road Farming, as the annual usage has been over 9,000 afy in the last 10 years. The Groundwater Water Management Plan (Tetra Tech 2003) projects relative stability in water use for the other users within the Basin and a two percent increase in water use through the IWV Water District through 2020.

Groundwater is the exclusive source for water for the Valley. At this time, there are no other outside sources of water that are brought into the Valley. The City of Los Angeles Department of Water and Power (LADWP) Aqueduct is located on the west side of the Basin in the foothills of the Sierra Nevada. The Antelope Valley East Kern Water Agency that brings water from the California Delta to the south terminates in California City, about 40 to 45 miles south of the City of Ridgecrest. Water supply from the California

[1] A yearly volume of 450 af equates to an average pumping rate of about 390 gallons per minute (gpm) of water for construction activities (assuming a continuous uninterrupted supply and continuous usage).

[2] IWV Water District wanted to include a margin even though the project will only use 150 afy.

Delta is uncertain and has been curtailed to users in the Antelope Valley and California City in response to reductions in supply from the Delta.

1.4 Current Water Conservation Programs in Indian Wells Valley

The following is a summary of current programs that have been implemented by a variety of water users within the Basin in response to overdraft conditions. They are discussed briefly to provide context for the current status of water savings programs in the Valley and as a basis for identification of possible supplemental programs or alternatives that could be used by the Project to offset its water supply.

1.4.1 Indian Wells Cooperative Groundwater Management Group Objectives

The Indian Wells Valley Cooperative Groundwater Management Group (Group) is a public data-sharing group consisting of most of the major water producers, other government agencies and concerned citizens in the Indian Wells Valley (http://iwvgroundwater.org/). The Group was formed in 1995 to encourage water conservation and preservation of the water resources within the Indian Wells Valley. To meet this goal, the members work to coordinate efforts, share data and avoid the redundancy of effort that has occurred in the past. The current signatories of the Group are:

- U.S. Bureau of Land Management
- City of Ridgecrest
- County of Kern-Board of Supervisors 1st District
- Eastern Kern County Resources Conservation District
- Searles Valley Minerals
- Indian Wells Valley Airport District
- IWV Water District
- Inyokern Community Services District
- Kern County Water Agency
- NAWS China Lake
- Quist Farms

With the exception of Brown Road Farming, the major water users within the Basin are included in the Group.

Currently, the Group has developed and published a Water Conservation Public Advisory (revised June 19, 2008) which provides a variety of recommendations for water conservation, including the use of gray water for all domestic, commercial, industrial and agricultural water users in the Valley. According to this advisory, the average water consumption per connection per year in Ridgecrest has decreased since the 1980s from 0.84 afy to 0.77 afy (the Group 2008):

In November 2009, the Group published its 2010 and 2011 planning objectives. The objectives and methods for meeting them are as follows:

- Objective No. 1: Limit additional large-scale pumping in areas that appear to be adversely impacted.
- Objective No. 2: Distribute new groundwater extraction within the Valley in a manner that will minimize adverse effects to existing groundwater conditions and maximize the long-term supply within the Valley.
- Objective No. 3: Aggressively pursue the development and implementation of water conservation policy and education programs.
- Objective No. 4: Encourage the use of treated water, reclaimed water, recycled, gray and lower quality water where appropriate and economically feasible.

- Objective No. 5: Explore the potential for other types of water management programs that are beneficial to the Valley.
- Objective No. 6: Continue cooperative efforts to develop information and data, which contributes to further defining and better understanding the groundwater resource in the Indian Wells Valley.
- Objective No. 7: Develop an inter-agency management framework to implement and enforce the objectives of this plan.

Of the 2010/2011 objectives, Objective No. 3 (water conservation and education) is directly applicable to the Project as it promotes water savings and a reduction in water usage within the Basin.

1.4.2 Indian Wells Valley Water District

Water conservation measures for new housing developments have been enacted through local Ordinance Numbers 90 and 91. The Ordinances require water efficient landscaping as a condition of receiving water service from the IWV Water District. Ordinance No. 90 pertains to new single-family housing developments while Ordinance No. 91 applies to new multi-family housing as well as landscape irrigation at new commercial business developments. Both Ordinances contain the following provisions:

1. No turf is allowed in the front yard;
2. Only plants from an approved plant list are allowed in the front yard;
3. Only low-volume irrigation systems are allowed; and
4. The landscaped area shall be designed to eliminate any runoff.

The IWV Water District has voluntary summer outdoor watering guidelines whereby from May 1 through October 31, residents are urged to limit outdoor watering to three days per week, with watering performed between the hours of 8:00 P.M. and 8:00 A.M.

The IWV Water District has not yet enacted a "cash for grass" program in which residents who remove lawns and replace them with low-water use plants and low-flow irrigation systems are reimbursed by the District on a unit cost per square foot basis, although elements of such a program are under review and the District has indicated they are interested in implementing such a program (IWVWD 2010b). The "cash for grass" are directly applicable to the Project offset requirements as they provide a mechanism for water savings and net reduction in water use within the Basin.

The IWV Water District has a free program called XERIC© (Xeriscape Education, Resources and Idea Corps) that helps homeowners transition to more water efficient landscape. The IWV Water District sends volunteer expert gardeners to a home for a free one-hour consultation. The homeowner/renter gets a sketch, plant recommendations, a plant guide, a watering guide, irrigation tips, hand-outs of do-it-yourself projects and other helpful information. They also receive a list of local plant and hardware providers known to be familiar with Xeriscape principles and a list of online nurseries. The IWV Water District also sponsors a public education program in the form of dry climate seminars and workshops that are given throughout the year.

1.4.3 Naval Air Weapons Station - China Lake

To comply with Executive Order 13323, Strengthening Federal Environmental, Energy and Transportation Management, signed January 24, 2007, the U.S. Navy developed a Water Management Plan (Plan) for NAWS China Lake. NAWS China Lake is located approximately 12 miles north of the Project. The Plan (U.S. Navy 2008) provides a guide for water use from the time it is pumped at a well through its ultimate disposal. Based on the use of the water, the Plan presents best management practices (BMPs) for water conservation and management.

The Plan specifically references ten BMPs, recommended by the Department of Energy (DOE), for water conservation. Currently, the DOE recommends facilities implement at least four of the following BMPs:

- Public Information and Education Programs;
- Distribution System Audits, Leak Detection and Repair;
- Water Efficient Landscaping;
- Toilets and Urinal;
- Faucets and Showerheads;
- Boiler/Steam Systems;
- Single-Pass Cooling Systems;
- Cooling Tower Systems;
- High Water-Use Processes; or
- Water Reuse and Recycling.

NAWS China Lake has completed phase one of a two-phase irrigation project that focused on irrigation system replacement at six buildings and installation of computerized irrigation controllers. The Navy estimates the water savings from these two upgrades is 118,500 kilogallons (Kgal) annually (364 afy).

Another BMP being implemented by NAWS China Lake is replacement of old style high-flow shower heads (approximately 2.5 gpm) with new low-flow (1.5 gpm) models. Additionally, they have replaced old style toilets in three buildings with new dual flush toilet flushometers. These two ongoing projects are estimated to save approximately 2,527 Kgal of water annually (7.7 afy).

The Plan also calls for NAWS China Lake to replace current urinals with new waterless models (or install models rated at less than one gallon per flush); to install water meters for all significant water uses on base (currently approximately 20 percent of the significant buildings are metered) to help in identifying system leaks; to implement a water conservation awareness program; and to implement other relevant BMPs. The estimated water savings from implementation of these activities/programs could be 33,000 Kgal annually (101 afy).

At present, most of the water savings programs proposed under the plan are being or have been implemented by NAWS. As such, other alternatives to meet the offset requirement are being considered.

2.0 Potential Water Offsets

To provide an offset of 215 afy, several potential programs were considered in light of the current water conservation measures being implemented or contemplated for the Basin by members of the Group. As the initial step of the plan, a group of possible offset measures were identified that could be implemented to meet the water savings requirement, either solely or in combination with other options. No option was considered that would not lead to a reduction in groundwater use within the Basin. For example, a change in water use from potable to recycled water or gray water use was not considered an alternative as there would be no net reduction in water use within the Basin. Additionally, use of wastewater in place of groundwater that is currently being discharged to land and serves as recharge to the Basin was also not considered since this would be a simple exchange of water and not result in a net reduction of water use in the Basin. The feasibility of their implementation and capability to meet the water offset requirement in a timely fashion is described in Section 3.0.

The options that are under consideration to address the offset of the proposed construction and operational water supply include the following:

1. Low-Flow Irrigation – Conversion to low-flow irrigation in the landscaped areas at the City of Ridgecrest recreational and government facilities and at County of Kern facilities within the Basin.
2. Artificial Turf Replacement – Replacement of natural turf with artificial turf at City parks and recreational fields (youth football, baseball, and soccer fields).
3. Tamarisk Removal – Implementation of a Tamarisk Removal Program for areas of infestation within the Basin.
4. Fallowing – Fallowing (or removal) of agricultural land within the Basin.
5. Xeriscaping (“cash for grass”) – Replacement of turf lawns for xeriscaping at homes within the Basin.
6. Water from LADWP Aqueduct – Secure a connection to the aqueduct to offset the construction water use.

2.1 Low-Flow Irrigation

Low-flow irrigation systems use small-diameter tubes placed on top of or below the soil’s surface. Frequent, slow applications of water are applied to the soil through small holes or emitters. The emitters are supplied by a network of main, submain, and lateral lines. Water is dispensed directly to the root zone, avoiding runoff or deep percolation and minimizing evaporation. Different types of low-flow irrigation systems include the following (eSSORTMENT 2010):

- Drip and Micro-Sprinklers – these are a cross between spray nozzles and drip irrigation. This type of sprinkler system has a low flow rate, a low application rate, a small radius that ranges from 4 to 12 feet and operates with low pressures. These types of sprinklers are well suited for ornamental plantings as well as a single tree or shrubs.
- Drip Irrigation (micro irrigation) – applies water to the soil at point locations using low controlled flow rates and drip emitters that discharge at a rate of 0.5 to 2 gallon per hour. Drip irrigation can be used on individual plants or groupings of plants. There are two types of drip irrigation: drip tubing and bubble irrigation.

Properly installed drip-irrigation systems use approximately 20 percent less water than conventional sprinkler systems.

For the Project, potential offsets could come from the landscaped areas managed by the City of Ridgecrest government buildings and parks and recreation department and those managed by the Kern County.

2.2 Artificial Turf Replacement

Artificial turf or synthetic turf has been in use for decades as the playing surface for professional sports teams and is increasingly popular as the playing surface of choice by athletic departments at colleges and universities. Manufacturers of artificial turf tout the benefits of the synthetic surface as a means to reduce the expense of irrigation and maintenance costs that are associated with natural turf fields.

Artificial turf installation typically includes ground preparation measures that entail removing a portion of the existing landscape. A blend of crushed rock is then spread and compacted to create a stable base. The turf is then laid and secured. All seams are then glued and stapled to avoid splitting. Lastly, the turf is in-filled with a rubber and sand composite. Section 3.0 describes some of the issues associated with artificial turf maintenance including the application of water for cooling the surface of the turf to maintain a safe temperature in hot climates.

For the Project, proposed water offsets would come in the form of replacing existing natural turf with artificial turf at City of Ridgecrest parks and recreational fields and/or installing artificial turf (instead of natural turf) at new parks/recreational fields that are planned to be constructed by the City over the next three to five years. Installation of artificial turf would reduce the demand for irrigation water thus generating savings in water use year after year.

2.3 Tamarisk Removal

Tamarisk (salt cedar) is native to southwestern Asia and was introduced to the United States in the early 1800s for wind breaks. In the western United States, tamarisk is a highly invasive weed that has taken hold in semi-arid and arid watersheds in recent decades (de Gouvenain 1996).

Tamarisk can consume up to 250 gallons of ground water per day per mature tree (State of Washington 2009). In addition, it competes for resources utilized by native species and, in many cases, disrupts ecological cycles. Previous studies suggest that tamarisk spread has significant effects on river channel morphology including the ability to decrease channel width, increase overbank flooding, stabilize sand bars at river bends, and enlarge and stabilize islands (Lovich 1996).

Using the assumption that a single tree can use 250 gallons per day, a single tree has the potential to consume about 0.28 afy. To meet the full volume of 215 afy, a total of about 800 trees would be required for removal.

A program to remove significant stands of Tamarisk within the Basin could reduce impacts to the groundwater supply. The amount of groundwater saved would then help to mitigate the impact caused as a result of water use by the Project. Further, a removal program would also provide substantial biological benefit by removing an invasive species. This species out-competes native vegetation and alters the natural desert ecosystem functions and values by converting the habitats into monocultures void of the diversity that supports native flora and fauna populations. There are known locations of Tamarisk around the perimeter of the Basin (**Figure 2**).

2.4 Fallowing of Agricultural Land

Under this option, the Project would lease or purchase agricultural farmland (or lease the water rights) within the Basin and fallow the land for the lifetime of the Project. This water can then be used for other purposes, in this case as an offset for Project water supply. The fallowing is generally rotated between tracts of land, with no tract of land being fallowed for more than five years (PVID 2010). The minimum size of each tract of land is normally considered to be five acres.

According to the Kern County Department of Agriculture (KCDA 2009), more than 970 acres of alfalfa are grown by private growers within the Basin, and much of this acreage is farmed along Brown Road north of the Project site (**Figure 3**). Alfalfa cultivation requires 5.1 af of water per acre (DWR 1986). Therefore, to mitigate the full volume of water supply of 215 afy, a total of 42 acres per year would need to be fallowed.

2.5 Xeriscaping

In the Mojave Desert of the southwestern United States, 60 to 90 percent of potable water drawn by single-family residences in municipalities is used for outdoor irrigation (Sovocool et.al. 2001). A water conservation measure that is gaining in popularity among municipalities and water districts of desert communities is xeriscape (low-water use or water-smart) landscaping in place of traditional natural turf.

The Alliance for Water Awareness and Conservation (AWAC) is a coalition of 25 regional organizations (municipalities, water districts, local colleges and universities, etc.) created in 2003 in response to the growing water demand that exceeds available supply throughout the 4,900-square mile area of the Mojave Desert in Southern California. It is the mission of AWAC to promote the efficient use of water and increase communities' awareness of conservation as an important tool to help ensure an adequate water supply (AWAC 2009). The IWV Water District is not a member of AWAC although they have indicated their interest in joining AWAC in 2010 or 2011 (IWV Water District 2010b). Both AWAC and IWV Water District promote xeriscape landscaping as a viable water conservation measure.

Xeriscape basic design guidelines include the following elements (AWAC 2009):

- Sound Landscape Planning and Design – planting trees near the house will provide shade and will serve to cool the house. Group plants with similar water needs together. Homeowners should keep in mind the mature size of the plants they choose for their landscape.
- Limitation of Turf to Appropriate Areas – grass should only be planted where it provides functional or recreational benefits.
- Use of Water-Efficient and Native Plants – these types of plants thrive with less water in hot, dry climates. A water-smart garden may include many elements, such as trees, grasses, shrubs, ground covers, and flowers. Young trees and shrubs will require water more often; but after they are established, they can be watered thoroughly on an infrequent basis. This will encourage them to grow deep roots and be tolerant of hot, dry conditions.
- Efficient Irrigation – install an appropriate irrigation system that includes an automatic sprinkler system, which targets plantings and avoids runoff. Installing a drip or bubbler systems to water shrubs, trees, and flower beds puts water directly in the root zone and saves hundreds of gallons of water. Irrigating early in the day and late in the evening also conserves water.
- Soil Amendments – to help shrubs and flowers thrive in a water-efficient landscape, adding 4 inches of organic material to the soil will increase the soil's ability to absorb and store water for plant use. The plants will be healthier, and watering can be kept to a minimum.

- Use of Mulches – a layer of mulch covering the soil surface around plants will reduce evaporation, help prevent soil compaction, conserve water and protect plant roots from both heat and cold temperatures. Good mulch materials include rocks, bark, gravel, wood chips, or compost.
- Appropriate Landscape Maintenance – weed control, proper mowing, proper fertilization, pest control and an efficient irrigation system will all help conserve water.

Increasingly, water districts and local municipalities have offered cash rebates to homeowners as an incentive to convert their natural turf grass yards to xeriscape, a program more commonly referred to as "cash for grass." Cash for grass programs are in place in several states including California, New Mexico, Nevada, and Texas as noted by Addink (2005) and are summarized as follows:

Table 2-1 Summary of Xeriscaping Programs "Cash For Grass" Southwestern and Southern United States (Addink 2005)

Location	Gallons Saved per Square Foot	Square Feet needed to Save One Acre-foot of Water
North Marin County, California	33	9,874
Albuquerque, New Mexico	19	17,150
Southern Nevada	56	5,256
El Paso, Texas	18	18,103

Notes:

Addink, S., 2005, "Cash for Grass" – A Cost Effective Method to Conserve Landscape Water?, University of California Riverside – Turfgrass Research Facility. **http://ucturf.ucr.edu/**

Acre-foot = 326,829 gallons

From the study of various "cash for grass" programs, some key conclusions drawn by Addink (2005) were:

- The water savings was partly due to the replacement of turf with xeriscape plants, but the savings also was due to the installation of a more efficient irrigation system.
- Overwatering of the xeriscaping was observed in some of the studies. In the case of the New Mexico study, Addink (2005) found that 17 percent of the participants used more water after putting in the drought-tolerant plants.

The "cash for grass" program enacted for Southern Nevada by the Southern Nevada Water Authority (SNWA) is an appropriate model for comparison to similar program for the City of Ridgecrest. The SNWA is a consortium of five water districts and municipalities in Clark County, Nevada and includes the greater Las Vegas area including Las Vegas Valley, and communities south and east of Las Vegas. SNWA manages the 300,000 af that Nevada has allocated from the Colorado River and approximately 200,000 af from return flow credits and groundwater aquifers; SNWA member agencies serve approximately 96 percent of Clark County's population (Sovocool, et.al. 2001). Monthly and annual climate and rainfall totals are similar between the Indian Wells Valley Area and Las Vegas according to data from the Western Regional Climate Center (WRCC 2010). As shown in Table 2-2, the average annual rainfall is similar (4.18 inches in Inyokern, 4.15 inches in Las Vegas); the average annual maximum temperatures are similar (80.5 degrees Fahrenheit [°F] for Inyokern, 80.1°F for Las Vegas), although the average annual minimum temperature is lower in Inyokern (47.2°F) than Las Vegas (54.1°F).

Table 2-2 Climate and Precipitation in Inyokern, California and Las Vegas, Nevada

Area	Climate	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual[1]
Inyo-kern	Ave. Max. Temp (ºF)	59.6	64.9	70.4	77.8	87.0	96.7	102.7	101.2	94.2	83.3	69.0	59.7	80.5
	Ave. Min. Temp (ºF)	30.7	34.6	38.7	44.4	52.9	60.5	66.2	64.6	58.1	48.2	37.3	30.3	47.2
	Ave. Total Precip (in)	0.73	0.95	0.56	0.17	0.07	0.02	0.16	0.22	0.21	0.10	0.39	0.59	4.18
Las Vegas	Ave. Max. Temp (ºF)	57.1	62.5	69.5	78.2	88.5	98.6	104.6	102.2	94.6	81.4	66.5	57.3	80.1
	Ave. Min. Temp (ºF)	34.4	38.9	44.3	51.7	61.1	69.9	76.5	74.8	66.4	54.3	41.9	34.7	54.1
	Ave. Total Precip (in)	0.49	0.57	0.45	0.20	0.15	0.07	0.43	0.44	0.32	0.26	0.37	0.40	4.15

Notes:
Source - Western Regional Climate Center, 2010, http://www.wrcc.dri.edu/

(Climate Stations 044278 – Inyokern, CA and 264436 – Las Vegas Airport, NV)

Data for Station 044278 is from 1940 – 2009 and Station 264436 is from 1937 – 2009.

[1] Refers to the annualized average of monthly temperature and precipitation values.

Key:
Ave – Average
Max – Maximum
Temp - Temperature
ºF - degrees Fahrenheit
Precip – Precipitation
in – inches

The average annual evapotranspiration (ET) rate in Indian Wells Valley area is 66.5 inches per year (CIMIS 2009) while the ET rate for Las Vegas is about 74 inches per year (Addink 2005). Given the relative similarity of climatic conditions, it would be anticipated that the savings rate for implementation of a xeriscaping program in Ridgecrest would be similar to the 56 gallons per square foot savings rate reported for the SNWA study.

According to Lucinda Crosby, Conservation Coordinator for the IWV Water District, (natural) turf in Ridgecrest requires 73 gallons of water per square foot per year (gpft^2/yr) to thrive (IWVWD 2010b). She indicated that xeriscape plants only need 17 gpft^2/yr to thrive, resulting in a water savings of 56 gpft^2/yr.

2.6 Water from the LADWP Aqueduct

According to the LADWP - Southern District, unless direction is given otherwise by the Aqueduct Manager, construction water for projects is available though it will only be granted to government-owned agencies or private utilities engaged in public works projects (e.g., highway construction, windmill construction for public power supply, etc.). As the Project once constructed would be a private utility engaged in a public works program, this option is being explored to offset water supply for its construction water use (1,500 af). A successful application process would lead to a connection to the aqueduct and metering of the water supply for construction water offset. Conveyance of the water from the aqueduct has not been determined at this time, and would be an important component of this option. The LADWP aqueduct is located approximately 10 miles west of the Project site and is located in the foothills of the Sierra Nevada (**Figure 4**).

3.0 Feasibility of Water Mitigation Options

In this section, each option identified in Section 2.0 is evaluated as to its feasibility for timely implementation of offsetting the Project water supply. In evaluating each option, the following criteria were applied:

- Could the option provide the full offset volume of water?
- Could the option be implemented at the start of construction?
- Could the option upon implementation offset the full volume of Project water use or would there be a phase-in period such that only after a period of time the full offset volume would be realized?

The goal of the feasibility study is to identify one or more options to offset water use on a 215 afy basis for the term of the Project.

3.1 Low-Flow Irrigation

Replacement of existing landscape irrigation systems with low-flow irrigation systems at City parks and recreational facilities within the City of Ridgecrest and at County of Kern facilities would appear to be a plausible option to reduce the amount of water use in the Basin. This option is predicated on the amount of available land that has not been converted to date and could be converted to low-flow irrigation. In the assessment of the feasibility of this option, the Parks and Recreation Department, City of Ridgecrest Schools, and Kern County were contacted to determine the availability of landscaping for conversion to low-flow irrigation.

3.1.1 City of Ridgecrest Parks and Recreation Department Landscaping

The City of Ridgecrest Parks and Recreation Department operates and maintains several recreational facilities and parks, all of which contain natural turf areas that require landscape irrigation. A potential water mitigation offset measure would be for the Project to install low-flow irrigation systems in the landscaped areas of the City's parks and recreational playing fields. There are at least six parks or recreational facilities with youth sports fields totaling more than 100 acres in the City of Ridgecrest according to the City's Park and Recreation Department (City of Ridgecrest 2010). The main water usage by the department is summarized as follows.

Table 3-1 Summary of Water Usage City of Ridgecrest Recreation and Parks Department

Facility	Facility Description	Facility Size	Annual Water Usage
Freedom Park	Open Turf	19.8 acres	Not Listed by the City of Ridgecrest
Jackson Sports Complex	Softball fields, soccer fields, and tennis courts	56 acres	36 afy
Kerr McGee Youth Sports Complex	Five baseball fields and one football field	11.7 acres	11 afy
Pearson Park	Playground with basketball courts and lawn with trees	4.5 acres	4 afy

Table 3-1 Summary of Water Usage City of Ridgecrest Recreation and Parks Department

Facility	Facility Description	Facility Size	Annual Water Usage
Upjohn Park	Combined playground, basketball courts, and lawn	6 acres	4.5-afy
Hellmers Park	Lawn and trees	5 acres	5 afy
Roadway Medians in Ridgecrest	Landscaped roadway medians	Not provided by City	3 afy
Pinney Community Swimming Pool	Recreational swimming pool	Not provided by City	Not provided by City

Although there are about 64 afy of water offset through the parks and other landscaping, according to the Parks and Recreation Department, most of the sprinklers already installed at these facilities are low-flow or water efficient systems (City of Ridgecrest 2010). Mr. Ponek, the Director of the Ridgecrest Parks and Recreation Department, indicated that the toilets and showerheads at the recreational facilities have not been upgraded with low-flow devices, but the toilets and showers are not heavily used and upgrading to low-flow would not likely create significant water savings. It is Mr. Ponek's opinion that unless parks and medians are closed or turf and landscaping is removed, a significant savings in water usage does not seem possible.

The community of Ridgecrest is in need of additional recreational facilities with one more regulation football field, four more baseball fields, two more softball fields, and two additional soccer fields (approximately 35 acres total) possibly being added by 2015 (Ponek 2010). While these might be candidates as future mitigation options, the City would likely require low-flow systems in the development, and as such, even if the Project would fund the installation there would not be a net savings in water to the Basin.

3.1.2 City of Ridgecrest Government Facilities Landscaping

Another potential water mitigation offset measure would be for the Project to replace the existing irrigation system with low-flow irrigation systems in landscaped areas of government facilities of the City of Ridgecrest. This would include landscaped areas at facilities such as City Hall and public school district (Sierra Sands Unified School District). The amount of landscaped area is approximately 23.2 acres (USGS 2009).

3.1.3 Kern County Government Facilities Landscaping

Kern County government facilities within the City of Ridgecrest include the Kern County Administrative Northeast Center, which includes the Superior Courthouse Building, County Administrative Building, the Ridgecrest Public Library, and Kern County Fire Station 74. The landscaped area for this complex of buildings is approximately 1.25 acres (USGS 2009). Kern County Fire Station 77 has a small natural turf lawn which is included in the acreage for the Kern County Administrative Northeast Center complex. These county facilities are landscaped with natural grass lawns and could be replaced with low-flow irrigation systems. The amount of water saved by converting to low-flow irrigation would create an offset amount available to the Project.

3.1.4 Feasibility of Low-Flow Irrigation as a Water Mitigation Option

Though some water savings is possible through the conversion at City or County government facilities, the amount of savings through implementation of a low-flow irrigation program is minimal, being less than 30 acres. As such, implementation of a low-flow conversion would not yield sufficient volume to

offset the entire water volume of 215 afy. At this time, there does not appear to be potential offset through the Parks and Recreation Department, as landscaping for those facilities has already been converted to low-flow irrigation.

The option should only be considered as part of a combination of options to address the full volume of yearly offset for the Project. Any consideration of this option in the future would depend upon implementation of one or more of the following more viable options that would appear to yield significantly higher volumes of water. It is important to note, that some of the landscaping mentioned above would be eligible for the xeriscaping program as described in Section 4.0. As the installation of low-flow irrigation systems is a subset of and an integral part of a xeriscaping program, some of the landscaping mentioned above would be eligible, and should be considered for the "cash for grass" program as described in Section 4.0.

3.2 Artificial Turf

Advertisements by manufactures of artificial turf list the "low cost" of maintenance and the "low water-requirements" among advantages of artificial turf over natural grass turf. However, maintaining synthetic turf systems is not as inexpensive or labor-free as the manufacturers would have prospective buyers believe, according to athletic turf managers at a Synthetic Turf Maintenance Seminar (Fouty 2005).

Synthetic turf fields require periodic watering to clean the playing surface as part of the normal maintenance as recommended by the Synthetic Turf Council (STC 2007). However, outdoor artificial turf fields tend to get very hot from exposure to sunlight to the extent that water is needed to cool the playing surface in order to avoid injury to players. According to a heat study of artificial turf surfaces versus natural turf surfaces by Brigham Young University (Williams and Pulley 2002), surface temperatures of artificial turf are substantially higher than temperatures of natural turf, such that constant wetting was necessary to lower temperatures in order for play to continue on artificial turf fields (e.g., football & soccer).

Williams and Pulley (2002) measured the surface temperatures of the artificial turf playing field that the University uses for sporting events as well as the temperature for other surfaces. Some of their key observations of artificial turf are summarized as follows

- The hottest surface temperature recorded on an artificial turf surface was 200°F on a day when the highest ambient air temperature measured for the day was 98°F.
- Irrigation of the artificial turf surface significantly cooled the surface from 174°F to 85°F; however, after 5 minutes, the surface temperature rebounded to 120°F and by 20 minutes later, the surface temperature had rebuilt to 164°F.
- The amount of sunlight has greater impact on the surface temperature of artificial turf than the air temperature. In October, when the air temperature was 80°F, the artificial turf surface temperature reached 112° F.

The Williams and Pulley study concluded that the heating characteristics of artificial turf make cooling the surface during sports events a priority. The study led the Safety Office at Brigham Young University to establish a surface temperature limit of 120°F as maximum temperature that surface could reach before measures were taken to cool the playing surface (when the surface temperature reaches 122°F, it takes less than 10 minutes to cause injury to skin). Williams and Pulley (2002) noted that heat control added significant cost to the maintenance budget for artificial turf fields.

Synthetic turf fields generally incorporate an efficient drainage system beneath the playing surface to divert runoff during heavy rain events and when the surface is cleaned. Without the drainage system, moisture build-up in the infill of the synthetic turf would foster mold and mildew growth, which would

shorten the life span of the synthetic surface and potentially cause adverse health effects among users of the playing fields. Unfortunately, the same drainage system would shorten the water retention time of the artificial turf field as water is added to cool the playing surface. Thus, the artificial turf drainage system would require more water to keep the playing surface within tolerable temperatures (below 120°F).

The volume of water that was used to cool an artificial turf field during the course of a year was not quantified in their study, and would be expected to be variable based on climatic conditions.

3.2.1 Quantity of Landscape Available

This option entails the replacement of selected portions of the natural turf at the City's recreational facilities. The amount of landscape that would be available to replace is the same area or acreage of City parks and facilities shown on Table 3-1.

3.2.2 Feasibility of Artificial Turf as a Water Mitigation Option

Replacing natural turf with artificial turf at the City of Ridgecrest's recreational facilities may result in some savings in the annual amount of water that is used by comparison to natural turf, but because of the potential need to use water to cool the surface of synthetic turf (especially in a desert environment such as Ridgecrest), it is difficult to quantify the amount of water savings.

As with the low-flow irrigation option, the combined acreage of natural turf at the City's recreational facilities is insufficient to provide the full offset volume (215 afy), and as such, the option would need to be part of several other alternatives to meet the offset objective. Further, with the Project start of construction scheduled to begin in late 2010, it is unlikely that conversion to artificial turf fields could be accomplished before Project construction activities begin.

Given the uncertainty in the actual water savings due to the maintenance requirements during the hotter summer months, the potential for injury and the limited acreage for replacement of turf, artificial turf is not considered a viable alternative at this time to offset the Project water supply. This option may be considered in the future depending upon the successful outcome of implementation of more favorable options.

3.3 Fallowing of Agricultural Land

In an agricultural fallowing program, a landowner is paid an annual fee to not grow crops on a specific acreage of land that otherwise would have been irrigated; this produces a volume of "Saved Water". This water can then be used for other purposes. The fallowing is generally rotated between tracts of land, with no tract of land being fallowed for more than five years. The minimum size of each tract of land is generally considered to be five acres. The fee paid to the landowner, is based on the value of the crop that would have been cultivated. Following the model used by the Palo Verde Irrigation District (PVID) for fallowing of agricultural land in the Blythe area, the steps to implement a fallowing program include identifying a willing landowner, establishing a water factor per acre of land fallowed (e.g., 5.1 af per acre as for alfalfa), and developing a lease agreement that would establish the term of the fallowing and crop rotation, payment terms entry, inspection privileges and means to verify that the water is not being used for other purposes.

3.3.1 Quantity of Agricultural Land Available

Several crops are grown in the communities of Inyokern and Phelan, which are near Ridgecrest. Over 970 acres of alfalfa, more than 288 acres of pistachios, and slightly more than 2 acres of tomatoes are grown in this area as shown in **Figure 3**. As noted in Section 1.3, Brown Road Farming north of the

Inyo-Kern Airport is the largest water user in the Basin, representing about 30 percent of the total volume of all the major water users since 1975.

3.3.2 Feasibility of Fallowing as a Water Mitigation Option

With the amount of land in which alfalfa is grown in the communities near Ridgecrest, there is sufficient land such that fallowing part of the land would mitigate the full potential impact to groundwater supply as a result of water use by the Project. Fallowing agricultural land is a mechanism that has been used successfully by the PVID in Riverside County to generate groundwater savings that can offset the water use required for other purposes in the Palo Verde Valley Groundwater Basin.

With the implementation of the option, the full volume of the offset could be realized, and through successful negotiation, the option could be brought online in time for the start of the construction program. As a result, fallowing agricultural land is a feasible option to mitigate the impact to groundwater resources in the Basin and will be carried forward as a plan option.

3.4 Xeriscaping of Residential Properties

Xeriscaping or “cash for grass” is a viable mitigation option that can meet the Project water supply offset requirements. The IWV Water District has indicated their interest in establishing a cash for grass water-smart landscaping program for the residents within their district, which includes the City of Ridgecrest (IWV Water District 2010b). The IWV Water District is reviewing elements of xeriscaping and has indicated their cash for grass program would incorporate elements from AWAC as well as elements of the cash for grass program initiated by SNWA.

Addink (2005) noted that “Good landscape water management is more important than plant material change.” His assessment indicated that a majority of the water savings in the Albuquerque, Las Vegas, and North Marin studies may be attributed to more efficient irrigation practices. Factors such as plant spacing, vegetation coverage, plant size, and growth rate can be more important determinants of water use than plant selection.

3.4.1 Quantity of Landscaping Available for Xeriscaping

To develop an estimate of landscaping within the Basin that could be included in a cash for grass program, AECOM used digital aerial photographs from the US Geological Survey (USGS) High Resolution State Ortho-imagery for Kern County, California and geographic information system software to create polygons representing natural turf lawns or playing fields over a representative area within the City limits of Ridgecrest. For each lawn or natural turf displayed in the aerial photographs, a polygon was created that represents the area of landscaping. Polygons were aggregated by land-use type within the City of Ridgecrest, under residential, commercial and industrial properties. The sum of the turf area was divided by the total area of the property to produce the percent coverage within each land use type. This percentage was then multiplied by the total area of each land use type to develop an estimate of the total acreage of landscaped area with natural turf for each land use type in the City of Ridgecrest. **Figure 5** shows the distribution of land use types within the City that were used to estimate the available acres of turf that could be converted to xeriscape.

In **Table 3-2**, the “Sample Acres” category is the area of a land use that was used to calculate the percentage. “Sample Lawn” category is the acreage of lawns within the sample area (Note that the rural sample area is larger than the rural acreage, this is because the sample was located out of the City of Ridgecrest city limits). Actual acreage is the number of acres in the City of Ridgecrest for that land use category (from the City of Ridgecrest General Plan). Lawn acreage is the actual acreage multiplied by the percent lawn.

Table 3-2 Estimate of Turf Acreage within the City Of Ridgecrest

Land Use Category	Sample Acres	Sample Lawn	Percent Lawn	Actual Acreage (acres)	Lawn Acreage (acres)
Residential					
Rural	817.41	2.05	0.25%	664	1.66
Estate	68.73	4.66	6.78%	700	47.48
Low Density	77.14	7.79	10.10%	2659	268.58
Medium Density	51.93	2.27	4.37%	675	29.49
Nonresidential					
Commercial	53.37	3.49	6.55%	2101	137.54
Industrial	76.88	0.15	0.20%	210	0.42

From this assessment, the following information was found:

- Total turf acreage – 485.17 acres;
- Total turf residential – 347.21 acres; and
- Total turf commercial/industrial – 137.96 acres.

The amount of natural turf landscaping in the City of Ridgecrest that is potentially available for conversion to xeriscaping is estimated to be approximately 485 acres. This represents the combined total for residential and nonresidential (i.e., commercial and industrial) land use in the City.

Using 215 afy as the basis for the annual volume of water to be offset and 56 gallons per square foot as the amount of water that can be saved by conversion from turf to xeriscape, an estimated 29 acres of turf would need to be converted. Assuming 2,000 square feet per residence (IWV Water District 2010c), this equates to total of about 625 homes in the City. This number of participating households is equivalent to about 10.1 percent of the 6,191 owner-occupied households in Ridgecrest (Ridgecrest Demographics 2010). This does not include multi-family dwellings or households that are leased or rented in Ridgecrest.

From this assessment, there appears to be available acreage to convert turf to xeriscape within the City to meet the yearly offset volume of 215 afy.

3.4.2 Feasibility of Xeriscaping as a Water Mitigation Option

Implementation of a xeriscaping program has the potential to meet the required offset volume for Project water use. It is not probable that the entire volume would be offset by the start of construction or several years following the start of construction based on the experience of other programs. For example, in the case of the SNWA program, residents have up to six months to convert to xeriscape landscaping (with accompanying installation of low-flow irrigation system) from the time in which the resident submits the application to enroll in the Cash for Grass Rebate Program. Although there would be financial incentive induced by the Project to convert from turf to xeriscape, it would be anticipated that homeowners in the Ridgecrest area would also participate in the program at a similar rate.

As an outdoor water conservation program, the conversion to xeriscape program has one of the lowest assumed customer acceptance percentages (five percent) according to Addink (2005). In a survey of 1,800 residential homeowners in Phoenix, for example, Addink notes that "70 percent of the homeowners preferred a landscape dominated by the color green that had at least some lawn area." In Utah, "citizens have a passion for green lawns with gardening as the number one hobby in the state" (Addink 2005).

While there would be a lag in the final implementation of the offset using a cash for grass program, the option would ultimately lead to the required savings and this savings would extend beyond the lifetime of the Project. For this reason, the cash for grass program is being retained and included in the plan for offsetting the Project water supply.

3.5 Water from the LADWP Aqueduct

If water can be provided for the construction supply to the Project, it would represent an outside source of water brought into the Basin. The application process includes initial approvals from the Aqueduct Manager and subsequent development of an agreement and access conditions to the aqueduct through the Bishop Real Estate Office and Mojave Superintendant. Because the option has the potential to provide the full water volume for construction, and potentially in a timely fashion, it is being pursued as a feasible offset option. Analysis of the connection and conveyance required to bring the water to the Project or serve as an offset within the Basin is not known at this time and will be considered upon successful application for a connection.

3.6 Tamarisk Removal

As noted in Section 2.0, the purpose of a Tamarisk Removal Program would be to provide for an additional mechanism to offset water supply by the Project. This component not only provides benefits to the groundwater system, but also provides a substantial biological benefit by removing an invasive species that out-competes native vegetation and alters the natural desert ecosystem functions and values by converting the habitats into monocultures void of the diversity that supports native flora and fauna populations.

3.6.1 Tamarisk Population

The known locations in eastern Kern County and Inyo County with significant Tamarisk locations are shown on **Figure 2**. As noted in Section 2.3, a total of 800 trees would be required to be removed in order to meet the project water supply offset under an assumption that each tree consumes 250 gallons of water per day. In consultation with the Bureau of Land Management (Glenn Harris 2010), there are insufficient numbers of tamarisk trees in the Indian Wells Valley Groundwater Basin to make a significant difference in the offset volume for the Project.

3.6.2 Feasibility of Tamarisk Removal as a Water Mitigation Option

As a result of an absence of significant population, the full amount of water offset for the Project cannot be realized. As such, exploration of a Tamarisk Removal Program is not a feasible option and is not carried forward at this time. This option may be considered in the future in conjunction with other programs should the total water savings goals not be achieved.

3.7 Summary of Feasible Options for Offsetting Project Water Supply

Table 3-3 below provides a summary of the feasibility study of potential options for offsetting the Project water supply. The options being carried forward into the Plan are those that have the potential to completely offset the water supply in a reasonable time frame following initiation of construction activities. Options such as low-flow irrigation and tamarisk removal are suitable for only a portion of the

required offset and as such may be considered in the future if required as one or more of the more robust options prove infeasible.

Table 3-3 Summary of Feasibility Study of Potential Offset Options to Mitigate Project Water Supply

Offset Option	Capable of Fully Meeting Project Water Supply (215 afy)	Option Implementable at the Start of Construction	Option to be Considered Further and Incorporated in Mitigation Plan
Low-Flow Irrigation	NO	YES	Option retained for future consideration. Possibly implemented through "cash for grass", as it is a subset of that program.
Artificial Turf	NO	NO	Option not being retained for consideration.
Tamarisk Removal	NO	YES	Option retained for future consideration as needed to supplement primary options.
LADWP Aqueduct	YES	UNCERTAIN[1]	Option included in Plan as a primary option.
Fallowing of Agricultural Land	YES	YES	Option included in Plan as a primary option.
"Cash for Grass" - Xeriscaping	YES	YES	Option included in Plan as a primary option.

Notes
1 – At this time, it is not clear on the period required to secure a connection.

4.0 Proposed Mitigation Offset Plan

From the feasibility study of potential options, the following were selected to be the initial focus of the water supply offset plan:

- Water Supply through the LADWP;
- Xeriscaping ("cash for grass") of residential and commercial landscaped areas; and
- Fallowing of agricultural land within the Basin.

Options such as low-flow irrigation and tamarisk removal will be considered as necessary depending on the outcome of the implementation of the construction water supply through the LADWP aqueduct, xeriscaping program though the IWV Water District or agricultural fallowing. These options may be implemented to make up the difference should one or more of the primary options not be realized.

The above portfolio of mitigation measures either solely or in combination is expected to provide enough water to meet the required offset of 215 afy. Table 4-1 summarizes the contribution expected from each measure.

Table 4-1Summary of Water Savings Potential - Primary Water Offset Options

Offset Option	Potential Water Savings
Water Supply through the LADWP Aqueduct	1,500 af for construction water only.
Xeriscaping of Residential and Commercial Properties	215 afy, assuming 56 gallons per square foot savings by replacing turf with xeriscape. At this savings rate about 29 acres of turf would need to be converted; 29 acres represents about 6 percent of the estimated acreage (485 acres) in the City.
Fallowing of Agricultural Land	215 afy, assuming fallowing of alfalfa and a water use rate of 5.1 afy/acre. At this usage rate, about 42 acres are required on an annual basis; 42 acres is about 4 percent of the more than 970 acres of alfalfa grown within the Basin. Much of this acreage is farmed along Brown Road.

At this time, all the options discussed in the following subsections are being pursued equally as viable alternatives to further understand their implementability in meeting the Project construction start date and water offset requirement. Should one or more options prove to be feasible, a multi-option approach may be undertaken and the plan will be updated to reflect apportionment of the water supply between one or more options.

4.1 Water Supply from the LADWP

Access to the aqueduct would provide water from outside the Basin to offset water supply for construction of the Project. The application and approval process requires initial approval of the Project

as a “public works” project through an initial contact with the Aqueduct Manager in Bishop, California. Following approval by the Aqueduct Manager, the application process is managed by Bishop Real Estate Office and the Mojave Superintendant, who will establish the terms and requirements of the agreement, location of the connection, size of connection and required service.

Ridgecrest Solar I, LLC has initiated contact with the Aqueduct Manager though a formal letter of request has not been provided. Further details leading to an understanding of the viability of this option and a schedule for implementation are not yet provided but will be when they are understood.

4.2 Xeriscaping of Residential Landscapes

The IWV Water District is currently in the process of developing a Cash for Grass Rebate Program for the City of Ridgecrest. The program consists of converting residential and commercial areas landscaped with grass/turf and replacing them with xericscape. The IWV Water District plans to model their program after the cash for grass program by the AWAC (IWV Water District 2010c). The AWAC cash of grass program details are summarized in Appendix A.

To meet the required offset volume, the Project would underwrite a portion of the xeriscaping program as planned by the IWV Water District to the 625 homes needed to offset the water supply. In providing this support, the Project would offer financial incentives to the property owners within the City to convert their landscape. The administration and monitoring of the implementation would be performed by the IWV Water District. Initial discussions between RSPP and the IWV Water District have begun to determine how the Project can participate in the implementation of the cash for grass program. The schedule for implementation of the program is planned following receipt of the license from the CEC and to be coincident with the initiation of the Project construction.

To assess the effects of water-use savings and to verify the quantity of water that is offset as a result of conversion to a xeric landscape, pre- and post-xeric conversion water consumption monitoring would be performed. For each participating property, monthly consumption data provided by IWV Water District would be summed to get annual and average monthly consumption values for each year from the five years before conversion (or as many records as are available) and for each year thereafter following post-conversion.

In return for the cash rebate incentive for converting to xeric landscape, the residents would need to agree to ongoing monitoring of their xeric landscape water consumption. This would be accomplished in two ways:

1. Main water meter data would be taken from normal monthly meter reading.
2. Residents would agree to install a sub-meter that monitored irrigation consumption on the xeric landscape only. Sub-meters would be read monthly, as with main water meters.

Annual consumption on a per area basis would be calculated for participating properties. This is accomplished by summing the monthly consumption values for each sub-meter and dividing by the measured area of the xeric landscape. In this way, accurate measures of consumption for each xeric landscape could be measured on a property-by-property basis.

Based on the monitoring program, a continuous assessment of the water savings would be provided that can be used to evaluate the total savings against the require offset on an annual basis. These data can be used to identify if a sufficient number of homes or commercial properties have been included in the program to meet the required offset volume. As the amount of irrigation is directly related to precipitation and ET rates, it is proposed that the total volume of water saved be estimated on an annual basis and that additional properties (or square feet of landscaping) that would be needed to meet the required offset be estimated on running average from all the annual estimates calculated to date.

Further, it is proposed that upon the water savings meeting the required volume, monitoring be conducted for a period of five years to ensure that the annualized water savings continues to exceed the required offset.

To manage properties that would choose to remove their xeriscape, it is proposed that through the agreement that would be required with the IWV Water District to implement, a condition be provided that if the xeriscape was removed the costs for installation, monitoring and administration up an to the date of removal be levied to the property owner.

4.3 Agricultural Fallowing

The fallowing program would focus on alfalfa crops that are grown by Brown Road Farming on over 970 acres of farmland north of Inyokern, approximately 12 to 16 miles north of the Project site. The proposed plan would be similar to the agricultural land fallowing program that is currently in use by the PVID in the County of Riverside and the City of Blythe in the Palo Verde Mesa Groundwater Basin.

A land fallowing program would include some or all of the following elements:

1. Meet with the Brown Road Farming landowner(s) and determine if they would be willing to participate in the fallowing program;
2. Establish a “water factor per acre” to determine the acreage of land that will need to be fallowed to obtain the required volume of water. (PVID/Metropolitan Water District [MWD]) has established a single “water factor per acre” for their fallowing program in the Palo Verde Valley/Palo Verde Mesa area.) For the Basin, a determination should be made on using a single “water factor per acre” or using one that is crop specific for the Ridgecrest area. (For the South Lahontan Basin area, which includes the Indian Wells Valley Groundwater Basin, the average alfalfa crop water use is about 5.1 afy per acre [DWR 1986]).
3. Develop contracts/lease agreement with the property owner that, include but are not limited to the following provisions:
    a) Establish what land is suitable for inclusion in this program. Suitable land would be that which has historically been used for agriculture (alfalfa) and previously irrigated and would be irrigated if not included in this program.
    b) Establish the total acreage to be fallowed and the crop rotation.
    c) Establish the minimum size of each parcel that could be fallowed (i.e., minimum of a 5-acre parcels to make up total acreage to be fallowed).
    d) Establish the time frame for each parcel of land to be fallowed, before rotation to reuse.
    e) Establish conditions granting rights of entry for inspection purposes, to confirm the land has been fallowed.
    f) Establish non-assignment of unused water (i.e., landowner acknowledges that it does not have the right to, and shall not transfer or assign (by lease, license, grant or any other form of agreement) any rights the Saved Water that is developed through the Fallowing pursuant to this contract/lease agreement).
    g) Establish a method of verifying the water saved is not being used for other purposes or by other entities.
    h) Establish a payment schedule for the length of the Program.

The proposed land fallowing program would include the IWV Water District in the agreement (similar to the role that the MWD plays in the PVID fallowing program) in that water use would be monitored on a

monthly and annual basis by the IWV Water District to ensure that the annual water use by the grower does not exceed the negotiated water offset amount.

To ensure that land fallowed for water use offsets remains fallowed, a monitoring program will be implemented. The IWV Water District does not provide water for irrigation to all growers; therefore, there are no meters or other means for monitoring water use other than visual inspection of the properties to ensure that they are not being irrigated. The monitoring program should consist of site visits on a regular or periodic basis to visually verify that properties participating in the fallowing program are complying with their contract requirements. Visual verification can be through site visits and/or review of aerial photography.

To date there have been no discussions between RSPP and the Brown Road Farming landowner on how the Project can implement a fallowing program. The schedule for implementation of the program is planned following receipt of the license from the CEC and to be coincident with the initiation of the Project construction.

5.0 References

Addink, S., 2005, “Cash for Grass” – A Cost Effective Method to Conserve Landscape Water?, University of California Riverside – Turfgrass Research Facility. http://ucturf.ucr.edu/

AECOM, 2009, Application for Certification, Ridgecrest Solar Power Project, Ridgecrest, California.

Alliance for Water Awareness and Conservation (AWAC), 2009, Getting Started with Water-Smart Landscaping. http://www.hdawac.org/watersmartlandscaping/gettingstarted.htm

City of Ridgecrest Wastewater Treatment Department. 2010, personal communication from John Brackett – City of Ridgecrest Wastewater Treatment Department, January.

California Irrigation Management Information System (CIMIS), 2009, Reference Evapotranspiration Zone Map of California. http://wwwcimis.water.ca.gov/cimis/images/etomap.jpg

de Gouvenain, Roland C, 1996, Origin, History and Current Range of Salt Cedar in the U.S., Bureau of Land Management. http://www.invasivespeciesinfo.gov/ docs/news/workshopJun96/ Paper1.html.>.

Department of Water Resources (DWR), 1986, Bulletin 113-4: Crop Water Use in California, April.

eSSORTMENT, 2010, Introduction to Irrigation. http://www.essortment.com/home/irrigationintro_siqm.htm

Fouty, Amy, 2005, “A Sports Field Manager’s Perspective: Synthetic Turf Construction Considerations, Maintenance Costs & Concerns,” Michigan Sports Turf Managers Association’s Synthetic Turf Infill Seminar, Detroit, May 11. http://www.athleticturf.net/athletiturf/article/articleDetail.jsp?id=162975

Harris, Glen, 2010, personal communication from Glenn Harris of the Bureau of Land Management with AEOCM, February 2.

Indian Wells Valley Water District (IWV Water District), 2010a, personal communication from Renee Morquecho of the Indian Wells Valley Water District to AECOM, January 29.

-------, 2010b, personal communication from Lucinda Crosby – Conservation Coordinator for IWVWD to AECOM, January

-------, 2010c, personal communication from Tom Mulvhill, Director of Indian Wells Valley Water District to AECOM, January 13.

Indian Wells Valley Cooperative Groundwater Management Group (the Group), 2008, Indian Wells Valley Cooperative Groundwater Management Committee Water Conservation Public Advisory, June 19. www.iwvgroundwater.org/

Kern County Department of Agriculture (KCDA), 2009, The 2008 Kern County Agricultural Crop Report, County of Kern Department of Agriculture and Measurement Standards, June. http://www.co.kern.ca.us/kernag

Lovich, Jeffery E. Phd, 1996, A Brief Review of the Impacts of Tamarisk, or Salt Cedar on Biodiversity in the New World, National Biological Service. http://www.invasivespeciesinfo.gov/docs/

Palo Verde Irrigation District (PVID), 2010, MWD/PVID Fallowing Program. http://www.pvid.org/PVIDMWDProgram.html

Ponek, Jim, 2010, personal communication between Jim Ponek, City of Ridgecrest Director of Parks and Recreation Department with Solar Millennium,, LLC, January.

Ridgecrest Demographics, 2010, The Number of Owner-Occupied households in Ridgecrest. http://profiles.nationalrelocation.com/California/Ridgecrest/

Southern Nevada Water Authority (SNWA), 2009, Cash for Grass Water Use Savings, http://www.snwa.com/html/cons_wsl.html

Sovocool, K.A., Rosales, J.L., and Southern Nevada Water Authority (SNWA), 2001, A Five-Year Investigation Into The Potential Water And Monetary Savings Of Residential Xeriscape In the Mojave Desert, 2001 AWWA Annual Conference Proceedings, June. Washington D.C. Southern Nevada Water Authority, NV. http://www.snwa.com/assets/pdf/xeri_study_preliminary.pdf

State of Washington, 2009, Non-Native Invasive Freshwater Plants, Department of Ecology, State of Washington. http://www.ecy.wa.gov/programs/wq/plants/weeds/aqua013.html>.

Synthetic Turf Council (STC), 2007, Suggested Guidelines for the Maintenance of Infilled Synthetic Turf Surfaces, April. http://www.syntheticturfcouncil.org/displaycommon.cfm?an=1&subarticlenbr=69

Tetra Tech EM Inc. 2003, Groundwater Management in the Indian Wells Valley Basin, Ridgecrest, California, June (Figure 5-1, Past, Current and projected Water Use).

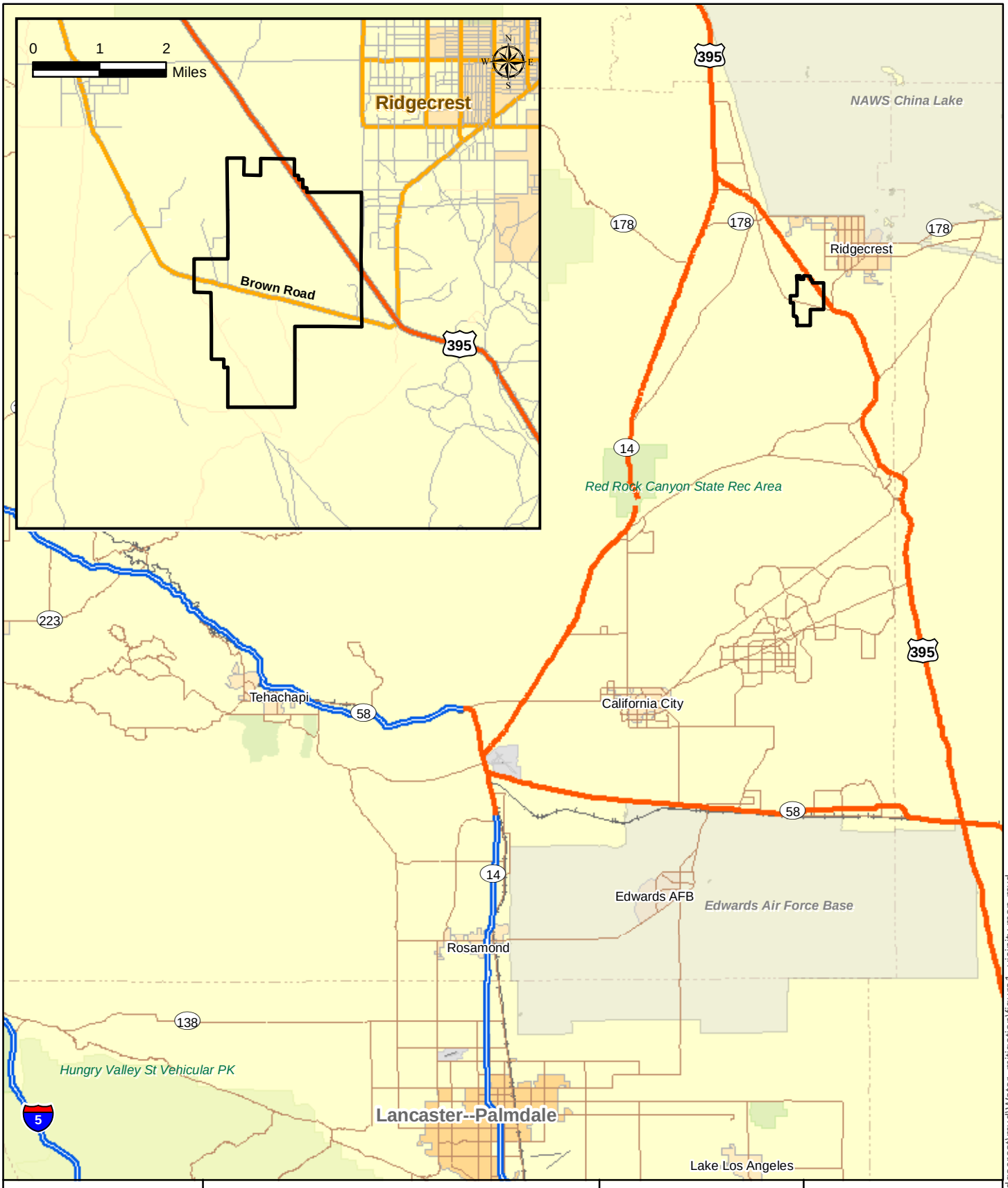
Western Region Climate Center (WRCC), 2010, Historical Climate for Climate Station 044278 (Inyokern, CA) and 264436 (Las Vegas WSO Airport). http://www.wrcc.dri.edu/

Williams, C.F. and Pulley, G.E., 2002, Synthetic Surface Heat Studies, Brigham Young University. http://aces.nmsu.edu/programs/turf/documents/brigham-young-study.pdf

U.S. Geological Survey (USGS), 2009, USGS High Resolution State Ortho-Imagery for Kern County, California.

U.S. Navy, 2008, Water Conservation Plan - Naval Air Weapons Station China Lake, NAWS China Lake Utility and Energy Management Branch, July.

Figures



Map Location

0 5 10
Miles

Ridgecrest Solar Power Project

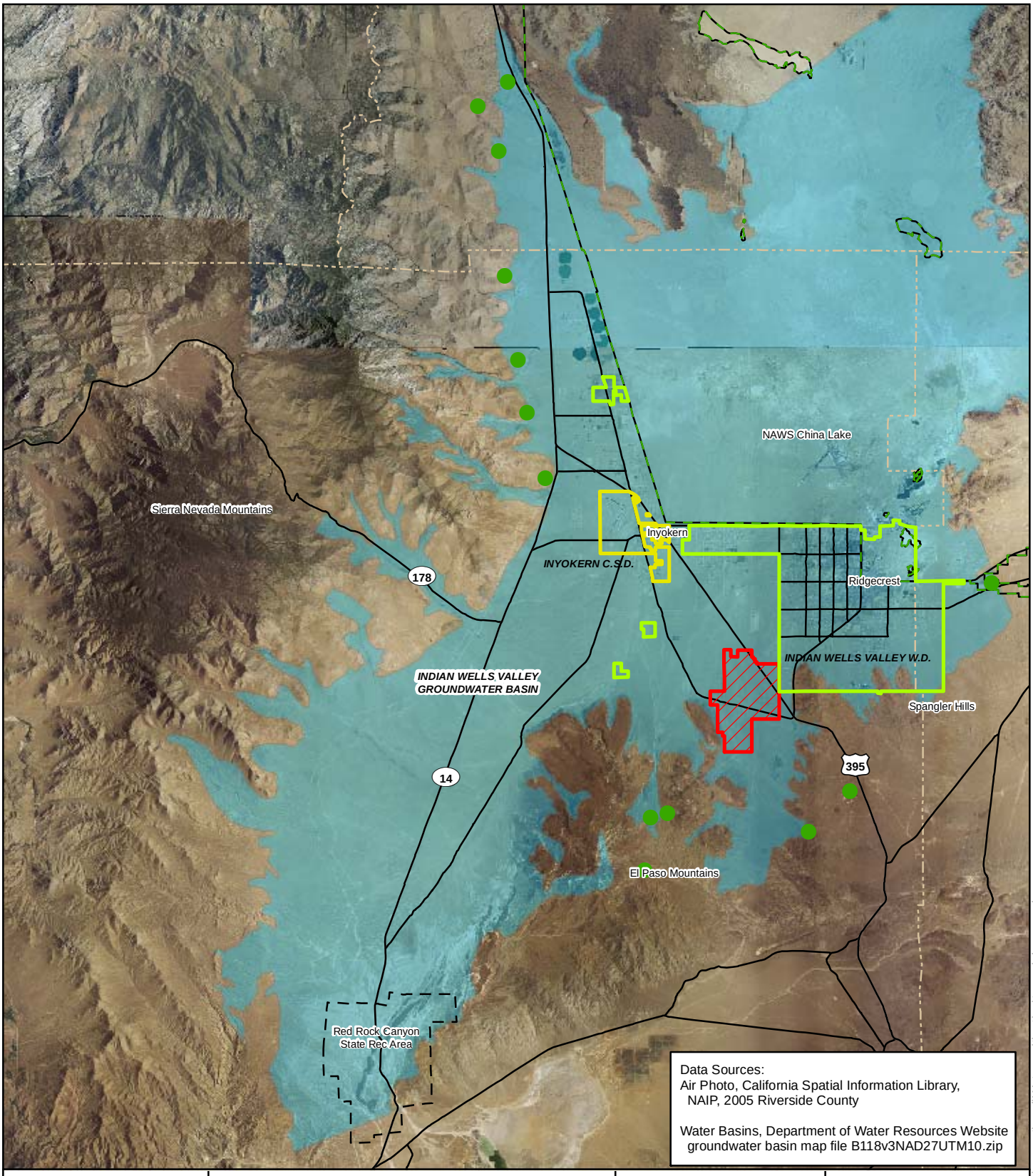
Figure 1
Regional Location and Vicinity Map

Solar Millennium

AECOM

Project: 60139696
Date: February 2010

J:\GIS\Projects\SolarMillinneum\Ridgecrest\mxd\Water_mitigation\figure1- vicinity map.mxd



Data Sources:
Air Photo, California Spatial Information Library, NAIP, 2005 Riverside County

Water Basins, Department of Water Resources Website groundwater basin map file B118v3NAD27UTM10.zip

Map Location

Legend

- Project Right-of-Way
- Inyokern C.S.D.
- Indian Wells Valley Groundwater Basin
- Indian Wells Valley Water District
- NAWS China Lake Boundary
- Approximate Location of Known Tamarisk (Source: BLM 2010)

0 4 8 Miles

N W E S

Ridgecrest Solar Power Plant

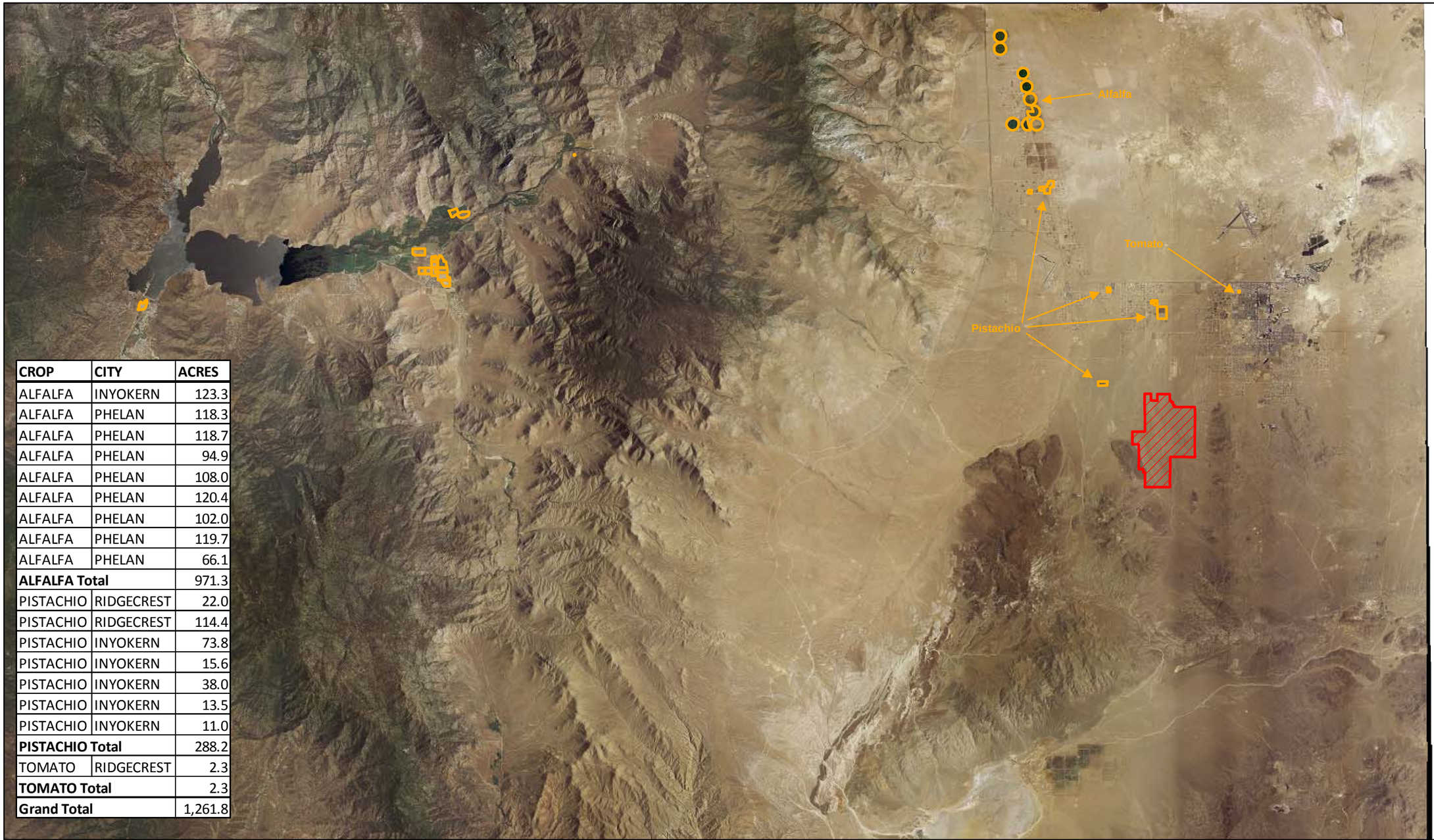
Figure 2
Known Tamarisk Locations in the Vicinity of RSPP

Solar Millennium

AECOM

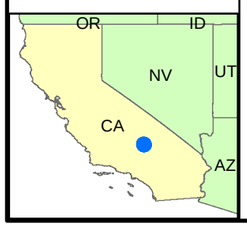
Project: 60139696
Date: February 2010

J:\GIS\Projects\SolarMillinneum\Ridgecrest\mxd\Water_mitigation\tamarisk-rev.mxd



CROP	CITY	ACRES
ALFALFA	INYOKERN	123.3
ALFALFA	PHELAN	118.3
ALFALFA	PHELAN	118.7
ALFALFA	PHELAN	94.9
ALFALFA	PHELAN	108.0
ALFALFA	PHELAN	120.4
ALFALFA	PHELAN	102.0
ALFALFA	PHELAN	119.7
ALFALFA	PHELAN	66.1
ALFALFA Total		971.3
PISTACHIO	RIDGECREST	22.0
PISTACHIO	RIDGECREST	114.4
PISTACHIO	INYOKERN	73.8
PISTACHIO	INYOKERN	15.6
PISTACHIO	INYOKERN	38.0
PISTACHIO	INYOKERN	13.5
PISTACHIO	INYOKERN	11.0
PISTACHIO Total		288.2
TOMATO	RIDGECREST	2.3
TOMATO Total		2.3
Grand Total		1,261.8

Map Location



4 0 4 Miles

1:253,440

Legend

- Project Right-of-Way
- Kern County Crop Land 2009

Data Sources:
Air Photo: California Spatial Information Library (CaSIL) NAIP, 2005
//casil.ucdavis.edu/casil/imagerybasemapslandcover/imagery/naip-2005/county_mosacis/kern
Permitted Crop Boundaries from Kern County Department of Agriculture, online at
http://www.co.kern.ca.us/gis/downloads.asp
and Measurement Standards
Basemap, (Roads, streams, cities), ESRI

Ridgecrest Solar Power Project

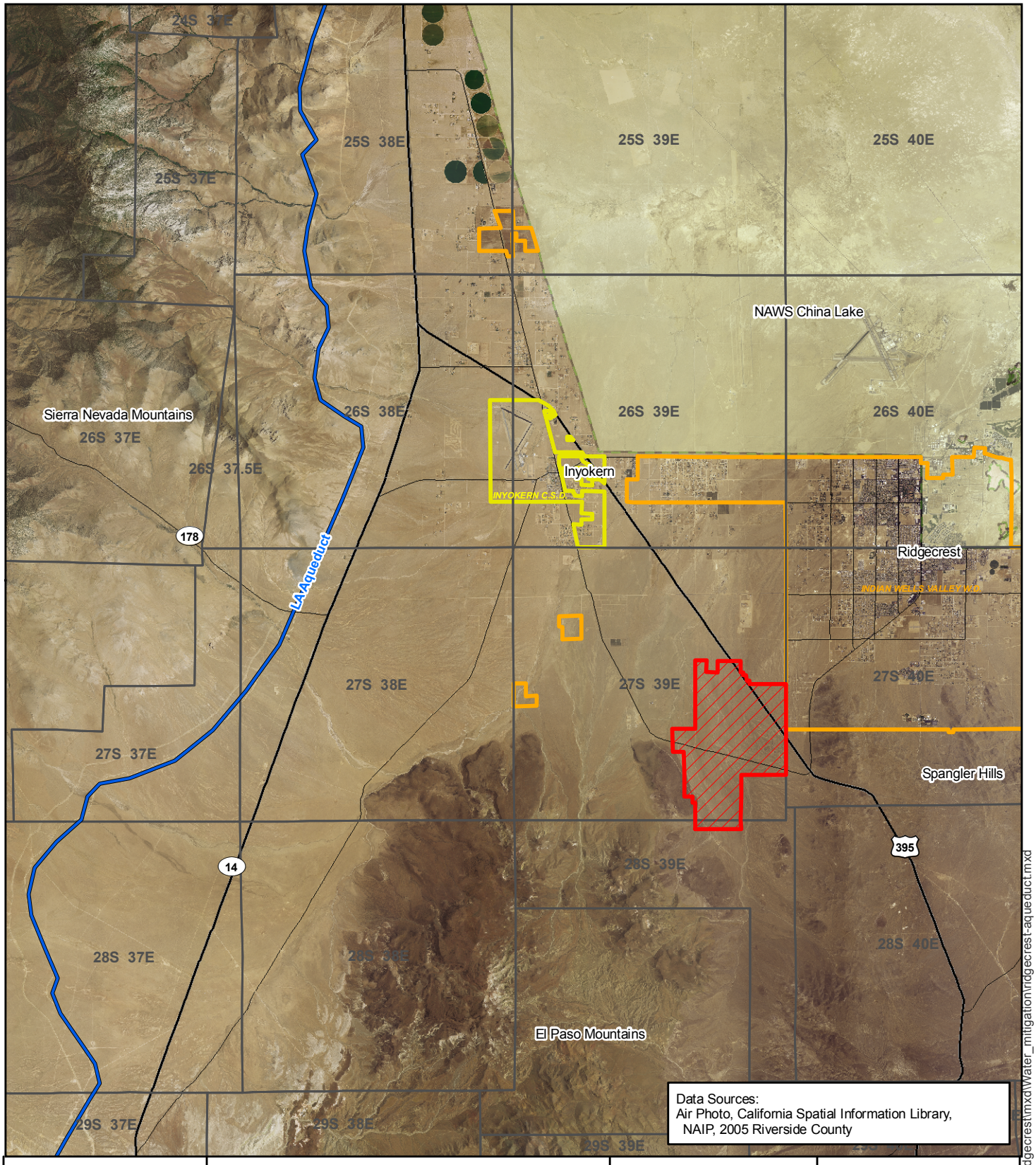
Figure 3
Ridgecrest Area Agricultural Resouces

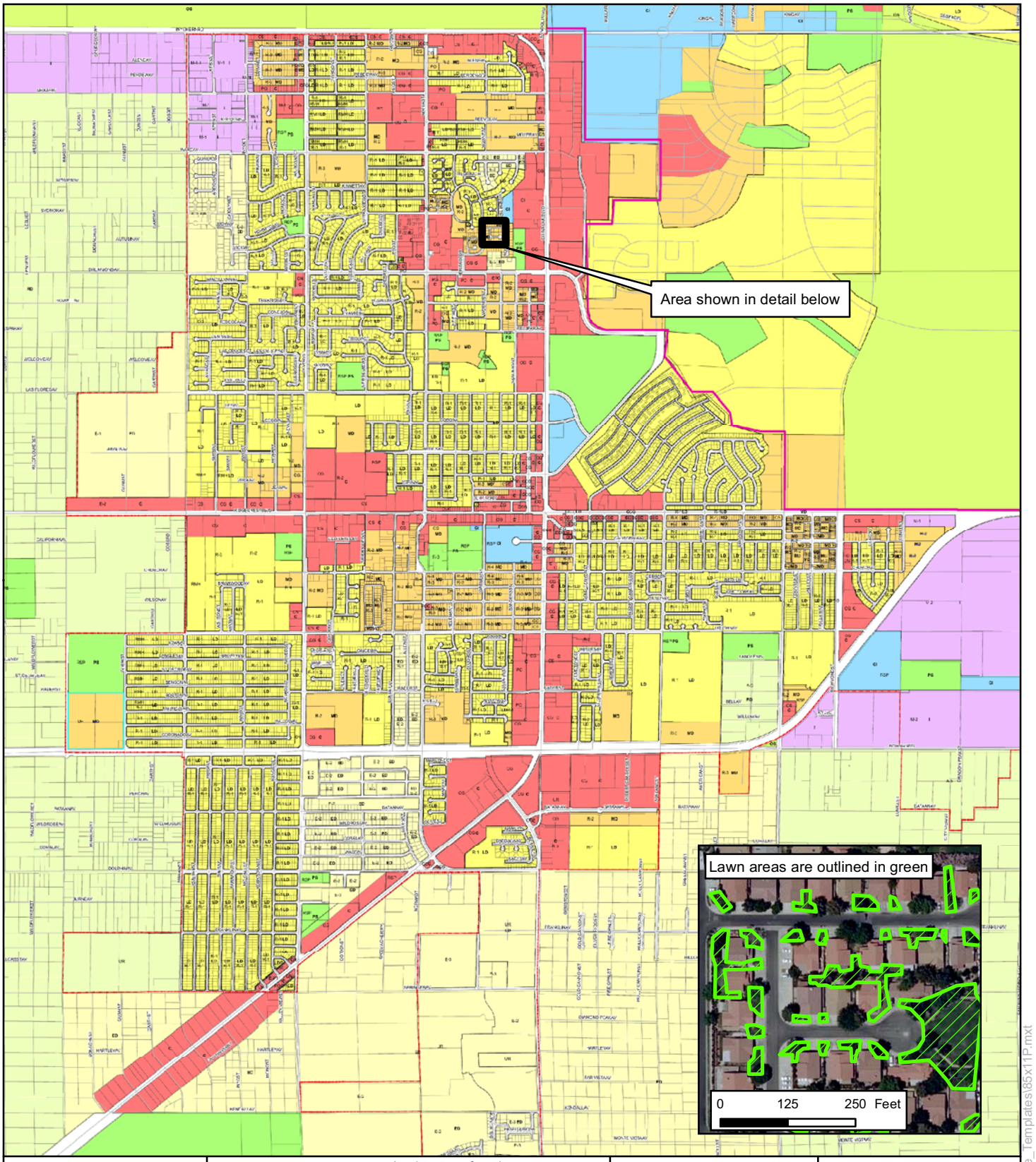
Solar Millennium

AECOM

Project: 60139696
Date: February 2010

J:\GIS\Projects\SolarMillinneum\Ridgecrest\mxd\Water_mitigation\ridgecrest-2009agland.mxd


24S 37E
25S 38E
25S 39E
25S 40E
25S 37E
NAWS China Lake
Sierra Nevada Mountains
26S 38E
26S 39E
26S 40E
26S 37E
26S 37.5E
Inyokern
INYOKERN C.S.D.
178
LA Aqueduct
Ridgecrest
INDIAN WELLS VALLEY W.D.
27S 38E
27S 39E
27S 40E
27S 37E
Spangler Hills
395
14
28S 39E
28S 37E
28S 38E
28S 40E
El Paso Mountains
29S 37E
29S 38E
29S 39E
Data Sources:
Air Photo, California Spatial Information Library,
NAIP, 2005 Riverside County
Map Location
OR
ID
NV
UT
CA
AZ
Legend
Project Right-of-Way
Township and Range
NAWS China Lake Boundary
LA Aqueduct
Indian Wells Valley W.D.
Inyokern C.S.D.
0
3
6
Miles
N
W
E
S
Ridgecrest Solar Power Project
Figure 4
Los Angeles Aqueduct Location Map
Solar Millennium
AECOM
Project: 60139696
Date: February 2010
J:\GIS\Projects\SolarMillinneum\Ridgecrest\mxd\Water_mitigation\ridgecrest-aqueduct.mxd



Map Location

Legend

General Plan

- RD=Rural Residential Density
- ED=Estate Residential Density
- LD=Low Residential Density
- MD=Medium Residential Density
- C=Commercial and Office
- I=Industrial
- CI=Civic and Institutional
- PS=Parks and Schools
- OS=Natural Open Space

Landuse types from the 2008 General Plan Map with Zoning as of January 1, 2008, found online at http://ridgecrest-ca.gov/uploadedFiles/Departments/Public_Services/Planning_Department/General%20Plan%20and%20Zoning%20with%20lots%201-2008%2030x42.pdf

N
W E
S

1 inch = 3,000 feet

0 3,000 6,000 Feet

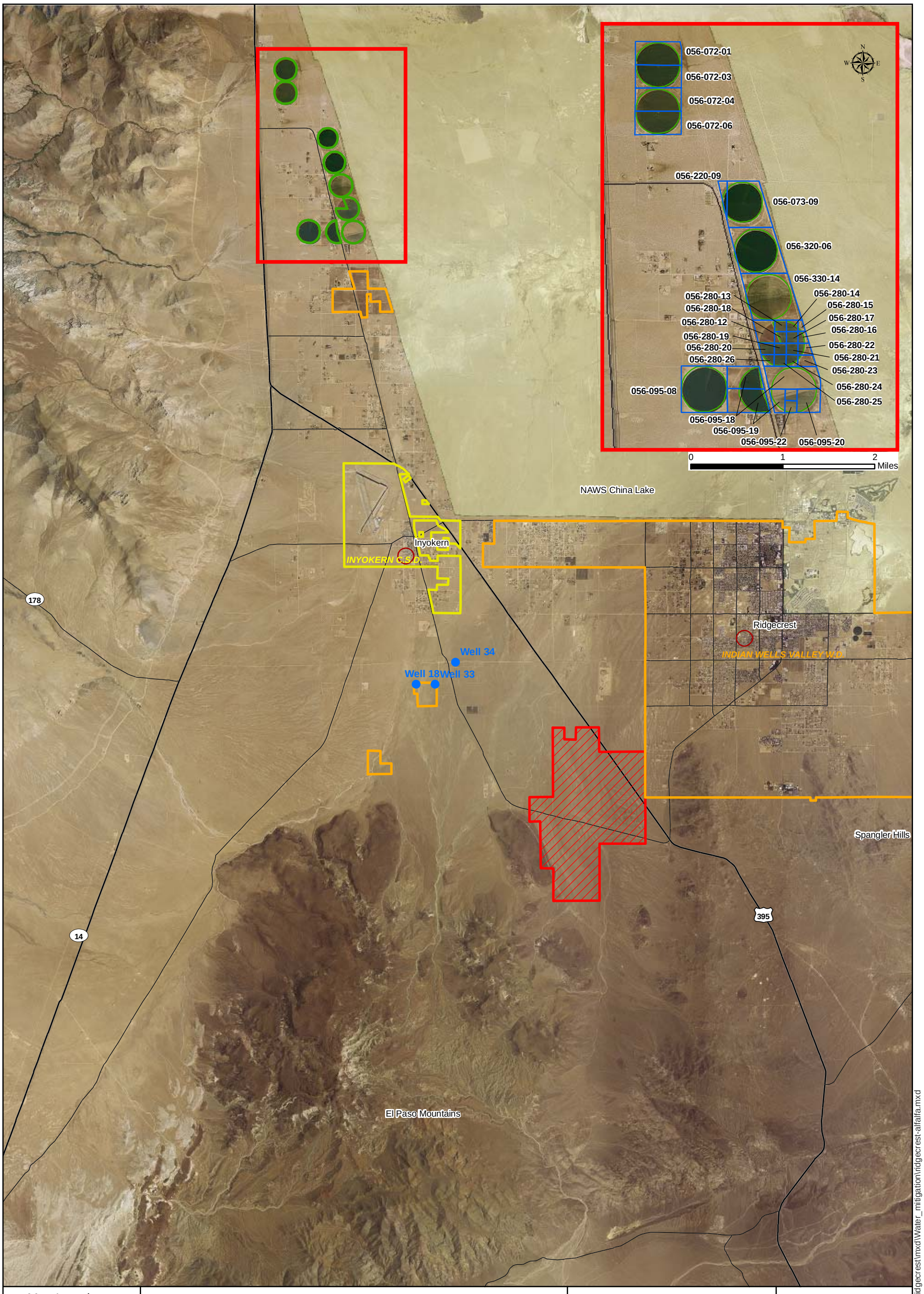
Ridgecrest Solar Power Project

Figure 5
Landuse for the City of Ridgecrest

AECOM

Project: 60139696-5230
Date: February 2010

Y:\Projects\Solar_Millennium\Figure_Templates\85x11P.mxt



Map Location

Legend

- Project Right-of-Way
- Parcel Boundaries
- 056-280-25 Parcel Number
- Alfalfa Field
- Indian Wells Valley W.D.
- Inyokern C.S.D.
- Geographic/Cultural Area of Interest
- NAWS China Lake Boundary
- Indian Wells Valley Water District Wells

0 2 4 Miles

Ridgecrest Solar Power Project

Figure 6
Parcel Numbers of Alfalfa Fields Near RSPP

Solar Millennium

AECOM

Project: # 60139696
Date: February 2010

J:\GIS\Projects\SolarMillinneum\Ridgecrest\mxd\Water_mitigation\ridgecrest-alfalfa.mxd

Appendix A

AWAC Xeriscape Program Details

The District plans to model their program after the “cash for grass” program by the Alliance for Water Awareness and Conservation (AWAC) (Personal Communication, Tom Mulvihill, January 13, 2010). The AWAC cash of grass program details are summarized below.

Eligibility Requirements

- Program application must be submitted and pre-approved by the District before any lawn is removed and before beginning the landscape conversion project.
- The District may require the participant’s presence during the site pre-inspection prior to receiving approval for the project.
- Areas to be converted must be living and maintained lawn.
- Residential landscape conversion limits - zero square feet (sq. ft.) up to 6,000 sq. ft. maximum.
- Commercial/Industrial/Institutional (CII) landscape conversion limits - zero sq. ft. up to 20,000 sq. ft. maximum.
- Applicant must participate in a post-inspection to receive final approval and sign-off of the landscape and irrigation system conversion.

Landscaping Requirements

- A minimum of 25 percent living plant coverage must be achieved within the converted area at plant maturity. This requirement will be determined during your pre-inspection.
- Plant lists are available through your local water district and the AWAC (www.hdawac.org).
- Remaining lawn areas are not considered as plant cover.
- Plants and lawn outside the converted area may be considered in the rebate calculation even if they are adjacent or overhanging into the area. This determination will be made during the pre-inspection.
- Impermeable surfaces that do not allow water to penetrate into the ground are not allowed. This includes concrete, plastic film used as landscape fabric, and all other non-permeable materials.
- Converted areas must be covered by a minimum 2-inch layer of permeable mulch.
- Mulches may include bark, rock, and un-grouted stepping stones.

Irrigation System Requirements

- Spray irrigation is not permitted in the landscape conversion area.
- If a spray irrigation system is currently being used, it must be converted to a low-volume drip system equipped with a pressure regulator, filter and emitters providing irrigation to new plantings.
- Each drip emitter must be rated at less than 20 gallons per hour (gph).
- If part of a lawn is converted, the sprinkler system must be properly modified to provide adequate coverage to the remaining lawn without spraying the converted area.

Rebate Amount and Details

- Rebate Amount - The AWAC cash for grass rebate amount is $0.50 per square foot for approved landscape conversions. Cash for grass rebate values are up to $3,000 for qualifying residential properties, and up to $10,000 for qualifying commercial, industrial and institutional properties. Rebate checks are issued within 60 days after the post-inspection to the billed customer named on the account.
- Rebate Terms - The terms of the agreement expire six calendar months from the date the District approves the application. The final inspection is not counted against the six-month time limit once the District has been notified that the project is complete. Only one rebate payment may be received under the agreement. The District reserves the right to reject or limit the number of applications being processed. Applications will be accepted on a first-come, first-serve basis and only while funding is available or until the program is discontinued.

Application Process

- Applications must be submitted to the District prior to commencement of any landscape conversions, otherwise the project will be ineligible for participation in the program.
- Applications are accepted on a first-come, first serve basis while funding is available.

Inspections

- Pre-Conversion Inspection - A pre-conversion inspection on the existing landscape will be conducted by the District. The application must be pre-approved before removing any lawn and beginning a conversion.
- Post-Conversion Inspection - Once the landscape project is finished, the owner is responsible for notifying the District to schedule a post-inspection. The post inspection will include taking photos of the converted landscape, obtaining converted landscape area measurements, irrigation system inspection, plant eligibility review for program compliance and rebate eligibility verification.

Conversion Sustainability Requirements

- The landscape conversion area must remain in compliance with all program conditions for a period of two years. If the landscaping is altered during this two year period, the participant may be required to refund some or the entire rebate if this requirement is violated. Landscape and plant maintenance, plant quality and appearance before, during, and after the conversion are the sole responsibility of the participant. This requirement is void upon property transfer of ownership

Copley, Elizabeth

From: Kingsley, Russ
Sent: Friday, February 12, 2010 11:13 AM
To: Copley, Elizabeth
Cc: Alice Harron; Billy Owens; Luttrell, Mark
Subject: FW: Solar Millennium Ridgecrest Solar Power Project

Elizabeth,

FYI - This e-mail should be docketed. - Russ

From: Glen Stephens [mailto:GlenS@co.kern.ca.us]
Sent: Tuesday, January 12, 2010 11:14 AM
To: Kingsley, Russ
Subject: Re: Solar Millennium Ridgecrest Solar Power Project

Russ, thanks for the update. I will wait for the additional information for the emergency generator (if you have a prospective manufacturer that information will be helpful). Also, do you have any additional information on pumps required for the solar fields, and electric motor horsepower required for the cooling tower (fans, pumps, etc.)?

Glen Stephens, P.E.
Kern County Air Pollution Control District
Phone: (661) 862-8687
FAX: (661) 862-5251

>>> "Kingsley, Russ" <Russ.Kingsley@aecom.com> 01/11/2010 6:36 PM >>>

Glen,

Will Walters over at CEC mentioned that you were getting close to finished with the PDOC for the RSPP. First of all, thank you for your effort – that is great! However, during the Data Request phase of the CEC review, CEC asked for some changes to the project and Solar Millennium made some changes. I think a couple of the changes impact your review, so I wanted to make you aware of them before you finalized anything.

The changes I know you need to know about are:

A new, larger emergency generator will be installed – the original application called for a 300 Hp generator, the project actually requires a 3,000 Hp generator (approx.) The larger engine is not really a revision – it simply reflects a more complete level of engineering – the original estimate of 300 Hp was a best guess, the new engine size is based on a thorough review of the pumps and motors that will have to operate during an emergency shutdown. We have prepared an application for the engine which is undergoing internal review – we should have it to you in a few days.

The CEC asked for a revision to the project layout so that a specific dry wash would not be impacted by the earthwork. Although this does not directly impact the emissions, it does impact the distance to the fence line and receptors for the health risk assessment and ambient air quality modeling. We are finalizing the risk assessment and modeling for submission to CEC in about 2 weeks; we will forward the relevant analyses to you when we have them prepared.

We made several other revisions that affect the emissions during construction and operations. These changes include:

- Model year 2013 emission factors for onsite, operational phase maintenance vehicle emissions
- Revisions to the vehicle travel distance onsite to reflect refueling requirements and refill requirements (for the mirror wash and soil stabilizer application trucks, amongst others)
- Revision to both construction and operating emission estimates to reflect site specific silt content of the soils (for entrained road dust fugitive emissions)

I don't think these changes impact your work, but I wanted to make you aware of them, just in case. If you want additional information on any of these changes, please let me know, we are happy to provide it.

Russell Kingsley

Program Manager

Environment

T 805.388.3775

Russ.Kingsley@aecom.com

AECOM

1220 Avenida Acaso, Camarillo, CA 93012

T 805.388.3775 F 805.388.3577

www.aecom.com

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION
For the *RIDGECREST SOLAR POWER PROJECT*

Docket No. 09-AFC-9

PROOF OF SERVICE
(Revised 2/4/2010)

APPLICANT
Nicole Tenenbaum
Senior Project Manager
1625 Shattuck Avenue, Suite 270
Berkeley, CA 94709-1161
tenenbaum@solarmillennium.com

Elizabeth Copley
AECOM Project Manager
2101 Webster Street, Suite 1900
Oakland, CA 94612
elizabeth.copley@aecom.com

Scott Galati
Galati/Blek, LLP
455 Capitol Mall, Suite 350
Sacramento, CA 95814
sgalati@gb-llp.com

Peter Weiner
Matthew Sanders
Paul, Hastings, Janofsky & Walker LLP
55 2nd Street, Suite 2400-3441
San Francisco, CA 94105
peterweiner@paulhastings.com
matthewsanders@paulhastings.com

INTERVENORS
California Unions for Reliable Energy (CURE)
Tanya A. Gulesserian,
Marc D. Joseph
Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard, Suite 1000
South San Francisco, CA 94080
tgulesserian@adamsbroadwell.com

***Desert Tortoise Council**
Sidney Silliman
1225 Adriana Way
Upland, CA 91784
gssilliman@csupomona.edu

INTERESTED AGENCIES
***Janet Eubanks, Project Manager,**
U.S. Department of the Interior
Bureau of Land Management
California Desert District
22835 Calle San Juan de los Lagos
Moreno Valley, California 92553
Janet_Eubanks@ca,blm.gov.

California ISO
e-recipient@caiso.com

ENERGY COMMISSION
JAMES D. BOYD
Vice Chair and Presiding Member
jboyd@energy.state.ca.us

***ANTHONY EGGERT**
Commissioner and Associate Member
aeggert@energy.state.ca.us

***Kourtney Vaccaro**
Hearing Officer
kvaccaro@energy.state,ca.us

Eric Solorio
Project Manager
esolorio@energy.state.ca.us

Jared Babula
Staff Counsel
jbabula@energy.state.ca.us

*indicates change

Public Adviser
publicadviser@energy.state.ca.us

DECLARATION OF SERVICE

I, Elizabeth Copley, declare that on February 19, 2010, I served and filed copies of the attached Ridgecrest Solar Power Project (Docket No. 09-AFC-9) Supplemental Data Response Information: for Cultural Resources, DR-CULT-105 and 262; for Soil & Water, DR-S&W 170-172; and January 12, 2010 email correspondence from Glen Stephens of the Kern County Air Pollution Control District. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at:

[http://www.energy.ca.gov/sitingcases/solar_millennium_ridgecrest].

The document has been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(*Check all that Apply*)

For service to all other parties:

__ sent electronically to all email addresses on the Proof of Service list;

X by personal delivery or by overnight delivery service or depositing in the United States mail at Oakland, California with postage or fees thereon fully prepaid and addressed as provided on the Proof of Service list above to those addresses **NOT** marked "email preferred."

AND

For filing with the Energy Commission:

X sending an original paper copy and one electronic copy, mailed and emailed Respectively, to the address below (preferred method);

OR

__ depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 09-AFC-9
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct.